AN ABSTRACT OF THE THESIS OF

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Title: A COMPARATIVE STUDY OF A CORRECTIVE READING PROGRAM AND ITS EFFECTS ON TWO FRESHMEN READING GROUPS AT CENTRAL OREGON COMMUNITY COLLEGE

Abstract approved [redacted]
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This study compared intensive corrective reading instruction with less intensive corrective reading instruction at the community college level: Group 1 students received 50 fifty-minutes of intensive corrective reading instruction during ten weeks, while Group 2 students received the same amount of corrective reading instruction during 20 weeks. Reading instruction for both groups began at the same time. After reading instruction had ceased for each group, an additional ten-week period had been given for both groups to see if the reading skills which were taught during intensive and less intensive corrective reading instruction had been maintained.

Materials, techniques, and methods to be used in this study had been initially prepared and refined in a pilot study. Through lectures and demonstrations, through assigned reading practices and independent reading, development and improvement of word recognition,

vocabulary, spelling, comprehension, reading rate, reading for general and specific purposes, and study skills have been sought. The purpose of instruction was to make each reading activity so clear that success was assured.

The hypothesis of this study was that there will be no differences in the total reading performance between one group of community college students using the intensive corrective reading approach and a second group using the less intensive corrective reading approach.

The hypothesis was tested by 70 community college students in two experimental groups, one group using the intensive and the other group using the less intensive corrective reading instruction.

Findings and Conclusions

1. Mean differences and the associated t values indicated that the results between intensive and less intensive corrective reading instruction at the end of the 10- and 20-week periods did not appear to be significantly different at the .05 level of confidence between Groups 1 and 2. The Nelson-Denny Reading Test, Forms A and B, were used as standardized instruments to measure reading improvement.

2. The single factor of time between the lessons differentiating intensive and less intensive corrective reading instruction did not

appear to be a significant influence on the effectiveness of corrective reading instruction. Mean differences did not indicate significant superiority of either procedure. It would appear, at least within the 10- and 20-weeks of instruction, that the intensive corrective reading instruction is as effective as the less intensive corrective reading instruction. However, a difference betweeen immediate post-test and delayed post-test for Group 2 was significant at the .01 level of confidence in total reading. Apparently, less intensive corrective reading instruction has produced a significantly better performance in total reading for Group 2 at the time of the delayed post-test.

3. Corrective reading instruction carried out in this study did appear to make a difference in students' reading performance between pre-tests and immediate and delayed post-tests as well as between immediate and delayed post-tests of Groups 1 and 2. The differences which appeared for both groups between pre-tests and immediate and delayed post-tests of the Nelson-Denny Reading Test, Forms A and B, and A in vocabulary, comprehension, total reading, and reading rate were all statistically significant at the .001 level of confidence.

4. When immediate and delayed post-test scores were compared for Group 1 a significant difference at the .01 level was found in total reading and a significant difference at the .05 level was found in vocabulary. When immediate and delayed post-test scores

were compared for Group 2 significant differences at the .001 level were found in vocabulary and total reading and significant difference at the .01 level was found in comprehension.

Students' individual improvement as a result of corrective reading instruction and the retainment of the reading skills has been assessed for both groups by using the residual gain statistics, both the computational and the graphical method.

Reading improvement resulted apparently from teaching and student effort regardless of the time during which intensive and less intensive corrective reading instruction was taught.

Evidence from this study indicates that many more community college students might be given the opportunity to participate in reading instruction if reading courses were taught intensively as, for example, five hours per week for ten weeks rather than extending less intensive reading instruction over a longer period of time.

A Comparative Study of a Corrective Reading Program And Its Effects on Two Freshmen Reading Groups at Central Oregon Community College

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF TABLES

LIST OF FIGURES

A COMPARATIVE STUDY OF A CORRECTIVE READING PROGRAM AND ITS EFFECTS ON TWO FRESHMEN READING GROUPS AT CENTRAL OREGON COMMUNITY COLLEGE

CHAPTER I

INTRODUCTION

Reading is one of the primary avenues to all knowledge. Reading offers access to the informations, ideas, ideals, aspirations and happenings of the past and the present. Through reading everyone--child, adolescent, and adult--can extend his environment from home to the world as a whole. For the child reading is a crucial key to success in school, to the development of out-of-school interests, to the enjoyment of leisure time, and to personal and social adjustment (80, p. 1). Reading is the most important single study tool for any individual at any learning level. "Next to the teacher, the textbook is usually the principal educative agency contributing to the pupil's academic success" (72, p. 11). Reading then is also the key to success in college work (71). In our cultural setting the student who cannot read is unable to perform at the level of expectation according to his mental and chronological ages, and therefore, fails to adequately master subject matter materials.

Many of those who fail to read efficiently drop out of high school before completing the senior year. Penty (6) obtained clear evidence

from data in the Battle Creek, Michigan, school system that the preponderance of early school leavers stood in the lowest quarter of the normative data with respect to reading ability. More than three times as many poor readers than good readers left school with the peak of dropouts occurring in the tenth grade.

Fortenberry (23) reported that about 90 percent of all the studies in high school and college involve reading and that in every subject matter course, students get reading assignments. A student who reads poorly may also do poorly in academic work and a student who reads well usually does well in his studies. Because of the great emphasis placed on assignments in textbooks and reference materials, efficient reading is an important determiner of school success (5; 38, p. 157-158; 47; 79; 102).

Further estimates of the prevalence of reading and study deficiencies among college freshmen are confirmed by Carter's study of 1, 029 students completing the freshmen year of college. Of these students, ". . . 68 percent reported that they had never been taught how to read a chapter effectively, 70 percent indicated that they had not been taught to concentrate upon a reading activity, 64 percent had not been shown how to develop an awareness of problems, and 70 percent had not been taught how to critically evaluate a writer's bias and use of preconceived ideas" (15, p. 156). Another example of college freshmen reading deficiencies is reported by Halfter and

Douglas (31) who after eight years of careful testing found that only one-third of the 3, 000 entering college freshmen in the Chicago area had sufficient reading skills necessary for academic success.

Writers and authorities in the field of reading, however, have suggested that students at high school and college level as well as at the adult level can be helped through reading programs to make both intellectual and personal gains. H. M. Robinson (70) recommended that any reading program should begin with reading materials at an appropriate level of difficulty in order to permit student success and to motivate further efforts. This recommendation calls for reading materials which vary in length and increase in difficulty. Yet, at the same time the reading materials must maintain a delicate balance between success and stimulation, so that a student may attain higher levels of efficiency without being frustrated by being given materials that are too difficult for him. When a student is sufficiently, but not over-challenged, he not only improves his reading skills but improves his own self-image.

To attain these goals a wealth of published instructional materials prepared for the deficient readers at the college level is available. The various kinds of content materials claim to contribute to the improvement of the student's reading attitudes and habits, his language skills and vocabulary building, his word study and comprehension skills, his interpretative abilities and flexibility in reading

methods, as well as his abilities in note-taking, listening, and discussion techniques.

Does reading improvement increase academic success? It does not seem unreasonable in light of available evidence and in spite of some well-based dissent to conclude in general terms that reading training can make significant contribution to academic achievement. While some of these conclusions are still tentative, Wright (103, p. 49) summarized these conclusions as a result of his review of this part of the literature as follows: (1) Reading training reduces drop-out rate and improves performance of probationary students. (2) Poor readers are benefitted more by reading training than are good readers. (3) Reading training is of particular benefit to students with high intellectual capacity and low reading ability. (4) To benefit scholastically from a reading program students must recognize their own need for training. (5) Achievement in a college reading improvement situation is related to the motivation or "need achievement" of the subject. (6) Reading training appears to be of greater benefit to students pursuing curricula of a verbal nature, i. e., humanities and social sciences, than to students largely concerned with quantitative studies, i. e., science and mathematics.

While research must seek further confirmations of Wright's conclusions and further answers to the basic question of increasing academic success through improving reading, the literature reports

a growing number of references to corrective reading instruction in colleges and universities (49; 98, p. 21; 102).

The different reported college reading programs varied not only in length of time during which instruction in reading was given, but also in the amount of instructional meetings during this time. In the length of time, they varied from six-weeks courses to one-semester courses and to three-quarter term courses. Concerning the frequency of instructional meetings, they varied from two 50-minute instruction periods per week to four 50-minute instruction periods a week (6; 7; 20; 63).

Furthermore, the literature reported on various aspects of general reading improvement programs and, in particular, on remedial reading programs, but no study or studies could be located concerning corrective reading instruction at two-year community colleges. Moreover, no study or studies could be found that compared the results of intensive with less intensive corrective reading instruction at the community college level.

Background of the Study

Professors at the community colleges usually assume that the entering student can read or, if he cannot, he will take appropriate steps to achieve reading proficiency on his own within the shortest possible time. Most of the professors at Central Oregon Community

College are no exception to this assumption, despite the fact that they voice complaints that students apparently are unable to read efficiently and effectively the assigned textbooks.

All entering freshmen at Central Oregon Community College are advised into course work according to scores they receive from taking the American College Testing Program. Students who score below the cut-off scores of the subtests in English, mathematics, social studies reading, and natural sciences reading are scheduled into non-transferable-credit courses such as basic English, mathematics, and American government. However, little or nothing is done about their reading deficiencies despite the fact that a student cannot write or generally perform above his own reading level (51, p. 142).

To expect that inefficient readers can overcome their reading deficiencies in a short time without competent teacher help is to expect the impossible. These students are doomed to fail! They are the "poor" readers who have remained inefficient during their school years while their peers in the same classrooms have understood and progressed.

The very fact that they have reading deficiencies suggests that systematic and intensive reading instruction must be made available to all entering community college freshmen who need it and that this instruction must be as effective as professional ability can

possibly offer.

Corrective Reading Defined

The Corrective Reader

The corrective reader, also known as the retarded reader, is one who is not reading up to his own ability or capacity. He has problems of various kinds that keep him from reaching his reading potential, but he is not mentally deficient or physically incapable of learning to read better (89). Although the corrective or retarded reader is reading below his reading potential, he is not so severely retarded in reading that he cannot be helped through corrective reading instruction in the classroom. His problems, while multiple, are corrective in nature (51, p. 82). His problems are not so severe that he must be taught individually by a reading expert or that he needs special help in a reading clinic (51, p. 82).

Characteristics of a Corrective Reader

Some of the characteristics of a corrective reader are enumerated by H. M. Robinson (70): (1) His progress is interrupted or blocked so that his level of reading remains almost static. (2) He falls further and further behind his reading potential and becomes, therefore, increasingly frustrated in academic areas which require

reading and, as a rule, comes to dislike reading. (3) He does not rely on reading for either information or for pleasure. (4) Without practice in the use of his reading skills and abilities he actually regresses rather than progresses; (5) he may read laboriously and everything at the same pace; (6) his reading may never have become a satisfying experience and consequently he has avoided it whenever possible; and (7) he has failed to acquire skills in reading materials in the various content areas.

H. A. Robinson (69) found the following characteristics of a corrective reader: (1) he obtains satisfactory grades but never seems to have time for anything else but study; (2) he finds it necessary to read over and over his materials in order to remember the informations and concepts; (3) his normal study technique is memorization; (4) he reads haltingly when called on to read orally; (5) he uses words incorrectly and does poorly on the vocabulary section of reading achievement; (6) he seems to be quickly moving toward the failure level in the various subject matters; (7) he needs to be helped in learning how to make use of the various contextual, typographical and structural aids in the textbooks; (8) he needs to learn a study system using the book; (9) he needs help in the vocabulary development in all of his subjects; and (10) he needs help in developing meaning from phrases and sentences.

Marksheffel (51, p. 82) provided additional information about

pertinent characteristics of the corrective reader stating that:

1. He shows lack of certain phonetic skills, such as the ability to pronounce words with consonant blends;

2. He is able to pronounce basic words, but unable to pronounce related words.

3. He needs help in reading for main ideas, relevant details, or specific purposes.

4. He may be unable to use context, or meaning clues, to aid in the pronunciation of words.

5. He needs to learn efficient dictionary skills.

6. He meets many words that have no meaning for him because of his inability to pronounce them.

The Corrective Reading Program

The corrective reading program is a program developed to help the corrective reader. Marksheffel (51, p. 84-85) suggested that this can be done by:

1. Providing reading materials at his instructional level in reading,

2. setting purposes for the reading, developing concepts, and introducing new and difficult vocabulary,

3. determining his ability to pronounce words used in the reading selections and his understanding of the material,

4. providing time for him to practice and review previous learned reading skills,

5. encouraging him to learn new vocabulary words by himself,

6. keeping records of his reading needs and giving him special help with these needs, and

7. informing him of noticeable progress and improvement.

Reading Process Defined

Reading according to Smith and Dechant (80, p. 11) consists of a complex of eight individual aspects which are: (1) a sensory process, (2) a perceptual process, (3) a response, (4) a learned process, (5) a growth process, (6) an interest, (7) a tool for learning, and (8) a developmental task. For the purpose of theoretical discussions these aspects may be separated. However, in the practical performance of the reading act these aspects act, react, and interact in an interwoven relationship.

Reading as defined by Marksheffel (51, p. 12) and as it is used throughout this study, is "a highly complex, purposeful, thinking process engaged in by the entire organism while acquiring knowledge, evolving new ideas, solving problems, or relaxing and recuperating through the interpretation of printed symbols."

Origin of the Study

This study began in an effort to assist poor readers at Central Oregon Community College. Freshmen in the lower percentiles of

the ACT placement test almost always have serious deficiencies in reading. Many students have a long history of numerous attempts to overcome the reading handicaps. Other students have resigned themselves to their deficiencies and have accepted their problems as something too difficult for them to change. They have come to avoid all but the required reading in the subject matter courses.

To fulfill course assignments and to maintain a satisfactory grade point average, students must spend many additional hours of study. Even when they spend the extra hours, their efforts are not always successful because of their reading deficiencies. The facts are that reading problems are common at the community college level, and that many readers seek help. Too often, however, such help is not available at all or is not available in accordance with the reading needs of the student.

This study is an attempt to find answers to the appalling problems of the various reading deficiencies which plague Central Oregon Community College students as well as students in other community colleges.

The Purpose of the Study

The purpose of this study was to compare two freshmen reading groups at community college level, one taught an "intensive" corrective reading improvement course and at the same time the other

being taught the same content in a "less intensive" corrective reading improvement course. The same corrective reading instructions were presented to both groups by the same instructor, the same amount of instructional time was provided, and the same amount and kinds of instructional materials were used.

This study sought specifically to answer the question: "Can a poor reader learn to read more efficiently by covering the same materials and skills in a comparatively short period of time than he might by taking a larger, less intensive course?" To answer this question the study compared the group- and individual-gains obtained in vocabulary, comprehension, total reading, and reading rate in an "intensive" corrective reading course with those gains of a "less intensive" corrective reading course.

This study was designed to answer three major questions: (1) Was the assigned time a significant variable in the effectiveness of corrective reading instruction for either group? (2) On the basis of the intensive or less intensive corrective reading instruction, did the training in the Reading Center result in statistically significant gains in vocabulary, comprehension, and reading rate for either group? (3) At the end of corrective reading instruction and at the end of the additional ten-week period for Groups 1 and 2, did significant differences appear between pre-tests and immediate and delayed post-tests?

Hypothesis

The hypothesis of this study was that there will be no difference in the following factors of the total reading performance: in (1) vocabulary, (2) comprehension, (3) total reading, and (4) reading rate between one group of community college students using the intensive corrective reading approach and a second group using the less intensive corrective reading approach.

CHAPTER II

REVIEW OF LITERATURE

This comparative study of "intensive" versus "less intensive" corrective reading instruction at the community college level required (1) cognizance of some of the aspects related to and contributing to the community college student's proficiency and disability in reading, (2) understanding of the relationship of reading to the community college student's scholastic or technical-vocational endeavor, and (3) review of studies reporting on the correlates of gains in reading.

Pertinent Factors Related to Proficiency and Disability in Reading

Many influences are apparently in operation to produce the syndrome known as reading disability. Among them are reading readiness, intelligence, sex differences and maturational factors, background experiences, physiological factors, psychological determinants, language, spelling, and personality development. Which of them are causal; which are resultant? Research is continually seeking answers to these questions. To find answers about why students do not achieve successfully in reading, it is necessary to know not only what factors contribute to proficiency and disability in

reading but how and why they do so.

The reading problem rarely exists in isolation but appears generally as part of a larger, more complex problem which is comprised of physiological, psychological, and/or language difficulties. Students bring their reading deficiencies with them from high schools to the community colleges, as they brought those deficiencies with them in like manner to each preceding educational level. Reading problems appear first in the elementary grades with the student's introduction to the printed and written words. Sometimes attempts are made to correct reading deficiencies early when they appear in elementary grades. Many times, however, they are not corrected because (1) some teachers lack adequate professional preparation and background in reading, (2) others do not realize that students have reading problems, and (3) others do not know what to do and do not seek professional help for the child but hope that time will take care of his reading deficiencies.

Time alone, however, does not alleviate children's reading deficiencies. Many of those children who do not receive competent help will become more severely retarded as they progress through the grades. Some will become so emotionally upset by continual failure in the classroom that they develop psychological problems in addition to their reading problems. These kinds of pupils can be helped only in a reading clinic which is both a slow and costly process.

Those children who do not receive clinical help have but two alternatives, (1) continue to stay in school and live with failure daily or (2) leave school. Far too many choose to become dropouts.

Many sources have contributed information about how one learns to read and what can go wrong in the process. Research in the field of psychology seeks further knowledge of reading as a thought process and its relationship within the complexity of the reading act. Educational research directs its efforts to testing and evaluating different reading approaches, methods, and techniques in actual classroom settings and seeks to encourage teachers to base their teaching on sound theory and the results of research. Furthermore, clinical investigation contributes to the deeper understanding of cause and effect relationships, diagnoses, and remediation of reading deficiencies of varying degrees.

Reading Ability and Reading Readiness

Hamlet in act V, scene 2 expressed the idea of readiness by saying that "if it be not now, yet it will come; the readiness is all."

The idea as expressed by Shakespeare that "readiness is all" appears to be not only an important principle in life but also a highly important principle in the student's educational process. Comenius and Rousseau also felt that emphasis in the learning process should be shifted from subject matter to the student. Burton (14, p. 166-167)

expressed the same principle by stating that one of the foremost factors in adjusting school experiences to the learner is readiness. At the same time he warned that one of the most serious errors of the traditional curriculum and of traditional teaching is the presentation of learning experiences and materials before the student is ready for them.

In analyzing readiness with special reference to reading, Smith and Dechant (80, p. 85) observed that the concept of readiness was originally reserved for initial reading. However, the importance of a succession of readiness is clearly shown at high school and college levels, where students are required to read on a far more complex basis and to use far more complicated materials than in the elementary school. The need of a succession of readiness has been emphasized by Lamoureaux and Lee (42, p. 1) who suggested that each stage of reading is a step toward readiness for further reading.

Students in high school and community college require a variety of readinesses for reading (14, p. 169; 51, p. 23; 80, p. 84; 91, p. 129-130). Some of these they normally develop in the elementary school, while others must be developed after they leave the elementary school. Readiness for reading is an important factor in reading at all grade levels and is not limited to beginning reading but is intrinsic to reading no matter what the grade level.

Spache emphasized (84, p. 2) that reading readiness is not a

single trait or characteristic which a student does or does not possess, but as Smith and Dechant suggest is composed of many skills, abilities, understandings, and interests (80, p. 86). Each contributes in some degree to the process of learning to read and each determinant is interrelated with the other and does not occur in isolation. Studies have indicated that the presence or absence of specific factors may not be as important as the complex of correlates in affecting the development of readiness. Sutton computed (93) 246 correlation coefficients. The measures that showed the highest degree of relationship with readiness scores were: mental maturity $r = .51$, language factors $r = .51$, enjoyment of listening $r = .44$ and social adjustment $r = .36$. Thus the complex of correlates denotes that there is an inextricable interrelationship of the determinants of reading readiness and the ability to read.

Hill (34) reviewed the literature and found that reading readiness is one of the aspects of reading instruction which seems to be neglected rather frequently by those working with college and adult reading. He emphasized that through readiness reading fluency, accuracy, and understanding are improved when the reader is prepared for a reading selection. Such readiness includes command of vocabulary and major concepts, desire to read, identification of purpose, and a plan of reading attack.

Reading Ability and Intellectual Readiness

Since reading is a thinking process, one can expect that intelligence is one of the important determinants of reading readiness (95). Bond and Tinker (10, p. 53), Monroe (52, p. 5), and Strang (89) showed that the relationship between intelligence and reading success becomes increasingly more pronounced as populations are sampled at succeedingly higher grade levels. As measured by individual Stanford-Binet tests, the correlations between mental age and reading comprehension at the end of the first grade is approximately .35; at the end of the fifth grade it is approximately .60; during the high school years it approaches .80 (80, p. 89). These findings suggest that mental age actually is a more basic determinant of reading success when children have reached the stage at which they read to learn than it is when they are learning to read. Gates (27, p. 506), however, point out that

> ... statements concerning the necessary mental age at which a pupil can be entrusted to learn to read are essentially meaningless. The age for learning to read under one program or with the method employed by one teacher may be entirely different from that required under other circumstances.

In conclusion, research concerning intellectual development and reading readiness cautions us that no single index can guarantee success in reading, but that the student's wants, interests, and

attitudes, and his level of physiological maturation may be at least as important as his level of mental development in the total school learning process.

Reading Ability and Sex Differences

Smith and Dechant (80, p. 91) cited studies by Alden, Sullivan, and Durrell, by Schonell and Macmeeken, by Monroe and Fernald which support the observation that boys have more difficulty with reading than do girls. Durrell stated that the ratio of boys to girls at the Boston University Educational Clinic has been ten to one. Stroud and Linquist (92) found that on the high school level the differences as shown by the Very-Pupil Tests of High School Achievement favored the girls in reading comprehension.

However, it appears that research does not always support the observation that girls are better readers than boys. For instance, some studies have shown (80, p. 394-399) that boys with high I. Q. 's are as proficient in reading as girls are.

Reading Ability and Background Experiences

In the reading process it is essential to associate meaning with the printed or written symbols. Where does meaning come from? Meaning can come only from the mind of the reader. Nila Banton Smith (81) suggested that symbols are but empty shells and that it

takes experience to fill them with the meat of meaning. Horn proposed that the author ". . . does not really convey ideas to the reader; he merely stimulates him to construct them out of his experience" (38, p. 154).

Further examples are found in the literature (37; 58, p. 330; 77) which restate the ideas that the raw material of oral and written expression is experience, that limited ideational input may result from a dearth of real-life experiences, and that the student's background experiences and his range of resulting ideas is one of the many kinds of working systems of conceptual strategies for attaining speed and power of comprehension.

In addition, the student's socio-economic background contributes to his experiences. In various studies in which the relationship of the student's socio-economic background and his reading ability has been explored, it is reported (21; 28; 44; 75) that underachievers in reading tend to come from homes of lower socio-economic background, that privileged high school youths received higher grades than underprivileged youths, that when the number of books in the home increases, the percentage of good readers increases, and that there appears to be an average correlation of .40 between test scores of children's intelligence and the occupational level of their fathers.

While these and other examples indicate that a rich or meager experimental background is connected with and tied to the parental

environment, it must also be realized that the correlation between the two is far from perfect. Cases of severe reading disability occur among children from all socio-economic levels and are not limited to any one group.

In conclusion, it can be stated that research studies from kindergarten to high school appear to be in complete agreement with the recommendation that the reader's experiential background is closely tied to his socio-economic background.

Reading Ability and Auditory and Visual Discrimination

Research shows that skills in auditory and visual discrimination are major factors in perceptual development and that these skills are closely related to reading. Harrington and Durrell (32) and Sister Nila (56) concluded that auditory and visual discrimination come before the range of information and mental age.

Concerning auditory discrimination Pratt (62) emphasized that an effective response to oral discourse can only be made when the ear is able to receive the stimuli, when the ability exists to differentiate among the stimuli, and when there is the ability to interpret the stimuli that are received and identified. Auditory discrimination at the high school level was pointed out by Marksheffel (51, p. 202) who noted that high school students need to learn to listen discriminately in order to hear the sounds of words and then to associate

these sounds with their written forms.

Studies reported by Smith and Dechant (80, p. 142) indicate high correlations between the ability to listen and the ability to read. These correlations range from approximately .30 to .80. In another study Brown (12) reported that those students who graduated from the University of Minnesota with "high distinction" had an average percentile rank of 78 in reading and of 92 in listening.

Auditory discrimination must be complemented by visual discrimination because the reader must also react visually to the graphic symbols. To develop visual discrimination, the student needs to acquire numerous skills. Some of them are: (1) to recognize likenesses and differences in size, shape, position, and color of objects; (2) to observe details in pictures; (3) to distinguish word forms by configuration; (4) to perceive distinguishing characteristics in word forms; (5) to notice likenesses and differences at the beginning of words; and (6) to detect words that look much alike (14, p. 175).

Inasmuch as visual efficiency is a desirable prerequisite for easy reading, to what degree or degrees do visual defects hinder progress in reading or cause reading disability?

Bond and Tinker (9, p. 86) pointed out that the evidence concerning the relationship between specific eye defects and reading disability is not unequivocal. Some investigations reveal greater

disability of ocular defects among reading disability cases than among good readers while other studies fail to show such differences. Bond and Tinker (9, p. 86) for example, reviewed a study which reported that the eyes of 611 college freshmen had been examined by ophthalmologists. The result of the eye examination revealed that all but 16 percent had either mild, moderate, or severe ocular defects. No significant relation was discovered, however, between ocular defects and either reading ability or scholastic achievement. Furthermore, correction of ocular defects did not guarantee improvement in reading or college grades.

In spite of the inconclusiveness of the role of visual deficiencies as causes of reading disability, reports emphasize and appear to agree that students with a visual handicap have to compensate for this by putting excessive strain on their eyes during prolonged reading. While hyperopia appears to be associated with a greater percentage of reading disability cases, myopia appears among good readers as often as or more often than among disability cases. However, more severe degrees of myopia will prevent clear vision of materials on charts and blackboards when viewed from a distance. Furthermore, when a student needs to hold his book closer to the eyes than normal (14 inches) for clear vision, myopia tends to produce undue fatigue of the eye muscles during prolonged reading. Astigmatism, another refractive error of the eye, does not appear to be closely related to

reading disability but seems rather associated with better than average reading (10, p. 102-104).

Generally, it can be concluded that ordinary myopia, hyperopia, astigmatism, and muscular imbalance can be corrected by properly fitted glasses. Therefore, students with properly corrected vision do not need to suffer from visual handicaps when they are learning to read or when they are engaged in the reading process (10, p. 480). It must be remembered that, in most instances, reading disability is the result of accumulative influences of many factors which operate together in a complex pattern. In this complex pattern visual deficiency may be but one of the contributing factors toward reading disability.

While Smith and Dechant (80, p. 146) agreed that reading is a visual skill, they advise that success in reading depends more on the underlying perceptual and assimilative process than on visual efficiency and the peculiar oculo-motor habits of the individual reader.

Additional attention to auditory, visual, and even kinesthetic components in reading at high school and college levels has been suggested by Holmes (36) in the Substrata-Factor Theory. He found that at the high school level approximately two-thirds of the students are predominantly visually minded; somewhat less than one-third will learn better through their auditory senses, and a small percentage, mostly boys, must rely heavily upon the proprioceptive or kinesthetic

senses as their most efficient input channel.

Reading Ability and Language Development

It is most commonly recognized that language is the basis for all group living and that it is difficult to imagine a modern world without language. Language is essentially doing something in such ways as speaking, reading, interpreting, or listening. Language is a human tool as well as a form of behaving. In reading, the student's language activities are reactions to the stimuli of the environment or parts of his interaction with that environment.

Facility in the use of the spoken language is one of the most important skills an individual can bring to reading. The degree to which a student excels in this skill makes him an individual user of langugage, not only when he enters school but also in the later grades. This ability is more poignantly stated by Harris (33, p. 38) when he emphasized that the mastery of the spoken language is important for the progress in the student's reading. Accentuating Harris' statement, Strang, McCullough, and Traxler (91, p. 30) noted that there is a reciprocal relationship between speaking and reading and that the facility in oral expression is a prerequisite to success in reading. To travel the road of success effectively, the roadsigns warn that progress depends upon a wide range of the student's

vocabulary, his competency in sentence structure, as well as his clarity of pronunciation.

What is the message of these roadsigns to the individual readers? Since individuals differ from one another, the message of the roadsigns is that not all students have equal proficiency in the language areas and that slow learners may experience a more difficult time in learning to interpret speech and to express themselves effectively (1).

Summarizing the foregoing statements it can be concluded that language impediment may bar many students from effective communication and that such impediment may reduce further the stock of meanings that they can take to the task of reading.

Reading Ability and Spelling

Reading ability and spelling are said to be closely related skills. Furness (24) emphasized this close relationship by stating that reading skills have a common basis in vocabulary, and require the ability to recognize, to study, to analyze, and to remember words.

This close relationship has been identified by correlations between scores on reading tests and spelling tests which according to Furness (24) range from .80 to .85. In addition, Spache (83) reported a correlation of .60 between spelling and vocabulary. What do these correlations indicate?

They may indicate the comparative rarity of good spellers who are poor readers and of good readers who are poor spellers. This point of view is taken by Plessas and Petty (61) who suggested that good readers are most often good spellers and poor readers are invariably poor spellers. A more thorough investigation on poor readers and poor spellers had been conducted by Staiger (86) who summarized his findings by emphasizing that

(1) poor readers are likely to have lower verbal aptitude than good readers have,

(2) poor readers' experiences with language are not as rich as are those of good readers,

(3) poor readers are less likely to have developed habits of accurate word perception,

(4) poor readers are less sufficient at pronouncing subvocally and using word attack skills when faced with new words, and

(5) poor readers have had fewer contacts with words and are less likely in consequence to retain word images.

In conclusion it may be suggested that a poor reader in addition to having reading deficiencies will also have spelling deficiencies. On the other hand, a poor speller may not necessarily be a poor reader, although the chances are that he will be.

Reading Ability and Personality Development

Since reading is not an isolated function but, ultimately, an individualized performance, the reader himself is invariably involved in the highly complex, purposeful, thinking process of the reading act. The individual's beliefs, desires, and passions, as well as his feelings, prejudices, and biases contribute voluntarily or involuntarily to the results of his reading. A person's reading ability or disability can, therefore, not be separated from his personality development.

One of the fundamental needs in the development of every individual is the need for achievement. When this need is rendered impossible in a given area such as reading, personality maladjustment may appear. Ordinarily, failure of any kind frequently leaves severe scars on the individual's personality. Students who have failed to make adequate progress in reading, have adopted certain types of escape mechanisms which, in turn, serve to gain the recognition they desire as well as to make the school situation bearable for them. In addition, students who have failed in the past in developing satisfactory and efficient reading proficiency invariably hate books and other types of reading materials (4, p. 12). Such an attitude may lead to negative identification with reading itself and make other aspects of education, including those people identified with it,

unattractive.

Further illustrations of negative identification was offered by Siegel (76) who suggested that disability in reading frequently was accompanied by maladjustment. However, he was unable to find a "typical" personality pattern which was characteristic of reading failure. To the same subject Johnson (40) noted that all of the 34 clinical reading cases she studied, exhibited some form of personal maladjustment, Wiksell (101) reported that about 50 percent of the poor readers in a college freshmen class had "emotional difficulties" and Challman (16) pointed out that reading retardation tended to cause emotional and personality disorders and maladjustment. Gates (25) took a more challenging and controversial attitude when he commented that failure in reading may frequently be a contributing cause of juvenile delinquency and all kinds of antisocial behavior.

Pursuing the antisocial behavior connected with reading inefficiency, few studies were located which pertained specifically to the college level. McDonald (48) reported that a random sample of students chosen from all those voluntarily enrolled in the reading improvement program at a reading center exhibited greater anxiety, more discouragement, less success in social encounters, and weaker achievement, autonomy, and agression needs than the average college group. Spache (82) in working with retarded readers found that a large proportion of them were antisocial, agressive toward authority,

and overanxious.

It must be noted, however, that the literature is far from being in agreement with some of the previous findings. Disagreement is voiced by Holmes (35) who observed that there is apparently no relationship between reading disability and personality traits.

While it appears that reading disability may have a negative influence on personality development, is there evidence in the literature that reading can also exert a positive influence on personality development?

General observations in the area of self-concept and self-image led Bills (3) to comment that how a person views himself will determine how he views the world, and in turn how the world views him. Relating to the self-concept of an individual, White (100, p. 156) pointed out that without the self-concept we can find no point of anchorage for an interpretation of the pattern of tendencies that is characteristic of each individual. More specifically, how can reading influence a pattern of tendencies that may become characteristic of an individual?

Weingarten (99), for example, in a questionnaire study which involved 1, 256 students from 17 colleges reported how reading had influenced their personality development. Results of this study indicated that 28. 2 percent of those responding felt that their reading had led to self-understanding; 32. 6 percent had found through reading

the ideal self; 19.9 percent had gained in understanding how to solve a problem; 10 percent had been helped in selecting a vocation; 34.3 percent had changed their behavior; 60.5 percent had been assisted through reading in finding a way of life; and 29.9 percent had been led to imitating a character read about. Could these results indicate that success in reading can contribute to a person's sense of self-worth which is essential to wholesome character formation (78)?

The Community College Students

The Community College Freshmen

Who are the community college students?

The entering community college freshmen are either senior high school graduates or students who failed to complete the senior high school year. Many had dropped out of school and had tried different kinds of employment opportunities before entering the community college.

The diversity of the community college population is furthermore stressed by the fact that the community college has an "open-door" policy which guarantees every individual the right to succeed or to fail by his own efforts. The Report on Education Beyond the High School (57, p. 213) states:

> Some of those who might be refused admission to the four-year colleges are persons with ability but poor high school

> records. The reasons for their poor marks might be many. For instance, a student might have been sick or otherwise absent a great deal during high school, he might be a "late bloomer", or he might have been just plain lazy. All three can be served by the two-year college if they acquire the motivation to match their performance with their ability.
>
> The two-year college does a great deal of remedial work, mending the holes left by a poor high school performance.

At Central Oregon Community College the entering freshmen have taken The American College Testing Program. The results which the students achieve on this testing program are interpreted in accordance with the norm tables and explanations in the handbook "Using ACT on the Campus." As a result of these interpretations many entering freshmen range from the lowest possible standard score of 1 to the approximate median score of 16 which places these students in the non-transferable credit courses or the basic courses.

Reading Requirements of Community College Freshmen

The results which those students obtained on the ACT may also indicate the wide range of reading ability or disability that may be expected among the entering freshmen at Central Oregon Community College and in most other community colleges. How will the students cope with and react to the rise in reading difficulty of the college text as contrasted with the high school text? The college text may be several levels beyond the student's independent reading level (11)

which may mean frustration, defeat, and discouragement instead of enjoyment, success, and encouragement for the student. Furthermore, the student will soon realize that the textbook is only the beginning to more extensive and supplementary reading. Pauk (59, p. 44) commenting on the college reading burden stated:

> The student must "run" to stay abreast fast-developing fields and areas by rifling through stacks of journals, magazines, newspapers, theses, bulletins, and microfilms which contain findings of research from various parts of the world.

Fortenberry (23) emphasized that reading ability becomes of paramount importance, that textbooks become more difficult, that study periods become longer, and that a higher level of thinking is required for achievement. Hadley (30) reported that about 95 percent of 3, 000 college entrants lacked adequate study skills and that a relatively small percent had adequate reading speeds and comprehension skills for handling all college assignments. McCallister (45, p. 2) studied 946 freshmen at the time they entered college and learned that 333 students were not able to read as effectively as college freshmen were expected to read. Townsend (96) noted when students ascend from elementary school through college that reading demands increase and that acquired reading skills, habits, and attitudes during high school years become inadequate tools for college reading even though they are still necessary and constantly in use.

In addition to these findings of pronounced reading inability of

entering freshmen at college level, Nelson (54) presented a partly subjective analysis of a reading program at New York City Community College. There 96 students were placed in five class sections for reading instruction according to deficiencies as measured by the Diagnostic Reading Test scores. After the data had been tabulated, Nelson reported that students made the most improvement in vocabulary, and the least improvement in comprehension and that only one student lost in comprehension skill as reflected by the post-test scores.

Schleich (73) in summarizing some of the research findings concluded that reading inabilities may be the cause of unnecessary failure and second-rate performances from potentially first-rate students, as well as the cause of frustration among first-rate faculty whose courses require more mature reading skills than their students bring to their courses.

Reading Ability in the Content Areas

Authorities in reading generally agree that before high school and college students can read efficiently in the content areas, they must become skillful in the fundamental reading practices and that basic reading skills must be mastered before higher level reading skills can be acquired to fully comprehend secondary school and college materials (46; 51, p. 84; 80, p. 183). It is also generally

accepted that in each content area reading for learning requires specific reading skills.

Spache (82), and Spache and Berg (85, p. 120) suggested the following specific reading skills which are essential for successful and efficient reading in content matter areas: To survey materials, to choose appropriate reading techniques, to acquire flexible reading rate, to identify facts and to evaluate or appraise them.

What do the steadily increasing reading demands in the content areas require from the entering community college freshmen? They require that every student should become increasingly adept in reading the different kinds of materials (88) and that he should master these specific reading skills in order to understand, communicate, and integrate efficiently the different contents of the reading materials. When the reader is proficient in these skills, he possesses a valuable tool that lays open to him the vast storehouse of knowledge that lies between the covers of books.

For the inefficient reader, however, the steadily increasing reading demands hold less promise for academic advancement. The poor reader either reads so slowly that he has not time to read much, or reads so inaccurately that he is little better off when he has finished than when he started. He must depend to a large extent on what he can learn by listening. In consequence he tends to fall behind in subjects that require reading (33, p. 4-5). In addition, his reading

inability may become a handicap toward good citizenship which, in turn, may influence and affect the health of a democracy and the freedom of a nation (53).

Summarizing the importance of reading ability in the content area Smith and Dechant (80, p. 373) postulated that effective reading in the content areas demands all the general reading skills and that each content course has its special vocabulary and concepts and requires its special reading skills. It can also be stated that reading is intimately and reciprocally related to all content fields offered in a community college and that any reading deficiency becomes an obstacle to proficiency in the required community college courses.

Reading Integrated into the Learning Process

The Harvard Report on "General Education in a Free Society" suggested that education is not merely the imparting of knowledge but the cultivation of certain aptitudes in the mind of the young. These aptitudes should be the abilities to think effectively, to communicate thought, to make relevant judgments, and to discriminate among values (94). To nourish and further these abilities suggests that reading as one of the key tools in learning must be integrated into the whole learning process that occurs on any educative level. Authorities seem to support the estimates that from 80 to 90 percent of all subject matter learning demand efficient reading skills from

community college students as well as from all other students in educational institutions (23; 51, p. 58).

Gray (29) pointed out that integration is the heart of the learning act in reading. Dechant (19, p. 375) emphasized integration as the last of the four steps involved in the completion of the reading act which begins with recognition, understanding, and reaction to the printed symbols. Smith and Dechant (80, p. 23) found whenever the student integrates what he is reading, his studying, and reading becomes a responsive and interpretive process.

Reading then is not a subject in itself, but a process, an art, a tool, a skill. Reading is a dynamic not a static process which calls for interpretive thinking with a purpose, which carries a sequence of concepts in mind, which associates immediate experiences with an experimental background, and which requires constant changes of behavior (18). Integrating reading within an individual's life may enable the reader to consult many sources, to be more or to become more critical, and to adjust more readily to individual needs and understanding (10, p. 27-31).

Studies Reporting on the Correlates of Gains in Reading Improvement Courses

Most of the previous research on the correlates of gains in reading have been conducted in one of two ways: In the first method

of measuring gain the pre-test score is subtracted from the post-test score. The difference between the two scores is called "crude gain" which may be symbolically expressed as: Crude gain = $X_2 - X_1$. In the second method, which is called "percent gain," the gain between the pre-test and the post-test is expressed as a percentage of the initial score. Percent gain may be symbolically expressed as: Percent gain = $X_2 - X_1/X_1$ (66).

Common findings of reading investigations in which "crude gain" or "percent gain" has been applied showed negative correlations between initial status in reading and improvement as measured after training (66).

Ranson (67) reported a negative correlation of -. 50 between initial status on the pre-test and gains obtained in comprehension. Bloomer (8) and Kammann (41) also reported negative correlations between initial reading status and gains made through reading improvement courses. Based on the results, Bloomer suggested that the students with low initial scores may have been more motivated and therefore improved more and that students for college reading programs might be selected upon the basis of low comprehension and vocabulary scores if larger gains are desired. Kammann suggested that superior students do not improve or may even be decreasing in skill as a result of training. Crude gain assessment tended to overestimate the "inferior" improver and to underestimate the "superior"

improver (65). Do such findings not only fly in the face of common sense but also of psychological expectations?

Research on the relationship between aptitude measures and crude gain in reading as a result of training as reported by Rankin and Tracy (66) has yielded either non-significant correlations or negative correlations between aptitude and reading gains. Ramsey (64) reported non-significant correlations between the California Test of Mental Maturity I. Q. scores and gains in reading. Kammann (41) obtained similar results with the scholastic Aptitude Test verbal score, but he found negative correlations between the American College Test and reading gains. A significant negative correlation of -. 26 between the Scholastic Aptitude Test verbal score and reading gains was found by Schneyer (74), while Chansky and Bregman (17) reported similar results with the American Council on Education Psychological Examination-L score. Bloomer reported a negative correlation of -. 53 between the ratio of the American Council on Education Test-L scores to initial reading scores and gains in reading and concluded that

> . . . students whose intelligence was greater than their reading ability did not learn to read in a college reading program to the extent of students whose reading ability tended to match or exceed their intelligence. (8, p. 117)

Since all of these correlations are based on crude gains, they seem to be highly questionable as do the interpretations of them.

Manning and DuBois reviewing crude gain studies pointed out that the negative correlations in these reading studies may simply reflect the spuriously negative correlation between initial status and crude gain (50). Rankin and Tracy (66, p. 231) stated: "Since reading is positively correlated with intelligence, there will be a tendency for those who are low in intelligence to be low in initial reading status and for those who are high in intelligence to be high in initial reading status." Manning and DuBois (50) and Rankin and Tracy (66) and Rankin (65) have suggested the residual gain method obtained very different and more meaningful results in reading improvement courses.

Residual Gain Statistic

To determine significant individual improvement for each participant in Groups 1 and 2, the residual gain statistic has been applied as developed by Manning and DuBois (50). They have revealed serious limitations of crude gain as a measure of individual differences in improvement and have proposed the use of "residual gain" as a superior measure (97). In comparing residual gains with "crude gain" (i. e., the simple difference between pre-test and post-training measures) Rankin and Tracy (66) and Rankin (65) noted that crude grades tend to underestimate the progress of superior "improvers" as measured by residual gain and to overestimate the progress of inferior "improvers" (97). A basic assumption underlying

the use of crude gain measurements is that the pre- and post-measurements be expressed in identical interval scales. Manning and DuBois stated that "these difficulties, encountered in measuring change by the absolute difference between two test scores, would probably be overcome if there were assurance that increments in scores on both initial and final tests were equivalent, that the two tests have the same zero point, and that the tests are valid and reliable at all levels of proficiency" (50, p. 290).

Initial differences in ability create statistical difficulties in the interpretation of simple differences between pre- and post-test measurements. Due to regression effects, students who start out with low pre-test scores may show apparent improvement on retesting, while students who start out with high pre-test scores may take lower scores on retesting. In addition, crude gain measurements tend to introduce a spurious negative correlation between initial status on the pre-test and the amount of improvement between pre-test and post-test. This negative relationship is a statistical artifact which has led to many erroneous conclusions (65).

Residual gain then has the following advantages over crude gain:

1. The reliability of residual gain measures is in most situations greater than that of crude gain.

2. Residual gain does not require that initial and final

measures be expressed in equal interval scales.

3. There are no spurious correlations between initial status and residual gain because residual gain always correlates zero with initial status, by definition.

4. Initial differences on the pre-test do not contaminate the measure of gain.

5. Residual gain is a more appropriate statistic than crude gain for correlation with other criteria (66).

Residual gain is the deviation of the observed post-test score from the post-test score that is predicted from the pre-test score (66). In a reading class, residual gain is the deviation of the actual post-course reading test score for a particular student from the post-course test score which was predicted for that student on the basis of the correlation between the pre- and post-course reading test results for the total group (65).

For arriving at residual gain scores and for evaluating such scores the computational and graphical methods are suggested by Tracy and Rankin (97). Both methods have been used in this study. The computational method will illustrate the meaning of residual gain for both the reading teacher and the researcher. The graphical procedures for estimating residual gains and for assigning grades to such gains are relatively simple and therefore recommended for classroom use.

CHAPTER III

DESIGN OF THE STUDY AND RELATED PROCEDURES

This study compared an intensive ten-weeks corrective reading course versus a less intensive 20-weeks corrective reading course at the community college level. Each corrective reading course was equal to 50 fifty-minute meetings of instruction. For the purpose of this study the participating college freshmen had been identified as Group 1 and Group 2. Group 1 subjects received ten weeks of intensive corrective reading instruction while Group 2 subjects received 20 weeks of less intensive corrective reading instruction.

Both groups had the same amount of instructional hours, used the same instructional materials, were taught by the same method, had the same sequence of instruction, and had the same instructor.

The aims of this study were to ascertain whether a ten-week intensive corrective reading improvement course produced as much gain in reading as a 20-week less intensive corrective reading improvement course and, secondly, whether the obtained gains, after corrective reading instructions had ceased for each group, are maintained over an additional ten-week period for either group. To satisfy the aims of this study the following design was developed and pursued:

Time	Group 1	Group 2
Begin	Pre-test of Group 1, followed by ten-weeks intensive reading instruction	Pre-test of Group 2, followed by 20-weeks less intensive reading instruction
10-week	Immediate post-test, followed by no reading instruction	Reading instruction continued
20-week	Delayed post-test	Immediate post-test, followed by no reading instruction
30-week		Delayed post-test

During this experiment, instruction was given in the development of comprehension and spelling, the building of word recognition skills, the stating of purposes for reading, and recognizing the need for flexibility in reading speed according to purposes, difficulty of materials, and student experiences. Immediately following instructions from the researcher, students practiced applying these skills under his supervision.

The vocabulary development included: (1) deciding with the help of the dictionary which meaning of a word fits best the context, (2) inferring meaning of a word with the help of context clues, and (3) finding word meaning through structural analysis by application of knowledge of prefixes, suffixes, and root words.

The comprehension development included: (1) practice in how to read a paragraph and a chapter, (2) how the authors have

organized materials in subject matter areas, (3) how to take notes, (4) how to prepare for examinations, (5) how to interpret stated and implied meanings, (6) how to evaluate or judge the author's intent through his choice of words and his presentation of facts and opinions, and (7) how to integrate newly acquired materials with previous learning.

The development of reading rate was not practiced in isolation or judged solely by a speed reading test. The approach taken by the researcher was that rate of reading was dependent upon a number of factors which included: (1) practicing word recognition skills, (2) developing sight vocabulary, (3) learning to state purposes for reading, (4) recognizing that different kinds of reading materials require and determine different reading rates, (5) recognizing the importance of previous experiences with reading, and (6) integrating the concepts and vocabulary of the new materials with previous experience.

This study compared the results of: (1) pre-tests versus immediate post-tests versus delayed post-tests between the members of Group 1 and Group 2, and (2) pre-tests, immediate post-tests and delayed post-tests between the members of Group 1 and Group 2.

This study was designed to answer three major questions: (1) Was the assigned time a significant variable in the effectiveness of corrective reading instruction for either group? (2) On the basis of the intensive or less intensive corrective reading instruction, did the

training in the Reading Center result in statistically significant gains in vocabulary, comprehension, and reading rate for either group? (3) At the end of corrective reading instruction and at the end of the additional ten-week period for Groups 1 and 2, did significant differences appear between pre-tests and immediate and delayed post-tests?

Such analysis would not only serve to evaluate the effectiveness of intensive versus less intensive corrective reading instruction but would also give evidence of the student's ability to retain what he had learned over a period of time after instruction had ceased.

The Pilot Study

The pilot study provided informations about how students worked with different kinds of reading materials and the validity of various techniques for measuring standardized progress in reading.

Data obtained from the pilot study indicated needed changes in the selection of reading materials to be used, the choice of tests with which to evaluate performance, and to determine the effectiveness of reading instructions. No statistical analysis of test results was possible from the data provided by the preliminary study because experimental procedures had varied broadly and investigative freedoms had provided data which were not comparable. Specifically, the pilot study provided pertinent information about refining teaching methods, and selecting reading materials and tests used in the experimental study.

Population, Experimental Sample, and Students

Following completion of the pilot study and the refinement of the procedure, the experiment in reading was initiated. It extended over the academic year 1967-1968 and concluded with the present study.

The experimental sample was part of the student population enrolled in the basic program at Central Oregon Community College. The sample included those students whose composite score on The American College Test was 15 or lower or whose standard score on the subtest English was 10 or lower as these scores had been established as cut-off scores by the staff of the Counseling Center of the college. Thus, the experimental sample numbered 77 students who on account of their low placement scores had been advised by either the counseling staff or the faculty student advisors to enroll in corrective reading. Hence, these 77 students constituted the experimental sample used in this study.

To insure that each of the 77 students had an equal chance to be in either Group 1 or 2, they were selected randomly using the table of random numbers by Kendall and Smith.

Group 1 included 39 students at the beginning of this study. Three students of Group 1 dropped the reading course after the second and third meeting due to errors made in advising and scheduling of

classes. Group 1, therefore, finished the ten-week intensive corrective reading instruction with 36 students. Since two students did not return to college for the Winter Term 1968 and one student dropped classes during the second week of this term, 33 students of Group 1 were retested after the additional ten-week period.

Group 2 included 38 students at the beginning of the study. After the 20-weeks of less intensive corrective reading instruction Group 2 finished with 34 students, because four students did not return to college for the Winter Term 1968. Since four other students did not return for the Spring Term, 30 students of Group 2 were retested after the additional ten-week period.

The Experimental Sample

The experimental sample consisted of two groups, each group being similar to the other according to the following four factors: (1) enrolled as freshmen at the same community college, (2) received instruction from the same instructor, (3) used the same instructional materials during the same amount of instructional time of the same college year, and (4) participated in the same corrective reading course.

Instructional Materials, Techniques, and Methods

The instructional materials were reading improvement books

as well as vocabulary and spelling improvement books (Appendix I). Students were always encouraged to practice what they had learned during instruction in independent reading situations with graded reading materials and with their own textbooks.

The reading materials contained exercises of varying length and levels of difficulty. They included word recognition, comprehension of word meaning, phrases, sentences, and paragraphs, and selected reading articles taken from popular magazines and different subject-matter area textbooks.

Critical examination of the summarizing statements and workbook type questions offered practice in the higher-level reading skills. For the purpose of effective and efficient study methods, the SQ3R Method of Study suggested by Robinson (68) was applied during classroom instruction providing for the transfer of previous learnings to students' current problems in subject matter learning. Practice was given in skimming materials to rapidly locate key words, dates, and other specific informations. The range of the student's vocabulary was broadened by introducing and discussing unknown words in the readiness period of Directed Reading Activities. Additional work in vocabulary was encouraged by using and doing exercises in different vocabulary workbooks.

A summary outline of a daily instruction period of corrective reading may best describe and explain how materials, techniques,

and methods have been used:

The first ten minutes were used for spelling. Students corrected spelling errors or learned new words with the help of an adaptation of the Fernald-Keller Technique (22, p. 103-111).

The next 20 minutes were used for assigned exercises. Students used various reading approaches to find main ideas and supporting details, to communicate summary statements, to choose supporting and non-supporting paragraphs, and to organize reading materials in both written and mental outlines.

The remaining 20 minutes were used in practicing the skills that were introduced both in the present lesson and in the previous lessons. The materials used varied in length from about 100 words to 2500 words and in difficulty from popular magazine articles to technical and specific subject matter reading.

For immediate evaluation the students recorded their achievements in spelling, vocabulary, comprehension, and, at selected times, the reading rate (88; 2, p. 479).

Test to Evaluate Progress During Corrective Reading Instruction

Informal reading tests of various length and difficulty were administered to students at different times during the instructional periods. They were thereby aware of a measure of achievement in

subject matter that was studied during the corrective reading instruction. The tests specifically measured growth in word recognition, comprehension of word meanings, phrases, paragraphs, and connected texts.

Student Evaluation of the College Reading Course

At the end of the entire instructional period of Group 1 and 2, each student was requested to express anonymously his subjective reaction to the reading improvement course (Appendix J). The purpose of this brief opinionnaire was to get some measure or indication of the student's reactions to the course and its effects upon him in the learning process.

Evaluative Instrument

This study used as a criterion measure before and after instruction the Nelson-Denny Reading Test, Revised, Forms A and B.

The Nelson-Denny Reading Test, Revised, Form A was administered to all participating students at the beginning of the corrective reading instruction and provided the initial guide of the student's reading ability or disability. At the end of the ten-week intensive corrective reading instruction Form B was administered to Group 1 students to ascertain immediate gains. Similarly, Group 2, the group receiving the less intensive corrective reading instruction,

was administered Form B of the Nelson-Denny Reading Test and immediate reading gains were ascertained. Post-tests were administered to both groups ten weeks after instruction had ceased in order to determine whether either group had lost or maintained those skills they had achieved during the original instructional periods according to standardized tests given. Form A of the Nelson-Denny Reading Test was used for this purpose.

Analytic Procedures

The study sought to determine: (1) whether time was a significant variable in the corrective reading instruction, (2) whether the results of the ten-week intensive corrective reading instruction differed significantly from those of the 20-week less intensive corrective reading instruction, and (3) whether immediate gains were retained over an additional ten-week period.

Regression Analysis

To determine whether time was a significant variable in the corrective reading instruction, the means were subjected to analysis of regression and the correlated t values

$$t = \frac{\bar{y}_1 - \bar{y}_2}{\sqrt{s_P^2 \left(\frac{1}{N_1} + \frac{1}{N_2}\right)}}$$

$$s^2_P = \frac{(N_A - 1)s^2_A + (N_B - 1)s^2_B}{N_1 + N_2 - 2}$$

$$d.f. = N_1 + N_2 - 2$$

s^2_P = estimate of variance

and the levels of significance for vocabulary, comprehension, total reading, and reading rate were compared (43, 109, 143, 279-354).

To determine significant group improvement during instructional time and the additional ten-week period, the mean pre-test scores, the mean immediate and delayed post-test scores, the mean differences, the correlated t values (to compute t value within each group):

$$t = \frac{\bar{y} - \bar{x}}{\sqrt{\frac{s^2_x + s^2_y - 2r\, s_x s_y}{N}}}$$

$\bar{y}$ = post-test mean

$\bar{x}$ = pre-test mean

s^2_x = variance of pre-test scores

s^2_y = variance of post-test scores

r = correlation coefficient

s_x = standard deviation of pre-test scores

s_y = standard deviation of post-test scores

To compute t value of delayed post-test versus immediate post-test DPT - IPT:

$$t = \frac{\bar{d}}{\sqrt{\frac{s^2_d}{N}}}$$

$$d = Y_{DPT} - Y_{IPT}$$

$$s^2_d = \frac{\Sigma(d - \bar{d})^2}{N-1}$$

$\bar{d}$ = sample mean

and the levels of significance were analyzed and compared.

Residual Gain

As described in Chapter II of this study, the computational and the graphical method were applied to determine individual gains of the students in Groups 1 and 2. To compute residual gain, the raw score method has been used; to estimate residual gain, the graphical method has been used.

Using the raw score method, the raw score formula

$$Y.X = Y - [bX + C]$$

where

X = pre-test score

Y = post-test score

$$b = \frac{N\Sigma XY - (\Sigma X)(\Sigma Y)}{N\Sigma X^2 - (\Sigma X)^2}$$

$$C = \bar{Y} - b\bar{X}$$

$\bar{Y}$ = post-test mean

$\bar{X}$ = pre-test mean

(1) is easier to compute and may also avoid some rounding errors. Scores do not have to be converted to z-scores, and the numbers involved in subtraction are always positive. (2) Residual gain can be easily expressed in normative units, i. e., a raw score residual gain could be interpreted in terms of increase in age units or percentiles which provide an accurate evaluation of change for each individual (66).

The graphical method (66)

$$Y' = bX + C$$

$$b = \frac{N\Sigma XY - (\Sigma X)(\Sigma Y)}{N\Sigma X^2 - (\Sigma X)^2}$$

X = any arbitrary pre-test score value

$C = \bar{Y} - b\bar{X}$

for estimating residual gain involved plotting a regression line on a graph and then subtracting scores on the regression line from obtained post-test scores according to the formula for the predicted post-test score (Y) for a given value of X. The appropriate residual

gain for any individual can now be quickly determined by locating the intersecting lines for X and Y and counting up or down to the regression line. These residual gains can then be used to compare the relative improvement of various individuals or to assign grades in a classroom situation (97).

CHAPTER IV

FINDINGS

This study is a report of the results of a two-group experiment comparing immediate and delayed reading performances of classes involved in intensive and less intensive corrective reading instruction.

To compare the corrective reading performances of the two groups three basic questions were posed: (1) Did the results of intensive corrective reading instruction differ significantly from the results of less intensive corrective instruction between Group 1 and Group 2 in vocabulary, comprehension, total reading, and reading rate? (2) Did the single factor of time between lessons differentiating intensive and less intensive corrective reading instruction produce a difference in the results of corrective reading instruction? (3) Did the group results obtained through intensive or less intensive corrective reading instruction differ significantly between pre-tests, immediate post-tests, and delayed post-tests or between pre-tests and immediate post-tests, between pre-tests and delayed post-tests, and between immediate and delayed post-tests for Groups 1 and 2 in vocabulary, comprehension, total reading, and reading rate?

Each student had taken the Nelson-Denny Reading Test, Form A, prior to the period of intensive or less intensive corrective

reading instruction and his raw score on that test provided an initial level of competencd with which to make later comparisons. Since the raw scores are free from concomitant considerations of norming samples, educational grade levels, age, and sex, they were used in preference to percentile norms and grade equivalent norms given in the manual in order that all students would be on equal basis.

Each student's scores were punched on IBM cards and then processed by a computer. The name and the number of the computer is Control Data 3300. The kind of program used to compute the data for this study is the Program for Regression Analysis, Stepwise Regression.

To ascertain whether (1) the results of intensive corrective reading instruction differed significantly from the results of less intensive corrective reading instruction and whether (2) the single factor of time between lessons differentiating intensive and less intensive corrective reading instruction produced a difference in the results of instruction, the study analyzed the raw scores made by 70 community college students who had taken the immediate post-test after finishing the intensive or the less intensive corrective reading instruction.

Results of Intensive Versus Less Intensive Corrective Reading Instruction

Mean differences revealed no significance between intensive and less intensive corrective reading instruction attributable to the time factor alone. Table 1 shows the mean differences and the associated t values of pre-test versus pre-test and immediate post-test minus pre-test between Groups 1 and 2 for vocabulary, comprehension, total reading, and reading rate. None of the t values reached 1.996 required for significance at the .05 level.

Table 1. Mean differences and associated t values of pre-test versus pre-test and immediate post-test minus pre-test between Groups 1 and 2 for vocabulary, comprehension, total reading, and reading rate.

	DF*	
Groups	68	68
Sample Size		
1	36	36
2	34	34
Comparison of	Pre-test versus pre-test	Immediate post-test minus pre-test
Vocabulary		
Mean difference 2-1	3.4804	-2.9625
t	1.3499	-1.7705
Comprehension		
Mean difference 2-1	-2.7091	1.4281
t	-1.4162	.7719
Total Reading		
Mean difference 2-1	.7713	-1.8224
t	-.0946	-.7694
Reading Rate		
Mean difference 2-1	-28.8398	10.1601
t	-1.8020	.4073

*Degree of freedom ($N_1 + N_2 - 2$)

No significance at the .05 level.

Time Alone as a Variable

Peformance of students taking the intensive corrective reading instruction was not significantly different from that of students taking the less intensive corrective reading instruction. When raw scores were used for analysis the results achieved by Group 1 receiving the intensive corrective reading instruction differed little from the results achieved by Group 2 receiving the less intensive corrective reading instruction. Within the 10 and 20 weeks of intensive and less intensive corrective reading instruction, the difference in time alone was not a decisive variable in the effectiveness of corrective reading instruction. When, however, at the end of the additional ten-week period, the two groups were retested for retention of the learned reading skills, analysis of regression showed a difference in total reading favoring Group 2 which had received the less intensive corrective reading instruction. The associated t value of the mean difference in total reading indicated that the difference was significant at the .01 level of confidence. Table 2 shows the mean difference and the associated t value of delayed post-test minus immediate post-test between Groups 1 and 2 for vocabulary, comprehension, total reading and reading rate.

The performance in total reading of Group 2 was significantly superior to that of Group 1 when immediate post-test to delayed post-test scores were compared.

Table 2. Mean differences and associated t values of delayed post-test minus immediate post-test between Groups 1 and 2 for vocabulary, comprehension, total reading, and reading rate.

Groups 1 and 2	DF 61
Sample Size	
1	33
2	30
Comparison of	Delayed post-test minus immediate post-test
Vocabulary	
Mean difference 2-1	1.7515
t	1.4504
Comprehension	
Mean difference 2-1	2.2606
t	1.6091
Total Reading	
Mean difference 2-1	4.0121
t	2.3598*
Reading Rate	
Mean difference 2-1	-9.4545
t	.3636

*.01 significance level t = 2.326

Corrective Reading Instruction as a Variable in Groups 1 and 2

The third issue with which the study concerned itself was whether corrective reading instruction significantly influenced reading improvement between pre-tests, immediate post-tests, and delayed post-tests or between pre-tests and delayed post-tests, and between immediate and delayed post-tests for Groups 1 and 2 in vocabulary, comprehension, total reading, and reading rate.

Inasmuch as all students had taken the Nelson-Denny Reading Test, Form A, prior to the beginning of corrective reading instruction, raw score performance on that test provided an initial level from which to begin comparison. Again, only raw scores were used for the statistical analysis of the data in order that all students would be on an equal basis. Table 3 shows the mean pre-test scores and the estimate of variance for Groups 1 and 2 in vocabulary, comprehension, total reading, and reading rate.

Table 3 shows that only minor initial mean differences between the two groups did exist. According to the tabulated t .05 the initial mean difference was not significant prior to the beginning of corrective reading instruction. This finding indicates that the students of Group 1 who would be given the intensive corrective reading instruction were not significantly better or poorer readers than the students of Group 2 who would receive the traditional less intensive corrective reading instruction.

When students were tested at the end of the intensive and less intensive corrective reading instruction with the Nelson-Denny Reading Test, Form B, Table 3 shows the mean immediate post-test scores and the estimate of variance for Groups 1 and 2 in vocabulary, comprehension, total reading, and reading rate. Although mean differences existed between the two groups, none of the differences was significant at the .05 level of confidence. This finding indicates

Table 3. Mean pre-test scores and estimate of variance of mean post-test scores of Groups 1 and 2

	Sample Size			Nelson-Denny Sub-test							
				Vocabulary Group		Comprehension Group		Total Reading Group		Reading Rate Group	
DF*	1	2	Comparing	1	2	1	2	1	2	1	2
68	36	34	Mean Pre-test scores	23.667	27.1471	27.9444	25.2353	51.6111	52.3824	210.222	181.3824
			Estimate of Variance	58.9225	98.7956	95.8186	87.2767	239.1260	286.6689	6,153.6180	4,580.4876
			t	1.3499		-1.4162		-.0946		-1.8020	
68	36	34	Mean Immediate Post-test scores	31.3056	31.8235	38.222	36.9412	69.5278	68.4767	417.9444	399.2647
			Estimate of Variance	122.7896	131.3614	59.1491	139.9347	275.1707	455.7627	13,189.1397	18,716.9761
			t	.1894		-.5401		-2.307		.-6200	
61	33	30	Mean Delayed Post-test Scores	34.1515	36.5333	40.0000	41.4667	74.1515	78.0000	441.3333	422.6333
			Estimate of Variance	117.5700	145.4988	79.0001	107.5680	280.9445	424.0000	12,072.5376	13,463.5411
			t	.8254		.6043		.8167		-.6569	

*Degree of freedom ($N_1 + N_2 - 2$)

No significance at the .05 level.

that both groups progressed in their reading performances almost equally.

Inspecting the mean delayed post-test scores and the estimate of variance in Table 3, the means indicate differences between Groups 1 and 2 at the time when the Nelson-Denny Reading Test, Form A, was administered as the delayed post-test to Groups 1 and 2. However, none of the mean differences reached the .05 level of significance. This finding indicates that both groups at the time of the retention test performed almost equally.

After instruction of Group 1 and Group 2 comparisons were made between scores on the Nelson-Denny Reading Test, Form B, to determine whether a significant difference might appear between pre-tests and immediate post-tests in either group after corrective reading instruction.

After an additional ten weeks of no corrective reading instruction for both groups, a similar analysis was made of the raw scores on the Nelson-Denny Reading Test, Form A, to ascertain if a significant difference might appear between pre-tests and delayed post-tests or between immediate and delayed post-tests in either group after corrective reading instruction had ceased.

To indicate the variability in the reading performances between Groups 1 and 2 in vocabulary, comprehension, total reading, and reading rate, the group means and the standard deviations of

the pre-tests, the immediate post-tests, and the delayed post-tests are presented in Table 4.

Tables 5 and 6 show where significant differences appeared in the reading performances between pre- and post-tests of Groups 1 and 2 as indicated by the mean differences between the same tests for both groups.

Table 5 and 6 show that for both groups the pre-test to immediate post-test mean differences in vocabulary, comprehension, total reading, and reading rate were statistically significant at the . 001 level of confidence.

Comparing pre-test with delayed post-test Tables 5 and 6 show that the differences which appeared between these two tests for Groups 1 and 2 in vocabulary, comprehension, total reading, and reading rate were statistically significant at the . 001 level of confidence.

Comparing immediate post-test with delayed post-test Table 5 shows that the differences which appeared between these two tests for Group 1 in total reading were statistically significant at the . 01 level and the differences in vocabulary were statistically significant at the . 05 level of confidence. No significant differences at the . 05 level appeared between the immediate and delayed post-test in comprehension and reading rate.

Table 4. Means and standard deviations of pre-tests, immediate post-tests, and delayed post-tests for Groups 1 and 2.

Group	Pre-to Immediate Post-test	Pre-to Delayed Post-test	Nelson-Denny Sub-tests	Mean Scores and Standard Deviations					
				Pre-test		Immediate Post-test		Delayed Post-test	
	Sample Size			Group 1					
1	36	33	Vocabulary	23.66	± 8.05	31.30	± 11.08	34.15	± 10.84
	36	33	Comprehension	27.94	± 9.82	38.22	± 7.69	40.00	± 8.88
	36	33	Total reading	51.61	±16.06	69.52	± 16.58	74.15	± 16.76
	36	33	Reading rate	210.22	±76.05	417.94	±114.84	441.33	±109.87
				Group 2					
2	34	30	Vocabulary	27.15	± 9.94	31.82	± 11.46	36.53	± 12.06
	34	30	Comprehension	25.24	± 9.34	36.94	± 11.83	41.47	± 10.37
	34	30	Total reading	52.38	±16.93	68.48	± 21.35	78.00	± 20.59
	34	30	Reading rate	181.38	±67.68	399.26	±136.81	422.63	±116.03

Table 5. Statistical comparison of mean difference and t-value of pre-test, immediate post-test, and delayed post-test of Group 1.

Sample Size	Comparing	Nelson - Denny Sub-tests: Vocabulary Mean Difference	Vocabulary t	Comprehension Mean Difference	Comprehension t	Total Reading Mean Difference	Total Reading t	Reading Rate Mean Difference	Reading Rate t
36	Pre-test and Immediate Post-test	7.64	6.30*	10.28	7.08*	17.91	9.56*	207.72	12.68*
33	Pre-test and Delayed Post-test	9.83	4.30**	11.46	4.90**	21.40	5.31**	227.73	9.54**
33	Immediate- and Delayed Post-test	1.84	2.25##	1.27	1.21	3.12	3.10#	21.45	1.31

*.001 significant level t = 3.591

**.001 significant level t = 3.460

#.01 significant level t = 2.750

##.05 significant level t = 2.042

Table 6. Statistical comparison of mean differences and t-value of pre-test, immediate post-test and delayed post-test of Group 2.

Sample Size		Nelson - Denny Sub-tests							
		Vocabulary		Comprehension		Total Reading		Reading Rate	
		Mean Difference	t	Mean Difference	t	Mean Difference	t	Mean Difference	t
34	Pre-test and Immediate Post-test	4.67	4.11*	11.70	10.39*	16.10	11.16*	217.88	11.55*
30	Pre-test and Delayed Post-test	8.40	6.10**	15.47	13.73**	23.87	14.51**	238.83	14.26**
30	Immediate- and Delayed Post-test	3.60	4.06**	3.54	3.22#	7.13	5.11**	12.00	.59

*.001 significant level t = 3.646

**.001 significant level t = 3.659

#.01 significant level t = 2.756

Comparing the immediate post-test with the delayed post-test Table 6 shows that the differences which appeared between these two tests for Group 2 in vocabulary and total reading were statistically significant at the .001 level of confidence, while the differences between the same two tests in comprehension were statistically significant at the .01 level of confidence. No significant differences at the .05 level appeared between the immediate and delayed post-test for Group 2 in reading rate.

To ascertain the gains of reading improvement in grade levels for both groups, the means of the pre-tests, the means of the immediate post-tests, and the means of the delayed post-tests as presented in Table 4 were compared using the Grade Equivalent Norm Table of the Nelson-Denny Reading Test, Form A and B, (55). Table 7 presents the group means of the pre-tests, the immediate post-tests, and the delayed post-tests, the mean grades of the same tests and the differences or the gains made in grade levels between pre-test and immediate post-test, pre-test and delayed post-test, and between immediate and delayed post-test in vocabulary, comprehension, total reading, and reading rate for Groups 1 and 2.

After the results of the performances of Group 1 and 2 have been presented, the individual gains of the students in Group 1 and Group 2 as measured by the residual gain procedure are presented in Appendices A, B and C for Group 1 and in Appendices D, E, and F

Table 7. Comparison of the means of the pre-tests, the immediate post-tests, and the delayed post-tests with the grade equivalent norms of the Nelson-Denny Reading Test, Forms A and B, to show gains of reading performance in grade levels between pre-test and immediate post-test, pre-test and delayed post-test, and immediate and delayed post-test for Groups 1 and 2.

	Form A		Form B		Form A		Gains Made in Grade Level		
	Pre-test		Immediate Post-test		Delayed Post-test		Pre-test to Immediate Post-test	Pre-test to Delayed Post-test	Immediate to Delayed Post-test
Sub-tests	Mean	Grade Level	Mean	Grade Level	Mean	Grade Level			
				Group 1					
Vocabulary	23.66	11.0	31.30	12.3	34.15	13.0	+1.3	+2.0	+ .7
Comprehension	27.94	9.8	38.22	12.4	40.00	12.7	+2.6	+2.9	+ .3
Total reading	51.61	10.4	69.52	12.5	74.15	13.0	+2.1	+2.7	+ .6
Reading rate	210.22	9.3	417.94	14.0	441.33	14.0	+4.7	+4.7	not measured
				Group 2					
Vocabulary	27.15	12.2	31.82	12.4	36.53	13.3	+ .2	+1.1	+ .9
Comprehension	25.24	9.3	36.94	12.0	41.47	13.1	+2.7	+3.8	+1.1
Total reading	52.38	10.4	68.48	12.3	78.00	13.3	+1.9	+2.9	+1.0
Reading rate	181.38	8.4	399.26	14.0	422.63	14.0	+5.6	+5.6	not measured

for Group 2. Appendices A and D present the computational method, while Appendices B, C, E and F present the graphical method of the Residual Gain Statistic. The computational method shows both the predicted regression and the residual gain of the immediate post-test scores and the delayed post-test scores on the pre-test scores. The graphical method in Appendices B and E, Figures 1 to 4 show the regression lines based on the data in Appendices A and D for immediate post-test scores on pre-test scores in vocabulary, comprehension, total reading, and reading rate, while Appendices C and F, Figures 1 to 4 show the same for the delayed post-test scores on pre-test scores.

Residual Gain Scores for Groups 1 and 2

To analyze individual gain scores it is necessary to identify the student's individual performances on the different sub-tests. This is done by referring to the number and raw scores of a student in Appendix A and then by checking his position on the graph in Appendices B and C, Figures 1 to 4 in relationship to the regression line. If the point that represents this particular student's performance falls directly on the line, the student has performed as predicted. If the student's performance falls above the regression line, a plus sign is before the residual gain score. If the performance falls below the regression line, a minus sign is before the residual gain score. The minus sign does not

represent lack of improvement but indicates that the student's immediate and delayed post-test score was lower than predicted on the basis of the pre-test score, thus he did not improve as much as was expected.

For instance, student No. 1 in Appendix A received a pre-course vocabulary raw score of 10, an immediate post-test score of 14, and a delayed post-test score of 16. When considering his improvement in the light of residual gain, his improvement on the immediate and delayed post-test was actually lower -3.105 units and -3.363 units, respectively, than that predicted on the basis of the regression line as shown in Appendices B and C, Figure 1.

How did the same student perform in comprehension, total reading, and reading rate?

The same student received a pre-test comprehension raw score of 16, an immediate post-test score of 26, and a delayed post-test score of 24. In the light of residual gain, his improvement was lower -7.287 units on the immediate post-test and -8.782 units on the delayed post-test. His reading performance was actually less in relationship to the regression line as predicted on the basis of his pre-test score (Appendices B and C, Figure 2).

In total reading, his improvement was lower than it should have been according to prediction based on pre-test (Appendices B and C, Figure 3). A similar result can be seen for the same student in

reading rate. The computational table indicates that his immediate post-test score in this sub-test was -143.493 and -172.807 on the delayed post-test, while the graphs in Appendices B and C, Figure 4, show his position in relationship to the regression line as predicted on his pre-test score.

Did student No. 1 improve his reading skills and did he benefit from the intensive corrective reading instruction? He did to the extent the data reveal it. However, when considering his improvement in vocabulary in the light of the residual gain statistic using the raw score method, comparison of the predicted immediate post-test score of 17.105 with the obtained score indicated that his vocabulary improvement was actually lower than expected while the predicted delayed post-test score of 19.363 or 3.363 less than expected, indicated that his retainment in vocabulary was actually lower than expected. It must also be observed that this student had a very low vocabulary score at the beginning of the course. Accordingly, he might be expected to progress upward toward the mean on retesting even without training, but he did not.

When the same student was asked how he thought he performed on this test he answered:

> I did fair on the vocabulary, only answering those I knew. On the reading rate I did very well for me. On the comprehension I finished, but I don't think I did very good.

Contrasting the student's residual gain with the crude gain, what would be the assessment of his improvement, for instance, in vocabulary?

Applying the crude gain method, i. e., immediate and delayed post-test raw score minus pre-test raw score, it would give the student a crude gain of 4 and 6 in vocabulary respectively, which can result in a fallacious assessment of his apparent improvement. While the student's residual gain improvement was less than expected by -3. 105 and -3. 363 respectively, it appears that crude gain tends (1) to over-evaluate reading improvement for inferior improvers and (2) not to take into consideration that a student with a low initial score might be expected to progress upward toward the mean even without training (66).

The preceding examples analyzed and compared the residual gain data of a student whose progress in vocabulary, comprehension, total reading, and reading rate on the immediate and delayed post-test was less than that predicted on the basis of his pre-test scores. Therefore, locating the intersecting lines on the graph for the student's X and Y scores, it is seen that the meeting point of the intersecting lines fall below the regression line. In the following example, the residual gain data of a student are analyzed and compared whose progress in the same sub-tests on the immediate and delayed post-test are higher than that predicted on the basis of his pre-test scores.

Student No. 10 in Appendix A received a pre-course vocabulary raw score of 21, an immediate post-test score of 37, and a delayed post-test score of 34. When considering his improvement in the light of residual gain, his progress on the immediate and delayed post-test was actually higher by +8.465 units and by +3.190 units, respectively, than that predicted on the basis of the regression line as shown in Appendices B and C, Figure 1.

The same student received a pre-test comprehension raw score of 16, an immediate post-test score of 38, and a delayed post-test score of 44. Residual gain interpretation indicates that his improvement was higher by +4.712 units on the immediate post-test and by +11.217 units on the delayed post-test. His progress in comprehension was actually more than four and eleven units higher in relationship to the regression line (Appendices B and C, Figure 2) than predicted on the basis of his pre-test score.

Considering No. 10 student's total reading, his improvement was higher by +16.985 units on the immediate post-test and on the delayed post-test by +17.437 units than predicted on the basis of the regression line (Appendices B and C, Figure 3). Similar results can be seen for the same student in reading rate. While the computational table of residual gain indicates +24.656 on the immediate post-test and +.063 on the delayed post-test, the graphs (Appendices B and C, Figure 4) show the same residual gains in his "plus" position

in relationship to the regression as predicted on his pre-test score.

The residual gain of this student's performance indicates that he made considerable improvement and that he did benefit from the corrective reading instruction to a greater extent than was predicted for him on the basis of his pre-test scores.

When the same student was asked how he thought he did perform on the delayed post-test, he answered: "I don't feel I did well in the vocabulary and comprehension. My reading rate was about average."

Contrasting this student's residual gain with the crude gain, the assessment of his improvement in comprehension, for instance, would have been different in the sense of overevaluation of his apparent progress.

The crude gain method would give student No. 10 a crude gain of 22 and 28 in comprehension on the immediate and delayed post-test, while the residual gain method would give him a residual gain of +4.712 and +11.217 on the same tests. When measuring change by the absolute difference between two test scores, a fallacious assessment of a student's progress in reading may result.

Similar analyses of each student's individual residual gain and his position in relationship to the regression line can be made by inspecting the computational residual gain tables of Groups 1 and 2 as well as the graphs of the regression lines for vocabulary,

comprehension, total reading, and reading rate of Groups 1 and 2.

While each student's regression prediction is given in the residual gain tables and plotted on the graphs of the regression lines found in the Appendices A to F, a summary of the group results in regression predictions is presented in Table 8. This table shows how many students of Groups 1 and 2 placed above or below the regression line for Y on X, i. e., the predicted post-test scores for all pre-test score values. "Above" the regression line in either one of the four-areas tested indicates that students have improved more on the immediate and delayed post-tests than predicted on the basis of the regression lines. Conversely, "below" the regression line in either one of the four areas tested indicated that students have improved less on the immediate and delayed post-tests than predicted on the basis of the regression lines.

What might the difference be in the measurement of reading improvement by the residual gain procedure versus the crude gain procedure? Crude gain is the single difference between pre- and post-training measures, while residual gain is the difference between a predicted and an observed measure.

To ascertain the differences in the measurement by these two procedures, the Total Reading sub-scores, which consist of vocabulary and comprehension subscores, was used as the basis for comparison. Table 9 presents this comparison.

Table 8. Summary of residual gain results for Groups 1 and 2 as predicted on the basis of the regression lines for immediate and delayed post-test scores on the pre-test score values in vocabulary, comprehension, total reading, and reading rate.

Nelson-Denny Sub-tests	Immediate post-test scores on pre-test scores			Delayed post-test scores on pre-test scores		
	Sample Size	Regression Line		Sample Size	Regression Line	
		Above	Below		Above	Below
			Group 1			
Vocabulary	36	13	23	33	15	18
Comprehension	36	20	16	33	17	16
Total reading	36	17	19	33	16	17
Reading rate	36	16	20	33	17	16
			Group 2			
Vocabulary	34	15	19	30	12	18
Comprehension	34	17	17	30	17	13
Total reading	34	16	18	30	13	17
Reading rate	34	18	16	30	16	14

Table 9. Comparison of gain procedures for total reading improvement for the five lowest and the five highest individual scores of Groups 1 and 2 based upon residual gain and crude gain for total reading.

		Immediate Post-test on Pre-test		Delayed Post-test on Pre-test		Delayed minus Immediate Post-tests on Pre-tests	
Group	Student No.	Residual Gain	Crude Gain	Residual Gain	Crude Gain	Residual Gain	Crude Gain
1	1	- 9.347	+14	-11.075	+14	- 1.047	±0*
	4	+ 2.864	+26	+ 9.062	+34	+ 6.874	+ 8
	5	-17.923	+ 5	- 7.800	+17	+10.707	+12
	6	+ 2.561	+24	-10.837	+13	-12.745	-11*
	7	- .226	+21	- 2.699	+21	- 1.822	±0*
	32	+33.194	+47	+28.116	+47	- 4.534	±0*
	33	+ .042	+13	- 5.333	+13	- 4.844	±0*
	34	-19.754	- 7	-22.196	- 4	- 1.922	+ 3
	35	- 1.896	+10	+ 1.354	+19	+ 3.767	+ 9
	36	+13.527	+25	+7.629	+25	- 5.387	±0*
2	1	- 3.464	+ 8	+ 4.889	+26	+ 8.526	+18
	3	+13.015	+25	+ 4.614	+26	= 8.240	+ 1
	4	+ 1.456	+15	+ 3.791	+26	+ 2.458	+11
	5	-10.543	+ 3	- 4.208	+18	+ 6.458	+15
	7	- 8.063	+ 6	- 2.482	+20	+ 5.691	+14
	30	- 7.261	+12	- 6.226	+19	+ 1.021	+ 7
	31	- 5.127	+15	- 6.683	+19	- 1.590	+ 4
	32	+ 9.486	+31	+23.584	+50	+14.030	+19
	33	+ 7.446	+30	+11.036	+38	+ 3.496	+ 8
	34	- 2.285	+22	- 4.878	+23	- 2.727	+ 1

*Crude gain tends to underestimate reading improvement as measured by residual gain. All other crude gain results tend to overestimate individual reading improvement as measured by residual gain.

Form A of the Nelson-Denny Reading Test was used as the pre-test, Form B of the same test was used as immediate post-test, and Form A of the same test was used as the delayed post-test. The results of the residual gain and the crude gain procedures for immediate post-test on pre-test, for delayed post-test on pre-test, and for delayed minus immediate post-test on pre-test were used to compare the five lowest and the five highest scores for Total Reading of those students of Groups 1 and 2. The numbers of the students which are listed in this table are the same numbers in the same order as they appear in the Residual Gain Tables in Appendices A and D.

Comparison of the residual gain scores versus the crude gain scores for Total Reading indicates that all crude gain scores of the 20 students of Groups 1 and 2 tend to either overestimate or underestimate their reading improvement as measured by residual gain. The 40 crude gain scores, 20 for immediate post-test on pre-test and 20 for delayed post-test on pre-test, show that crude gain procedure overestimates apparent reading "improvement." The 20 crude gain scores for delayed-minus immediate post-test scores on pre-test score values indicate that crude gain procedure in six cases underestimated students' reading improvement, while the Total Reading improvement of the other 14 students appeared to be overestimated.

The comparison of the two procedures, residual gain versus crude gain, indicates how failure to use residual gain can result in fallacious assessments of reading improvement.

In summary, 90 percent of the 60 crude gain scores listed in Table 9 overestimated individual reading improvement as measured by the residual gain procedure, while ten percent of the 60 crude gain scores underestimated individual reading improvement as measured by the residual gain procedure.

Further consideration must be given to the differences between the regression lines of the immediate and delayed post-test of Groups 1 and 2 on vocabulary, comprehension, total reading, and reading rate.

To see if the slopes of the regression lines differed significantly from zero, i. e., if the learning differences depended on the pre-test scores, the statistical data of the y-interceptor and the slope of the regression line of the four Nelson-Denny sub-tests for Groups 1 and 2 were subjected to additional t-tests, and F-tests. Appendix G shows the calculated t- and F-values for both groups. The table in Appendix G shows that of the four Nelson-Denny sub-tests for Group 1, only the slope of the regression line of the reading rate sub-test is significantly different from zero, i. e., the reading rate gains depended on the students' pre-test scores. The t-value is statistically significant at the .01 level of confidence and the F-value

is statistically significant on the .01 level of confidence. Because of the difference in the slope of the regression line in reading rate, the graph of this line is shown in Appendix H.

Related Observations and Comments

Some of the observations that are related to teaching and practicing reading in the classroom, are presented in the following. One of the most obvious faults of the poor reader appears to be pretending to read and guessing in order to answer questions. When asked "How do you think you performed on this particular reading task," one student replied: "My performance was non-commendable for I guessed most of the questions due to the fact that I am very slow, and wanted to keep up with the rest of the class."

To what degree or degrees a student's pretending to read is evidence of actual reading disability is debatable.

Another of the observed difficulties of the poor reader is that of verbalizing or merely pronouncing words orally. While the student is able to pronounce innumerable words with accuracy and, perhaps, to memorize them, he gets little or no meaning from his reading. In this case the student's performance is simply that of a human tape recorder (51, p. 184).

Another defense characteristic of the poor reader is that of what might be called "self-defeat" which, by boys and girls alike, is

expressed in the taciturn statement "I am dumb," "I can't read," "I flunked the entrance test," or "I always was a poor reader." These statements seem to say something like "Here I am, don't try to reach me because my defense system will try to fight you," or "If I can't do it, you know why." Related to these students is the one who, psychologically, has been beaten again and again by repeated failure through his years of schooling. Yet, as soon as one student scores his first success in years, he seems to break his shell and change into an active participant who is eager to reach for further success.

On the other hand, there are those students who appear to have a goal in mind and who want help. Their desire to improve reading is expressed in questions like "How long will it take me to read better? I mean, you know, I want to understand more," or comments like "I need to read faster so I can cover all my books," or statements like "If I would have understood what I read on that test, I would have made it."

Additional information of students' opinions about the corrective reading instructions have been summarized and reported in the student opinionnaire which is presented in Appendix J. Most of these opinions seem to be in agreement with that feeling which one student tried to express in writing:

> All reading we did in class helped me very much in school. It makes me get to know what to really look for now. I think this course has helped me out a great deal.

CHAPTER V

CONCLUSIONS AND RECOMMENDATIONS

Summary

The purpose of this study was to compare intensive with less intensive corrective reading instruction in a community college as well as to compare retainment of the learned reading skills after corrective reading instruction had ceased. The study raised the following questions:

1. Did the results of intensive corrective reading instruction differ significantly from the results of less intensive corrective reading instruction between Group 1 and Group 2 in vocabulary, comprehension, total reading, and reading rate?

2. Did the single factor of time between lessons differentiating intensive and less intensive corrective reading instruction produce a difference in the results of corrective reading instruction?

3. Did the group results obtained through intensive or less intensive corrective reading instructions differ significantly between pre-tests, immediate post-tests, and delayed post-tests or between pre-tests and immediate post-tests, between pre-tests and delayed post-tests, and between immediate and delayed post-tests for Groups 1 and 2 in vocabulary, comprehension, total reading, and reading rate?

The hypothesis which was formulated as a result of the foregoing questions and which was raised at the end of Chapter I was as follows:

The hypothesis of this study was that there will be no difference in the following factors of the total reading performance: in (1) vocabulary, (2) comprehension, (3) total reading, and (4) reading rate between one group of community college students using the intensive corrective reading approach and a second group using the less intensive corrective reading approach.

The summary of the findings and the conclusions which have been drawn as a result of the above hypothesis are discussed in this chapter.

The investigation began with a pilot study of four and five college reading classes which were composed of freshmen and sophomores. The purpose of the investigation was to improve the format and the structure of instructional materials as well as to select or devise tests with which to evaluate performance.

Following the completion of the pilot study and the revision of materials, the experiment itself was undertaken. It included two groups of community college freshmen who were enrolled at Central Oregon Community College in Bend. There were 70 students taking part in the experiment relating to corrective reading instruction.

Scores of 70 students provided the data from which a comparison of the effectiveness of the intensive versus the less intensive corrective reading instruction could be made. Each student took the Nelson-Denny Reading Test, Form A, prior to the reading instruction. The mean raw score on that test was compared with the mean raw score on the immediate post-test of Form B of the Nelson-Denny Reading Test. The mean differences and the associated t values between the immediate post-tests and the pre-tests of Groups 1 and 2 in vocabulary, comprehension, total reading, and reading rate did not show significant differences at the .05 level of confidence. Apparently, within the 10 and 20 weeks of intensive and less intensive corrective reading instruction, the difference in time alone was not a decisive variable in the effectiveness of corrective reading instruction. When, however, at the end of the additional ten-week period the two groups were retested for retention with the Nelson-Denny Reading Test, Form A, a significant difference in total reading appeared at the .01 level of confidence, thus favoring Group 2 which had received the less intensive corrective reading instruction.

At the conclusion of instruction for both groups a comparison was made of both groups on the pre-tests, the immediate post-test, and the delayed post-tests. No significant differences were found on the .05 level of confidence.

When comparisons were made between pre- and immediate post-tests for both groups significant differences were found at the .001 level in vocabulary, comprehension, total reading, and reading rate. When pre- and delayed post-tests were compared the same differences at the .001 level were found for both groups. When immediate and delayed post-test scores were compared for Group 1 a significant difference at the .01 level was found in total reading and a significant difference at the .05 level was found in vocabulary. When immediate and delayed post-tests were compared for Group 2 significant differences at the .001 level were found in vocabulary and total reading and a significant difference at the .01 level was found in comprehension.

A subsequent analysis of the data to test the hypothesis that the slope of the regression line of the difference between delayed and immediate post-test on pre-test is zero showed for Group 1 that the t-test for reading rate was statistically significant at the .01 level of confidence and that the F-test for total reading and reading rate was statistically significant from zero at the .01 level of confidence. For Group 2 the data indicated that the F-test was statistically significant from zero at the .01 level of confidence for vocabulary, comprehension and total reading.

Conclusions

The hypothesis of this study was that there will be no difference in the following factors of the total reading performance; in (1) vocabulary, (2) comprehension, (3) total reading, and (4) reading rate between one group of community college students using the intensive corrective reading approach and a second group using the less intensive corrective reading approach.

Based on this hypothesis of the study, the following conclusions are drawn:

1. As shown by the mean differences and the associated *t* values, results between intensive and less intensive corrective reading instruction at the end of the 10- and 20-week periods did not appear to be significantly different at the .05 level of confidence between Group 1 and Group 2.

2. The single factor of time between the lessons differentiating the intensive and the less intensive corrective reading instruction did not appear to be a significant influence on the effectiveness of corrective reading instruction. Groups 1 and 2 made gains in all of the areas tested, but no significant difference appeared to indicate

superiority of either procedure. It would appear, at least within the 10 and 20 weeks of intensive and less intensive corrective reading instruction that the intensive corrective reading instruction is as effective as the less intensive corrective reading instruction. A significant difference at the .01 level was found in Group 2 between immediate and delayed post-tests. Compared with students of Group 1, students of Group 2, less intensive corrective reading instruction, made significantly greater gains in total reading performance during the period of no instruction between the two post-tests. Apparently, Group 2 students continued to improve on their own with no instruction to a significant greater degree than the students who had the intensive reading instruction.

3. Corrective reading instruction carried out in this study did appear to make a difference in students' reading performances between pre-tests and immediate and delayed post-tests as well as between immediate and delayed post-tests of Groups 1 and 2. The differences which appeared for both groups between the pre-tests and the immediate post-tests in vocabulary, comprehension, total reading, and reading rate were all statistically significant at the .001 level of confidence.

The differences which appeared for both groups between the pre-tests and the delayed post-tests in vocabulary, comprehension

total reading, and reading rate were statistically significant at the .001 level of confidence.

The results which appeared between the immediate and the delayed post-tests for Groups 1 and 2 indicated that the immediate gains which had been achieved at the end of corrective reading instruction by both groups in all areas tested were maintained by the two groups over the additional ten-week period. For Group 1, total reading was statistically significant at the .01 level and vocabulary at the .05 level of confidence, while for Group 2, vocabulary and total reading were statistically significant at the .001 level and comprehension was statistically significant at the .01 level of confidence.

4. In this study the residual gain statistic was used. The assessment of individual student improvement in reading on the basis of the residual gain statistic appeared to be a more realistic approach in measuring reading gains than when the same reading gains were measured by the conventional crude gain method.

Implications for Practice

Analysis of the data of this study showed that the time factor difference between intensive and less intensive corrective reading instruction did not significantly influence the personal effectiveness of instruction. Inasmuch as the two groups made comparable gains in reading, the implication for the teaching of reading in the classroom

is that improvement in reading may come more from the reading instructor's activity of teaching reading as well as from the students' activities of studying and practicing reading skills than from the difference in time.

Community College students of Group 1 taking intensive corrective reading instruction performed as effectively as the community college students of Group 2 taking less intensive corrective reading instruction. At least within this sample, the classroom implications are that reading improvement at the community college level can be taught effectively by offering intensive corrective reading instruction. Were reading to be taught intensively as, for example, five hours per week for ten weeks as in this study, many more community college students may be given the opportunity to participate in reading instruction and to improve their own reading ability. The results of this study also showed that the reading skills were maintained over at least the ten-week period after instruction had ceased. Probably continued use during the intervening period without training of the learned skills was responsible for the lack of decrement in retention test scores. This finding suggests that the students applied most of the learned reading skills in their regular reading requirements of the different academic and technical-vocational subjects offered in the community college.

The results of this study may suggest that additional

research may turn its attention to the following areas of investigation:

1. What is the relationship between a student's reading improvement and his attitude? 2. What is the relationship between a student's estimate of his own reading performance compared to his actual reading achievement on a standardized instrument? 3. How is reading taught at the community college levels? 4. How and to what degree should reading instruction be integrated within the collegiate subject matter areas? 5. Since Group 2 made a significant gain in total reading after formal reading instructions had ceased, would this imply that their period of less intensive reading instruction has better prepared them to continue their own self-improvement?

Reading is part of an individual's total communication equipment. The measure of efficient reading no longer lies in how well an individual can pronounce words orally. It lies instead in how fluently and efficiently he can comprehend the written prose essential to everyday expression and communication in education, in industry and business, and in community and personal activities and relationships. To further efficient comprehension through reading, reading instructors in community colleges must accept the responsibility to make effective reading instruction available to all their students. Those who are in dire need of improving their reading must often be asked to participate in reading programs because of their reluctance to seek help. Provision must also be made to provide reading instruction for those who are fairly efficient readers but who desire to become even more so.

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APPENDICES

APPENDIX A

Computational Raw Score Method of Residual Gain Table of Individual Student Progress in Group 1

Table 1. Residual gain table showing individual progress of the students in Group 1.

Students	Nelson-Denny sub-tests	Pre-raw scores	Immediate post-raw scores	Delayed post-raw scores	Regression of immediate post-test on pre-test		Regression of delayed post-test on pre-test	
					Predicted	Residual gain	Predicted	Residual gain
1	V	10	14	16	17.105	- 3.105	19.363	- 3.363
	C	16	26	24	33.287	- 7.287	32.782	- 8.782
	T. R.	26	40	40	49.347	- 9.347	51.075	- 11.075
	R. R.	150	226	262	369.493	-143.493	434.807	-172.807
2	V	11	16	---	18.144	- 2.144	---	---
	C	16	30	---	33.287	- 3.287	---	---
	T. R.	27	46	---	50.135	- 4.135	---	---
	R. R.	150	195	---	369.493	-174.493	---	---
3	V	11	10	---	18.144	- 8.144	---	---
	C	16	38	---	33.287	4.712	---	---
	T. R.	27	48	---	50.135	- 2.135	---	---
	R. R.	174	438	---	388.802	49.197	---	---
4	V	15	17	23	22.300	- 5.300	24.566	- 1.566
	C	12	36	38	31.634	4.365	30.481	7.518
	T. R.	27	53	61	50.135	2.864	51.937	9.062
	R. R.	262	599	571	459.601	139.398	446.298	124.701
5	V	14	11	17	21.261	- 10.261	23.525	- 6.525
	C	14	22	28	32.460	- 10.460	31.631	- 3.631
	T. R.	28	33	45	50.923	- 17.923	52.800	- 7.800
	R. R.	174	299	384	388.802	- 89.802	437.269	- 53.269
6	V	15	27	26	22.300	4.699	24.566	1.433
	C	20	32	22	34.939	- 2.939	35.083	- 13.083
	T. R.	35	59	48	56.438	2.561	58.837	- 10.837
	R. R.	207	413	513	415.352	- 2.352	440.655	72.344
7	V	18	33	33	25.417	7.582	27.687	5.312
	C	18	24	24	34.113	- 10.113	33.933	- 9.933
	T. R.	36	57	57	57.226	- .226	59.699	- 2.699
	R. R.	185	379	513	397.652	- 18.652	438.398	74.601
8	V	7	33	30	13.987	19.012	16.241	13.758
	C	30	40	32	39.071	.928	40.836	- 8.836
	T. R.	37	73	62	58.014	14.985	60.562	1.437
	R. R.	250	425	436	449.947	- 24.947	445.067	- 9.067
9	V	15	26	29	22.300	3.699	24.566	4.433
	C	22	46	48	35.766	10.233	36.234	11.765
	T. R.	37	72	77	58.014	13.985	60.562	16.437
	R. R.	115	425	309	341.334	83.665	431.216	-122.216
10	V	21	37	34	28.534	8.465	30.809	3.190
	C	16	38	44	33.287	4.712	32.782	11.217
	T. R.	37	75	78	58.014	16.985	60.562	17.437
	R. R.	161	403	436	378.343	24.656	435.936	.063

Table 1. Continued.

Students	Nelson-Denny sub-tests	Pre-raw scores	Immediate post-raw scores	Delayed post-raw scores	Regression of immediate post-test on pre-test		Regression of delayed post-test on pre-test	
					Predicted	Residual gain	Predicted	Residual gain
11	V	22	15	26	29.573	- 14.573	31.849	- 5.849
	C	16	34	88	33.287	.712	32.782	- 4.782
	T. R.	38	49	54	58.802	- 9.802	61.424	- 7.424
	R. R.	150	327	371	369.493	- 42.493	434.807	- 63.807
12	V	18	25	24	25.417	- .417	27.687	- 3.687
	C	26	38	42	37.418	.581	38.535	3.464
	T. R.	44	63	66	63.530	- .530	66.598	- .598
	R. R.	174	279	349	388.802	-109.802	437.269	- 88.269
13	V	19	26	23	26.456	- .456	28.728	- 5.728
	C	26	42	46	37.418	4.581	38.535	7.464
	T. R.	45	68	69	64.318	3.681	67.461	1.538
	R. R.	250	615	621	449.947	165.052	445.067	175.932
14	V	30	35	35	37.886	- 2.886	40.173	- 5.173
	C	16	34	32	33.287	.712	32.782	- .782
	T. R.	46	69	67	65.106	3.893	68.323	- 1.323
	R. R.	207	438	639	415.352	22.647	440.655	198.344
15	V	27	31	34	34.769	- 3.769	37.052	- 3.052
	C	22	40	38	35.766	4.233	36.234	1.765
	T. R.	49	71	72	67.470	3.529	70.910	1.089
	R. R.	262	425	371	459.601	- 34.601	446.298	- 75.298
16	V	24	31	32	31.651	- .651	33.930	- 1.930
	C	26	42	42	37.418	4.581	38.535	3.464
	T. R.	50	73	74	68.258	4.741	71.733	2.226
	R. R.	150	269	359	369.493	-100.493	434.807	- 75.807
17	V	27	34	32	34.769	- .769	37.052	- 5.052
	C	24	36	46	36.592	- .592	37.384	8.615
	T. R.	51	70	78	69.046	.953	72.635	5.364
	R. R.	161	356	338	378.343	- 22.343	435.936	- 97.936
18	V	20	34	42	27.495	6.504	29.768	12.231
	C	32	44	38	39.897	4.102	41.987	- 3.987
	T. R.	52	78	80	69.834	8.165	73.498	6.501
	R. R.	94	319	468	324.439	- 5.439	429.061	38.938
19	V	22	39	37	29.573	9.426	31.849	5.150
	C	30	36	38	39.071	- 3.071	40.836	- 2.836
	T. R.	52	75	75	69.834	5.165	73.498	1.501
	R. R.	226	450	609	430.638	19.361	442.604	166.395
20	V	29	28	34	36.847	- 8.847	39.133	- 5.133
	C	24	48	38	36.592	11.407	37.384	.615
	T. R.	53	76	72	70.622	5.377	74.360	- 2.360
	R. R.	250	344	327	449.947	-105.947	445.067	-118.067

Table 1. Continued.

Students	Nelson-Denny sub-tests	Pre-raw scores	Immediate post-raw scores	Delayed post-raw scores	Regression of immediate post-test on pre-test		Regression of delayed post-test on pre-test	
					Predicted	Residual gain	Predicted	Residual gain
21	V	23	27	28	30.612	- 3.612	32.890	- 4.890
	C	30	40	46	39.071	.928	40.836	5.163
	T.R.	53	67	74	70.622	- 3.622	74.360	- .360
	R.R.	287	403	287	479.715	- 76.715	448.863	-161.863
22	V	31	35	35	38.925	- 3.925	41.214	- 6.214
	C	26	32	44	37.418	- 5.418	38.535	5.464
	T.R.	57	67	79	73.773	- 6.773	77.810	1.189
	R.R.	384	511	418	557.755	- 46.755	458.815	- 40.815
23	V	26	38	39	33.730	4.269	36.011	2.988
	C	32	34	36	39.897	- 5.897	41.987	- 5.987
	T.R.	58	72	75	74.561	- 2.561	78.672	- 3.672
	R.R.	468	599	349	625.336	- 26.336	467.433	-118.433
24	V	28	28	28	35.808	- 7.808	38.092	- 10.092
	C	32	26	30	39.897	- 13.897	41.987	- 11.987
	T.R.	60	54	58	76.137	- 22.137	80.397	- 22.397
	R.R.	262	599	468	459.601	139.398	446.298	21.701
25	V	28	33	38	35.808	- 2.808	38.092	- .092
	C	34	44	44	40.724	3.275	43.138	.861
	T.R.	62	77	82	77.713	- .713	82.122	- 12.227
	R.R.	195	226	287	405.697	-179.697	439.424	-152.424
26	V	31	35	---	38.925	- 3.925	---	---
	C	32	30	---	39.897	- 9.897	---	---
	T.R.	63	65	---	78.501	- 13.501	---	---
	R.R.	195	425	---	405.697	19.302	---	---
27	V	23	31	36	30.612	.387	32.890	3.109
	C	40	42	44	43.203	- 1.203	46.589	- 2.589
	T.R.	63	73	80	78.501	- 5.501	82.984	- 2.984
	R.R.	161	511	446	378.343	132.656	435.936	10.063
28	V	33	40	41	41.003	- 1.003	43.295	- 2.295
	C	30	40	40	39.071	.928	40.836	- .836
	T.R.	63	80	81	78.501	1.498	82.984	- 1.984
	R.R.	140	538	446	361.447	176.552	433.781	12.218
29	V	26	30	37	33.730	- 3.730	36.011	.988
	C	38	38	34	42.376	- 4.376	45.439	- 11.439
	T.R.	64	68	71	79.289	- 11.289	83.847	- 12.847
	R.R.	174	413	456	388.802	24.197	437.269	18.730
30	V	26	30	39	33.730	- 3.730	36.011	2.988
	C	40	50	56	43.203	6.796	46.589	9.410
	T.R.	66	80	95	80.865	- .865	85.571	9.428
	R.R.	207	438	578	415.352	22.647	440.655	137.344

Table 1. Continued.

Students	Nelson-Denny sub-tests	Pre-raw scores	Immediate post-raw scores	Delayed post-raw scores	Regression of immediate post-test on pre-test		Regression of delayed post-test on pre-test	
					Predicted	Residual gain	Predicted	Residual gain
31	V	32	40	43	39.964	.035	42.255	.744
	C	36	40	50	41.550	- 1.550	44.288	5.711
	T. R.	68	80	93	82.441	- 2.441	87.296	5.703
	R. R.	262	615	578	459.601	155.398	446.298	131.701
32	V	37	66	72	45.159	20.840	47.457	24.542
	C	34	52	46	40.724	11.275	43.138	2.861
	T. R.	71	118	118	84.805	33.194	89.883	28.116
	R. R.	161	290	318	378.343	- 88.343	435.936	-117.936
33	V	29	44	34	36.847	7.152	39.133	- 5.133
	C	46	44	54	45.682	- 1.682	50.041	3.958
	T. R.	75	88	88	87.957	.042	93.333	- 5.333
	R. R.	174	538	639	388.802	149.197	437.269	201.730
34	V	28	33	24	35.808	- 2.808	38.092	- 14.092
	C	48	36	48	46.508	- 10.508	51.192	- 3.192
	T. R.	76	69	72	88.754	- 19.745	94.196	- 22.196
	R. R.	359	461	468	537.642	- 76.642	456.250	11.749
35	V	36	44	51	44.120	- .120	46.417	4.582
	C	44	46	48	44.855	1.144	48.891	- .891
	T. R.	80	90	99	91.896	- 1.896	97.645	1.354
	R. R.	226	499	524	430.638	68.361	442.604	81.395
36	V	40	51	55	48.276	2.723	50.579	4.420
	C	42	56	52	44.029	11.970	47.740	4.259
	T. R.	82	107	107	93.472	13.527	99.370	7.629
	R. R.	161	356	426	378.343	- 22.343	435.936	- 9.936

APPENDIX B

Graphical Method of Residual Gain for Vocabulary, Comprehension, Total Reading, and Reading Rate of Immediate Post-test on Pre-test for Group 1

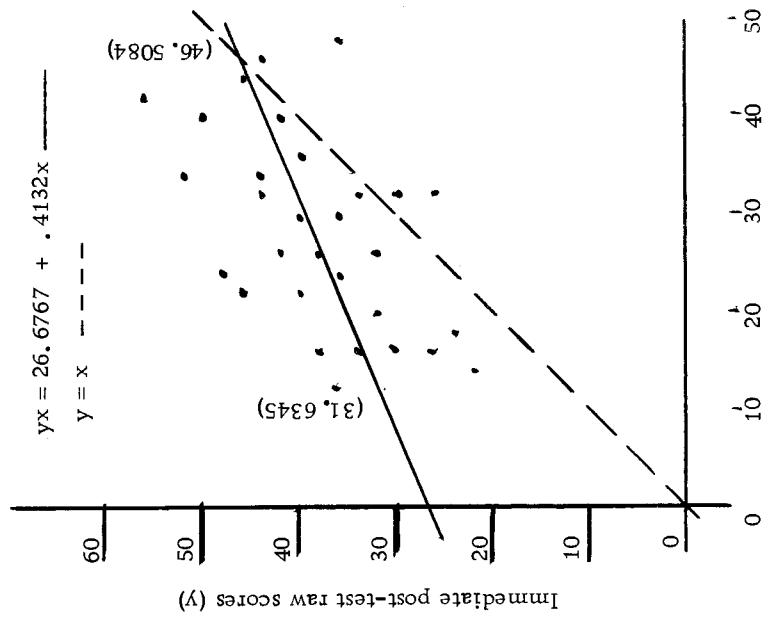

Figure 2. Regression line, comprehension - Group 1.

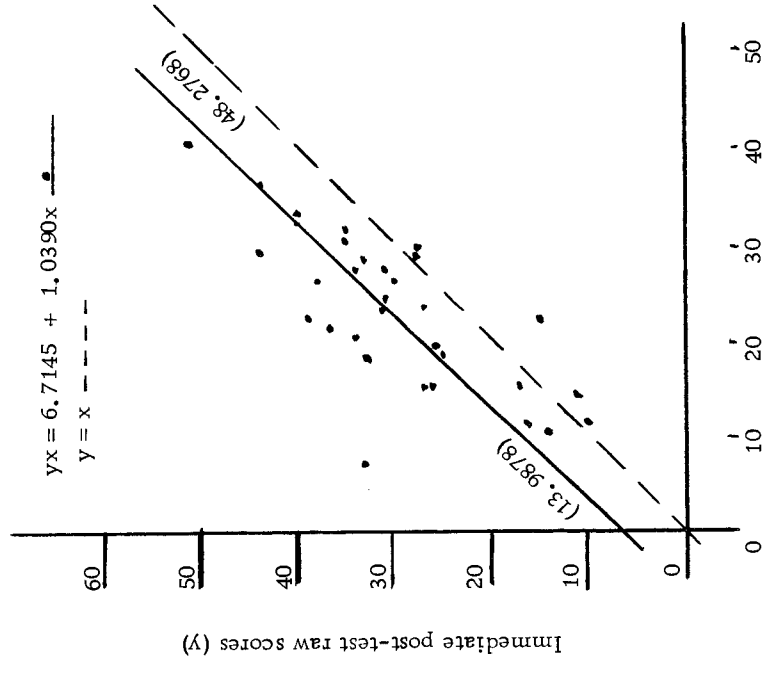

Figure 1. Regression line, vocabulary - Group 1.

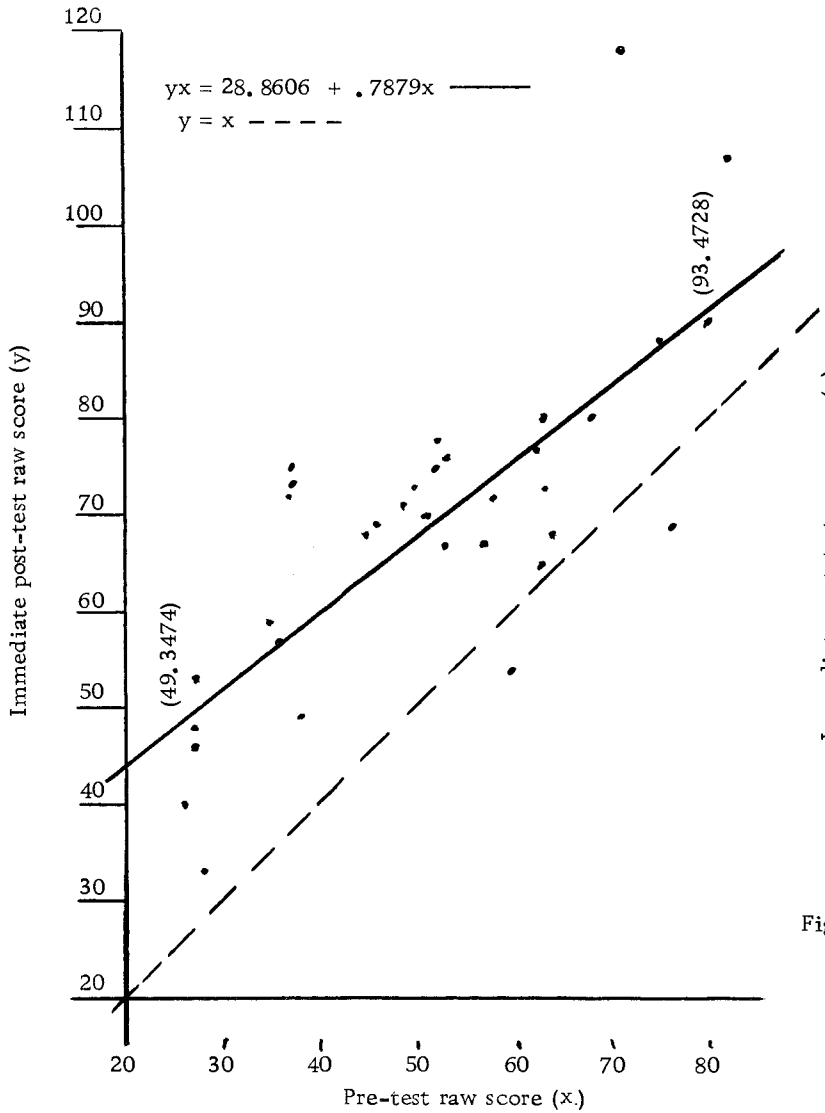

Figure 3. Regression line, total reading - Group 1.

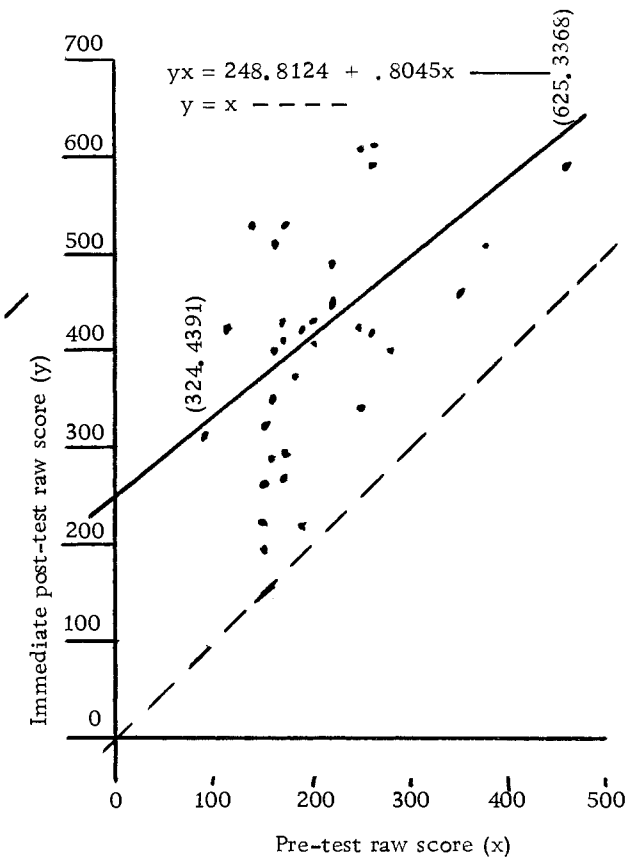

Figure 4. Regression line, reading rate - Group 1.

APPENDIX C

Graphical Method of Residual Gain for Vocabulary, Comprehension, Total Reading, and Reading Rate of Delayed Post-test on Pre-test for Group 1

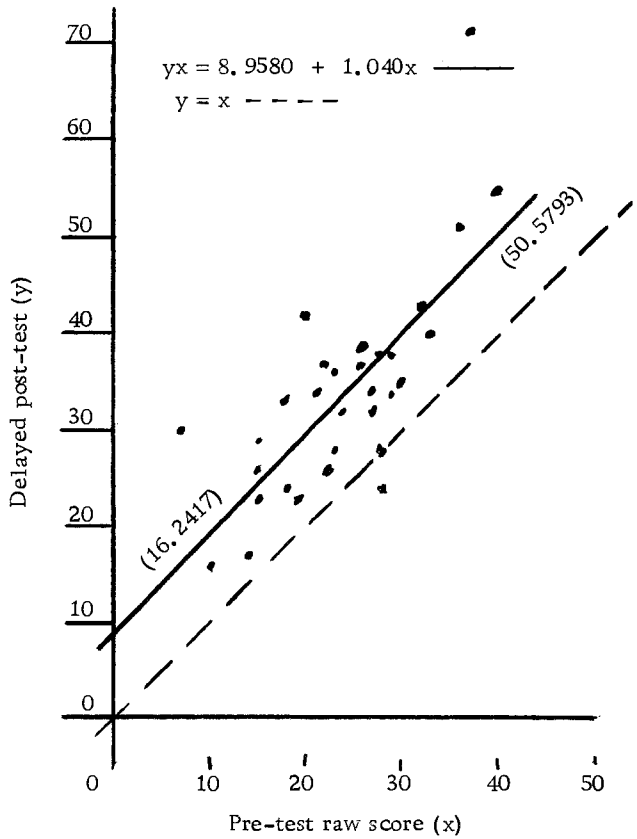

Figure 1. Regression line, vocabulary. (Group 1).

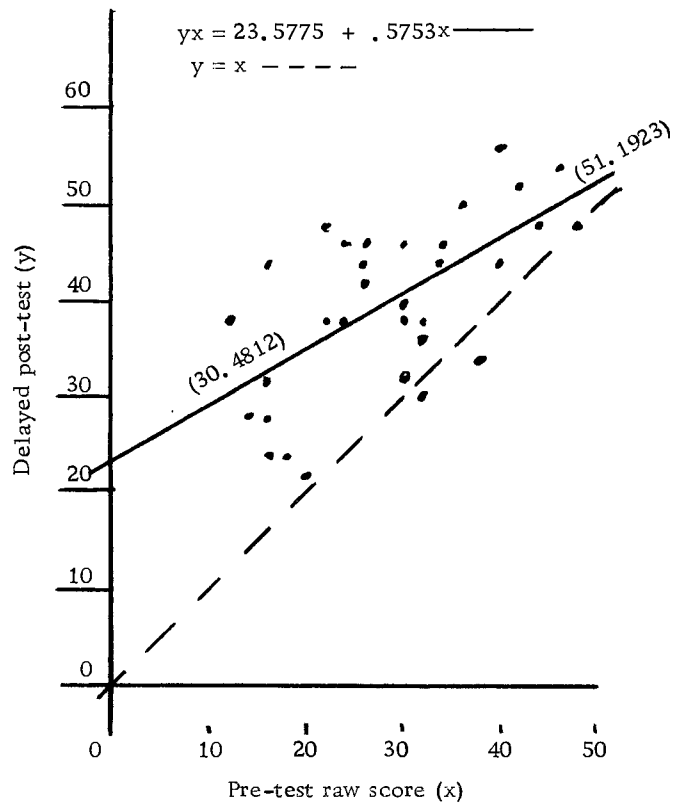

Figure 2. Regression line, comprehension. (Group 1).

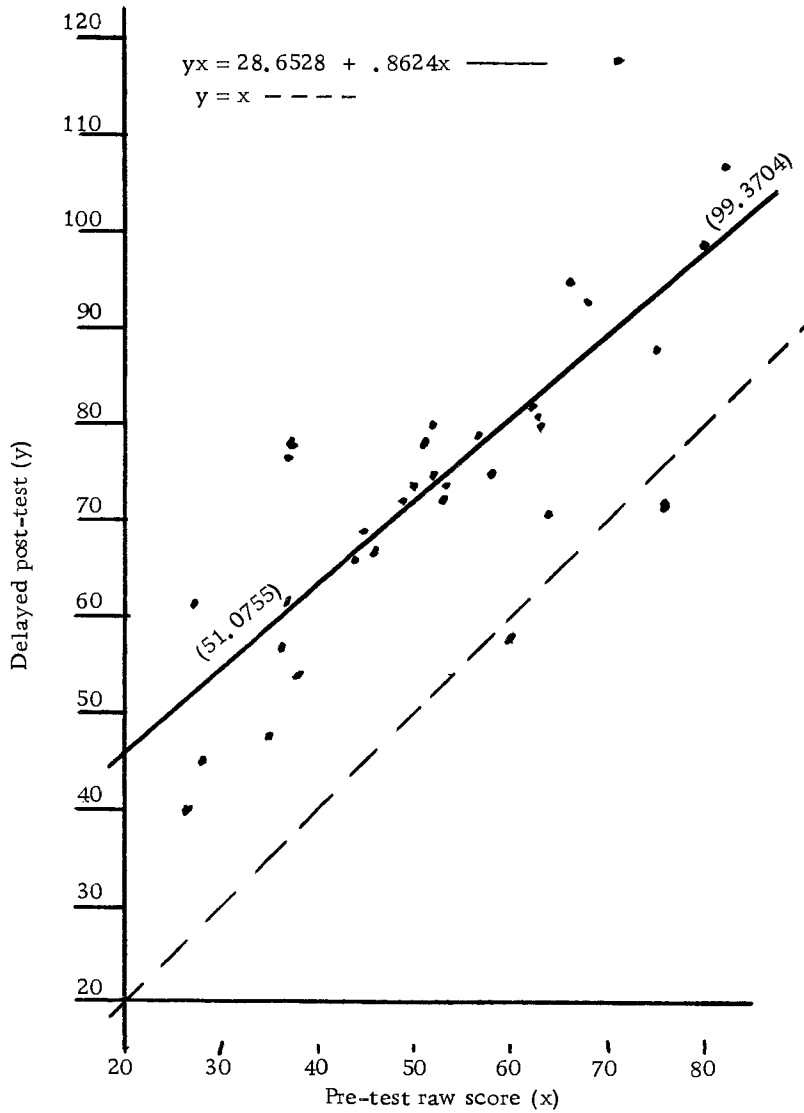

Figure 3. Regression line, total reading.(Group 1).

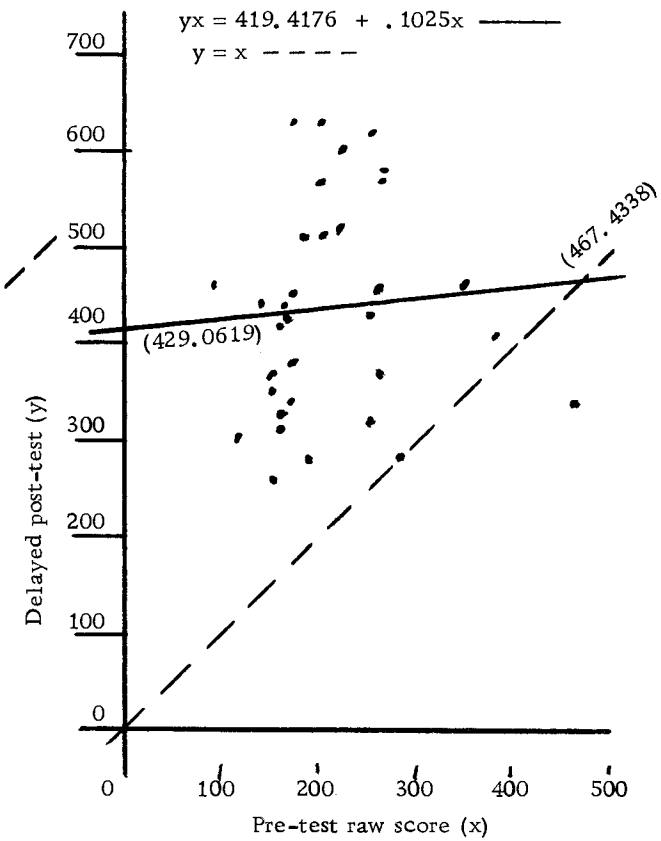

Figure 4. Regression line, reading rate.(Group 1).

APPENDIX D

Computational Raw Score Method of Residual Gain
Table of Individual Student Progress in Group 2

Table 2. Residual gain table showing individual progress of the students in Group 2.

Students	Nelson-Denny Sub-tests	Pre-test Raw Scores	Immediate Post-test Raw Scores	Delayed Post-test Raw Scores	Regression of immediate post-test on pre-test		Regression of delayed post-test on pre-test	
					Predicted	Residual gain	Predicted	Residual gain
1	V	10	12	18	15.677	- 3.677	19.479	- 1.479
	C	14	20	32	25.642	- 5.642	30.756	+ 1.243
	TR	24	32	50	35.464	- 3.464	45.110	+ 4.889
	RR	104	214	226	304.707	-: 90.707	341.119	-115.119
2	V	16	17	--	21.327	- 4.327	---	---
	C	10	20	--	21.619	- 1.619	---	---
	TR	26	37	--	37.811	- .811	---	---
	RR	104	141	--	304.707	-163.707	---	---
3	V	9	22	23	14.736	+ 7.263	18.539	+ 4.460
	C	18	30	30	29.664	+ .335	34.326	- 4.326
	TR	27	52	53	38.984	+ 13.015	48.385	+ 4.614
	RR	128	327	309	334.034	- 7.034	365.635	- 56.634
4	V	22	23	26	26.977	- 3.977	30.765	- 4.765
	C	14	28	36	25.642	+ 2.357	30.756	+ 5.243
	TR	36	51	62	49.543	+ 1.456	58.208	+ 3.791
	RR	174	403	384	390.243	+ 12.756	412.622	- 28.622
5	V	20	17	22	25.093	- 8.093	28.884	- 6.884
	C	16	22	32	27.653	- 5.653	32.541	- .541
	TR	36	39	54	49.543	- 10.543	58.208	- 4.208
	RR	115	226	417	318.149	- 92.149	352.355	+ 64.644
6	V	19	25	--	24.152	+ .847	---	---
	C	20	28	--	31.676	- 3.676	---	---
	TR	39	53	--	53.063	- .063	---	---
	RR	150	235	--	360.917	-125.914	---	---
7	V	21	21	27	26.035	- 5.035	29.824	- 2.824
	C	18	24	32	29.664	- 5.664	34.326	- 2.326
	TR	39	45	59	53.063	- 8.063	61.482	- 2.482
	RR	250	461	491	483.111	- 22.111	490.255	+ 74.493
8	V	25	24	26	29.801	- 5.801	33.586	- 7.586
	C	14	28	30	25.642	+ 2.357	30.756	- .756
	TR	39	52	56	53.063	- 1.063	61.482	- 5.482
	RR	74	245	275	268.049	- 23.049	310.475	- 35.475
9	V	16	25	31	21.327	+ 3.672	25.122	+ 5.877
	C	24	28	40	35.698	- 7.698	39.681	+ .318
	TR	40	53	71	54.237	- 1.237	62.574	+ 8.425
	RR	174	344	407	390.243	- 46.243	412.622	- 5.622

Table 2. Continued.

Students	Nelson-Denny Sub-tests	Pre-test Raw Scores	Immediate Post-test Raw Scores	Delayed Post-test Raw Scores	Regression of immediate post-test on pre-test: Predicted	Regression of immediate post-test on pre-test: Residual gain	Regression of delayed post-test on pre-test: Predicted	Regression of delayed post-test on pre-test: Residual gain
10	V	20	24	27	25.093	- 1.093	28.884	- 1.884
	C	22	44	40	33.687	+ 10.312	37.896	+ 2.103
	TR	42	68	67	56.583	+ 11.416	64.757	+ 2.242
	RR	82	615	327	277.824	+337.175	318.647	+ 8.352
11	V	31	32	35	35.451	- 3.451	39.229	- 4.229
	C	12	26	26	23.630	+ 2.369	28.971	- 2.971
	TR	43	58	61	57.756	+ .243	65.848	- 4.848
	RR	140	203	318	348.697	-145.697	377.892	- 59.892
12	V	30	28	40	34.509	- 6.509	38.288	+ 1.711
	C	14	40	34	25.642	+ 14.357	30.756	+ 3.243
	TR	44	68	74	58.930	+ 9.069	66.939	+ 7.060
	RR	195	333	537	415.904	- 82.904	434.073	+102.926
13	V	16	25	--	21.327	+ 3.672	---	---
	C	28	32	--	39.721	- 7.721	---	---
	TR	44	57	--	58.930	- 1.930	---	---
	RR	161	356	--	374.358	- 18.358	---	---
14	V	21	29	31	26.035	+ 2.964	29.824	+ 1.175
	C	26	38	36	37.710	+ .289	41.466	- 5.466
	TR	47	67	67	62.449	+ 4.550	70.214	- 3.214
	RR	250	368	359	483.111	-115.111	490.255	-131.255
15	V	26	28	40	30.743	- 2.743	34.627	+ 5.472
	C	22	30	46	33.687	- 3.687	37.896	+ 8.103
	TR	48	58	86	63.623	- 5.623	71.305	+ 14.694
	RR	185	269	309	403.685	-134.685	423.859	-114.859
16	V	28	27	--	32.626	- 5.626	---	---
	C	20	38	--	31.676	+ 6.323	---	---
	TR	48	65	--	63.623	+ 1.376	---	---
	RR	238	524	--	468.448	+ 55.551	---	---
17	V	25	32	33	29.801	+ 2.198	33.586	- .586
	C	24	40	50	35.698	+ 4.301	39.681	+ 10.318
	TR	49	72	83	64.796	+ 7.203	72.397	+ 10.602
	RR	327	615	639	577.201	+ 37.798	568.908	+ 70.091
18	V	18	28	30	23.210	+ 4.789	27.003	+ 2.996
	C	32	40	38	43.744	- 3.744	46.821	- 8.821
	TR	50	68	68	65.969	+ 2.030	73.488	- 5.488
	RR	275	615	407	513.660	+101.339	515.792	-108.792

Table 2. Continued.

Students	Nelson-Denny Sub-tests	Pre-raw Scores	Immediate Post-test Raw Scores	Delayed Post-test Raw Scores	Regression of immediate post-test on pre-test: Pre-dicted	Regression of immediate post-test on pre-test: Residual gain	Regression of delayed post-test on pre-test: Pre-dicted	Regression of delayed post-test on pre-test: Residual gain
19	V	29	31	30	33.568	- 2.568	37.348	- 7.348
	C	24	30	36	35.698	- 5.698	39.681	- 3.681
	TR	53	61	66	69.489	- 8.489	76.763	- 10.763
	RR	115	413	456	318.149	+ 94.850	352.355	+103.644
20	V	32	36	33	36.393	- .393	40.169	- 7.169
	C	22	36	40	33.687	+ 2.312	37.896	+ 2.103
	TR	54	72	73	70.662	+ 1.337	77.854	- 4.854
	RR	161	425	407	374.358	+ 50.641	399.343	+ 7.656
21	V	32	24	30	36.393	- 12.393	40.169	- 10.169
	C	22	32	38	33.687	- 1.687	37.896	+ .103
	TR	54	56	68	70.662	- 14.662	77.854	- 9.854
	RR	140	425	396	348.697	+ 76.302	377.892	+ 18.107
22	V	21	45	47	26.035	+ 18.964	29.824	+ 17.175
	C	34	38	42	45.755	- 7.755	48.606	- 6.606
	TR	55	83	89	71.838	+ 11.164	78.945	+ 10.054
	RR	174	450	513	390.243	+ 59.756	412.622	+100.377
23	V	26	34	37	30.743	+ 3.256	34.527	+ 2.472
	C	32	34	40	43.744	- 9.744	46.821	- 6.821
	TR	58	68	77	75.355	- 7.355	82.220	- 5.220
	RR	140	425	359	348.697	+ 76.302	377.892	- 18.892
24	V	26	24	25	30.743	- 6.743	34.527	- 9.527
	C	34	62	50	45.755	+ 16.244	48.606	+ 1.393
	TR	60	86	75	77.702	+ 8.297	84.403	- 9.403
	RR	140	524	491	348.697	+175.302	377.892	+113.107
25	V	28	34	36	32.626	+ 1.373	36.407	- .407
	C	32	28	32	43.744	- 15.744	46.821	- 14.821
	TR	60	62	68	77.702	- 15.702	84.403	- 16.403
	RR	161	226	250	374.358	-148.358	399.343	-149.343
26	V	41	38	45	44.867	- 6.867	48.633	- 3.633
	C	20	40	38	31.676	+ 8.323	36.111	+ 1.888
	TR	61	78	83	78.875	- .875	85.494	- 2.494
	RR	185	450	468	403.685	+ 46.314	423.859	+ 44.140
27	V	31	35	34	35.451	- .451	39.229	- 5.229
	C	32	54	60	43.744	+ 10.255	46.821	+ 13.178
	TR	63	89	94	81.221	+ 7.778	87.677	+ 6.322
	RR	262	573	426	497.775	+ 75.224	502.512	- 76.512

Table 2. Continued.

Students	Nelson-Denny Sub-tests	Pre-test Raw Scores	Immediate Post-test Raw Scores	Delayed Post-test Raw Scores	Regression of immediate post-test on pre-test: Predicted	Regression of immediate post-test on pre-test: Residual gain	Regression of delayed post-test on pre-test: Predicted	Regression of delayed post-test on pre-test: Residual gain
28	V	34	53	47	38.276	+ 14.723	42.050	+ 4.949
	C	30	40	46	41.732	- 1.732	45.036	+ .963
	TR	64	93	93	82.395	+ 10.604	88.769	+ 4.230
	RR	207	450	384	430.568	+ 19.431	446.331	- 62.331
29	V	35	36	47	39.217	- 3.217	42.991	+ 4.008
	C	32	38	36	43.744	- 5.744	46.821	- 10.821
	TR	67	74	83	85.914	- 11.914	92.043	- 9.043
	RR	262	573	591	497.775	+ 75.224	502.512	+ 88.487
30	V	35	41	40	39.217	+ 1.782	42.991	- 2.991
	C	34	40	48	45.755	- 5.755	48.606	- .606
	TR	69	81	88	88.261	- 7.261	94.226	- 6.226
	RR	185	319	639	403.685	- 84.685	423.859	+215.140
31	V	46	45	47	49.575	- 4.575	53.336	- 6.336
	C	28	44	46	39.721	+ 4.278	43.251	+ 2.748
	TR	74	89	93	94.127	- 5.127	99.683	- 6.683
	RR	74	319	318	268.049	+ 50.950	310.475	+ 7.524
32	V	40	55	70	43.925	+ 11.074	47.693	+ 22.306
	C	42	58	62	53.801	+ 4.198	55.747	+ 6.252
	TR	82	113	132	103.513	+ 9.486	108.415	+ 23.584
	RR	275	615	639	513.660	+101.339	515.792	+123.208
33	V	40	50	60	43.925	+ 6.074	47.693	+ 12.306
	C	48	68	66	59.835	+ 8.164	61.102	+ 4.897
	TR	88	118	126	110.553	+ 7.446	114.963	+ 11.036
	RR	262	333	359	497.775	-164.775	502.512	-143.512
34	V	54	62	59	57.108	+ 4.891	60.859	- 1.859
	C	44	58	62	55.812	+ 2.187	57.532	+ 4.467
	TR	98	120	121	122.286	- 2.285	125.878	- 4.878
	RR	298	561	578	541.765	+ 19.234	539.285	+ 38.714

APPENDIX E

Graphical Method of Residual Gain for Vocabulary, Comprehension, Total Reading, and Reading Rate of Immediate Post-test on Pre-test for Group 2

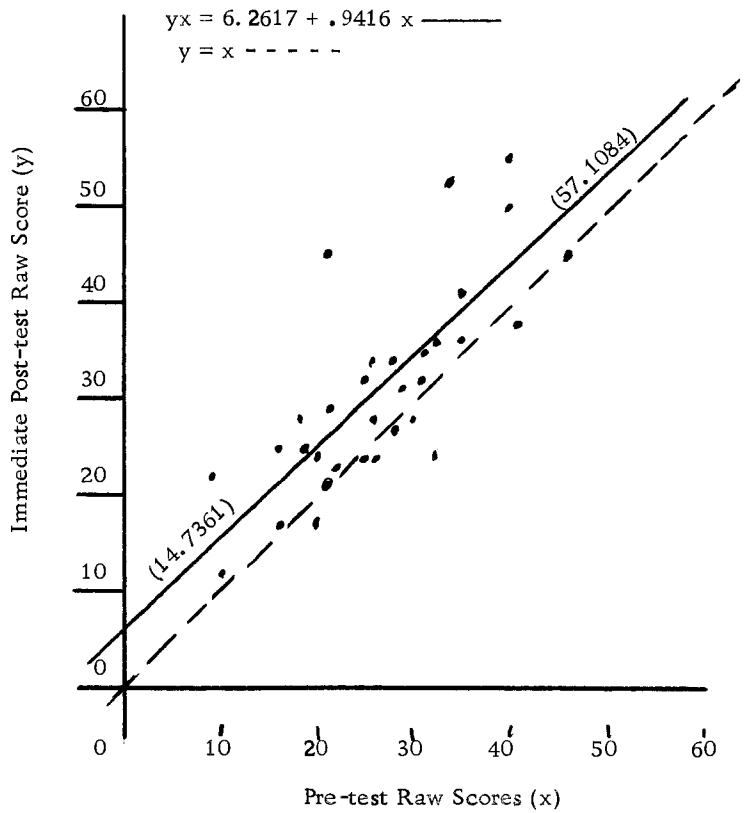

Figure 1. Regression line, vocabulary (Group 2).

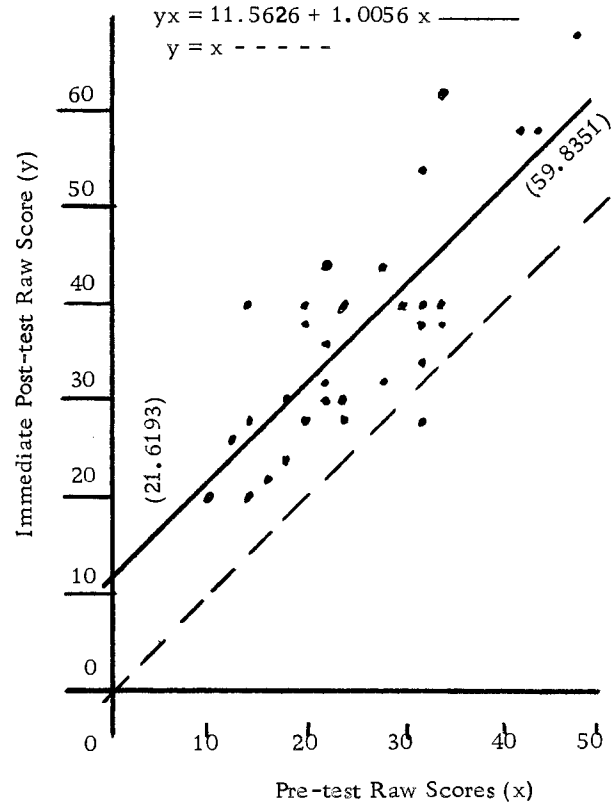

Figure 2. Regression line, comprehension (Group 2).

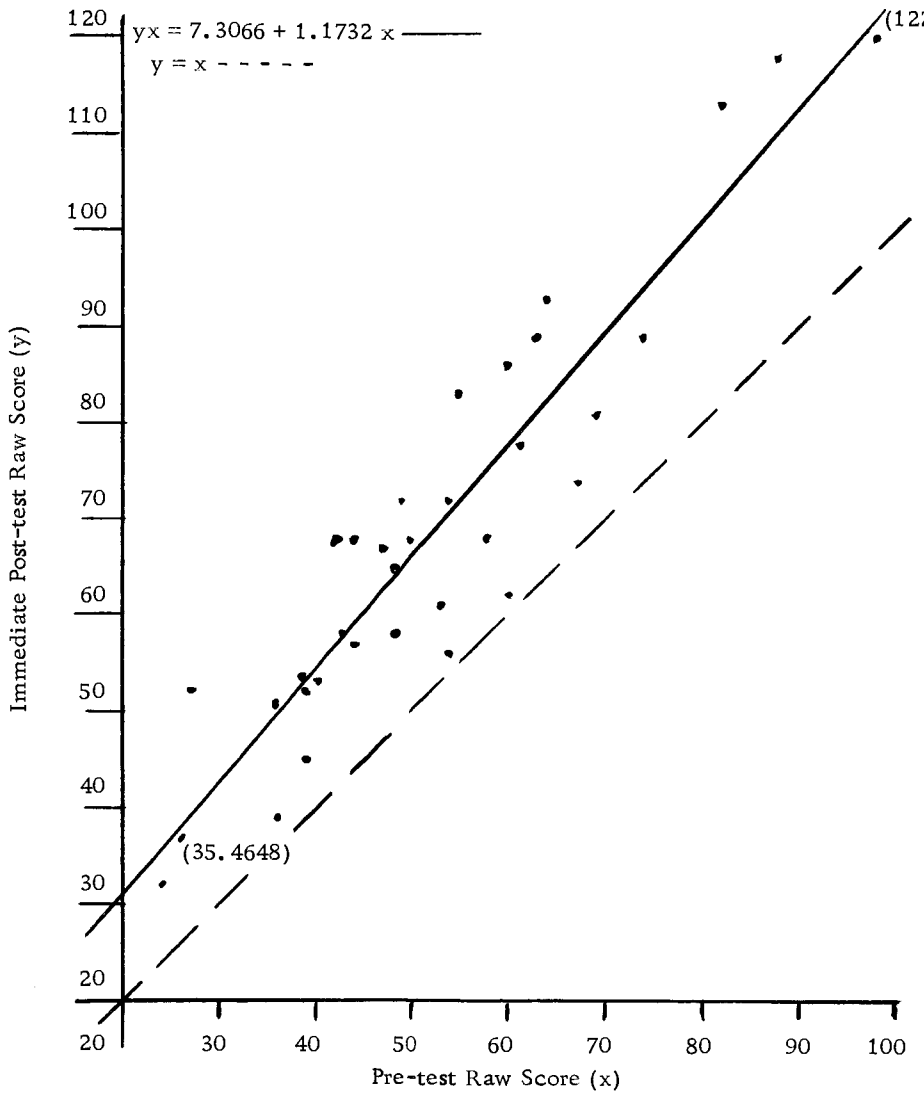

Figure 3. Regression line, total reading (Group 2).

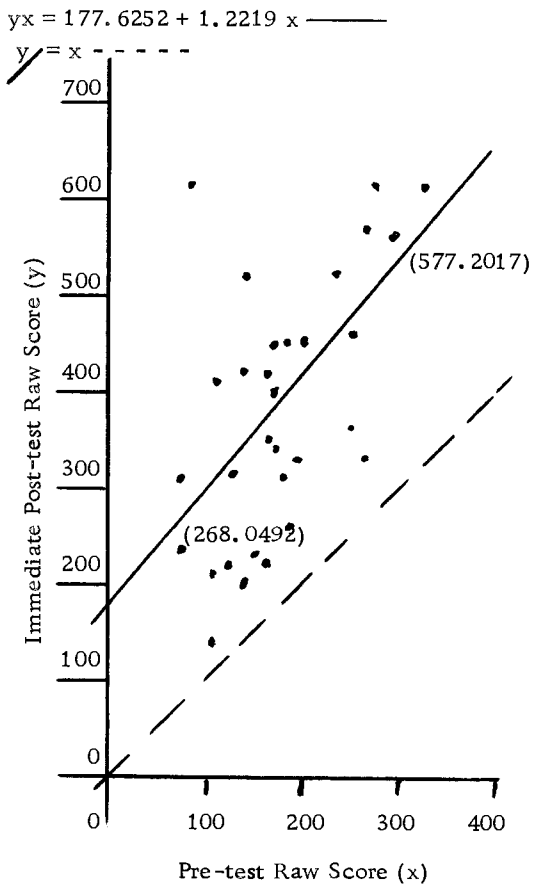

Figure 4. Regression line, reading rate (Group 2).

APPENDIX F

Graphical Method of Residual Gain for Vocabulary, Comprehension, Total Reading, and Reading Rate of Delayed Post-test on Pre-test for Group 2

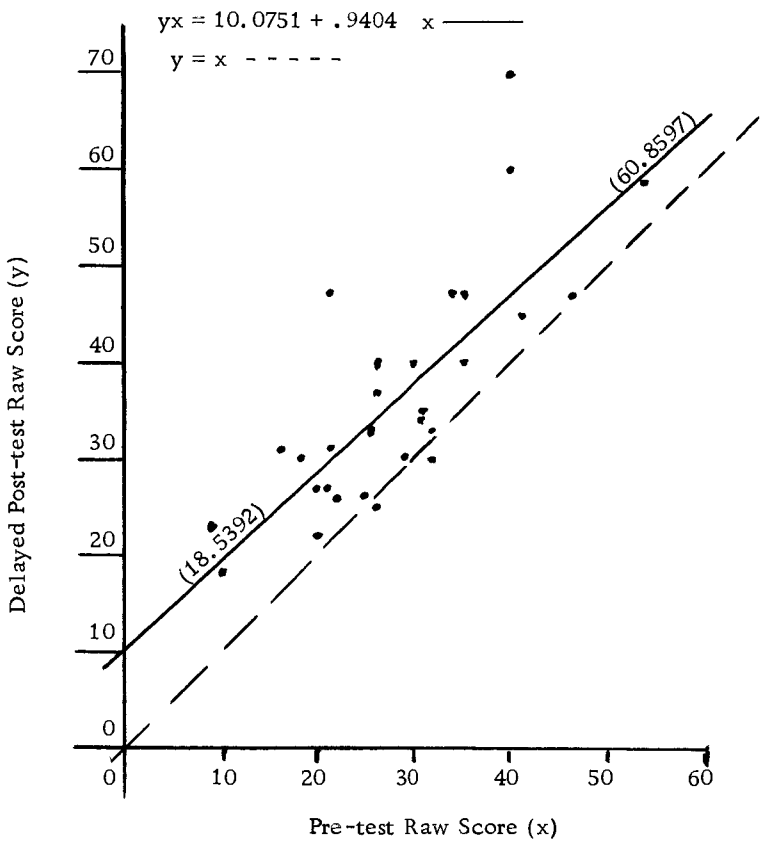

Figure 1. Regression line, vocabulary (Group 2).

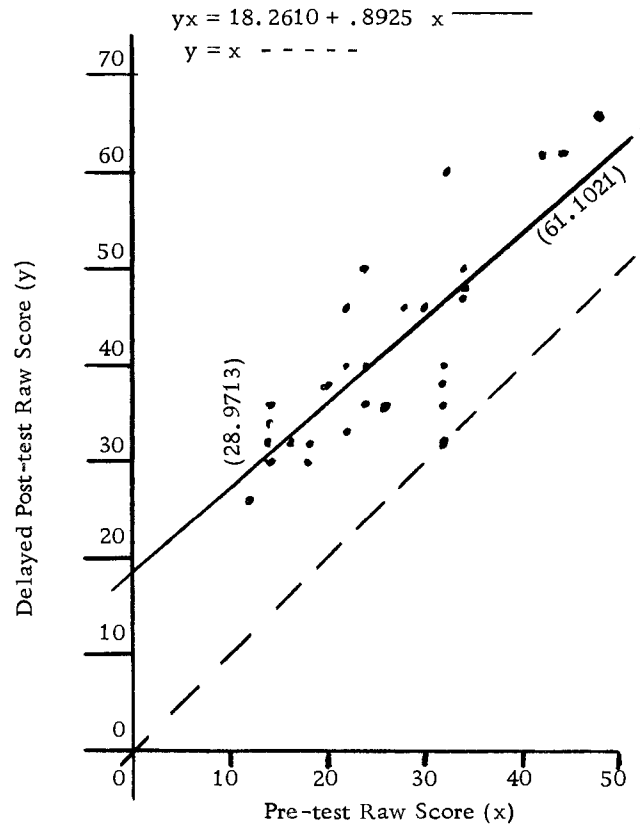

Figure 2. Regression line, comprehension (Group 2).

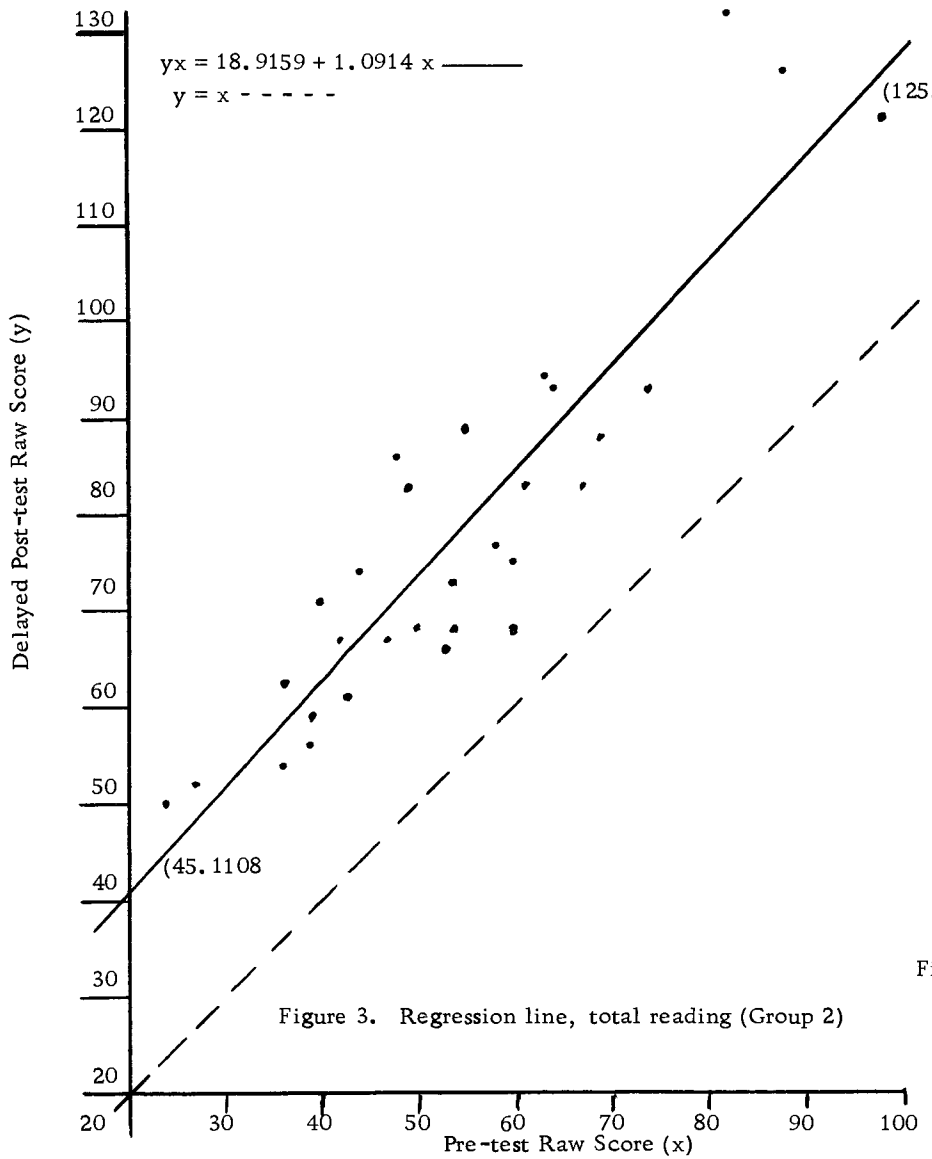

Figure 3. Regression line, total reading (Group 2)

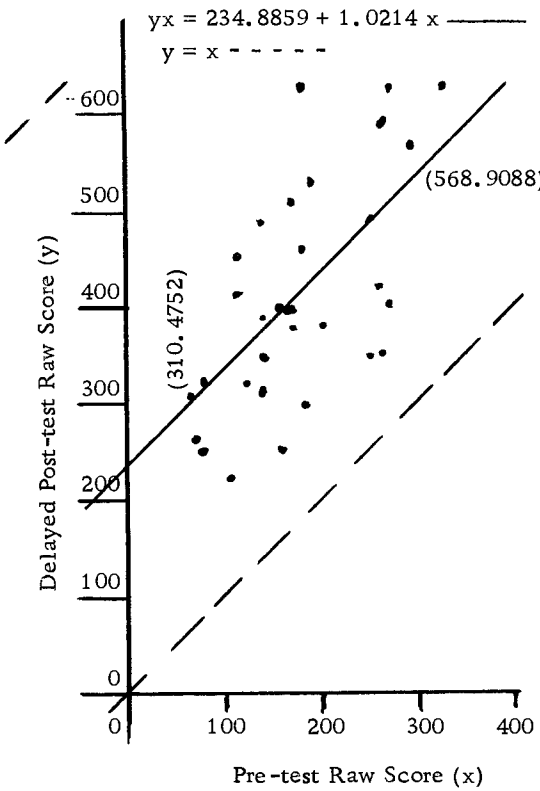

Figure 4. Regression line, reading rate (Group 2)

APPENDIX G

Test of the Hypothesis that the Slope of the Regression Line of the Difference Between Delayed Post-test and Immediate Post-test on Pre-test is Zero for Groups 1 and 2

Test of the hypothesis that the slope of the regression line of the difference between delayed post-test and immediate post-test on pre-test is zero for Groups 1 and 2.

Nelson-Denny Sub-tests	a Interceptor on Y-Axis	b Slope of Regression Line	Hypothesis: Slope of Regression Line Equal to Zero	Hypothesis: Slope of Regression Line Equal to Zero; i.e., a = b = 0
		Group 1		
Vocabulary	.4095	.0594	t = .540	F = 2.62
Comprehension	-2.8709	.1451	t = 1.348	F = 1.66
Total reading	.9670	.0775	t = 1.177	F = 5.54*
Reading rate	157.8570	-.6573	t = -3.457**	F = 6.68*
		Group 2		
Vocabulary	3.6231	-.0008	t = - .009	F = 7.97***
Comprehension	6.5302	-.1152	t = - .972	F = 5.66***
Total reading	11.3368	-.0776	t = - .928	F = 26.81***
Reading rate	21.6805	-.0526	t = 1.728	F = .18

*.01 significant level F = 5.394

**.01 significant level t = -2.462

***.01 significant level F = 5.453

APPENDIX H

Graph of Regression Line of the Difference Between Delayed and Immediate Post-test on Pre-test for Reading Rate of Group 1

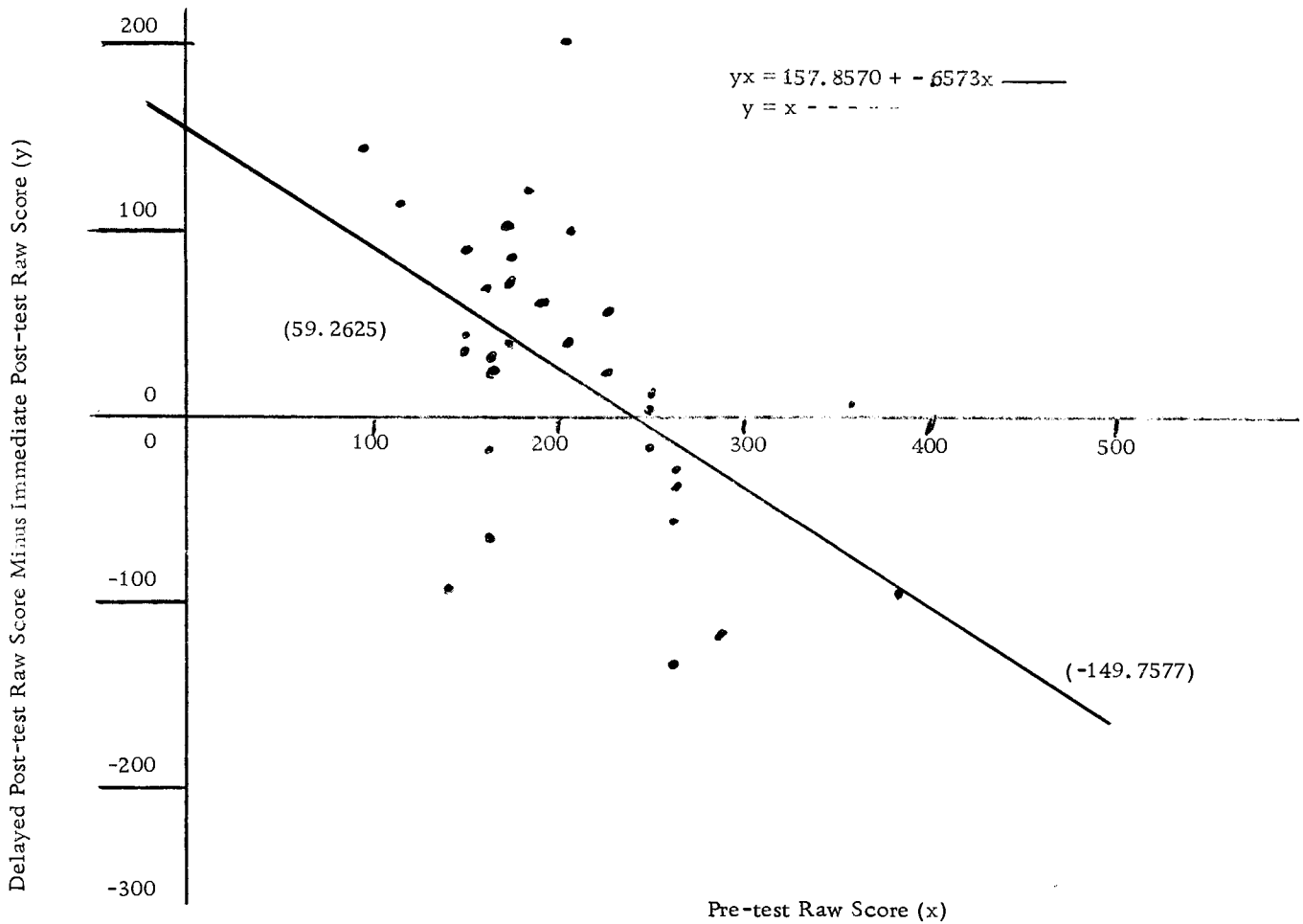

Figure 1. Regression line, reading rate (Group 1)

APPENDIX I

List of Reading Books, Vocabulary Books, and Spelling Books Used During Corrective Reading Instruction

Reading Books Used During Instruction

1. Braam, L. S. and W. D. Sheldon. Developing Efficient Reading. New York: Oxford University Press, 1959. p. 120.

2. Brown, J. I. Efficient Reading. Rev. Ed. Boston: D. C. Heath and Co., 1962. p. 303.

3. Jones, E. L. An Approach to College Reading, Form Three. New York: Holt, Rinehart and Winston, 1964. p. 282.

4. Leavell, U. W. and A. M. Caughran. Reading for Significance. New York: American Book Company, 1959. p. 432.

5. Miller, L. L. Increasing Reading Efficiency, Rev. Ed. New York: Holt, Rinehart and Winston, 1964. p. 319.

6. Robinson, F. P. Effective Reading. New York: Harper & Row, 1962. p. 92.

7. Smith, N. B. Be a Better Reader, I-V. New Jersey: Prentice-Hall, 1958.

8. Spache, G. D. and P. C. Berg. The Art of Effective Reading, 2nd ed. New York: The MacMillan Company, 1966. p. 323.

9. Stroud, J. B., R. B. Ammons, and H. A. Bamman. Improving Reading Ability, 2nd. ed. New York: Appleton-Century-Crofts, 1956. p. 188.

Vocabulary Books Used During Instruction

1. Jones, W. P. Practical Word Study, Form A and B. New York: Oxford University Press, (Fifteenth Printing), 1964.

2. Weber, Ch. O. Reading and Vocabulary Development, 2nd. ed. New Jersey: Prentice-Hall, (Eighth Printing), 1964. p. 168.

3. Witty, P. and E. Grotberg. Illinois:SRA, (Fifth Printing), 1963. p. 96.

Spelling Books Used During Instruction

1. Johnson, F. S. A Self-Improvement Guide to Spelling. New York: Holt, Rinehart and Winston, 1965. p. 138.

2. Marksheffel, N. D. Spelling for High Schools. New York: The L. W. Singer Company, 1957. p. 122.

3. Williams, R. M. Phonetic Spelling for College Students. New York: Oxford University Press, 1960. p. 180.

APPENDIX J

Student Opinionnaire and Tabulated Results of
Evaluation of Corrective Reading Instruction

To the student:

How do you feel about the Reading course you have taken? Express your opinion by marking "X" in the appropriate column and space. DO NOT write or sign your name on this paper.

	Yes	No	Undecided
1. Do you feel that this course has helped improve your reading skills?	69	0	1
2. Have you enjoyed taking this course?	67	0	3
3. Do you feel that this course has helped improve your grade in any of your academic courses - or other courses?	53	1	16
4. Do you feel that this course has helped improve your spelling?	54	0	16
5. Do you feel that this course has helped improve your study habits?	67	1	2
6. Would you recommend this reading course to other COCC students?	68	0	2

Can you offer suggestions to improve the reading course?