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A STUDY OF THE PROGRESS MADE BY TWENTY-FOUR RETARDED
READERS IN AN IMPROVEMENT PROGRAM

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A STUDY OF THE PROGRESS MADE BY TWENTY-FOUR RETARDED
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Dedicated to my husband,
Harold

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A STUDY OF THE PROGRESS MADE BY TWENTY-FOUR RETARDED
READERS IN AN IMPROVEMENT PROGRAM

CHAPTER I

THE PROBLEM AREA

Almost everyone recognizes the need for a usable skill in reading, but, many children have difficulty in acquiring this skill. In an effort to correct this situation, remedial reading programs have evolved either in the form of special remedial reading classes or by an attempt to meet the needs of the retarded readers in the regular classroom.

The early schools depended upon repetitious drills or punishment as a means of coping with the problem of the retarded reader. Hildreth (25, p. 669), points this out when she states, "In traditional schools little has been done to help deficient readers, except to extend hours of practice before or after regular school hours, or to apply some form of punishment." During the period when there was little emphasis upon phonics and many unplanned and haphazard methods of teaching reading were in vogue, (36, p. 252), many remedial reading classes were formed in order to meet the needs of those children who were failing to learn to read. However, by 1940, elaborate and extensive remedial reading programs were no longer pointed to with pride, as they were considered evidence of failure to provide adequate developmental reading programs

in the early elementary grades (20, p. 28). As a result, an attempt has been made in recent years to meet the needs of the retarded reader in the regular classroom. Harris (23, preface p. ix), sums up this change in policy when he says: "Major emphasis in reading instruction has shifted from the development of remedial programs to the incorporation of individualized and remedial techniques into everyday classroom instruction."

A major difficulty encountered when sending a child "back" for help in reading arises from a misunderstanding of the purpose of the program. Too often the retarded reader either has been jeered at by his classmates or has lost confidence in himself and has come to expect failure rather than success (36, p. 246). Often the child feels that being sent to this special reading class is a way of inflicting punishment upon him for being a failure, and he also feels that he has lost the respect of his group. As a result, his mind is so tied up in tensions because of these misapprehensions that he is no longer receptive to the processes that might be helpful in making him a more proficient reader.

It then becomes imperative to find some method of motivation that will not only reduce the tension that is present, but will also be a learning device that may be continued to the child's advantage after completion of the remedial program. Many devices have been used in an attempt to create a more harmonious setting for remedial reading. However, in some instances, the device has been so unrelated to that which was being taught, or, the instrumentality has become the focal point of the study, relegating whatever good could be accomplished for remedial reading to a secondary place.

With this thought in mind, it was decided to use the typewriter as a motivational device. It was used to encourage the children to become interested in the improvement program and thus to avoid the above pitfalls. This instrument was temporarily set aside after its purposes had been served, and was later returned to in order to determine whether the typing or the remedial reading, had become the main interest of the pupils.

The typewriter offers several advantages, as follows:

1. The use of the typewriter is related to reading in that it deals with letters and its results are words resembling those found on the printed page.

2. It has left-to-right and line-to-line movement which is the same as the eye movement used for reading.

3. It offers an opportunity for the reteaching of small words which most retarded readers apparently require:

4. It can be used as a tool for teaching particular facets of reading, such as: building words from root words, or writing words with common phonetic elements, beginnings, or endings.

5. It can be used to teach certain aspects of visual discrimination, such as: likenesses and differences in words, and common reversals.

6. Since typing is not a part of the regular elementary curriculum in the school where this study was conducted, some pupils might consider it a privilege to learn to type.

It should be noted that, although much group remedial work has been done over the years, most of the remedial reading which has been reported either concerns high school or college level (81, p. 83-4), or

pertains to work done in clinics or otherwise done individually. Because of this, much of the teaching done in remedial reading groups is merely an adaptation to the group of work intended for individual teaching, or the use of standard classroom techniques which are not designed for remedial work (9, p. 274).

The problem of the remedial reading program in the public schools involves more than individual work with a limited number of students. The cost imposed upon the community for carrying on a program of an individualized nature, and the possible neglect of the non-problem children, will not justify this kind of remedial program. Some method must be found whereby children needing remedial reading can be given the benefits of individualized classroom instruction, yet be taught within a specially selected group, if any impact is to be realized upon the problem of remedial reading in the public schools. An attempt is made in this study to meet the individual needs of each child in the improvement program, yet to conduct the remedial classes in small groups.

Related Research

In the field of educational literature, a great amount of material is available in secondary sources concerning remedial reading, its purposes, methods, and techniques. Fernald (15, p. 322), summarizes the scope of remedial reading as follows:

In general, the investigations represent three main types of procedure: (1) the objective, in which the stress is on the development of remedial materials; (2) the physiological, in which a study is made of such factors as eye movements, brain function, handedness, eye dominance, and other structural and functional matters that may cause reading disability; (3) the psychological, in which the primary interest is in the psychological factors involved in reading, and the individual characteristics that may be responsible for reading disabilities under certain conditions.

Relatively few studies have been made in which the typewriter was used in the elementary schools or in reading classes. In these studies, the typewriter, for the most part, was used as an incidental or supplemental device rather than as an instrument for motivation, and for the teaching of particular facets of reading.

Monroe (35, p. 116), reports that typewriting is taught in only a few elementary schools with the main emphasis being on facilitating and motivating learning in the regular elementary school subjects. He concludes from a review of the studies, that there is some evidence that elementary children can learn touch typing and that it is helpful to them in learning other subjects, but that other studies indicate that the benefits are not great enough to warrant the trouble and cost involved. No mention is made of any studies pertaining to the typewriter's use in remedial reading groups.

Wood and Freeman (42), in 1929, made an extensive experimental study into the educational influences of the typewriter in the regular elementary school from kindergarten through grade six. This study covered a two-year period and involved over 14,000 school children, 400 teachers and over fifty schools in twelve cities across the nation. They found a small but definite advantage for the experimental classes which they conclude probably is attributable in part to the direct and indirect influence of the typewriter. They found the most favorable influence to be on spelling. This study dealt with pupils in the regular classroom and had as its object to see if the typewriter should or should not be adopted for regular use in the elementary school classroom.

Unzicker (41), in 1931, made an investigation into the effect of typewriting on beginning reading of first grade children. She found a trend of slight, but constant, superiority on the part of the pupils who used the typewriters.

Phillips (91), in 1937, began a four-year study to find out at what age elementary school children could effectively use the typewriter; how much the typewriter might contribute directly to learning activities; its value in creative work; and standards of achievement in typing suitable for elementary school pupils. He found the typewriter to be an efficient tool of instruction in grades two through six; that the children could write much more accurately and faster on the typewriters than by hand; and, that the typing groups achieved a slightly higher percentage of accuracy in spelling than the control groups. The typewriters were used in connection with spelling, social studies, number work, creative work, and language arts. No emphasis was placed on their use with reading.

Tate (68), in 1941, made a small controlled experiment in using the typewriter for remedial work in the regular classroom, in the 4th, 5th, and 6th grades. He did not teach the children any system of typing, but allowed them to use the typewriters to answer questions from weekly readers, individualized spelling lists, invitations, or the writing of letters. He stated that it was evident that the typewriter was valuable in remedial teaching of spelling and language usage, but pointed out that before conclusive evidence could be drawn, more scientific measures would have to be used.

Only one study was found in which another device similar to the

typewriter was used, that device being the printing press. Hansburg (22), in 1939, made an experimental study into the psychological effects of the print shop on dull normal elementary school children. He found that printing improved their spelling and areas of reading which depend on visual perception, more than in reading comprehension.

Since the ability to read is of great importance, it follows that all possible should be done to help children achieve success in reading and prevent them from becoming frustrated to the extent of maladjustment or delinquency. It would seem to warrant the finding of some way to motivate and aid these retarded readers so that they can attain status in their peer groups and personal satisfaction to themselves, and help them remove any emotional blocks that have been a hindrance to them in learning to read.

Since there are no studies relating to the use of the typewriter as a motivational influence in teaching remedial reading in a group situation in the elementary grades, and, so far as the writer can determine, no such study is in progress, it seems appropriate and important to find out if the typewriter can be used to motivate retarded readers; and if it can be used for the teaching of certain facets of reading to children in remedial groups.

Purpose of the Study

One purpose of this study was to assess the effects of an operative one-year program of remediation in the area of reading. This investigation was limited to children who were retarded in reading and who were participating in special remedial reading groups in the public

elementary school of Maricopa, California. Generally speaking, the students were selected for participation in the improvement program on the bases of both intellectual ability and reading retardation. One unique feature of this reading improvement program with the 24 pupils, was the inclusion of the use of the typewriter as a possible aid and motivational device.

Concern was initially focused upon the practical problem of whether each individual pupil exhibited gains or improvement in each of the following areas: (1) reading performance on standardized tests, (2) oral reading proficiency, (3) types of errors made, (4) sight vocabulary, (5) phonetic inventory, (6) spelling, (7) improvement in personal and social adjustment, and (8) growth in the regular classroom--gains in these last two areas being shown by teacher and pupil questionnaires and observations in the form of anecdotal records.

Although consideration was given to the gains of the 24 pupils as a group, the major emphasis, however, was directed toward an analysis of the improvement exhibited by each individual student. In essence, the study was a longitudinal analysis of 24 individuals who were originally classified as being retarded in reading. Each student was compared with his performance on the list of foregoing variables before entering the reading program, with his respective performance on the same measures after participating in the program. In effect, each pupil acted as his own control.

Other objectives of the study were to assess the value of the typewriter: (a) as a possible motivational device, (b) as a device for teaching specific facets of reading, and (c) as a means of reducing

tension associated with reading. No attempt was made to assess the skill attained in typing by the retarded readers.

CHAPTER II

METHOD

Design of the Study

In order to reach the objectives set forth in Chapter I, the design of the study and the steps used in the procedure were set up as follows: (1) selection of the subjects, (2) examination of the physical, family, and school backgrounds of the subjects, (3) pre-testing period, for determining the status of the pupils in several aspects of reading, and in spelling, (4) typing period, for teaching various facets of reading, for motivation, and for reduction of tension, (5) non-typing period, for the teaching of reading in a group situation, and for observing reactions of pupils when the typewriters were not available, (6) optional period, for observing whether reading or typing were of greater import to pupils, and (7) post-testing period, for observing gains made by pupils in several aspects of reading and in spelling.

Setting of the Study

The reading improvement program described in this study was carried on in the elementary school of the Maricopa Unified School District, Maricopa, California. In order that the reader gain an increased understanding of the setting of the investigation, the following description of the school and community is presented.

Maricopa is located in the extreme southwestern part of the San Joaquin valley in Kern County, California. It lies in the foothills of the Sierra Nevada mountains and looks eastward into a wide flat plain. For years, Maricopa has been a rich oil producing area, and with the advent of irrigation, it is now also known for its farming section on the "flats". Although it originated as a "boom" town with the discovery of oil, it has now settled down to a stable town with a population of 800.

The Maricopa Unified School District includes a high school and an elementary school. The elementary school in 1954-55 was more than twice as large as the high school and had an average daily attendance of 351 pupils. About two-thirds of the pupils were brought in by bus from the oil leases and ranches, some of them coming a distance of 35 miles. As a rule, many transient children were enrolled, so the turnover was quite great. The elementary school had a principal, 18 teachers, a school nurse, and a part time psychologist who devoted two days to this school. There were two classrooms of each of the grades from 1 through 8, and one kindergarten. The children selected for this study were from grades 5, 6, 7, and 8.

Duration of the Study

The school year, 1954-55, was spent on this investigation. In September, a preliminary study was made of the permanent records of pupils recommended by the teachers as needing remediation, and consultations were held with the nurse, psychologist, classroom teachers, and the teacher of remedial reading in the primary grades. The pre-testing

period began the first week of October, 1954 and the post-tests were given in May, 1955. Each of the typing, non-typing, and optional periods was two months in length.

Selection of Subjects

The size of the groups in this study was limited to 5 pupils or less in order to have a number large enough for group participation, yet small enough for work of an individualized nature. Final selection of the children to be included in the groups in the improvement program was made according to intelligence and degree of reading retardation.

The meaning of retardation is described in a recent yearbook of the National Society for the Study of Education (83, p. 225), as follows: "A student is commonly described as retarded if he is one year or more below the grade 'norm' as measured by a standardized reading test." The mean retardation of the subjects selected for this study was 2.0 years, and they ranged in retardation from .8 year to 3.4 years.

No child with an I.Q. below 80 was included in this study since most authorities point out that remedial work with pupils with low I.Q.s often results in scarcely perceptible improvement or an increase in disabilities (25, p. 376).

Twenty-four pupils constituted the total number who participated in the reading improvement program. Table 1 shows the distribution of boys and girls according to sex and grade. Seven, or 29 per cent, of these pupils were girls, and 17, or 71 per cent, were boys. This distribution tends to vary from the general trend of remedial groups as is pointed out by Ragan (36, 246) that, "remedial reading classes usually

TABLE 1

DISTRIBUTION OF SEXES OF CHILDREN IN THE IMPROVEMENT
PROGRAM ACCORDING TO GRADE

Sex	Grade				Total
	Five	Six	Seven	Eight	
Male	5	5	4	5	17
Female	5	2	0	0	7

have about nine times as many boys as girls." However, it is to be noted that the present study dealt with a rather restricted number of cases. With respect to grade levels, the pupils were distributed as follows: five 8th graders; four 7th graders; five 6th graders; and ten 5th graders who were put into two groups of five each.

Time and Length of Remedial Reading Classes

Since only mornings of the school day were allotted for the improvement program in the upper elementary grades, they were divided into five 30 minute periods, as follows:

SCHEDULE FOR THE REMEDIAL CLASSES

Group	Grade	Time	Mon.	Tues.	Wed.	Thurs.	Fri.
I	5th	8:45 - 9:15	*	x	x	x	x
II	6th	9:15 - 9:45	x		x	x	x
III	5th	10:00 - 10:30	x	x		x	x
IV	7th	10:40 - 11:10	x	x	x		x
V	8th	11:10 - 11:40	x	x	x	x	

*The x's indicate the periods that the groups met for remedial work.

Four of these five periods for each group were used for group remedial teaching and one was kept open for special individual teaching, testing, or preparation of remedial materials.

Pupil Conferences

Early in the program, individual conferences were held with the children in an attempt to establish rapport and to discover any particular interests of the children; and, through observation, to note anything further that might help in diagnosing their cases. In these individual conferences, the children were asked to dictate a letter to a friend, real or imaginary, while the teacher typed it. This was done for the purpose of creating an interest in typing, and it was anticipated that at the same time, the children might reveal something of their personalities, interests, likes, and dislikes. Leading questions were asked in order to draw out usable information from the children. Samples of the letters are found in Appendix A.

Procedures Used in Gathering Test Information

Pre-tests and post-tests were given in silent reading, oral reading, types of reading errors made, sight words, phonics, and spelling. In addition to these, standardized achievement tests in reading and spelling were given to the pupils in January, at the end of the typing period, and in March, at the end of the non-typing period. This was done in an attempt to discover if any noticeable difference could be observed in their reading and spelling progress during these periods.

Intelligence tests.--Since, according to the permanent records, many intelligence tests had been given these pupils in the years before,

it seemed unnecessary to give individual Stanford-Binet tests to all of the pupils. The California Short Form Test of Mental Maturity was given to all pupils recommended by the classroom teachers. These scores were checked against previous intelligence test scores on the permanent records. In three cases, the Stanford-Binet test was given by the school psychologist as a further check since these were exceptional cases. One child had frequent petit mal seizures, another had had a previous slight brain concussion, and the third had been an emotional problem in earlier grades.

Silent reading tests.--The California Reading Achievement tests were used to test the pupils in their silent reading. These tests checked vocabulary and comprehension.

Informal analysis tests.--It seemed important to check the pupils' oral reading ability also. An informal analysis test, the Informal Reading Inventory Test, secured from the Houston Reading Clinic¹, was given individually to each child. This test is composed of short paragraphs from pre-primer level through eighth grade, with questions for testing comprehension. The reading level of each child was determined by the following criteria: when he made two errors in twenty running words; and when he could not answer correctly at least three out of the four questions concerning the paragraph.

Types of reading errors made.--Record was kept of the types of errors each child made while reading orally during the informal analysis test. Such things as tense voice, low sight vocabulary, omits words,

¹Informal Reading Inventory Test, Houston Reading Clinic, Houston University, Houston, Texas.

fills in words, repeats, ignores punctuation, exemplify the types of errors made by the children.

Basic sight vocabulary tests.--Each child was tested individually on the Dolch Basic Sight Word Test¹. This test consists of a list of 220 words identified by Dolch as making up from 50 to 70 per cent of all reading material at the approximate level the subjects were reading (29, p. 70). No nouns are included in this list. A record was kept of the number of words each child called correctly at sight on first trial. A copy of the Dolch Basic Sight Word Test is found in Appendix C.

Phonetic inventory tests.--A phonetic inventory test was given each child individually. This test is composed of a random order alphabet of lower and upper case letters; common beginning blends; prefixes and suffixes; monosyllables of short vowel sounds; nonsense syllables and multisyllable words; and words commonly seen as reversals. The test used was taken from Kottmeyer's book, "Handbook for Remedial Reading" (29). Mimeographed sheets were made of the test as was suggested by Kottmeyer. Record was kept of the letters, sounds, and words known by each child. A copy of the Phonetic Inventory Test is found in Appendix B.

Spelling tests.--Since reading and spelling are so closely related, a standardized spelling test was given each group of children in order that the progress made in spelling might also be observed. A graded list of 50 words from the Stanford Achievement Test was dictated to the pupils, and a record was kept of the number of words spelled correctly.

¹Dolch, E.W., The Basic Sight Word Test, Garrard Press, Champaign, Illinois.

Typewriters Used

Three standard Underwood typewriters were used for each group of five children throughout the improvement program. The use of only three typewriters for the five children tended to intensify their use as a motivator, and offered a natural opportunity for the teaching of reading to those not engaged in typing. This was desired, as the prime objective in the study was to help the retarded reader, while the development of skill in typewriting was only incidental.

However, in order that all five children in each group could learn the keyboard and become fairly proficient at handling the typewriter at approximately the same time, small cardboard keyboards or "typewriters" were made of heavy cardboard. While three of the children used the real typewriters, the other two drilled on the small cardboard keyboards. These were made by cutting a large piece of cardboard, approximately 8" by 11", then drawing "keys" the size of real typewriter keys on another piece of cardboard. After the small circles for the keys were drawn, each child lettered these and drew the numbers and other symbols on the keyboard with India ink. These "keys" were cut out and glued to the large piece of cardboard. Two advantages accrued from allowing each child to glue the small "keys" to the large piece of cardboard. First, the child had experience in locating each key on the typewriter as he glued it on. Secondly, the fact that the "keys" were raised slightly tended to help the child develop the touch system as he was able to feel the keys as he tried to type.

The making of the cardboard "typewriters" also served other purposes. The periods used in making them helped to set up harmonious

relationships and understandings among the children. The children were allowed to talk while making these "typewriters" and from their conversation, clues were picked up by the teacher concerning their interests, as well as their problems. Thus, it is felt that the art project of making the "typewriters" in itself, acted as a means of reducing tension in these children.

At the end of two weeks' time, the use of the cardboard typewriters in class was discontinued since the children had mastered the keyboard fairly well and were able to manipulate the real typewriters independently. The children, alternating in turns, used the typewriters each day for the first two months of the remedial program. At all times, the children not working on the typewriters were helped with whatever skills they needed in reading. The cardboard typewriters were still of some use to the children since they could use them for extra practice and drill at home. Others seemed to take pride in having them to show their classmates as proof that they were being permitted to type in the remedial classes.

The children in this study used typewriters that had covered keys and were taught to use correct fingering and the touch system. Nothing was done in connection with the typing itself that would tend to make the pupils frustrated. It was felt that if too many rigid standards were imposed, the benefit of it acting as a motivational device and tension reducer would be lost. Consequently, no particular stress was laid on speed, accuracy, or rhythm.

Objectives in Reading Which Were Facilitated by the Typewriter

A demonstration lesson on the typewriter was given each group of children. At this time, the children were given an opportunity to ask questions about its workings. They were shown the proper position of the hands, how to insert the paper, and taught the correct fingering. It was also pointed out to them that the typewriter moves from left-to-right and line-to-line just as one's eyes move when reading.

Phonetic analysis.--When all the pupils were using either real or cardboard typewriters as a group, the first few lessons were spent in drilling on letters and small words that would be of the most help in learning to type. Therefore, words were made with the letters on the home row only. Examples of these are: fad, lad, sad, had; as, ask, asks; has, gas, lass, glass; and all, fall, hall. Whenever it was possible, even at this stage of typing, an attempt was made to keep words together that had a common sound element in them and to point out these likenesses to the pupils. This same technique was used when teaching the second row of keys: it, wit, pit, quit; rot, tot, pot. Later, longer lists of words were practiced by using all the letters in these two rows: wet, set, get, jet, let, pet; he, we, see, free, greet; and wish, dish, fish, wishes, dishes. Finally, the bottom row of letters was learned by adding its letters to the already known ones, forming additional words.

Drill in vowel sounds and beginning blends.--Most of the children had acquired sufficient familiarity with the keyboard that they could type small words with ease by this time. Therefore, an attempt was made to stress the words that would help them more specifically in reading, rather than because of their particular location on the keyboard or their

ease to type. The majority of the children in this improvement program had trouble with short vowel sounds, so words were built with the short vowels and single consonants as: bet, bat, bit, but; put, pat, pet, pot, pit; and pan, can, ran, an, tan, fan, man. Words with long vowel sounds were also grouped together: cake, rake, lake, make, sake, bake; mate, rate, hate, late, gate, fate. In order to give more drill in the short and long vowel sounds and at the same time give practice in making words of the consonant blends, the next step was to build words with the short vowels and such consonant blends as: bl, cl, sh, gr, th, or, dr, st, sw, -- blue, clot, check, gray, this, crate, drum, state, swim. Following this, three letter blends were used: thr, str, sor, spl, spr, -- threw, string, scratch, splash, spring.

Double vowel sound drills.--When it was felt that the pupils had acquired enough practice in single vowels, attention was called to the double vowels having a long sound as: ai, ea, ee, oa, -- rain, grain, reach, green, moan, groan. It was observed that usually the second vowel is silent and the first has a long sound.

Developing sight vocabulary.--Practice was also given in typing the basic sight words from the Dolch list, a few at a time. This was done early in the typing period, interspersed with the phonetic drills, as in most cases, the children were drilling on these sight words during their individual reading periods.

Study of endings.--Drill was also given in writing words with similar endings as: boys, toys; much, such, rich, bunch; dish, rush, bush; and bath, path, wrath. Words having the same single consonant endings were also typed: rap, tap, flap, flop, stop.

Drills in diphthongs.--Diphthongs were drilled on in groups and it was observed that those ending in "y" or "w" were, as a rule, found at the end of words. Examples are: oi and oy -- noise, poise, boy, toy; au and aw -- cause, pause, claw, paw, raw; eu and ew -- feud, new, blew; ou and ow -- ouch, out, cow, how.

Structural analysis.--Root words were typed, and as many words as could be built from a single root were typed directly underneath them so that the children could observe them more closely:

<u>happy</u>	<u>carry</u>	<u>place</u>	<u>build</u>
happier	carries	places	building
happiest	carriage	placement	builder
happiness	carrier	displace	rebuild
happily	carried	displacement	builds
unhappy		replace	
unhappiness		replacement	

Also, as many words as the children could think of were built from endings, as: age -- postage, carriage, marriage, luggage, baggage; tion -- nation, notion, mention, station, ration. Later, these were made into longer and more difficult words, as: conglomeration, reputation, exclamation, discrimination, hemorrhage. Other word endings were: ful, less, ness, ance, ence, ant, ent, ment, ing, ed, ary.

Silent letter study.--Words having silent letters were also drilled on: know, knit, knew, knee; write, wrong, wren; gnat, gnaw, sign; and final silent letters as: dumb, thumb, bomb, lamb.

Visual discrimination lessons.--Lessons were given on the typewriter that pointed out certain likenesses and differences in words. For example: three and there; think and thank; tired and tried; first and fast. Writing these one under the other oftentimes helped the

children to observe their differences. Certain words that are often reversed when read were pointed out and typed: was and saw; star and rats; spot and tops; pal and lap.

Auditory discrimination drills.--Some auditory discrimination exercises were given to the pupils. As the words were pronounced, the children typed them, as: bit, bet, bat, but; will, wall, well; pan, pen, pin, pun. Afterwards, these were checked to see if they had been spelled correctly and written in the order pronounced.

Punctuation and phrasing.--Certain individual needs of the children were met by giving specific lessons on the typewriter to individual children. For instance, if a child were found to be poor in observing punctuation as he read, he was given exercises in typing short phrases and sentences in which the comma and period were used. This helped to point out to him that commas and periods are placed in reading materials for a reason, and that when he sees one when reading, he should pause.

Free periods.--Although the major use of the typewriter was in word building rather than work in sentences of any length or copy work, occasionally the children were permitted to type anything they wished. Some would type spelling lists from their regular classwork or type book reports for their home room assignments. Others would make pictures or type border designs of various kinds. It was felt that these free periods in typing offered an opportunity for relaxation and reducing of tension that could not be obtained in other ways.

Individual interests.--Other activities related to reading that were done on the typewriter as individual projects follow: A child particularly interested in airplanes listed all the words he could think

of or find out about airplanes: air, plane, propeller, pilot, stewardess, co-pilot, bomber, passenger. Others typed short sentences concerning interests pertaining to baseball, Indians, or ships. Occasionally, a favorite poem or paragraph from some book was copied on the typewriter.

The actual teaching of remedial reading to these children entailed both individual and group work. Individualized teaching of reading was carried on, as was pointed out, during the period from October to January. For example, if a child not using the typewriters needed more practice in auditory discrimination of short vowel sounds, he was given drill in this. At the same time, the other child not using the typewriter might be given a written or silent reading lesson in consonant blends. Sometimes, if both of these children needed the same type of drill, for example, help with basic sight words, they were drilled together. Other types of individualized reading dealt with drill on sounds of the consonants; writing the alphabet; the soft and hard sounds of g and c, and the two sounds of s; endings of words: ch, sh, th; silent letters in the combinations: wr, gn, kn; drill on long vowel sounds, and diphthongs. If a child had particular trouble with phrasing, observing punctuation, vocalizing as he read silently, moving head, pointing, hesitating, skipping words, or similar errors, help was given for his particular weakness during this period.

By the first of January, the initial novelty of the typewriter had apparently dissipated. Furthermore, the typewriter had served its purpose of encouraging the children to come to the remedial classes and of maintaining the motivation that was needed for this period. It had

served as a tool for the teaching of such facets of reading as: visual and auditory discrimination, phonetic and structural analysis, initial consonants and blends, vowels, prefixes, and suffixes. It had served as a means of relaxation for the pupils as they appeared to associate pleasure with its use. It was also interesting to note that the pupils appeared to be changing their attitudes towards reading and to have lost some of their resentments toward it. Furthermore, they seemed to have acquired a feeling of "groupness" which they had lacked at the beginning of the program.

It was desired to make a shift in emphasis from the typewriter to the reading. It was believed that the pupils could derive more value from the classes at this time by devoting a two-month period to group remedial reading. Therefore, the typewriters were set aside for two months, although they were kept in the room where the classes were held. Two purposes were met from setting aside the typewriters. First, it offered an opportunity for the teaching of group remedial reading. Secondly, it offered an opportunity to watch the pupils' reactions towards reading when they were no longer permitted to use the typewriters. Anecdotal records were kept concerning the pupils' comments and actions. These will be found in Chapter III. An attempt was made during this period, to stress the pleasure side of reading as much as possible and to maintain an interest in reading for reading itself.

By March, after the standardized tests were readministered, the children were divided according to their reading levels on the March test, allowing the 2 or 3 most nearly alike in reading achievement to

have alternate turns at reading and typing together. During this period, the children were allowed to decide for themselves whether they preferred to read or to type. If they preferred to read, they merely gave up their turn at typing. Only about one-third of the children regularly returned to the typing during this optional period. This period of reading was spent, for the most part, in reading stories, some concentrated drill on spelling in the form of more difficult word building and structural analysis of words, vocabulary drill, and whatever type of reading activity would benefit the group as a whole.

As the children worked throughout the reading periods in the improvement program, an attempt was made to keep the spelling and phonic rules as simple and general as possible. These rules evolved out of the study, mostly through observation, and were put into a language that the children understood. The fact that no rule would apply in all cases was emphasized, and the word "usually" was stressed when applying the rules. Some of the rules that evolved out of the study are found in Appendix D.

One short and simple question that was constantly asked the children as they read, that seemed to help them in their comprehension was, "Does it make sense?" In attacking new words, another question that seemed to help the children was, "Is there any part of the word that you do know?" The pupils would then look for endings, beginnings, root words, or any clue with which they were familiar, and usually would figure it out satisfactorily themselves.

A great amount of oral reading was done throughout the improvement program classes since "poor readers usually profit from considerable

practice in reading aloud." (34, p. 86) Very few workbook lessons were used as it appeared that the children derived more help from the other types of reading lessons that were presented.

CHAPTER III

RESULTS AND DISCUSSION

Analysis of Quantitative Data

The initial section of this chapter is devoted to the quantitative data and the latter section to the more qualitative or subjective data obtained from the use of teacher and pupil questionnaires, anecdotal records, and observations. These data are summarized in a series of 14 tables and describe personal history; reading achievement; spelling achievement; changes during the typing, non-typing, and optional periods; and teacher opinions concerning the reactions of each of the 24 pupils during the typing and non-typing periods.

Personal history of subjects.--In the personal history of each of the subjects in the study, consideration was given to such factors as intelligence, school history, physical condition, and family background. The data compiled in the tables pertaining to this topic were obtained from two sources: standardized tests and cumulative records of the Maricopa Unified School District.

Since it is important first to understand the capabilities of the pupils involved in the program, standardized intelligence tests were given. The test used was the California Short Form Mental Maturity Test. The results of the test were compiled and are presented in Table 2.

TABLE 2

CHRONOLOGICAL AGES, MENTAL AGES, INTELLIGENCE QUOTIENTS, AND
INTELLIGENCE GRADE PLACEMENTS OF THE 24 PUPILS AS MEASURED
BY THE CALIFORNIA MENTAL MATURITY TESTS, OCTOBER, 1954

Pupil No.	Pupil Name	Grade	C.A.	M.A.	I.Q.	Intelligence Grade Placement
1	Sue*	Five	10-0	9-3	93	4.0
2	Jane		10-5	8-10	85	3.6
3	Josie		9-11	8-10	89	3.6
4	Ray		10-4	9-9	94	4.5
5	Walt		11-9	9-9	83	4.5
6	Frank	Five	10-5	9-8	93	4.4
7	Stan		10-0	8-9	88	3.5
8	Lou		11-0	10-0	91	4.8
9	Bob		11-9	11-3	96	5.9
10	Nan		10-10	9-5	87	4.2
11	Sally	Six	11-9	9-3	83	4.0
12	Elton		12-1	11-8	97	6.3
13	Rex		12-11	10-6	81	5.2
14	Henry		12-9	11-5	90	6.1
15	June		12-0	11-6	96	6.2
16	Allen	Seven	12-9	11-5	90	6.1
17	Vic		13-0	11-6	88	6.2
18	Ben		12-11	12-7	97	7.2
19	Hal		12-10	10-3	80	5.2
20	Don	Eight	14-4	14-0	98	8.7

TABLE 2--Continued

Pupil No.	Pupil Name	Grade	C.A.	M.A.	I.Q.	Intelligence Grade Placement
21	Jim	Eight	14-0	11-7	83	6.2
22	Ike		13-3	14-7	110	9.1
23	Peter		14-1	11-10	84	6.5
24	Kent		13-5	11-0	82	5.7
Means			12.02	10.77	89.91	5.48

*The pupil names used in this study are fictitious for the purpose of concealing the true identity of the children selected for this study.

The Intelligence Grade Placement Norms presented in this table were secured from a table of standardized norms of the California Mental Maturity Test.

The reader may notice a similarity between the present data and the conclusion of Hildreth (25, p. 373), who states:

The great majority of children having unusual difficulty with reading have intelligence quotients of less than 95. Universally, the greatest amount of reading retardation appears in the 80 to 95 I.Q. range.

It will be noted in this table that the intelligence quotients of the subjects in this study ranged from 80 to 98, with the exception of one child whose I.Q. was 110. The mean I.Q. for the group as measured by the California Mental Maturity Test was 89.91.

The Intelligence Grade Placement Norms presented in this table show the grade levels these pupils are capable of achieving according to their I.Q. scores and standard norms on the California Mental

Maturity test. The mean grade placement for the group was found to be 5.48, or approximately 5th grade, 5th month. It is interesting to note that, according to these grade placements, only 6, or 25 per cent of these pupils were capable of doing work up to their respective grade levels.

According to chronological age, over 50 per cent of these pupils may be considered "over age" for their particular grade levels. The mean chronological age for the group was 12.02 years, while the mean mental age was 10.73 years.

Factors in the pupils' school experience that might indicate previous scholastic difficulties, as well as the state in which each child was born, are shown in Table 3.

TABLE 3

GRADES REPEATED, PREVIOUS REMEDIAL READING, SCHOOLS ATTENDED,
AND BIRTHPLACE OF THE 24 PUPILS IN THE IMPROVEMENT PROGRAM

Pupil No.	Pupil Name	Grade	Grades Repeated	No. of Years of Previous Remedial Reading	No. of Schools Attended	Birthplace
1	Sue	Five	0	0	4	Oklahoma
2	Jane		0	0	1	California
3	Josie		0	0	1	Michigan
4	Ray		0	1	1	Texas
5	Walt		1	1	2	Oklahoma
6	Frank	Five	0	2	1	California
7	Stan		0	0	4	Arkansas
8	Lou		1	1	2	Arkansas

TABLE 3--Continued

Pupil No.	Pupil Name	Grade	Grades Repeated	No. of Years of Previous Remedial Reading	No. of Schools Attended	Birthplace
9	Bob	Five	1	1	3	Oklahoma
10	Nan		0	0	3	Arizona
11	Sally	Six	1	2	2	California
12	Elton		1	2	7	Arkansas
13	Rex		1	1	3	Texas
14	Henry		0	0	9	Oklahoma
15	June		1	2	3	Texas
16	Allen	Seven	0	3	5	Arkansas
17	Vic		1	2	3	Arkansas
18	Ben		0	0	4	California
19	Hal		1	3	6	Louisiana
20	Don	Eight	1	0	5	Oklahoma
21	Jim		1	2	1	California
22	Ike		0	0	2	Texas
23	Peter		1	3	2	Texas
24	Kent		0	1	1	California
Means			.50	1.12	3.12	

It is interesting to note that 12, or 50 per cent of these pupils, sometime during their school experience, had repeated a grade. The fact that 11 of these 12 pupils had attended more than one school may have been a factor in necessitating that a grade be repeated. Pupil

number 21, who repeated a grade while in attendance at Maricopa Elementary School only, was reported as being a behavior and emotional problem in his early school years which may account for his school retardation. The mean number of schools attended for the group was 3.12. The fact that these pupils were found to have attended so many different schools, and to have been born in many different states, would seem to indicate that their families have a tendency to move about considerably. However, for whatever bearing birthplace of each child might have, it should be pointed out that no one state had a predominant number of children in this improvement program. California was the birthplace of 6; Arkansas, Oklahoma, and Texas, each claimed 5; while Arizona, Michigan, and Louisiana each claimed 1.

Many of the pupils in the improvement program had been faced with the problem of difficulty in reading for several years. Fifteen of the 24 pupils had from 1 to 3 years of previous remedial reading, making a total of 27 years previous remedial reading for the group and a mean of 1.12 years. With the exception of one child, pupil number 19, this remedial reading training had been in the Maricopa Elementary school.

Often, children who have had occasion to move from school to school because of their parents' occupation, become retarded in their scholastic achievement because of the time it takes them to readjust to a "new" situation. Of the 24 pupils in this study, 18, or 75 per cent, had attended from 2 to 9 different schools, with the mean number of schools attended for the group being 3.12.

The child's place in the family group, as well as the general

atmosphere of the home often affects his personality, and in turn, his achievement in school. Table 4 presents data relevant to the family background of the pupils in the improvement program.

TABLE 4
BACKGROUND OF THE 24 PUPILS IN THE IMPROVEMENT PROGRAM
IN RELATION TO THEIR FAMILY UNITS

Pupil No.	Pupil Name	Grade	Siblings		Place in Family	Father's Occupation	Resides with
			Brothers	Sisters			
1	Sue	Five	0	2	oldest	farm laborer	both parents
2	Jane		2	1	3rd child	oil worker	both parents
3	Josie		0	2	youngest	oil worker	both parents
4	Ray		0	4	youngest	farm laborer	both parents
5	Walt		0	0	only	farm laborer	both parents
6	Frank	Five	2	0	youngest	oil super-visor	both parents
7	Stan		1	0	oldest	farm laborer	both parents
8	Lou		1	2	oldest	mechanic	both parents
9	Bob		2 half 2 full	3 half 1 full	5th child	invalid	real mother step father
10	Nan		1	3	3rd child	farm laborer	both parents
11	Sally	Six	2 half	1	3rd child	oil worker	both parents
12	Elton		1	1	oldest	farm laborer	both parents
13	Rex		1 half 1 full	0	oldest	oil worker	real mother step father
14	Henry		1	2	oldest	farm laborer	both parents
15	June		3	1	2nd child	farm laborer	both parents
16	Allen	Seven	1	0	oldest	teacher	both parents
17	Vic		3	0	2nd child	farm laborer	both parents

TABLE 4--Continued

Pupil No.	Pupil Name	Grade	Siblings		Place in Family	Father's Occupation	Resides with
			Brothers	Sisters			
18	Ben	Seven	1	2	oldest	ranch foreman	both parents father,
19	Hal		2	0	oldest	farm laborer	grandmother
20	Don	Eight	3	1	oldest	oil worker	both parents mother
21	Jim		1	0	youngest	deceased	grandparents
22	Ike		2	2	4th child	invalid	both parents
23	Peter		1	1	middle	farm laborer	both parents
24	Kent		0	0	only	mechanic	both parents

An inspection of Table 4 shows that, of the 24 children, 2 were "only" children; 10 were "oldest" in the family; 4 were "youngest"; and 8 were in the "middle" group of children in the family. Of the 2 "only" children, Kent, pupil number 24, showed evidence of being a very lonely child. His mother worked, as well as the father, so he spent much time alone during the noon hour and after school. In addition to this, he was not very well accepted by his play groups, nor the children in his home room. Of the "youngest" children, Josie, pupil number 3, gave some evidence of being immature and spoiled, while Jim, pupil number 21, had been reported a behavior problem through 6th grade, with traits of moodiness and sullenness still being exhibited in the 7th grade, and occasionally in the present school year. Peter, pupil number 23, a "middle" child, gave evidence of withdrawing tendencies, pouted a great deal, and often complained. The behavior of the group classified as "oldest" was such as to indicate a considerable degree of maladjustment. Examples of this behavior are as follows: Sue, pupil number 1, had a previous

record of stealing and lying, and was found this school year to have stolen \$5.00 from her teacher's purse. Elton, pupil number 12, was reported as being anti-social in the classroom and on the playground. Rex, pupil number 13, was reported by his home room teacher to be very antagonistic. However, it is interesting to note that he displayed no such traits in the remedial classes, being very pleasant and agreeable throughout the school year. At the end of the year he seemed more considerate of the group's wishes than most of the other children. Rex, during the second semester, was being helped by the school psychologist and was also beginning to make better adjustment in his home room. Henry, pupil number 14, was reported as being a rebellious child in the regular classroom, although it is interesting to note that he did not exhibit this trait in the process of the improvement program. Don, pupil number 20, according to his school records and reports of the school psychologist, had been very maladjusted throughout his school life. He was a very aggressive child, hot tempered, and inconsiderate both in the home and at school.

Of the family groups, Bob, pupil number 9, belonged to the most unusual one. He was one of nine children, the largest of any of the family groups. His stepfather had children from another union, his mother had children from another union, and there were children from the present marriage. On the surface, he appeared to be a very calm, quiet child who let nothing upset or excite him. However, from a study made by all the teachers who had him in their classes and the school psychologist, it was concluded that this calm, unconcerned attitude was an air

of "passiveness"--of accepting whatever came along, good or bad, with no ado. He had been forced by circumstances to develop this attitude at home, and appeared to be reacting to his school work in much the same way.

Rex, pupil number 13, was also affected by a broken home. He and his full brother were from a previous marriage of his mother, and his half brother was from the present union. He admitted that he felt very alone in the home, as he didn't feel free to confide in his step father and refused to confide in his mother since when he had previously, it had worried and upset her. This insecurity in the home seemed to be reflected in his emotional reaction at school and in his school achievement.

Twelve, or 50 per cent of these children had fathers whose occupations pertained to farming--one parent was a ranch foreman, and the others were all farm laborers. Six, or 25 per cent, had fathers whose occupations had to do with the oil fields, while only one of these was in a supervisory capacity. Of the remaining 25 per cent, 2 were mechanics, 1 was a teacher, 2 were invalids, and 1 was deceased. Bob, pupil number 9, of the family of 9 children had a step father who had been an invalid for the past year and a half. Because of this illness, the family was on county relief. The other invalid father was Ike's, pupil number 22. In the latter part of this school year, when Ike's father became ill, his mother took over the support of the family by working in a shirt factory. It seemed to disturb Ike that his father was ill and the mother had to leave the home to work. The mother of Hal,

pupil number 19, died this school year. However, Hal seemed to make satisfactory adjustment to living with his father and grandparents. Jim, pupil number 21, lost his father several years ago due to death in an automobile accident. Since that time, he has lived in the grandparents' home on a farm which they own. According to the school records, his most severe maladjustment occurred before the mother returned to live in the home with the grandparents.

All but four of the children were living with both of their "true" parents. Two of the children lived with their real mothers and step fathers, one lived with his mother and grandparents, and another with his father and grandparents. It is interesting to note that in all of these homes, there was no absence of maternal contact of some sort, although in one case it was the grandmother. Only two of these children might be expected to be lacking in paternal love, these being the two who had step fathers--Bob, number 9, and Rex, number 13--who had given evidence of being maladjusted.

Visual and auditory discrimination are, of course, necessary factors in the reading process. Screening was conducted by the school nurse to check each of the 24 pupils for possible visual and auditory malfunction. Table 5 summarizes information concerning the eye and ear tests and other facts concerning the pupils' physical health that might contribute to reading retardation.

For the visual screening, the Snellen E chart was used by the school nurse since it is recommended for detecting gross disturbances. (3, p. 34) However, since the Snellen E chart serves the purpose of

TABLE 5

PHYSICAL CONDITION OF THE 24 PUPILS IN THE IMPROVEMENT PROGRAM

Pupil No.	Pupil Name	Grade	Vision	Hearing	Other Information
1	Sue	Five	Normal	Normal	Frequent earaches and draining. Ruptured ear membrane, but hearing is normal for classroom.
2	Jane		Normal	Normal	Child very large and tall for her age group.
3	Josie		Normal	Normal	Rubs eyes some, but does not complain of eye strain. Slight nervous condition.
4	Ray		Normal	Normal	--
5	Walt		Far-sighted	Normal	Eye doctor, '54, says child does not need glasses.
6	Frank	Five	Normal	Normal	--
7	Stan		Normal	Normal	Enlarged tonsils
8	Lou		R20/40* L20/40	Normal	No correction for eyes. Complains of vision blurring. Has marble-sized movable lump under throat. Appendectomy in '55.
9	Bob		Normal	Normal	--
10	Nan		R20/40 L20/40	Normal	Complains of eyes hurting, but Dr. reports it is malingering. Frequent colds, sore throats, earaches. Measles and mumps, '55.
11	Sally	Six	Normal	Normal	Caesarean birth, six weeks premature. Petit mal seizures** since 5 years old. Complains of vision blurring.
12	Elton		R20/100 L20/50	Normal	Eyes checked by Dr. in '54. Wears glasses--corrected to R20/70, L20/30.
13	Rex		Far-sighted	Normal	Dr. prescribed glasses for class work, '55. Appendectomy '55. Complained of vision blurring, watering, burning. Nervousness.

TABLE 5--Continued

Pupil No.	Pupil Name	Grade	Vision	Hearing	Other Information
14	Henry	Six	Normal	Normal	Slight lisp. Has help from speech teacher.
15	June		Normal	Normal	Complains of blurring and watering of eyes.
16	Allen	Seven	Normal	Normal	Complains of eyes blurring. Dr.'s check reports eyes are all right. Nervousness.
17	Vic		R4/100 L4/100	No range of normal hearing.	Wears glasses. Eyes corrected to R20/40 and L 20/70. Cannot take part in any strenuous activity, nor be hit in head area. Obese. Asthmatic. Under Dr.'s care. Takes lip reading classes at school.
18	Ben		Normal	Normal	--
19	Hal		Normal	Normal	Not allowed to take physical education. Had rheumatic fever, '54. Heart murmur, but Dr. reported heart all right by Feb., '55. Health greatly improved in spring of '55.
20	Don	Eight	Normal	Normal	Unusually tall for age group--6'2".
21	Jim		Normal	Normal	In previous years has complained of eyes bothering him--stinging, watering, blurring. Maladjusted in previous years as to mental health--morose, withdraws, daydreams. Improved in upper grades.
22	Ike		Normal	Normal	Nervousness.
23	Peter		Normal	Normal	Valley Fever in '53, also appendectomy. Broken right arm which necessitated surgery, Apr., '55.
24	Kent		Normal	Normal	Slight brain concussion in pre school years. Malingering. Nervousness.

*The term 20/40 is interpreted to mean that an object can be seen at a distance of 20 feet which should ordinarily be seen at 40 feet.

**Petit mal is a type of mild attack of epilepsy in which only momentary lapses of attention occur. (3, p. 309)

detecting nearsightedness, a special pair of glasses for testing far sightedness was also used. The auditory screening was done on the ADC Puretone audiometer as it is a more accurate means of testing hearing than the "whisper test" or the "watch tick" test (3, p. 90). As defined by Hirsh (26, p. 311), "an audiometer is a device used to measure the response of the hearing mechanism (human) to sounds of different measured intensities."

Only two children were found to be far sighted. Upon further examination by the doctor, one was prescribed glasses and the other was not considered a serious enough defect to need glasses. Four other children were found to need glasses. Of the two pupils, numbers 8 and 10, found to have the 20/40 readings, one was reported by the doctor as being a case of malingering, and the other was not taken to the doctor for further check. Elton and Vic, pupil numbers 12 and 17, had been wearing glasses for several years, although Elton was prescribed new glasses when he went to the doctor for a recheck this year. All of the other children were reported to have no vision defects according to the screening tests. The many complaints of eyes blurring, watering, and stinging by these pupils may have been from emotional rather than physical causes.

Only one child was found to have a serious hearing defect. Vic, pupil number 17, according to the tests, had no range of normal hearing. To help him with his handicap, the speech correction teacher was teaching him lip reading.

Of other physical conditions that hindered these pupils, either in the form of absence from school or general good health, the following

are pointed out: Sally, pupil number 11, had petit mal seizures; Hal, pupil number 19, was troubled with rheumatic fever and a heart murmur; Lou and Rex, pupil numbers 8 and 13, had to have appendectomies this school year; and Peter had to have an operation on his right arm because of a compound fracture.

Analysis of Reading Performance

In this study, consideration was given to several aspects of reading ability as follows: (a) sight words, (b) knowledge of phonics, (c) oral reading ability, (d) type of errors made, and (e) silent reading ability. The data compiled in the tables pertaining to this topic were obtained from standardized tests and informal tests. Since it was considered appropriate for the major type of the data presented in this study, the statistical technique used to analyze the data was the sign test. A test statistic was needed which would compare distributions without specifying the form of the distributions. This procedure is called a non-parametric statistic, "since the comparison is between distributions and not between parameters." (8, p. 247)

Dixon and Massey (8, p. 247), describe the conditions under which the sign test is most useful by stating:

In experimental investigations, it is often desired to compare two materials or treatments under various sets of conditions. Pairs of observations (one observation for each of the two materials or treatments) are obtained for each of the separate sets of conditions. . . . the circumstances under which the sign test is most useful are when:

- a. There are pairs of observations on two things being compared.
- b. Each of the two observations of a given pair was made under similar conditions.
- c. The different pairs were observed under different conditions.

The procedure used in applying the sign test was the counting of the number of positive and negative differences for each test, and then referral to a table of critical values. The table used in this study for determining the significance levels can be found in Dixon and Massey (8, p. 324).

The pairs of observations in this study were the scores made by the pupils in the various pre-tests and post-tests in aspects of reading and in spelling. In cases where there were ties in these scores of the pre-test and the post-test, the zeros were divided and added equally between the plus and minus signs. "N" is used to denote the number of cases, and "r", the number of times the less frequent sign occurs.

The null hypothesis in each instance is that each difference has a probability distribution with median equal to zero. The null hypothesis will be true if each difference is symmetrically distributed about a mean of zero, and will be rejected when the number of positive and negative signs differ significantly from equality. This procedure will be carried out for each time the sign test is applied to the data.

Basic sight vocabulary test.--Knowledge of a basic sight vocabulary is necessary before word attack or phonic teaching becomes meaningful to children. Table 6 presents the number of words recognized in the Dolch List of 220 Basic Sight Words in the pre-test and post-test and the gain made in words recognized by each pupil in the improvement program.

According to Dolch, if a child knows all the 220 Basic Sight Words, "his sight vocabulary is at least that of the middle of grade III.

TABLE 6

GAINS IN NUMBER OF SIGHT WORDS RECOGNIZED IN A SIX MONTH PERIOD BY 22
PUPILS WHO COMPLETED THE IMPROVEMENT PROGRAM DURING THE SCHOOL YEAR
1954-55

Pupil No.	Pupil Name	Grade	Pre-Test Oct '54	Post-Test May '55	Words Gained	Sign
1	Sue	Five	190	--	--	--
2	Jane		195	212	17	+
3	Josie		189	218	29	+
4	Ray		153	195	42	+
5	Walt		139	183	44	+
6	Frank	Five	174	202	28	+
7	Stan		136	182	46	+
8	Lou		159	210	51	+
9	Bob		135	202	67	+
10	Nan		149	186	37	+
11	Sally	Six	201	212	11	+
12	Elton		208	214	6	+
13	Rex		177	206	3	+
14	Henry		192	216	24	+
15	June		150	--	--	--
16	Allen	Seven	195	208	13	+
17	Vic		206	211	5	+
18	Ben		202	209	7	+
19	Hal		185	202	17	+
20	Don	Eight	213	219	6	+
21	Jim		197	218	21	+

TABLE 6--Continued

Pupil No.	Pupil Name	Grade	Pre-Test Oct '54	Post-Test May '55	Words Gained	Sign
22	Ike	Eight	212	219	7	+
23	Peter		190	209	19	+
24	Kent		172	215	43	+

Mean 26

N = 22

r = 0

Statistically significant from zero at the .01 level of confidence

If he knows half of them, it is about the middle of grade II. If he knows only a fourth, it is still in grade I." (9, p. 28-29) According to this standard, no child was found to be below the middle of grade II, since the lowest score on the pre-test was 135 words. The range of words recognized in the pre-test was from 135 to 213 and in the post-test, 182 to 219. The largest number of words gained by any one child was 67, the smallest gain was 5, and the mean gain in words was 26.

In the preceding table, Table 6, when $N = 22$ and $r = 0$, there is significance at the 1 per cent level. That is, the chances are only 1 in 100 of obtaining a value of r equal to or less than 4 when there is no real difference in the scores made in the pre-test and the post-test (8, p. 324). Therefore, the null hypothesis is rejected and the conclusion is that these gains are significant at the 1 per cent level.

Phonetic Inventory Test.--In addition to a sight vocabulary, children need a knowledge of phonics so that they can attack unknown words. Dolch (9, p. 29), points this out when he says: "Beyond grade III the child should not be reading by relying on sight vocabulary

TABLE 7

NUMBER OF PHONIC ELEMENTS IN PHONETIC INVENTORY TEST RECOGNIZED IN PRE-TEST AND POST-TEST
BY THE 22 PUPILS WHO COMPLETED THE IMPROVEMENT PROGRAM DURING THE SCHOOL YEAR 1954-55

Pupil No.	Pupil Name	Grade	<u>Alphabet</u>			<u>Blends</u>			<u>Prefixes</u>			<u>Suffixes</u>			<u>Short Vowels</u>			<u>Nonsense Syllables</u>			<u>Nonsense Words</u>			<u>Reversals</u>		
			Oct	May	Sign*	Oct	May	Sign	Oct	May	Sign	Oct	May	Sign	Oct	May	Sign	Oct	May	Sign	Oct	May	Sign	Oct	May	Sign
1	Sue	Five	26	--	--	14	--	--	7	--	--	13	--	--	24	--	--	11	--	--	11	--	--	17	--	--
2	Jane		26	26	0	12	16	+	6	9	+	13	17	+	24	26	+	14	17	+	11	13	+	17	17	0
3	Josie		26	26	0	12	17	+	8	10	+	12	19	+	24	26	+	13	14	+	14	16	+	15	16	+
4	Ray		24	25	+	11	14	+	9	10	+	9	12	+	23	26	+	8	13	+	7	13	+	13	16	+
5	Walt		25	26	+	10	13	+	6	8	+	10	16	+	21	26	+	10	14	+	11	13	+	16	17	+
6	Frank	Five	25	26	+	11	17	+	5	11	+	6	13	+	22	24	+	9	13	+	11	11	0	15	15	0
7	Stan		24	26	+	13	17	+	6	10	+	4	13	+	19	18	-	7	10	+	9	8	-	17	17	0
8	Lou		26	26	0	15	17	+	7	9	+	11	16	+	20	23	+	10	14	+	10	15	+	16	17	+
9	Bob		25	24	-	10	13	+	5	7	+	10	19	+	19	18	-	11	12	+	9	12	+	13	16	+
10	Nan		26	25	-	9	15	+	6	8	+	7	14	+	18	23	+	1	3	+	1	2	+	12	14	+
11	Sally	Six	26	26	0	12	14	+	7	9	+	12	14	+	24	25	+	13	18	+	13	12	-	17	17	0
12	Elton		26	25	-	12	17	+	9	10	+	15	17	+	24	26	+	18	16	-	12	15	+	17	17	0
13	Rex		24	26	+	15	17	+	6	11	+	10	17	+	23	26	+	10	18	+	10	13	+	15	16	+

TABLE 7--Continued

Pupil No.	Pupil Name	Grade	Alphabet			Blends			Prefixes			Suffixes			Short Vowels			Nonsense Syllables			Nonsense Words			Reversals														
			Oct	May	Sign*	Oct	May	Sign	Oct	May	Sign	Oct	May	Sign	Oct	May	Sign	Oct	May	Sign	Oct	May	Sign	Oct	May	Sign												
14	Henry	Six	25	26	+	15	16	+	7	10	+	9	15	+	23	26	+	16	16	0	11	15	+	17	16	-												
15	June		24	--	--	5	--	--	7	--	--	10	--	--	21	--	--	9	--	--	5	--	--	16	--	--												
16	Allen	Seven	25	26	+	12	16	+	7	10	+	14	20	+	22	24	+	15	16	+	10	15	+	17	17	0												
17	Vic		24	26	+	16	17	+	8	10	+	15	18	+	25	26	+	16	18	+	13	13	0	16	16	0												
18	Ben		23	26	+	12	17	+	8	11	+	15	18	+	25	25	0	17	18	+	12	13	+	17	17	0												
19	Hal		24	25	+	10	14	+	6	7	+	10	11	+	19	27	+	3	14	+	4	3	-	12	15	+												
20	Don	Eight	26	26	0	17	17	0	9	11	+	14	15	+	26	27	+	18	18	0	13	14	+	17	17	0												
21	Jim		25	25	0	13	17	+	6	11	+	13	17	+	24	25	+	15	17	+	12	12	0	17	16	-												
22	Ike		26	26	0	17	17	0	10	11	+	14	17	+	27	27	0	16	18	+	15	16	+	17	17	0												
23	Peter		26	26	0	15	17	+	6	10	+	14	18	+	24	25	+	14	16	+	11	16	+	16	17	+												
24	Kent		26	25	-	13	17	+	6	11	+	15	18	+	22	23	+	13	18	+	13	13	0	15	17	+												
			N = 22			N = 22			N = 22			N = 22			N = 22			N = 22			N = 22			N = 22														
			r = 8			r = 1			r = 0			r = 0			r = 3			r = 2			r = 5			r = 7														
*Alphabet			-- No significance												Short Vowels												--Significance at 1 per cent level											
Blends			-- Significance at 1 per cent level												Nonsense Syllables												--Significance at 1 per cent level											
Prefixes			-- Significance at 1 per cent level												Nonsense Words												--Significance at 5 per cent level											
Suffixes			-- Significance at 1 per cent level												Reversals												--Significance at 25 per cent level											

alone. He should be attacking those words that he does not know by sight." The preceding table, Table 7, presents the number of phonic elements of the Phonetic Inventory Test recognized by each individual pupil in a pre-test and post-test. The sign test was applied to test the significance of the results obtained.

It is to be noted that there are eight different aspects tested in the Phonetic Inventory Test: alphabet, blends, prefixes, suffixes, short vowels, nonsense syllables, nonsense words, and reversals. The sign test was applied to each one of these aspects. In the test on the alphabet, when $N = 22$ and $r = 8$, no significance was found since the critical value of r at the 25 per cent level is 7 (8, p. 324). Therefore, the null hypothesis cannot be rejected. It is to be pointed out, however, that since most upper grade children already know the letters of the alphabet, it is not to be expected that much difference would exist between the pre-test and post-test, since, for example, approximately 50 per cent of the children already knew all of the letters of the alphabet on the pre-test.

In the test concerning blends in Table 7, when $N = 22$ and $r = 1$, significance was found to be at the 1 per cent level. That is, the chances are only 1 in 100 of obtaining a value of r equal to or less than 4 when there is no real difference in the scores made in the pre-test and the post-test (8, 324). Therefore, the null hypothesis is rejected and the conclusion is drawn that these gains are significantly different from zero at the 1 per cent level. The tests pertaining to prefixes, suffixes, short vowels, and nonsense syllables in Table 7,

were also found to be significant at the 1 per cent level.

In the test concerning nonsense words, Table 7, when $N = 22$ and $r = 5$, significance was found to be at the 5 per cent level. That is, the chances are only 1 in 20 of obtaining a value of r equal to or less than 5 when there is no real difference in the scores made in the pre-test and the post-test (8, p. 324). Therefore, the null hypothesis is rejected and the conclusion is drawn that these gains are significantly different from zero at the 5 per cent level.

The test on reversals, Table 7, when $N = 22$ and $r = 7$, showed significance only at the 25 per cent level, that is, the chances are only 1 in 4 of obtaining a value of r equal to or less than 7 when there is no real difference in the scores made in the pre-test and the post-test (8, p. 324). However, the null hypothesis cannot be rejected as, in this study, it is desired to reject the hypothesis only when the level of significance is at the 1 per cent or 5 per cent level.

Oral reading test.--Oral reading tests often show difficulties that pupils may have that can not be observed in silent reading tests. The growth made by the pupils in the improvement program in oral reading according to an Informal Reading Inventory Test given in October and re-administered in May, is shown in Table 8.

It is to be remembered that the Informal Reading Inventory Test given the pupils in the improvement program extended from pre-primer level to 8th grade level only, therefore, no child could achieve higher than 8th grade level on this test. In order to figure the gains made by the pupils in oral reading, the grade level scores were converted into

TABLE 8

YEARS GAINED IN ORAL READING IN A SIX MONTH PERIOD BY THE 22 PUPILS WHO COMPLETED THE IMPROVEMENT PROGRAM DURING THE SCHOOL YEAR, 1954-55, AS MEASURED BY THE INFORMAL READING INVENTORY TEST

Pupil No.	Pupil Name	Grade	Pre-Test Grade Level	Post-Test Grade Level	Years Gained	Sign
1	Sue	Five	High 2nd	--	--	--
2	Jane		High 2nd	High 3rd	1.0	+
3	Josie		High 3rd	4th	1.0	+
4	Ray		High 2nd	High 3rd	1.0	+
5	Walt		High 1st	Low 3rd	1.5	+
6	Frank	Five	High 2nd	High 3rd	1.0	+
7	Stan		High 1st	High 2nd	1.0	+
8	Lou		High 1st	Low 3rd	1.5	+
9	Bob		High 1st	Low 3rd	1.5	+
10	Nan		Low 2nd	High 2nd	.5	+
11	Sally	Six	4th	5th	1.0	+
12	Elton		4th	5th	1.0	+
13	Rex		High 2nd	7th	5.0	+
14	Henry		Low 3rd	5th	2.5	+
15	June		Low 2nd	--	--	--
16	Allen	Seven	High 3rd	5th	2.0	+
17	Vic		4th	6th	2.0	+
18	Ben		4th	5th	1.0	+
19	Hal		High 2nd	High 3rd	1.0	+
20	Don	Eight	7th	8th	1.0	+
21	Jim		4th	6th	2.0	+

TABLE 8--Continued

Pupil No.	Pupil Name	Grade	Pre-Test Grade Level	Post-Test Grade Level	Years Gained	Sign
22	Ike	Eight	7th	8th	1.0	+
23	Peter		High 3rd	5th	1.5	+
24	Kent		Low 2nd	4th	2.5	+

Mean 1.52 N = 22

r = 0

Statistically significant from zero at the .01 level of confidence

numerical values, for example: "Low 2nd was converted to a 2.0 and "High 3rd was converted to 3.5, while 4th, 5th, and 6th, were converted to 4.5, 5.5, and 6.5 respectively.

The greatest gain made in oral reading according to this test was that of Rex, pupil number 13. This gain in oral reading may be attributable to the fact that this test was not timed, as Rex was a very accurate reader, but slow. He seemed, also, to be making his best gains in reading in the latter part of the improvement program and this may be partly accountable by the fact that at this time, he was making better social and personal adjustment, both at home and in school.

Nan, pupil number 10, made the least gain of any of the pupils, gaining only a half a year in oral reading. Nan is a member of the 5th grade group which was the most irregular in attendance and, in addition to that, she had a greater number of days absence than any of the other children. Hal, pupil number 19, made the least gain of the 6th, 7th, and 8th graders. This may be accounted for by his general ill health, and absences due to rheumatic fever and to doctor visits.

The mean gain for the group in oral reading in Table 8, was found to be 1.52 years, and when the sign test was applied to test the significance of the results obtained, significance was found at the 1 per cent level.

Types of errors made.--The kind of errors pupils make must be identified before specific help can be given them in improving their reading. Broom, et al (6, p. 433) states, "The identification of specific errors is a necessary first step in the correction of reading difficulties." The following table, Table 9, presents the type of errors made by the pupils when taking the Informal Reading Inventory pre-test and post-test.

It is interesting to note in this table that there were 88 errors for the total group in the pre-test and 24 errors in the post-test. Of all the types of errors made by the pupils, the greatest improvement was shown in "Hesitates". Fifteen showed hesitation in reading in the pre-test and only two in the post-test. Since hesitation in reading implies insecurity in attacking unknown words, and fear of making errors, it would seem that improvement in this type of error might tend to show that the pupils had gained in self confidence.

The next greatest improvement was in "Misses small words". Ten children were observed missing the small words on the pre-test, and none on the post-test. This may indicate that their gains of the basic sight words as was shown in Table 6, is also being carried over into their paragraph reading. "Vocalizing" seemed to be the only type of error retained by many of the pupils, 15 being observed vocalizing in the pre-test, and 13 in the post-test.

TABLE 9

TYPE OF ERRORS IN ORAL READING MADE IN INFORMAL ANALYSIS TEST GIVEN TO THE PUPILS IN THE
IMPROVEMENT PROGRAM, OCTOBER, 1954 AND MAY, 1955

Pupil No.	Pupil Name	Grade	<u>Misses</u> <u>small</u> <u>words</u>	<u>Ignores</u> <u>punctu-</u> <u>ation</u>	<u>Vocal-</u> <u>izes</u>	<u>Hesi-</u> <u>tates</u>	<u>High</u> <u>tense</u> <u>voice</u>	<u>Misses</u> <u>end-</u> <u>ings</u>	<u>Re-</u> <u>peats</u>	<u>Poor</u> <u>compre-</u> <u>hen-</u> <u>sion</u>	<u>Spells</u> <u>out</u> <u>words</u>	<u>Makes</u> <u>grim-</u> <u>aces</u>	<u>Skips</u> <u>words</u>
1	Sue	Five	x*	x	x					x			
2	Jane			x	xo	x		x		x			
3	Josie		x			x	x	x					
4	Ray				xo	x			xo			xo	
5	Walt					xo			x		o		
6	Frank	Five	x		o	x				x			
7	Stan		x		xo	x			x		x	x	
8	Lou		x	x	xo	x			x	x		o	
9	Bob			x	xo	x			x	x			
10	Nan			x	xo				o	xo	x		
11	Sally	Six			xo	x	x						
12	Elton				xo	x	x			x			x
13	Rex		x										

TABLE 9--Continued

<u>Pupil</u> <u>No.</u>	<u>Pupil</u> <u>Name</u>	<u>Grade</u>	<u>Misses</u> <u>small</u> <u>words</u>	<u>Ignores</u> <u>punctu-</u> <u>ation</u>	<u>Vocal-</u> <u>izes</u>	<u>Hesi-</u> <u>tates</u>	<u>High</u> <u>tense</u> <u>voice</u>	<u>Misses</u> <u>end-</u> <u>ings</u>	<u>Re-</u> <u>peats</u>	<u>Poor</u> <u>compre-</u> <u>hen-</u> <u>sion</u>	<u>Spells</u> <u>out</u> <u>words</u>	<u>Makes</u> <u>grim-</u> <u>aces</u>	<u>Skips</u> <u>words</u>
14	Henry	Six			x	x			x				
15	June		x						x	x			
16	Allen	Seven			x	x	x				x	x	
17	Vio							x	x				x
18	Ben			x					x				x
19	Hal		x		xo	xo	x	x		xo			
20	Don	Eight			xo				x				x
21	Jim		x			o				x			
22	Ike				xo								
23	Peter					x		x					x
24	Kent		x		xo	x			o		xo		

*Note: x refers to errors made in pre-test
o refers to errors made in post-test

Silent reading tests.--The growth of the pupils in the improvement program in silent reading according to standardized California Reading Achievement tests, Form AA and DD, is shown in Table 10. The

TABLE 10

YEARS GAINED IN SILENT READING IN A SIX MONTH PERIOD BY THE 22 PUPILS WHO COMPLETED THE IMPROVEMENT PROGRAM DURING THE SCHOOL YEAR, 1954-55 AS MEASURED BY CALIFORNIA READING ACHIEVEMENT TESTS

Pupil No.	Pupil Name	Grade	I.Q.	Pre-Test Oct '54	Post-Test May '55	Years Gained	Sign
1	Sue	Five	93	3.1	--	--	--
2	Jane		85	3.2	4.1	.9	+
3	Josie		89	3.4	4.8	1.4	+
4	Ray		94	3.1	3.5	.4	+
5	Walt		83	3.2	3.8	.6	+
6	Frank	Five	93	3.6	4.4	.8	+
7	Stan		88	2.8	3.4	.6	+
8	Lou		91	3.5	3.6	.1	+
9	Bob		96	3.9	3.3	-.6	-
10	Nan		87	3.6	3.4	-.2	-
11	Sally	Six	83	3.7	4.8	1.1	+
12	Elton		97	5.1	5.9	.8	+
13	Rex		81	3.5	5.5	2.0	+
14	Henry		90	4.0	4.8	.8	+
15	June		96	2.9	--	--	--
16	Allen	Seven	90	4.7	6.0	1.3	+
17	Vic		88	6.1	6.8	.7	+

TABLE 10--Continued

Pupil No.	Pupil Name	Grade	I.Q.	Pre-Test Oct '54	Post-Test May '55	Years Gained	Sign
18	Ben	Seven	97	6.0	7.0	1.0	+
19	Hal		80	4.0	5.6	1.6	+
20	Don	Eight	98	6.6	9.8	3.2	+
21	Jim		83	5.2	7.4	2.2	+
22	Ike		110	7.4	9.5	2.1	+
23	Peter		84	5.3	7.3	2.0	+
24	Kent		82	4.8	6.4	1.6	+

Mean 1.13 N = 22

r = 2

Statistically significant from zero at the .01 level of confidence

sign test was applied to test the significance of the results obtained, and significance was found at the 1 per cent level. The null hypothesis was rejected and the conclusion drawn that these gains are significantly different from zero at the 1 per cent level.

The greatest gain made by any of the pupils in silent reading as shown in Table 10, was that of Don, pupil number 20, who gained 3.2 years in the six month period. A loss was shown by Bob and Nan, pupils number 9 and 10. The mean years gained in silent reading was 1.13 years for the whole group. It is interesting to note that Don, who made the greatest gain, showed great improvement in his social and personal adjustment as the year progressed. This was apparently evident not only to the teachers but to the pupils, as they elected him to the office of vice president of the student body which was composed of grades 6, 7,

and 8. The two pupils who showed a loss in the scores made in the silent reading tests, were both in the 5th grade group which was very irregular in attending the classes in the improvement program. In addition to this fact, as was pointed out before, Bob is the child who had developed a "passive" air towards conditions at home and seemed to carry this attitude toward his school work also, while Nan is the child who was absent more than any of the other children in the groups.

As to the group gains as shown in Table 10, the 8th grade group made the greatest gains in silent reading, while the second group of 5th graders made the least gain. It is interesting to note that in a study of remedial reading groups, Monroe (33, p. 154) found that the older children made greater gains than the younger children. This is also true in the present study as neither of the 5th grade groups made as great gains as the 6th, 7th, and 8th grade groups.

Analysis of Spelling Improvement

Since reading and spelling have been found to have a close relationship in other studies (25, p. 481), consideration was given to the improvement made by the pupils in spelling. The data compiled in Table 11 were secured from the scores made by the pupils. The test used was the spelling test of the Stanford Achievement Tests, Forms D and E. This test was a graded list of 50 words which were dictated to the pupils. The scores listed in the table are the number of words spelled correctly in the pre-test and the post-test.

The sign test was used to test the significance of the results obtained, significance being found at the 1 per cent level. The null

TABLE 11

WORDS GAINED IN SPELLING IN A SIX MONTH PERIOD BY THE 22 PUPILS WHO
COMPLETED THE IMPROVEMENT PROGRAM DURING THE SCHOOL YEAR, 1954-55,
AS MEASURED BY STANFORD ACHIEVEMENT TESTS

Pupil No.	Pupil Name	Grade	I.Q.	Pre-Test Oct '54	Post-Test May '55	Words Gained	Sign
1	Sue	Five	93	9	--	--	--
2	Jane		85	10	22	12	+
3	Josie		89	3	21	18	+
4	Ray		94	3	13	10	+
5	Walt		83	1	18	17	+
6	Frank	Five	93	6	13	7	+
7	Stan		88	3	9	6	+
8	Lou		91	7	13	6	+
9	Bob		96	0	10	10	+
10	Nan		87	1	13	12	+
11	Sally	Six	83	5	19	14	+
12	Elton		97	9	27	18	+
13	Rex		81	2	18	16	+
14	Henry		90	13	29	16	+
15	June		96	7	--	--	--
16	Allen	Seven	90	0	16	16	+
17	Vic		88	1	20	19	+
18	Ben		97	7	16	9	+
19	Hal		80	0	7	7	+
20	Don	Eight	98	5	20	15	+
21	Jim		83	0	2	2	+

TABLE 11--Continued

Pupil No.	Pupil Name	Grade	I.Q.	Pre-Test Oct '54	Post-Test May '55	Words Gained	Sign
22	Ike	Eight	110	1	16	15	+
23	Peter		84	9	23	14	+
24	Kent		82	7	18	11	+

Mean 12.34 N = 22

r = 0

Statistically significant from zero at the .01 level of confidence

hypothesis was rejected and the conclusion is that these gains are significantly different from zero at the 1 per cent level.

The greatest gain made by any of the pupils in spelling as shown in Table 11, was that of Vic, pupil number 17, who made a gain of 19 in number of words spelled correctly. The least gain made by any of the pupils in spelling was that of Jim, pupil number 21, who made a gain of only 2 words. The mean number of words gained for the whole group was 12.34 words.

The greatest gain made by any of the groups was that of the 6th grade. It is interesting to note that the second 5th grade group made the least gains in spelling, as was also true in the results of the reading tests, Table 10. The irregularity of attendance of this group, in comparison to the other groups, seemed to be the greatest contributing factor to their low gain.

Changes Made During the Typing, Non-Typing and Optional Periods

In order to observe if any changes were made in the pupils' progress when the typewriters were available to them, and when they were

not available, standardized achievement tests were given at two month intervals in reading and spelling. These tests included the pre-test and post-test scores already presented in Tables 10 and 11, and in addition, included test scores from standardized tests given in January and March. The tests used in reading for the January and March scores were Forms BB and CC of the California Reading Achievement Test, and for spelling, Forms D and E of the Stanford Achievement Test. The following table, Table 12, presents the results of the tests given in reading during these periods.

TABLE 12

GAINS MADE IN READING ACHIEVEMENT ACCORDING TO SCORES MADE IN CALIFORNIA READING TESTS BY THE 24 PUPILS IN THE IMPROVEMENT PROGRAM DURING THE TYPING, NON-TYPING, AND OPTIONAL PERIODS OF THE SCHOOL YEAR 1954-55

Pupil No.	Pupil Name	Grade	Typing Period				Non-Typing Period				Optional Period			
			Oct	Jan	Gain	Sign	Jan	Mar	Gain	Sign	Mar	May	Gain	Sign
1	Sue	Five	3.1	3.3	.2	+	3.3	4.3	1.0	+	--	--	--	--
2	Jane		3.2	3.2	.0	+	3.2	2.8	-.4	-	2.8	4.1	1.3	+
3	Josie		3.4	3.3	-.1	-	3.3	4.6	1.3	+	4.6	4.8	.2	+
4	Ray		3.1	2.6	-.5	-	2.6	3.8	1.2	+	3.8	3.5	-.3	-
5	Walt		3.2	2.9	-.3	-	2.9	3.4	.5	+	3.4	3.8	.4	+
6	Frank	Five	3.6	3.5	-.1	-	3.5	3.9	.4	+	3.9	4.4	.5	+
7	Stan		2.8	2.7	-.1	-	2.7	2.7	.0	0	2.7	3.4	.7	+
8	Lou		3.5	3.9	.4	+	3.9	3.4	-.5	-	3.4	3.6	.2	+
9	Bob		3.9	2.8	-1.1	-	2.8	2.7	-.1	-	2.7	3.3	.6	+
10	Nan		3.6	3.2	-.4	-	3.2	3.5	.3	+	3.5	3.4	-.1	-
11	Sally	Six	3.7	4.4	.7	+	4.4	4.5	.1	+	4.5	4.8	.3	+

TABLE 12--Continued

Pupil No.	Pupil Name	Grade	Typing Period				Non-Typing Period				Optional Period			
			Oct-Jan	Jan	Gain	Sign	Jan-Mar	Mar	Gain	Sign	Mar-May	May	Gain	Sign
12	Elton	Six	5.1	5.0	-.1	-	5.0	4.8	-.2	-	4.8	5.9	1.1	+
13	Rex		3.5	3.5	.0	0	3.5	3.7	.2	+	3.7	5.5	1.8	+
14	Henry		4.0	3.9	-.1	-	3.9	3.6	-.3	-	3.6	4.8	1.2	+
15	June		2.9	2.8	-.1	-	2.8	3.3	.5	+	--	--	--	--
16	Allen	Seven	4.7	4.9	.2	+	4.9	5.2	.3	+	5.2	6.0	.8	+
17	Vic		6.1	6.6	.5	+	6.6	6.7	.1	+	6.7	6.8	.1	+
18	Ben		6.0	6.4	.4	+	6.4	6.7	.3	+	6.7	7.0	.3	+
19	Hal		4.0	4.5	.5	+	4.5	4.8	.3	+	4.8	5.6	.8	+
20	Don	Eight	6.6	8.0	1.4	+	8.0	8.7	.7	+	8.7	9.8	1.1	+
21	Jim		5.2	6.6	1.4	+	6.6	6.1	-.5	-	6.1	7.4	1.3	+
22	Ike		7.4	9.0	1.6	+	9.0	9.0	.0	0	9.0	9.5	.5	+
23	Peter		5.3	6.1	.8	+	6.1	6.4	.3	+	6.4	7.3	.9	+
24	Kent		4.8	5.2	.4	+	5.2	5.7	.5	+	5.7	6.4	.7	+
Means			.23				.25				.65			
			N = 24				N = 24				N = 22			
			r = 10				r = 7				r = 2			
Typing Period			--No significance											
Non-Typing Period			--No significance											
Optional Period			--Statistically significant from zero at the .01 level of confidence											

It is pointed out that each of the periods referred to in both Tables 12 and 13, was two months in length, although the Oct-Jan period appears to be longer. Pre-testing and a two weeks' Christmas vacation intervened in the Oct-Jan period.

Generally, little progress is anticipated at the first in remedial

reading programs (25, p. 670). It is interesting to note that in this study, also, progress was found to be slow at the beginning of the program as is evidenced by the mean gains in the typing and non-typing periods. The 8th grade group was the only one that made an unusually large gain in reading during the typing period, making an average gain of 1.0 years in two months. However, it is of further interest to note that for all the groups, there was very little discernible growth in the mean gains in reading in the tests given at the end of the typing period and the non-typing period. The greatest gain was found to be made during the optional period when the typewriters were available and each child could choose for himself whether he wished to read or type, the mean gain in this period being .65 years for the two month period. It might be explained that some of this gain in the optional period may possibly have been cumulative or to have stemmed from previous practices.

In Table 12, the sign test was used to test the significance of the scores made in silent reading for each of the two month periods. In the typing period, no significance was found in the results obtained in the reading test. In this first test, when $N = 24$ and $r = 10$, no significance was found since the critical value of r at the 25 per cent level is 8 (8, p. 324). It is to be remembered that the value of r has to be less than or equal to the value in the table before significance is found at a given per cent level.

In applying the sign test to the results obtained in the tests during the non-typing period, when $N = 24$ and $r = 7$, significant gains were found to be only at the 10 per cent level. That is, the chances

are only 1 in 10 of obtaining a value of r equal to or less than .7 when there is no real difference in the scores made in the pre-test and the post-test (8, p. 324). In this study, since it was desired to reject the hypothesis only when the significance is at the 1 per cent or the 5 per cent level, the null hypothesis cannot be rejected.

In applying the sign test to the results obtained in the tests during the optional period as shown in Table 12, significance was found at the 1 per cent level.

It is interesting to note that the results of the spelling tests, as shown in Table 13, show a different pattern in gains for the group than the reading gains found in Table 12.

TABLE 13

GAINS IN NUMBER OF WORDS SPELLED CORRECTLY FROM A LIST OF 50 DICTATED WORDS OF THE STANFORD ACHIEVEMENT TEST BY THE 24 PUPILS IN THE IMPROVEMENT PROGRAM DURING THE TYPING, NON-TYPING, AND OPTIONAL PERIODS OF THE SCHOOL YEAR, 1954-55

Pupil No.	Pupil Name	Grade	Typing Period				Non-Typing Period				Optional Period			
			Oct	Jan	Gain	Sign	Jan	Mar	Gain	Sign	Mar	May	Gain	Sign
1	Sue	Five	9	17	8	+	17	20	3	+	--	--	--	--
2	Jane		10	16	6	+	16	21	5	+	21	22	1	+
3	Josie		3	13	10	+	13	13	0	0	13	21	8	+
4	Ray		3	16	13	+	16	12	-4	-	12	13	1	+
5	Walt		1	7	6	+	7	14	7	+	14	18	4	+
6	Frank	Five	6	2	-4	-	2	11	9	+	11	13	2	+
7	Stan		3	5	2	+	5	6	1	+	6	9	3	+
8	Lou		7	3	-4	-	3	11	8	+	11	13	2	+
9	Bob		0	4	4	+	4	3	-1	-	3	10	7	+

TABLE 13--Continued

Pupil No.	Pupil Name	Grade	Typing Period				Non-Typing Period				Optional Period			
			Oct	Jan	Gain	Sign	Jan	Mar	Gain	Sign	Mar	May	Gain	Sign
10	Nan	Five	1	6	5	+	6	10	4	+	10	13	3	+
11	Sally	Six	5	6	1	+	6	17	11	+	17	19	2	+
12	Elton		9	11	2	+	11	24	13	+	24	27	3	+
13	Rex		2	11	9	+	11	15	14	+	15	18	3	+
14	Henry		13	14	1	+	14	28	14	+	28	29	1	+
15	June		7	7	0	0	7	13	6	+	--	--	--	--
16	Allen	Seven	0	0	0	0	0	10	10	+	10	16	6	+
17	Vic		1	8	7	+	8	7	-1	-	7	20	13	+
18	Ben		7	10	3	+	10	13	3	+	13	16	3	+
19	Hal		0	1	1	+	1	10	9	+	10	7	-3	-
20	Don	Eight	5	8	3	+	8	17	9	+	17	20	3	+
21	Jim		0	2	2	+	2	5	3	+	5	2	-3	-
22	Ike		1	4	3	+	4	16	12	+	16	16	0	0
23	Peter		9	9	0	0	9	21	12	+	21	23	2	+
24	Kent		7	13	6	+	12	21	8	+	21	18	-3	-
Means			3.52				6.50				2.63			
			N = 24				N = 24				N = 22			
			r = 3				r = 3				r = 3			

Typing Period --Statistically significant from zero at the .01 level of confidence

Non-Typing Period--Statistically significant from zero at the .01 level of confidence

Optional Period --Statistically significant from zero at the .01 level of confidence

While the greatest reading gains were found to be in the last, or optional period, the greatest spelling gains were found to be in the

second, or non-typing period. It is of further interest to note that the smallest gains in spelling were made in the optional period, with a mean gain of only 2.63 words, while the non-typing period showed a mean gain of 6.50 words, and the typing period, 3.52 words.

Although Allen, pupil number 16, retained his 0 score in January, showing no growth in spelling according to his scores, it should be pointed out that he was spelling his words more nearly correct than during the first test. Certain sounds in the words were being spelled correctly and in some instances, he missed only one letter in the words.

The sign test was applied to test the significance of the results obtained in the spelling tests for each of the two month periods. Significance was found at the 1 per cent level for the results obtained at the end of each of these periods--typing, non-typing, and optional

Analysis of Comparative Gains of Individuals

There appears to be no definite pattern to the gains made by the pupils in this study either in relationship to intelligence or in consistency of gains. For example, some of the pupils in the lower I.Q. range made the greatest gains in certain areas, while others, who made the greatest gain in one particular area, may have made only average or below average gains in the other areas.

The individual gains made by the pupils in the improvement program in spelling and in three major aspects of reading--sight words, oral reading, and silent reading, are presented in Table 14 which follows.

Rex, pupil number 13, who had an I.Q. of 81, made the greatest

TABLE 14

COMPARISON OF INDIVIDUAL GAINS MADE BY THE 24 PUPILS IN THE IMPROVEMENT
PROGRAM IN SPELLING AND IN THREE MAJOR AREAS OF READING

Pupil No.	Pupil Name	Grade	I.Q.	Sight Words	Oral Reading	Silent Reading	Spelling
1	Sue	Five	93	--	--	--	--
2	Jane		85	17	1.0	.9	12
3	Josie		89	29	1.0	1.4	18
4	Ray		94	42	1.0	.4	10
5	Walt		83	44	1.5	.6	17
6	Frank	Five	93	28	1.0	.8	7
7	Stan		88	46	1.0	.6	6
8	Lou		91	51	1.5	.1	6
9	Bob		96	67	1.5	-.6	10
10	Nan		87	37	.5	-.2	12
11	Sally	Six	83	11	1.0	1.1	14
12	Elton		97	6	1.0	.8	18
13	Rex		81	3	5.0	2.0	16
14	Henry		90	24	2.5	.8	16
15	June		96	--	--	--	--
16	Allen	Seven	90	13	2.0	1.3	16
17	Vic		88	5	2.0	.7	19
18	Ben		97	7	1.0	1.0	9
19	Hal		80	17	1.0	1.6	7
20	Don	Eight	98	6	1.0	3.2	15
21	Jim		83	21	2.0	2.2	2

TABLE 14--Continued

Pupil No.	Pupil Name	Grade	I.Q.	Sight Words	Oral Reading	Silent Reading	Spelling
22	Ike	Eight	110	7	1.0	2.1	15
23	Peter		84	19	1.5	2.0	14
24	Kent		82	43	2.5	1.6	11
Means			89.91	26	1.52	1.13	12.34

gain of all the pupils in oral reading, while Ike, pupil number 22, who had the highest I.Q., 110, did not make the "greatest" gain in any of the areas; and Bob, pupil number 9, with an I.Q. of 96 was one of the two pupils to show a loss. Don, pupil number 20, who had an I.Q. of 98, made the greatest gains of all in silent reading.

Only two pupils, numbers 9 and 10, showed a loss in any of the tests. It is interesting to note that Nan, pupil number 10, also had the least gain in oral reading, although she made average gains in spelling and above average gains in sight words. Bob, on the other hand, made the greatest gain of any of the pupils in sight words, average gains in oral reading, and a little below average gains in spelling.

Rex, pupil number 13, made the greatest gain of all the pupils in oral reading, making a gain of 5.0 years. He also showed a substantial gain, 2.0 years, in silent reading. This large difference in gain between silent and oral reading may be attributed largely to the fact that the silent reading test was timed, and the oral reading was not. Rex was a slow, but very accurate reader. He showed more than average gains in spelling, but practically no gain, 3 words, in sight words.

The greatest gain in silent reading was made by Don, pupil number 20, who gained 3.2 years. He made a little more than average gain in spelling, but only 6 words in the sight word test. However, it is to be pointed out that Don knew 213 of the 220 basic sight words in the pre-test. While his gain in oral reading showed only 1.0 years as in contrast to the 3.2 years in silent reading, it must be remembered that the oral reading test extended only to the 8th grade level, so his ability above that was not measured.

Vic, pupil number 17, who made the greatest gain of all the pupils in spelling, showed more than average gains in oral reading, but less than average gains in silent reading, and only a slight gain in sight words. Jim, pupil number 21, who made the least gain in spelling, showed more than average gains in both silent and oral reading and almost average gains in sight words.

Summary of Quantitative Results

1. The I.Q.s of the pupils in the improvement program ranged from 80 to 98 with one exception. The mean I.Q. was 89.91; the mean M.A. was 10.77 years; and the mean C.A. was 12.02 years, resulting in 50 per cent of the pupils being over age for their respective grade levels.

2. Seventy-five per cent of the pupils had attended more than one school, the mean being 3.12 schools. Over 50 per cent of the pupils had taken remedial reading previously. The mean number of years for the group was 1.12. Fifty per cent of the pupils had repeated a grade sometime during their school experiences.

3. At the beginning of the improvement program, the greatest

number of maladjusted children were found to be the "oldest" children in their respective families.

4. The gains made by the pupils in recognition of basic sight words were found to be significant at the 1 per cent level according to the sign test. The largest number of words gained was 67, the smallest 5, and the mean number of words gained was 26.

5. Significant gains were found either at the 1 per cent or 5 per cent level, for all aspects of the Phonetic Inventory Test, with the exception of aspects dealing with the alphabet and reversals.

6. Some gain was made in oral reading by all of the pupils. The greatest gain made by any one pupil was 5 years, and the least gain made was .50 year, the mean gain being 1.52 years.

7. All the pupils showed improvement in the number of errors made while reading, the greatest improvement being shown in "hesitates" and the least improvement being shown in "vocalizes".

8. The gains made by the pupils in silent reading were found to be significant at the 1 per cent level when the sign test was applied. The greatest gain made by any one of the pupils was 3.2 years. Two pupils showed a loss. The mean gain of the group was 1.13 years. As to group gains in silent reading, the 8th grade group showed the greatest gains, while the least gain was made by the second group of 5th graders.

9. Significance at the 1 per cent level was also found in the results obtained in the spelling tests. The greatest gain made by any of the pupils was 19 words, and the least gain was 2 words. The mean gain in spelling for the group was 12.34 words.

10. As a result of the sign test, the gains made in reading were found to be significant at the 1 per cent level for the tests given at the end of the optional period; significant at the 10 per cent level at the end of the non-typing period; and no significance was found at the end of the typing period. The 8th grade group was the only group that made substantial gains in reading during the typing period.

11. In spelling, significance was found at the 1 per cent level in the tests given at the end of the typing, non-typing, and optional periods.

12. As to changes made by the pupils during the typing, non-typing, and optional periods, the greatest growth took place during the optional period in reading, while in spelling, the greatest growth took place during the non-typing period.

13. There appeared to be no definite pattern to the individual gains made by the pupils in this study in three major aspects of reading and in spelling, either in relationship to intelligence or in consistency of gains.

Analysis of Qualitative Information

The section concerning the objective data, while complete in itself, may be accentuated by reference to the qualitative data presented in the following section.

Teacher and pupil opinions were solicited in the form of questionnaires in an effort to discover what changes were made in pupil progress, and what reactions, if any, were shown by the pupils when the typewriter was used as a motivational device. The questionnaires submitted to the

teachers and pupils had been carefully thought out to maintain simplicity and in order to elicit honest opinions and appraisals, in contradistinction to laudatory sentiments. A copy of the teacher questionnaire is found in Appendix E and a copy of the pupil questionnaire is found in Appendix F.

A variety of comments and observations concerning the behavior of the pupils during the improvement program, emerged from the teachers and pupils as the study progressed. These have been incorporated in this section for the purpose of lending completeness to the study. It is unnecessary, no doubt, to urge the reader to exercise caution when placing interpretation upon the following qualitative data.

Data from Questionnaires

Teacher questionnaires.--The responses of the home room teachers, indicating their observations of the effects of the program upon their pupils in the improvement program, are presented in Table 15.

Dealing with the first three questions in Table 15, which were concerned with the observable improvement in the classrooms, it will be noted that the responses in March indicate that the teachers observed only one pupil was doing exceptionally better work in the classroom, while seven pupils were reported as not being affected. However, it is of interest to note that to the same three questions in May, twelve pupils were observed doing exceptionally better classroom work and only 4 were observed as not being affected by the remedial program.

The last two questions of Table 15 were concerned with the noticeable effects on the pupils when permitted to use or not to use the

TABLE 15

HOME ROOM TEACHERS' OPINIONS IN MARCH AND MAY, 1955, AS TO PROGRESS
MADE BY PUPILS IN THE IMPROVEMENT PROGRAM AND EFFECTIVENESS
OF THE TYPEWRITER AS A MOTIVATIONAL DEVICE

Questions	Responses--March				Responses--May		
	No Differ- ence	Some Differ- ence	Marked Differ- ence		No Differ- ence	Some Differ- ence	Marked Differ- ence
1. Do your remedial readers appear to be doing better in over-all school work?	1	22	1		0	15	7
2. Do your remedial readers appear to be doing better in work that involves reading?	3	21	0		1	18	3
3. Will the grades of your remedial readers be affected this quarter in comparison to the first quarter of school?	3	21	0		3	17	2
4. Were you able to notice any difference in your remedial readers' eagerness to come to class when not allowed to type? (Jan. to Mar.)	17	5	2				
5.* Were you able to notice any difference in your remedial readers' eagerness to come to class when allowed to use the typewriters? (Mar. to May)					13	9	0

*Question 5 was asked in lieu of Question 4 in the May questionnaire.

typewriters. It is interesting to note that the largest number of responses indicated that there was no observable differences in the pupils' eagerness to come to the remedial classes when they were allowed to use the typewriters or when they were not allowed to use them. Only two pupils were reported in the March responses as being observed as greatly affected by the typewriters not being available to them.

In addition to the responses on the questionnaires as presented in Table 15, the following comments were made by the teachers:

Walt is always eager to go. Occasionally Stan doesn't want to go over.

Evidence of strong motivation present from about the second month.

Elton is very much better in overall school work.

Individually, Allen has improved. Comparatively with the other students, little improvement has been shown except for small gain in self confidence.

Noticeable improvement individually. Without individual help, I'm sure they'd not have made any improvement if left with the class as a whole. I'm only sorry they could not have had more time in the remedial class.

Don has had much difficulty with spelling, but has learned to sound words and does fairly well now.

Remedial reading has helped Jim some, but he is still quite poor in classroom reading and won't work unless forced.

Pupil questionnaires.--A questionnaire was given the pupils in March and again in May in an effort to find out if the pupils' attitudes towards reading and typing were changing, and if the typewriter had acted as a motivational influence. During the period previous to the March questionnaire, the pupils were not allowed to use the typewriters, while during the period previous to the May questionnaire, they had been

permitted to use them.

Question 1: "Has this class helped you in reading?".--In answer to the first question, the pupils answered unanimously "Yes" at both times. One child commented, "Before I came to this class I could hardly read."

Question 2: "Has this class helped you in other school work?".--In answer to this question, only two said they didn't know, while the others all stated that it had, particularly in spelling. One child stated she had been in the low group in spelling at first but had now been moved to the first group. Others commented that the class helped them in English, and one said, "Even in Arithmetic." Another stated that it had helped him "in everything."

Question 3: "Which do you like best, reading or typing?".--The answers varied somewhat for the March and May questionnaires in answer to this question. In March, 5 stated they liked to read better, 8 preferred the typing, and 11 said they liked both. In May, 5 said they liked to read better, 5 preferred the typing, and 12 said they liked both. Two children had moved away so were not included in the May responses. One child stated in March, "I don't care if I read or type now, but at first I always wanted to type."

Question 4: "Do you look forward to coming over to this class?".--In answer to this question, only one child answered "No" both in March and May and qualified the "No" by stating that, "If I am doing something in the room I like, I don't like to stop." It is interesting to note that one child qualified her "Yes" answer with the statement, "When

we have tests, I don't like it." Several of the children commented in answer to this question that they looked forward to coming over to the class so they could read, type, or do both, their comments being much in agreement with their answers to questions 1 and 2. Three said they thought the class was fun and one commented, "It is quieter." These answers might imply that the children felt more relaxed in the class than in their own classrooms. One stated that he looked forward to coming over because he got out of social studies, while another stated, "I get out of English and I learn more than I do in my own room."

Question 5: "Would you like to keep on with your typing?"---

This question received a unanimous "Yes" answer in March. In May, one stated she would rather read, and one stated he didn't know, the others all answered "Yes". One boy qualified his "Yes" with, "I would like to do more typing in high school, but I want to learn to read first."

Comments of Teachers

Status in peer groups.---Some of the comments made by the teachers indicated that the pupils not only took pride in their typing, but that they had achieved status in their peer groups because of it. Many of the children were said to have passed their typing around in the classrooms. One teacher stated that the first time this happened she thought the child was passing a note, but when she learned it was her typing, she also praised the child's work.

Gain in self confidence.---Some of the teachers remarked that their pupils were gaining in self confidence, particularly when they read orally in their classrooms. Others mentioned they had noticed

improvement in work habits in the room and assumption of responsibility, particularly during the last semester of school.

Improved social and emotional adjustment.--As the improvement program progressed, several of the teachers remarked about their pupils making favorable changes in emotional or social adjustment. Most of these same children had been reported at the beginning of the year as being anti-social. Other comments indicated that the teachers had observed the pupils had greater interest in their work, more initiative and better group adjustment. The 5th grade teachers noted less social and emotional adjustments in their groups. One 8th grade teacher remarked that two of her remedial readers had been elected to offices in the student body the second semester. This would indicate that these boys were not only being accepted by the group, but being chosen as the leaders of the group.

Pupil Comments

Interest in the typewriter.--The children often remarked that other pupils had shown a desire to take the remedial classes because the typewriter was being used this year. Many comments of, "It's my turn to type today!" were heard, particularly at the first of the program. It was interesting to note that one child gave up part of his play period each day so that he could use the typewriter longer. Whenever it was necessary for the children to miss a remedial reading class because of assembly programs, or other similar activities, they would arrange to make up the period if possible as they "didn't want to miss typing."

Belief that typing helped them in reading and other work.--Very early in the program, the pupils commented on how much the typing was helping them in language, spelling, and other work in their rooms. One 8th grade boy was the first to state, "typing has already helped me." He had taken remedial reading for three years previous to this time, and remarked often how bored he'd been with the ordinary motivational techniques used in his other remedial reading classes. The following remark made by a 7th grade boy seemed to express the confidence and satisfaction some of the pupils were acquiring later in the program:

I was complimented by all the kids in the room yesterday. The teacher asked me to read a paragraph over again. When I asked him if it was wrong, he said, "No, you read it so well I just wanted to hear it again." Everyone in the room said it was good.

Importance of reading.--As the program progressed, comments were heard that indicated reading was becoming more and more important to the pupils and that the typewriter was no longer the motivational influence it had been earlier. Even as early as November, some of the pupils remarked how fast a reading period had gone. Later, other pupils would ask if they "had to do the typing"--that they "wanted to read." In February, Josie, pupil number 3, remarked, "I don't care if I ever get to type again."

However, on the other hand, the second group of 5th graders who achieved the least in their achievement tests, indicated by their remarks that the typing continued to be more important to them than the reading.

Observations

Several observations were made concerning the pupils' reactions to the typing, non-typing, and optional periods. The children appeared to show a keen interest in the typewriters at the first of the program. They usually arrived out of breath as most of them ran the block from their classrooms to the remedial classes, in the hopes that first arrivals would be the ones who were allowed to type. Later, when regular periods to type had been arranged for each child, it was interesting to note that the children appeared to accept whatever reading lessons were assigned them as long as they knew that the next day they would get to type. Although for the most part, the children watched their time to come over to the classes, themselves, it was a rare thing for one of them to come late to class. One boy accidentally came an hour early one day and appeared to be very disappointed to find it wasn't time for his class yet.

When the pupils were informed in January that they could not use the typewriters for awhile since most of them had reached a leveling off place in their reading achievement, and they needed some help in group reading at this time, most of them accepted this information without comment. Others expressed pleasure. The 8th grade group was the most reluctant at this time to give up the typewriters. However, it is to be pointed out that these children, being 8th graders, had had more years of unsuccessful reading and spelling experience than the others, so it is not surprising that they were less eager to give up something which had been a satisfying experience to them. It was not until they began observing their own growth according to the achievement tests that

this group began to be interested in the reading phase of the program. Throughout the remainder of this non-typing period, very few of the pupils in the improvement program complained about not being allowed to use the typewriters even though the typewriters were kept in the same room.

In the optional period, many of the children expressed no particular desire to go back to the typewriters. During this period, no stress was made that the children should use typewriters if they did not choose to do so. Even though it was a child's turn to type on a certain day, it was optional with him if he preferred to read every day instead of alternate days. It was interesting to note that often, even though a child had chosen to type, he would become so interested in the story the others were reading that he would stop to listen, or to answer a question concerning it, hardly realizing he was doing so. On one occasion, an 8th grade boy stopped typing, quietly got a book like the one the others were reading, finished reading the story silently to himself, and then returned to his typing.

Peter, Hal, Roy, and the entire second group of 5th graders were the only ones who regularly went back to the typewriters during this optional period. This would seem to indicate that most of the children no longer needed the typewriter as an incentive to come to the remedial classes, but had reached a stage of confidence, assurance, and pleasure in reading for reading itself.

Summary of Qualitative Information

1. Teacher opinions indicated that the pupils showed their

greatest progress in classroom reading during the last two months of the study.

2. For the most part, the teachers observed very little difference in the pupils' eagerness to come to the remedial classes during the periods when the typewriters were, or were not, available to them.

3. Pupil opinions indicated that the pupils felt the remedial classes were helping them.

4. Although there was a slight tendency at first to favor the typing, at the end of the program, over half of the pupils stated they liked both reading and typing.

5. In answering two of the questions, pupil opinion indicated that, for the most part, the pupils looked forward to coming to the remedial classes; and that they were desirous of taking more typing at a future time.

6. Comments of the teachers indicated the pupils were achieving status in their peer groups; were showing more self confidence; and making adjustments socially and emotionally.

7. The pupils evidenced in their comments that the typewriter was of interest to them and that they believed it helped them in reading and other work.

8. As the program progressed, the typewriter appeared to have served its purpose as a motivational influence and the reading became the important aspect of the program to the majority of the pupils.

CHAPTER IV

SUMMARY AND CONCLUSIONS

Although reading is recognized as being very important, some pupils are faced with difficulty in learning this skill. Attempts have been made in the public schools to remedy this situation and to meet the needs of the retarded reader in many and varied ways. Most of the studies reported however, have dealt with remediation of individual pupils in contrast to groups; or with the remedial problem at high school or college level, rather than at the elementary level.

This study was conducted to assess the effects of a one-year program of remediation in the area of reading. The investigation was limited to 24 children who were retarded in reading and who were participating in special remedial reading groups in the public elementary schools of Maricopa, California.

The subjects in this improvement program were selected from grades 5, 6, 7, and 8 on the bases of both intellectual ability and reading retardation. Five groups of children participated, and although they met in groups of 5 or less, individual, as well as group, instruction was given. The remedial classes met 4 days a week for 30 minute periods. A careful study was made of the school, family, and physical background of each child in order to gain a clearer understanding of

his particular problems.

Concern was focused upon the problem of whether each individual pupil exhibited gains or improvement in each of the following areas:

(1) reading performance on standardized tests, (2) oral reading proficiency, (3) types of errors made, (4) sight vocabulary, (5) phonetic inventory, and (6) spelling.

Consideration was given to the gains of the 24 pupils as a group, although the major emphasis was directed toward an analysis of the improvement exhibited by each individual student. Each student was compared with his performance on the list of foregoing variables before entering the improvement program with his respective performance on the same measures after participating in the program, thus acting as his own control. The sign test, a non-parametric test of significance was the statistical technique used in the investigation.

One unique feature of the improvement program was the use of the typewriter as a possible motivational device and aid in teaching certain facets of reading. However, the reader's attention is called to the fact that the use of the typewriter was only one of a compound set of techniques used in the remedial teaching. Examples of other techniques used are: (1) use of simplified phonetic and spelling rules, (2) a large amount of oral reading, (3) drill in visual and auditory discrimination, and (3) exercises in structural analysis of words.

The improvement program was divided into three two-month periods: the typing period, non-typing period, and optional period. In addition to the pre-tests given in October and the post-tests given in May, additional tests were given in January and March in order to determine if

any changes were made in pupil progress, and in order to observe pupil reactions, when the typewriter was, or was not, present. No attempt was made to measure skill in typing.

The results of the remedial program are given in this study in terms of objective test data. However, there were some less tangible, but valuable effects of the program shown in improved social and emotional adjustment of the pupils and growth in the regular classroom--the gains in these areas being evidenced by teacher and pupil questionnaires, and observations in the form of anecdotal records.

The findings of the study are:

1. The standardized achievement test results in silent reading showed gains for the group at the 1 per cent level of significance according to the sign test--a non-parametric test of significance used in this investigation. Only two of the 24 pupils showed a loss, while the greatest gain in silent reading by any one pupil was 3.2 years, and the mean gain was 1.13 years.

2. Informal analysis test results in oral reading indicated that all the pupils had made some gain, ranging from .50 year to 5.0 years and the mean gain was 1.52 years.

3. Considerable decrease (from 88 to 24) in reading errors of various kinds was made by the group during the progress of the study.

4. The gains made by the pupils in sight words were found to be significant at the 1 per cent level.

5. In the phonetic inventory test, gains made by the pupils were found to be significant in all but two aspects--alphabet and reversals.

6. All pupils showed some gain in spelling achievement, this being significant at the 1 per cent level.

7. As to changes in growth made by the pupils during the typing, non-typing, and optional periods, the greatest gains in reading for the whole group were made during the optional period, while the greatest gains in spelling were found to be during the non-typing period.

8. The data disclosed no definite pattern to the individual gains made by the pupils in three major aspects of reading, and in spelling, either in relationship to intelligence or in consistency of gains.

9. The classroom teachers observed very little difference in the pupils' eagerness to come to the remedial classes during the periods when they were, or were not, allowed to use the typewriters.

10. Teacher and pupil opinions indicated the pupils felt the remedial classes were helping them quite early in the program, although the pupils did not show their greatest progress in the classrooms until the last two months of the study.

11. Comments of the teachers indicated that some of the pupils achieved status in their peer groups, showed evidence of more self confidence, and made better social and emotional adjustment as the program progressed.

12. Pupil opinions and comments indicated that the typing was of great interest to them at the first of the program, but as the program progressed, that reading also was important to them. This is further evidenced by the fact that only one-third of the pupils regularly returned to the typing during the optional period.

From the results of this investigation, the following conclusions are offered:

1. That elementary pupils who are retarded in reading make significant gains in reading and spelling when taught in special remedial groups, when attention is given to their individual needs and the above compound set of remedial techniques is used.

2. That the typewriter serves as an effective tool for transmitting certain aspects of the remedial teaching to the pupils; that it acts as a motivation to them, but as the improvement program progresses, it loses its initial attraction for the most part, and the reading gains in importance to the pupils.

3. That the techniques of using simplified phonic and spelling rules, a great amount of oral reading, drills in phonetic and structural analysis, sight word drills, and others, are effective in a remediation program, but that no one technique can be isolated from the others and given credit for the progress made by the pupils.

4. That the improvement program tended to help some of the retarded readers gain in self confidence, status, and social and emotional adjustment.

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APPENDIX A
PUPIL LETTERS

September 28, 1954
Maricopa, California

Dear Mr. Jones:

I am staying with my family. My father is working on a farm. My mother used to work at a shirt factory but she got sick and had to quit.

I like school very much. My favorite subject is arithmetic. I get along with the students. I play games for fun. I like hard ball, basket ball, and kick ball. These are my favorite.

I wish I could go back to Arkansas and live on a farm of our own. I like Jimmy Wolfenberger for a good pal.

To make book reports is pretty hard in school. Arithmetic is pretty easy for me and spelling.

I would like to go swimming if I could do what I'd like to. I would go to see my grandma and grandpa if I could go where I wanted to. Grandpa is in the hospital. He had a heart attack and had to go to the hospital. I think he is at home now.

My little brother bothers me most at home. Social Studies bothers me most at school. I get mixed up in that.

Sometimes I get scared, but nothing special. Also, nothing especially makes me sad. I am happy that my uncle came to stay with us.

Very truly yours,

Elton Johnson

September 27, 1954
Maricopa, California

Dear Barbara Sue,

I like school very much. I am really getting along o.k. How are all of you doinb?

I am going to get a bicycle for Christmas. Mother and Daddy are working every day. I want to pick cotton Saturday. I picked 196 pounds. I am catching up on my Arithmetic. I hope you don't get too far ahead of me.

Always, your nephew,

Stan

September 27, 1954
Maricopa, California

Dear Mr. Jones:

I am a boy of 12 and I went deep sea fishing Sunday and I caught one fish, 9 lbs. It cost \$4.00 to go out on the boat and that included fishing poles and all. When I got back from fishing that day, we had my brother's birthday party. I saved \$5.00 for him a beebee gun but my mother got a check so she bought it for him.

I like to draw best. To draw a horse seems the hardest for me to do. If I could go where I'd like to best, I would go to Honolulu.

I am afraid of falling overboard when going fishing.

To go to the carnival makes me the happiest. When the boys voted me out of the club it made me more than sad. This was the Shiny Rock Club.

Passing my grade at school bothers me most. I didn't pass the first grade once.

I go to movies and watch TV. I like to play base ball and foot ball best.

Very truly yours,

Rex

September 28, 1954
Maricopa, California

Dear Mr. Jones:

I have two sisters and one brother and live with my mother and father. I like to play with beebee guns that shoot pellets and beebees and darts. Sometimes I like to ride my bike and go off some place and shoot at birds.

I like Arithmetic, that's all! I hate to do spelling. It is the hardest for me to do.

I feel saddest when I can't do what I want to. I can't think of anything that I am afraid of. If I could go just where I wanted to, I imagine I'd go by bus.

My daddy works on a ranch and my mother works in the house. My two sisters are going to school. My brother is about 5 months old.

Very truly yours,

Henry

APPENDIX B
PHONETIC INVENTORY TEST

SAY:

What are the names of these letters?

I A B S C D F E P T M L R

Z J U H G W X Q K V Y N O

r o n l m y t v k p z i a

j u s h b c g w d f x q e

SAY:

When words begin like these, with what sounds do the words start?

cl dr br wh st ch sh th

r fr pl tw sp gr sm fl sw

SAY:

Many words begin like this. If a word begins like this (____),
with what sound does the word start?

re in con de dis com

un ex pro pre en

SAY:

Many words you know have endings like these. How does a word
end when this (____) is the last part?

s ed ing y ly ty er est tion ance

ness ful ant ous ent ment able al ive less

TO TEACHER:

Record all confusions on the above tests. Next test for vowels.
Any uncertainty will show up if you ask the child to read mono-
syllable words very rapidly.

SAY:

Read these as fast as you can.

tap tip top hop hot hat hut hit bug

big bag beg bat bit bet but pet pot

pat ham him hum hem run ran sit sat

TO TEACHER:

Letter sounds produced with intermittent pauses are comparatively useless. The following is a quick check on sound blending. If a child is really blending he will have no difficulty calling off the following list:

fis gud hin sut jav wab lort tam mnts

nibs pad rold vin ket nel pur kim sult

TO TEACHER:

Nonsense words are used to check multisyllable word attack.

SAY:

These words do not make sense, but I'd like to see if you can read them anyway. Try them.

manletter	repanly	bansinglet	betterflynet
-----------	---------	------------	--------------

fullenter	runletter	worletterly	discandy
-----------	-----------	-------------	----------

unmanish	probunly	afternoonly	subentor
----------	----------	-------------	----------

contransfor	singoptive	aplingstock	permensub
-------------	------------	-------------	-----------

TO TEACHER:

A child who habitually reverses words will turn some of the following around.

SAY:

Call these off quickly.

pal even no saw raw ten tar won pot

rats keep nap tops read meat lap never

APPENDIX C

THE DOLCH BASIC SIGHT VOCABULARY

was	our	out	green	came	let	wash
and	she	so	hot	can	like	went
as	that	soon	kind	carry	live	were
because	their	then	light	come	look	will
but	them	there	little	could	made	wish
if	these	today	long	cut	make	work
or	they	together	many	did	may	would
write	this	too	new	do	must	want
laugh	those	up	old	does	open	call
about	us	very	own	done	pick	good
after	we	well	one	don't	play	only
at	what	when	pretty	draw	please	my
by	which	where	red	drink	pull	walk
down	who	why	right	eat	put	know
for	you	yes	round	fall	ran	buy
from	your	funny	seven	find	read	once
in	myself	use	six	fly	ride	keep
into	bring	a	small	found	run	full
of	again	all	some	gave	said	off
on	always	an	ten	get	saw	me

over	around	any	the	give	say	try
to	away	best	three	go	see	jump
under	before	better	two	goes	shall	been
upon	far	big	warm	going	show	four
with	fast	black	white	got	sing	now
its	first	blue	yellow	grow	sit	think
is	here	both	be	had	sleep	five
he	how	brown	not	has	start	it
her	just	clean	am	have	stop	thank
him	much	cold	are	help	take	hurt
his	never	eight	ask	hold	tell	ate
I	no	every				

APPENDIX D

SPELLING AND PHONIC RULES

1. In spelling words with "q", follow it with a "u", as: queer, quiet, require.

2. The "f" sound is sometimes spelled "ph", as: graph, phone, diphtheria.

3. Very few words begin with an "x", as in x-ray. Therefore, when the "x" sound is heard at the first of a word, spell it "ex".

4. Change the "y" to "i" before adding most endings to words: happiness, merrily.

5. Drop the final "e" before adding most endings to words: hoping, preparing, discriminating.

6. For "au" and "aw" sounds, use "au" within words and "aw" to end words: cause, nausea, claw, flaw.

7. For "ou" and "ow" sounds, use "ou" within words and "ow" to end words: house, couch, now, plow.

8. For "oi" and "oy" sounds, use "oi" within words and "oy" to end words: noise, boisterous, employ, annoy.

9. To know when to double a consonant before adding an ending, check to see if the syllable is short or long. If it is short, double the consonant as: hopping, scrubbing. If it is long, do not double the consonant as: hoping, revoking.

10. In pronouncing two "g's" or two "c's", the first letter has a hard sound and the second is soft: accept, suggest.

11. If an "i" or "e" follows the "c", pronounce it as an "s"; other times, it will have the sound of "k", as: precise, century, and incorporate, catalog.

12. In a word like picnicking or panicking, the "k" has to be put in, in order to keep the hard "c" sound.

13. If an "i" or "e" follows the "g", pronounce it as a "j"; other times it will have the hard "g" sound, as: ginger, generous, and gallop, gorgeous.

14. In a word like guide or disguise, the "u" has to be put in, in order to keep the hard "g" sound.

15. When a word has two vowels together in it, pronounce only the first one with a long sound, as: plain, suitable. (This does not include diphthongs.)

16. Final "e" on a word makes the preceding vowel sound long: lane, require.

17. Disregard the "gh" and sometimes the "ugh" in words when pronouncing them. Very few of these sound, as: light, through, thought. When "ugh" does sound, it is at the end of a word and has an "f" sound: rough, laugh, enough.

APPENDIX E

TEACHER QUESTIONNAIRE

TO CLASSROOM TEACHERS: Please answer the following questions to the best of your ability and as honestly as you can. Return at your earliest convenience.

1. Do your remedial readers appear to be doing better in their overall school work?

Pupils	No Difference	Some Difference	Marked Difference
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

2. Do your remedial readers appear to be doing better in work that involves reading?

Pupils	No Difference	Some Difference	Marked Difference
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

3. Will the grades of your remedial readers be affected this quarter in comparison to the first quarter of school?

Pupils	No Difference	Some Difference	Marked Difference
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

4. Were you able to notice any difference in your remedial readers' eagerness to come to class when not allowed to type, January to March?

Pupils	No Difference	Some Difference	Marked Difference
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

5.* Were you able to notice any difference in your remedial readers' eagerness to come to class when allowed to use the typewriters, March to May?

Pupils	No Difference	Some Difference	Marked Difference
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

*Question 5 was asked in lieu of Question 4 in the May questionnaire.

APPENDIX F

PUPIL QUESTIONNAIRE

Answer these questions as truthfully as you can:

1. Has this class helped you in reading? _____

2. Has this class helped you in other school work? _____

3. Which do you like best, reading or typing? _____

4. Do you look forward to coming over to this class? _____

5. Would you like to keep on with your typing? _____
