

A STUDY OF THE EFFECT OF A COLLEGE READING
PROGRAM UPON GRADE-POINT AVERAGE IN
ODESSA COLLEGE, ODESSA, TEXAS

Thesis for the Degree of Ph. D.
MICHIGAN STATE UNIVERSITY
Imogene Johns Freer
1965



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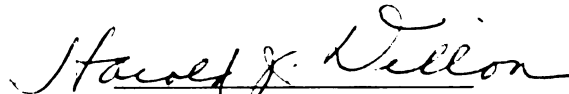
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presented by

Imogene Johns Freer

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By

Imogene Johns Freer

AN ABSTRACT OF A THESIS

Submitted to
Michigan State University
in partial fulfillment of the requirements
for the degree of

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College of Education

1965

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ABSTRACT

A STUDY OF THE EFFECT OF A COLLEGE READING PROGRAM UPON GRADE-POINT AVERAGE IN ODESSA COLLEGE, ODESSA, TEXAS

By Imogene Johns Freer

The problem of this study is to determine the effectiveness of the developmental reading program in Odessa Junior College, Odessa, Texas by making a comparison of the grade-point averages for one academic year, 1963-64, of forty matched pairs of students. One group of forty students had reading instruction and is referred to as the experimental group. The control group had no reading instruction.

The purpose of this study is to formulate conclusions while answering these basic questions:

1. Do students who take a reading course make better grade averages than those who do not have reading instruction if they have initially the same ability?
2. Are there any sex differences with respect to the number of males or females who take a reading course?
3. Do students who take a reading course show a substantially higher percentile gain than those who have not had such a course?

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4. Are the students who take reading able to retain the gains achieved over a long period of time?

The experimental population was drawn from a total available freshman population of five hundred and ninety students who took college entrance examinations in the fall of 1963. Out of this population, two hundred and ninety-three students attended Odessa College for at least two semesters. The forty pairs, the experimental and control groups, were chosen from this population.

The forty pairs were matched on five variables: initial reading score, SCAT score, class load, age, and sex. The groups appeared to be very similar and were able to be compared.

The students in the experimental group enrolled in a one-semester, one-credit course called English III which emphasized the improvement of reading skills as well as the attainment of self-confidence, through the formation of a better self-concept. The control group had no reading training.

The first statistical technique utilized in the study was the matched pairs "t" test to determine the significance of the mean difference between the experimental and the control groups in terms of grade averages. The "t" test was selected because the data could be construed to have met most of the assumptions associated with a parametric test.

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The second statistical method selected was the chi square to test the hypothesis concerning the number of males versus females enrolled in a reading course. This method was chosen because the hypothesis under test concerned a comparison of observed frequencies in discrete categories.

As an adjunct to the study twenty-three students who had taken reading and thirty-six students who had not taken reading were compared in terms of percentile gain scores in comprehension, vocabulary, rate, and total score on the Nelson-Denny Reading Test. This test was given initially in the fall of 1963 and again in the spring of 1965. The first purpose was to determine whether or not students who take reading retain their gains over a long period of time. The second purpose was to discover whether or not student who do not take reading improve their skills by virtue of simply attending school.

The major conclusions found in this study are presented as follows:

1. The mean difference in grade-point average was significantly higher for the experimental group.
2. There was no statistical significance in the number of males versus females who took the reading course in proportion to the population.
3. Students who take reading make higher percentile gain scores on comprehension, vocabulary, rate, and

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total score as measured by the Nelson-Denny Reading Test.

4. Students who take reading tend to retain most of the gains made in the reading scores for a period of at least one year.

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CHAPTER I
STATEMENT OF THE PROBLEM

The purpose of this study was to determine the effectiveness of the Developmental Reading Program in Odessa Junior College, Odessa, Texas by making a comparison of the grade point averages for one academic year, 1963-64, of forty matched pairs of students. One group of forty students had a developmental reading course and will be referred to as the experimental group. The control group had no reading instruction.

The data were available also to show sex differences in reading ability and reading achievement. As an adjunct to the study, gains in reading achievement between a group of students who had reading and those who had not were reported.

Delimitations

- I. This study was confined to forty students who took a developmental reading course and forty who did not take a reading course.
- II. The investigation involved a one-year period beginning in September, 1963 and ending in May, 1964.
- III. The population was selected from two hundred and ninety-three entering college freshmen who had attended Odessa College for at least two semesters.

Rationale

Americans in all walks of life are finding it increasingly difficult to do all of the reading required of them in the normal course of their daily lives. New knowledge is emerging at a rate never before dreamed of, and published materials are increasing so rapidly that professional people, tradespeople, and citizens generally who seek to keep abreast of current developments are overwhelmed by the volume of reading required of them.

Bracken says the answer to the question "Why teach reading in college?" may be found in a consideration of the following: (1) the reading burden of college freshmen, (2) the reading ability of entering freshmen, and (3) the offerings of college reading courses. (17:52)

Some ten years ago only five or six libraries in America had over a million volumes. During the past six years many others have joined the ranks of libraries with "a million-plus" volumes.

The students' reading burden is only partially indicated in a brief glance at the explosion of knowledge and at statistics on libraries. Walter J. Pauk says that today's students are confronted with a reading task which differs decidedly from that which students faced only a decade ago. (78:44) No longer are reading assignments confined to a single traditional text. Today, the selected text is only the beginning. The student must "run" to stay abreast of fast-

developing fields and areas by riffling through stacks of journals, magazines, newspapers, theses, bulletins, and microfilms which contain the findings of research from various parts of the world.

Shaw and Townsend point out that many college texts are several levels beyond the independent reading level of the student. (91:30) The texts may also be poorly written and lacking in typographical aids. The college reader must adjust to his new found reading freedom, that is to say, he suddenly finds himself confronted with problems of selection and choice as well as problems of organization and assimilation. Even though he has syllabi which should serve as guides, these aids vary to such an extent that the student is still very much on his own without immediate direction. These reading problems are difficult for freshmen to solve in fields wherein they have some background, but they often become impossible blocks to learning when the student is involved with subject matter which is completely unfamiliar to him.

What are the reading abilities of entering college freshmen? Carter has reported at Western Michigan University, sixty-one per cent of 1,029 students completing their freshmen year in college reported that their high school teachers had provided no opportunity to improve their reading skills. (20:156) Sixty-eight per cent reported that they had never been taught how to read a chapter effectively, and seventy

per cent indicated that they had not been taught to concentrate upon a reading activity. Sixty-four per cent had not been shown how to develop an awareness of problems, and seventy per cent had not been taught how to critically evaluate a writer's bias and use of preconceived ideas.

Hadley estimated that ninety-five per cent of college entrants lack adequate study skills and reported that a relatively small per cent have reading speeds and comprehension skills adequate for handling all college assignments, while a great proportion are weak in notetaking. (36:353) Halfter and Douglass carefully tested and studied their entering freshmen for eight years. (37:42) As a result of their studies they concluded that two-thirds of their entering college freshmen lack reading skills required for academic success. In a comprehensive survey of college reading, Shaw pointed out that reading deficiencies are prevalent among college freshmen; estimates run from sixty-four to ninety-five per cent. (90:336-354)

Seashore says that junior college freshmen generally are not as able in the areas measured by The College Qualifications Tests as the four-year or senior college freshmen. (88:74-80) The following statements are given concerning this assumption:

1. The median score for junior college freshmen is near the twenty-fifth percentile for senior college freshmen.

2. About twenty-four per cent of junior college women are above the respective medians for freshmen in four-year colleges.
3. There is a considerable overlap of scores. These distributions tell us that there are many junior college students whose scores would be considered superior in senior colleges, and many low-scoring senior college freshmen would also rate low in junior colleges.
4. The difference in favor of the four-year student is slightly greater for women than for men.

The data do not mean that junior colleges should "run fast" to raise their admissions standards to the level of the typical senior college. Different colleges have distinctly different purposes and serve different clientele. Each college must decide for itself where its average and range of scores ought to be in relation to its own well-considered objectives and responsibilities.

Colleges, both junior and senior, have seriously considered the needs of students and have designed programs for improving reading skills. (17:54) In 1960, Shaw found that four hundred out of nineteen hundred colleges in the nation offered reading programs, whereas, a decade ago, only a few colleges were affording such services. (90:49)

There are few investigations reported in the literature which have challenged the value of college reading instruction.

Eller stated that one of the most carefully planned experiments was one reported by McDonald who compared groups of students who had taken the reading course at Cornell University with matched groups who had not taken reading training. (27:198) McDonald found that students who had taken reading instruction had a higher grade point average than his control group and were less likely to drop out of college than were either the controls or their classmates not involved in the experiment.

It is obvious that skillful use of reading as a tool is necessary for academic success in college. Instructors on the college and adult level have generally depended upon other teachers to equip their students with all the necessary skills in reading. The expectation that students entering freshman science will be able to read that subject adequately is based upon a false conception of reading. A person does not learn to read once and for all, however competent and complete the materials. Different levels and different subjects demand varying skills in reading.

Few people read at the rate and on the level of comprehension of which they are capable. Yet with competent help and systematic effort, most people can improve their reading ability substantially. This is a real challenge for college and adult education in these times.

Scope of the Study

The influence of reading instruction upon academic success in subjects which are designated as "solids" at Odessa

College was investigated in this study. A "solid" subject is defined as one which carries three semester hours of credit or more. For the most part they are required subjects such as English, history, mathematics, chemistry, biology, languages, etc.; however some are electives. Courses carrying only one semester hour of credit such as physical education, choir, developmental reading, drama, etc. were excluded.

The plan of the study was to provide answers to three basic questions:

1. Do students who take a developmental reading course make better grade averages than those who do not take a reading course if they have initially the same ability?
2. Are there any sex differences with respect to the number of males or females who take a reading course?
3. Do students who take a reading course show a substantially higher percentile gain than those who have not had such a course?

The specific null hypotheses will be given in Chapter III. A review of the literature is given in Chapter II, the design of the study is discussed in Chapter III, an analysis of the findings reported in Chapter IV and, finally, the summary, conclusions and implications are given in Chapter V.

Definition of Terms

READING ABILITY -- In this study reading ability is used

to describe a person who possesses all of the characteristics which enables him to perform well on standardized reading tests.

READING TRAINING -- Reading training, as employed in this study, refers to group reading improvement activities offered within the framework of the course described in Chapter III of this report.

ACADEMIC ACHIEVEMENT -- Academic achievement refers to scholastic performance as measured by a commonly used criterion, the grade-point average.

DEVELOPMENTAL READING -- A reading course designed for improvement of reading skills, regardless of level of ability.

REMEDIAL READING -- A reading course especially designed for retarded readers.

SOLID ACADEMIC COURSE -- This term is used to designate a course carrying three semester hours or more which may be either a required or an elective subject.

CHAPTER II
REVIEW OF THE LITERATURE

PART I

Introduction

A considerable number of research studies have been reported through the years concerning specific reading programs, participants, and descriptions of the programs in general.

Many of these programs reported obtaining indications of advantage or gain for those participating in the respective programs. Procedures used in different programs and methods of evaluating effectiveness of programs varied considerably. Use of standardized tests was indicated for a number of programs. In a number of reports the obtained results of pre- and post-test scores of each of the individuals in a given program were listed. In some, scores were presented in terms of quartiles and medians. In other reports, a detailed discussion of test results was to be found.

The studies selected for inclusion in this review of literature are primarily research studies dealing with topics pertinent to the relationship of reading instruction to academic achievement. The literature which appeared relevant to the problem being studied will be presented using the following organization: Reading Ability and Academic Success, Characteristics of College Reading Programs, and Reading Training and Academic Success.

The Relationship of Reading Ability and Academic Success

The belief that reading ability is an outstanding factor in college success has been implicit in the treatment of college reading problems. However, the absolute necessity for establishing this relationship on a sound quantitative basis did not become apparent until such work had been done on the lower levels. (110:6) Dorris May Lee reported a study in 1933 concerning the achievement of pupils in grades four, five, and six. (48:1-64) Another study with students on a ninth grade level was made by Eva Bond in 1938. (15:57) She concluded that reading abilities, as measured by standardized tests, are highly related to achievement in literary areas; and they are not as highly related to achievement in other subject matter areas.

Witty and Lehman stated in 1927 that they had encountered many college students who read slowly and comprehended little. (109:48) Book also found students to be so deficient in the ability to read that there was no reason to expect students to succeed in academic work until the reading deficiency was made up. (16:243) Several years later Parr noted that many educators believe that mastery of many college courses depends in large measure upon the ability to read textbook material adequately. (74:324) Anderson and Dearborn observed that in light of the prominent part that textbooks play in college instruction, it seems obvious that

there should be a close relationship between reading ability and college achievement. (3:387)

In 1948, Witty summarized the findings by stating the following: (1) scholastic success correlates closely with ability to read; (2) successful students are usually good readers; (3) poor students often lack real competence in reading; and (4) frequently, mentally superior students make surprisingly poor scholastic records because of their inability to read. (108:9-10) In this discussion Witty noted that the reported coefficients of correlation vary widely, but that a large majority fall between thirty and fifty. The wide variation was probably due to the unreliability of college grades as well as by the fact that all reading tests do not choose to measure the same abilities.

Experimental work in the relationship between reading and achievement appears to support the views expressed above. One such study was made by Garrett in an extensive review of studies seeking to isolate the factors in scholastic achievement. (31:102-103) Garrett cited ten studies made between the years 1929 to 1945 which relate to the problem. Reported correlations range from .25 to .67, with a median of .38. Numerous other studies have also reported results falling essentially within this range.

In a report published in 1941, Anderson and Dearborn made a study of college freshmen. (3:387) Their report sought to take into account the factor of intelligence in

arriving at a true relationship between college ability and college success. They found that both reading ability and intelligence could affect scholarship, and since intelligence is considered to be the more general factor, it is possible that it could be a major influence in both academic achievement and the ability to read. The question was "Do such differences in reading ability as vary independently of intelligence affect scholarship?"

In order to find an answer to this problem, Anderson and Dearborn studied sixty-eight pairs of Harvard freshmen matched on the basis of intelligence but differing in scholarship. They found that there was still a positive relationship between reading ability and college achievement even when only such differences as vary independently of intelligence are considered. They noted further that the results were sufficient to justify attention to reading at the college level.

Results obtained by Mose in his investigation, involving college entrance examination and other data and social studies test scores of approximately four thousand freshmen, led him to conclude that objective test data were more useful in determining academic success in social studies courses than were high school social studies grades or numbers and kinds of social studies courses taken in high school. (65: 2032-2033) Results obtained in Kim's prediction study indicated that study habits among other non-intellectual factors,

as well as academic aptitude played a significant role in determining college grades. (46:150)

Ahmann, Smith, and Glock found that Brown-Holtzman Study Skill Habits and Attitudes scores could be withdrawn from a regression equation used for predicting first semester grade-point averages of a sample of Cornell freshmen without significantly weakening or lessening the prediction efficiency of the equation. (2:857) They reported finding the discriminating power (between upper and lower groups) of most of the items "quite satisfactory." Metzger reported finding that the Cooperative English Test, C2, scores could be used to distinguish men most likely to achieve satisfactory first semester grade-point ratios. (63:2020)

Calia used a discriminant analysis technique in a study to predict membership of Boston University Junior College freshmen in "failure," "terminal," or "transfer" groups. (19:184-190) He inferred, on the basis of his findings, that students lacking in spelling and grammar skills need not be hindered in attaining academic success if they possess verbal aptitude for academic learning. However, it appeared that students who had poor verbal reasoning ability would be likely to experience some academic failure even if they possessed verbal mechanical skills. Tiedeman, in a criticism of Calia's study and of the discriminant analysis technique, maintained that some variables in Calia's study "were not given a chance to discriminate;" but he felt that a definite relationship of academic performance with scholastic

aptitude and scientific and literary preference was indicated. (105:190-192)

D'Amico, Bryant, and Prah1 found a verbal comprehension factor in the Multiple Aptitude Tests to contribute significantly to prediction of academic success of Flint Junior College students in biology, psychology, foreign language, English composition, general business and drawing. (25:611-616)

Newton did a case study of ten of the most severely retarded readers in a Bennet College reading program. (69:497-499) Indications were found which tend to influence verbal skill of certain sections of the country. Some of these were socio-economic family background, limited cultural experiences, small high schools, rural background, and poor and limited language patterns of adults in the environment.

Stewart found a positive relationship between "logic test" scores and reading comprehension and verbal ability test scores. (98:289-292) In a study of fifteen hundred teachers evaluated as to "unemployability," fourteen failed the verbal part of the fundamental skills test, and sixteen had participated in remedial-writing courses. (30:53-54)

Cummiskey found the reading ability of college students to be a significant factor with respect to final test scores in a general psychology course. (24:281) Hotchkiss found that vocabulary test scores discriminated significantly among "job applicants," "poor supervisors," and "better supervisors." (40:1247) A significant tendency toward higher

scores on vocabulary tests as amount of education of volunteer applicants at the Minnesota State Employment Agency increased was also noted. (41:1247-48)

Centi investigated differences between highest and lowest ranking School of Education students of a large urban university. (21:102-105) He found the highest group to be significantly superior to the lowest group on all the scores of the Cooperative English Test (including the various reading scores). He also found the highest ranking group to be significantly superior with respect to the various scores obtained with the California Test of Mental Maturity. Lunn found that the greater the reading comprehension (among several skills) of two hundred and forty-five students in three sequential professional education courses, the greater the success in those courses was apt to be. (52:1409-1411) A similar relationship was found with respect to scholastic aptitude. Neville made several comparisons of good and poor readers who were successful academically and those who were unsuccessful. (68:3525-3526) Among conclusions he drew was that reading ability influences reading test scores more than academic success. He based his conclusion on the finding that a group of average readers who had failed academically had mean scores consistently higher than a group of poor readers who had succeeded academically. Results obtained when he compared successful poor readers and failing poor readers who had participated in a reading clinic program

indicated that the failing group differed significantly on most test scores; however, Neville found that prediction of success or failure among poor readers could be made with only "limited accuracy."

In a study of four hundred and ten Newark College of Engineering students, it was found that sixty-seven students held back for scholastic reasons or transferred to an evening division had higher mean reading comprehension scores than did the entire entering class. (82:38-43) Wesley found that the high achievers in a group of freshmen enrolled in the College of Arts and Sciences, when compared with low achievers, were "able to take examinations with more confidence," "study better without problems of concentrating," and "used their time more advantageously which allowed time for study." (106:154-155) Ikenberry compared two hundred and fifty students who remained for a full academic year at Michigan State University with three hundred and three students who had entered the same class but who had dropped out within the year. (42:322-329) He found scores on a reading test to be positively related to all three of the significantly different functions or areas found between the two groups of students (the intellectual or achievement function being one of those areas).

Sweeney found no statistically significant relationship between the amount of high school English and either fall or spring semester grades in freshmen or remedial English. (102:

2640-2641) She found that reading proficiency actually had more bearing than any other single factor upon success in English beyond the freshman year and in determining whether or not a student needed to take remedial English during his freshman year. Reading proficiency was also found to be the most closely related, of any single criterion, with success in college English. She concluded that her findings indicated that much more emphasis on reading in high school was needed.

Endler and Steinberg found the reading subtest scores of the STEP to be more highly correlated with grade-point averages than were other aptitude and achievement test scores involved in their study; but high school averages were found to be still better predictors of grade-point averages. (28: 694-699)

McCord concluded that reading and test-taking ability had perhaps more influence on certain group intelligence tests than was commonly realized. (56:214-215) He found that obtained I.Q. scores tended to be higher in the case of groups or subjects who had participated in an adult course in rapid reading after the course than such scores were at the beginning or before the course. However, Shein, who also investigated the influence of reading comprehension and time variables on group intelligence tests at the college level, concluded that timed group intelligence tests are not more valid indicators of ability for superior readers than for retarded readers. (92:4275-4276) He further concluded that the validity

of group intelligence tests does not decrease more for retarded readers than for superior readers as time decreases, and that validity of group intelligence tests was not increased by singling out reading comprehension.

In the years from 1955 to 1960, Guertin, Rabin, Frank, and Ladd made an intense research study concerning the Wechsler Adult Intelligence Scale. (34:1-26) They noted that the WAIS was an improvement over other intelligence tests, but there was still a need for a deeper and broader theoretical framework. Goldman studied the contents of the verbal portion of the WAIS and the items included in the School and College Ability Tests (SCAT). (33:51-53) It appears that a striking similarity exists between at least two corresponding tasks of each instrument. The corrected correlation of .89 between the verbal halves of the WAIS and the SCAT which was obtained in this study strongly suggests these two sets of test items are measuring very nearly the same abilities. In fact, when the corrected correlation of .92 between the WAIS Verbal and the SCAT is noted, the similarity between the two instruments is all the more apparent.

To test the hypothesis that reading skill is related to grades, product-moment correlations were computed by Robertson and Harrison for first semester freshman grade-point averages and each of four Diagnostic Reading Test subtest scores. (83:258-62) Only vocabulary and total comprehension scores showed substantial correlation with grades. Using

the computed grade-point average, the standard error of estimate was corrected for both the vocabulary score and total comprehension scores. The standard error of estimate was corrected for both the vocabulary score and total comprehension scores. The standard error of estimate was .98 for vocabulary and 1.03 for total comprehension.

Kamman found American College Test scores correlating higher with Diagnostic Reading Tests scores than with Scholastic Aptitude Test scores. (44: 77-86) The American College Test scores were found to be negatively related to amount of gain achieved in a reading program (relative to comprehension and vocabulary scores on the Diagnostic Reading Tests.)

Diener emphasized that the relationship between reading and college success is not a simple one. (26:1692) In an investigation of over- and under-achievers at the college level, he found a significant but negative relationship between the two factors involved.

Krippner made a study of the correlates of reading improvement in 1962. (47:29-39) The main purpose of his investigation was to determine whether such variables as intelligence, social competence, vocabulary, mental health, socioeconomic status, chronological age, grade placement, and amount of reading retardation were related to the degree of improvement manifested in a remedial program.

Relation of Ability to Grade-Point Average

Krippner found that if the purpose of a remedial program were to enroll students who could be expected to make

the most progress, those in the upper grades with high WISC Verbal and Full Scale I.Q.'s, mental health assets, and extensive listening vocabularies should be selected. Younger subjects with mental health liabilities, lower WISC I.Q.'s and smaller listening vocabularies would not show as rapid improvement.

Such variables as the degree of retardation, social maturity, and the father's occupational level had the least predictive value.

Although the Performance I.Q. did not appear to be connected with reading progress, the Verbal I.Q. had a high correlation. The study indicated that the absence of emotional disturbance and the presence of verbal intelligence can be fairly effective predictors of the progress to be made by poor readers in an adequately staffed remedial program.

Stinson and Morrison found the best predictor of grade-point average for high school seniors was the comprehension section of the Cooperative English Test. (99:108)

Relation of Ability to Reading

Schneyer made a study of the relationship of scholastic aptitude factors to progress in a college reading course. (87:261-8) The results indicated that students in the High Improvement Group (those making the most progress in the reading course) have significantly lower mean SAT verbal scores than either the Average or Low Improvement Groups. Schneyer accounted for this by explaining two factors: (1) the High

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Improvers achieved the lowest mean total reading test scores of any of the three groups and (2) both the reading test and the verbal aptitude test seemed to be measuring similar tasks.

The High Improvers tended to be students who began the reading course with the lowest mean total reading scores, therefore, they had the greatest room for improvement. It was suggested that a developmental reading program which results in real growth in reading skills may also result in increased scores on verbal aptitude tests.

The significance of reading skills for academic achievement and the relationship of these skills to certain outside criteria have been explored on numerous occasions and the plight of the poor reader has been approached from practically every point of view. Teachers generally concede that better readers are better students and bear witness to the old cliché, "Readers are leaders." (89:295)

Sex Differences

Another question concerning reading ability and academic achievement is whether or not there are sex differences. According to Parsley in 1927 Lincoln summarized the findings up to that time concerning sex differences in achievement and pointed out such facts as: girls excel consistently in arithmetic computation; boys are slightly better in arithmetic reasoning; girls are somewhat superior in reading rate, spelling, and handwriting; boys were better in history and geography, and definitely better in geometry. (76:210-212) Stroud and

Lindquist, using the Iowa Every Pupil Test of Basic Skills, showed significant sex differences in achievement favoring girls in most of the achievement areas studied. (101:657-667) In 1959, Olson indicated substantial sex differences in a number of areas of achievement. (72:257)

Parsley stated that as a result of the findings concerning sex differences, there is an apparent advantage held by girls. (76:211-212) Studies of school retention indicate that boys are more often retained in a grade than girls. Yet educators are also fully aware that there are individual differences within the sex groups so that a substantial number of boys do achieve successfully at expected grade levels. Whether these differences, if they do exist, are due to the different maturational rates of the sexes, or to the fact that teachers seem to favor girls, or to still other factors is uncertain.

Parsley studied sex differences between scores in total I.Q., Reading Vocabulary, Reading Comprehension, Arithmetic Reasoning, and Arithmetic Fundamentals. (76:211-212) No significant differences between the sexes were found. These results of most of the earlier studies in which substantial sex differences in achievement were found to exist.

Gates concluded, in a study of sex differences in reading, that girls' reading ability excelled that of boys. (32:63) Girls' superiority as a result of earlier maturity seems

unlikely as girls' superiority appears greater in the upper grades as in the lower grades. The data suggested an environmental rather than hereditary explanation.

Unfortunately, there seems to be a lack of research studies concerning sex differences especially on the higher levels.

Summary

According to many studies of the relationship of reading ability to academic success in college, there appears to be a high degree of correlation. Verbal scores seem to be more highly related to reading ability than non-verbal scores on tests of ability. In at least one study, verbal scores on the SCAT seemed to be measuring the same characteristics of intelligence as the Wechsler Intelligence Test. Therefore, both high verbal scores and intelligence appear to be good predictors of reading ability.

The comprehension factor in reading appears to be more highly related to college success than to rate of reading. Some studies show vocabulary scores to have a rather high correlation to academic success. These factors appear to have more influence on curriculums of a humanities type, with little or no relationship in courses of study heavily weighted with science and mathematics materials.

There were very few references, especially on the higher levels, concerning sex differences in achievement. It has been assumed by most educators that girls usually read better

than boys. There appears to be some question about this assumption. More studies should be made before any conclusion can be reached.

This section has been an attempt to introduce selected references concerning the relationship between reading ability and scholastic success. Major findings and authoritative statements have been presented which are directly relevant to this study.

PART II

Characteristics of College Reading Programs

There is such a wide diversity of reading services offered throughout the nation that it would be impossible to describe in specific detail every single program now in operation. It will be the purpose of this section to list typical patterns of organization, to describe certain commonly employed activities, and to discuss in general terms the results which have been attributed to reading programs. In addition, a study of several specific programs was made and reported.

Organization. Strang, McCullough, and Traxer reported the results of a survey in 1955 which showed that fifty-seven thousand students were reported to be taking reading-improvement courses. (100:55) However, fewer than twenty-five per cent of these institutions reported an existing reading program, and only one-third of the total student population were participating in such a program. The reading-improvement work is offered most frequently in the English department, with education, counseling, and guidance departments close seconds.

College reading instruction may be given as an intrinsic part of the freshman program or on a par with other subjects. Everyone takes it. Classes are sectional according to the students' initial reading ability. Reading instruction

may also be offered as a service on a non-credit basis to any students who want to take advantage of it. Or it may be required of all students who fall below a certain level on the reading test given at college entrance.

In content, too, reading instruction in colleges varies widely. In some situations the emphasis is almost exclusively on "speeding your reading;" other programs stress the deeper interpretation of meaning. There is also a wide range in comprehensiveness; some programs depend mainly on the use of several gadgets, while others include instruction and practice in every aspect of reading. The multiple-emphasis program, which does not concentrate on one reading skill, such as speed or vocabulary, but helps students to perform all their diverse reading tasks more efficiently, is obviously the kind of program that should be widely introduced.

As the result of his study of the origins of reading improvement programs in American colleges and the development of such programs Leedy concluded, in 1959, that reading improvement programs were in a state of flexibility with regard to methodology, materials, and procedures at present and that the future missions of reading improvement programs would be far greater than in the past. (50:2841) Among the findings obtained by Miller in his extensive questionnaire survey, with over two hundred schools responding, were the following: that reading courses are offered on a non-credit

basis in over one-half of the schools responding; that twenty to thirty hours of supervised reading practice appeared to be the general practice; that the most popular plan for programs is basic group practice using workbooks for the whole group, with such being supplemented by individual practice with mechanical aids; that tachistoscopes and reading accelerators were the most popular mechanical aids; and that the Diagnostic Reading Tests, the Cooperative English Tests, C 2, and the Iowa Silent Reading Test were the most frequently used pre- and post-tests.

Methods and Procedures Used in Reading Programs. Most reading programs, although including a wide variety of procedures, are logically arranged into three divisions: diagnosis, training, and evaluation. (110:25) In many programs a diagnosis may be attained by use of a battery of tests which may include oral reading, a vocabulary test, comprehension tests (timed and untimed), a visual screening test, hearing test, study habits inventory, a reading history, and a personal-information questionnaire. (100:59-60) The results of these tests are then discussed with each student in a personal interview. All of these techniques for diagnosis may be used or only those selected which apply to the particular goals of a given program. In an individualized program obviously a more thorough diagnosis can be made than in a classroom situation where time is of the essence.

Training activities often include the use of many workbooks and exercises on varying in levels of difficulty. Some are used to develop a better reading and speaking vocabulary, while others are designed to afford practice in reading speed and comprehension of general material. Exercises and materials pertaining to the development of structural and phonetic analyses are also utilized in specific situations.

Machines or reading devices, as used for materials of instruction, are found in many college reading programs. In general, reading films, filmstrips, tachistoscopes, and reading accelerators are used mainly for motivational purposes. Most reading authorities agree that these devices should not be used unless the students have developed sufficient basic skills and have chiefly a problem of rate.

Studies of Specific Reading Programs

The Reading Program in Kendall College. Frances Oakes, reading consultant at Kendall College, Evanston, Illinois, says that a developmental reading program should be designed to increase speed of reading, establish more efficient reading habits, build vocabulary, increase concentration (and hence comprehension), and develop disciplines relating to study, note taking, and preparation for examinations. (70: 85-89) At Kendall College, students are introduced to the reading program during freshman orientation week, during which time the meaning of their placement scores is explained and a description of, and introduction to, the reading course

is given. During the first week of classes, the student is given further tests including an ophthalmographic test which records on film his speed of reading, eye span, number and length of fixations, and regressions. The scores from the reading portion of the freshman placement test are used for a vocabulary and comprehension check. A word discrimination test and an additional speed test drawn from the student's regular practice material complete the initial battery. Through conferences, the student discovers his weaknesses and discusses any practices which may need special remedial attention.

The exercises used in the course are quite simple, consisting for the most part of mimeographed and cross-line exercises designed to increase speed and eye-span, to decrease regressions, to develop rhythm and phrase reading. Many courses use machines such as the tachistoscope, the reading pacer, or the metronoscope to increase reading speed. These mechanical devices are interesting to use and provide good motivation, but they are somewhat remote from the normal reading situation. Although the students who use printed exercises and their own will-power to improve reading may improve at a slower rate than those subjected to such speed-up devices as the Harvard Films, there is reason to believe that new reading habits are more easily and permanently retained when the simpler devices are used.

To be effective, a reading program must be approached from two points of view -- psychological and linguistic. Too many reading programs are approached from one or the other and consequently do not meet the total needs of the student. The simple exercises designed to retain reading habits and to develop speed fulfill the psychological need, while attention to vocabulary development, spelling, and the relationships between sounds and symbols meets at least some of the linguistic needs.

A final ophthalmographic check at the end of the course reveals the bad habits that have been overcome and the ones which still need attention.

On the average, one can expect the student to double his speed by the end of the first month and triple it by the end of the third. By the end of the course, one can expect to show up to fifteen per cent increase in comprehension as a result of improved concentration and expansion of vocabulary. Some students, who show a high level of comprehension at the beginning, simply maintain that level.

The increased amount of reading which a well-trained student will be able to do will not only aid him to become a better student but will give him a better chance at job success, increased knowledge, and lasting personal pleasure and satisfaction.

Reading Program at Syracuse University. William D. Sheldon reports that Syracuse University has had a reading

program for many years. The classes are now taught by graduate students who are studying for degrees in education and psychology. (93:44-46) These instructors participate in a seminar in reading on the college level before teaching the course. The basic purpose of the seminar is to develop in the instructors as complete an understanding as possible of the aims and procedures of the remedial course.

The students attending the course are drawn from three separate segments of the University population. In the first and largest group are those whose post-entrance examinations reveal weaknesses in reading and in various content areas. They are required to enroll in the course by the deans and directors of the various colleges and schools. They usually attend the course in the first semester of their freshman year. The second large group is made up of students who have been placed on probation because of academic deficiencies. The third group is composed of volunteers from all four of the undergraduate classes who want to improve their already adequate scholastic status.

In addition to attending classes three times a week for a semester, each student meets with his instructor for individual counseling sessions. Each section is organized on the basis of general and specific needs of the students enrolled. A general diagnosis of all students based on the results of a series of tests precedes most of the activity of the class. The Ohio State Psychological Examination is used to assess

the ability of each student, and the results of this examination, taken on entrance to the University, are available to the instructor. Scholastic Achievement is also appraised at entrance through the Cooperative Test Battery, which includes tests of mathematics, science, and social studies. Reading is surveyed by the Cooperative Reading Test and the Iowa Silent Reading Test. The study skills of the student are assessed by the Syracuse University Reading and Study Skills Inventory. From a study of these general diagnostic instruments, the student and teacher gain an understanding of the student's status, his potential ability, and the areas in which the greatest effort must be made to compensate for or to eliminate his inadequacies. In many instances, however, it has been found that these measures fail to reveal areas of inadequacy which handicap the student. If the instructor and the student are dissatisfied with the general diagnosis, a more individual diagnostic program is set up.

In general, the major survey is completed within the first two weeks of the course. On the basis of its results the class proceeds to tackle the problems of general and specific importance. The individual diagnosis, however, often takes a whole semester. It sometimes leads to individual tutoring of those drastically handicapped in reading and study skills, to therapeutic counseling or to vocational counseling for students who are handicapped in academic or vocational areas by emotional or personality disturbances. The therapy needed is often given concomitantly with the

reading and study-skills course. Sometimes, however, the course work is suspended and therapy substituted.

Reading, as a major activity of study and also as a more or less acceptable approach to the group's problem, receives first attention. An attempt is made to give each student an approach to reading in general as well as a view of specific areas of difficulty.

Because rate offers dramatic and rapid changes in basic performance and therefore presents convincing evidence to a student that something can be done to aid him, exercises and instruction aimed at the improvement of reading rate precede other instruction. The flexible rate of a skilled reader is demonstrated by showing that the rate is adjusted to the reader's purpose, his method of obtaining data, and the difficulty of the material.

Many varied techniques are used and some help is given to the student. None of them has seemed appropriate or sufficient when used alone. The related learning skills of concentration, reference, reviewing, time scheduling, taking of examinations, presentation of written assignments, note-taking, organization, and memorization are discussed, and certain useful lessons and exercises in each of these skills aid in giving the student a greater mastery in a weak area.

Whether the classes are conducted non-directively in a student-centered manner or in a slightly more traditional fashion, the emphasis on the student's needs and individual

differences has definite values for the academic and personal adjustment of the student.

The Reading Program in The University of Chicago. McCaul has given these objectives for the remedial-training program in The University of Chicago. (54:98-100)

1. To furnish training which will enable certain students to read as well as they are mentally capable of reading, and
2. To offer all students the opportunity of having their diagnosed and of receiving suggestions for improving it.

During Freshman Week in September and periodically during the school term, the Board of Examinations of the University administers aptitude and achievement tests to first, second, and third year students in the College. The battery includes the American Council on Education Psychological Examination and test appraising non-verbal intelligence, vocabulary, words in context, reading comprehension, logical reasoning, writing skills, and subject-matter achievement. The results are used for guidance and placement.

After the Board of Examinations has administered and scored the tests, the percentile ranks which the students have earned are sent to the remedial-reading teacher who picks out the names of prospective trainees. The following kinds of students are likely to be chosen:

1. Those whose nonverbal-test scores are forty or more percentile ranks higher than their verbal-test scores.

2. Students who score high on the American Council Psychological Examination and low on reading and vocabulary tests.

3. Students in the lowest quartile on all tests.

The reading weaknesses run the gamut from slow speed to illogical reasoning. Students generally fall into one of four overlapping categories: superficial readers, those who cannot organize printed materials nor discriminate between what is important and what is unimportant, slow readers, and those with inferior word-recognition skills. These weaknesses are usually complicated by a meager vocabulary and a chronic dislike for reading.

Few published workbooks and manuals are used. However, copies are available for supplementary use. Ordinarily, the materials are the textbooks which the students are studying in their courses.

The results of the remedial reading program demonstrate that students on the average gain twenty percentile ranks in vocabulary, thirty percentile ranks in comprehension, and one hundred and ten words a minute in speed. Remedial reading students tend to get higher marks than do students matched with them by reading deficiencies but who have not asked for remedial instruction. This superiority could be produced by a host of uncontrolled influences, and might not be attributed to remedial reading. It is logical, for example, to postulate that a student who takes the training is more con-

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scientious and industrious than an equally poor reader who does not choose to avail himself of remedial-reading services. The data do justify a generalization that any student who is willing to apply himself diligently to the training can improve his reading.

At the end of every quarter of the school year, the remedial teacher sends reports to the advisers of his students. Each report summarizes a student's reading weaknesses, outlines possible causes, enumerates the remedial techniques being employed, proposes ways in which the adviser can cooperate, describes the student's non-reading problems, and presents the remedial teacher's suggestions for coping with these problems. These reports bring to the adviser's attention the common symptoms of reading difficulties and make him more skillful in identifying students who are in need of remedial attention.

The success of the program is due to thorough diagnosis, a painstaking attempt to ferret out the causes of reading difficulties and to eliminate them, remedial measures focused directly upon weaknesses, and carefully planned motivation.

The Cornell University Reading Improvement Program. Pauk states that the reading program is a non-credit course and enrollment is voluntary. (77:16-22) Each fall the incoming freshmen are given a battery of tests during Orientation Week. Included in this battery are several tests which are used by the director of the reading program for the purpose of selecting

those students who are eligible to take the reading course. When the students are thus assembled for testing, a brief description of the reading course is given by the reading program personnel. After this talk, the students are asked to state, in writing, whether they want to take the course.

For the fall reading program, only those freshmen are considered whose scores on the speed of comprehension section of the Cooperative Reading Comprehension Test fall in in the lowest thirty per cent of the scores for their school or college. However, final selection of these students, who are in the bottom thirty per cent, is made on the basis of a formula which takes into consideration the scores of the Scholastic Aptitude Test: (1) scores on the Ohio State University Psychological Test and (2) scores on the Vocabulary and Speed of Comprehension sections of the Cooperative English Test, C2: Reading Comprehension (Higher Level).

The names of the students in the bottom thirty per cent are made known to the advisers, who talk over the situation with the student. Students in the bottom thirty per cent, who did not make a written request for the course, if they so desire, after consulting with their advisers.

The spring program is made up of students from the undergraduate and graduate schools and colleges. This group is comprised of students who have experienced difficulty with their college work during the first semester and have come directly to the reading laboratory for help; and students

referred by faculty advisers, counselors, and other university officials.

It is found that the optimum results were obtained when sections were limited to about sixteen students. These sections meet for two fifty-minute periods a week for nine weeks. The balance of the semester is allotted to the holding of conferences with the individual students who feel that they need further work on some of the aspects of reading during the class periods.

In the Cornell reading program emphasis is placed on immediate follow-up of a lecture or demonstration with a practice exercise which gives the student the opportunity to better understand a specific technique or principle by practicing under supervision.

This process of understanding is aided by lively discussions in which the students recognize that their problems are not unique, but are possessed by many of the individuals comprising the group. It is the contention, further, of the Cornell group that individual instruction is far more meaningful, efficient, and effective when it is done after the student has had the reading course.

The instruction of the Cornell program is based on the broad principles recommended by the National Committee on Reading:

1. Adjusting reading to achieve the reader's purpose
 - a. define purpose for reading

- b. select suitable approach for purpose and nature of material
 - c. adjust speed to purpose and nature of material
2. Grasping literal meanings of reading passage
 3. Getting broader meanings
 - a. defining type of article
 - b. recognizing tone and intent of selection
 - c. understanding of organization of article
 - d. perceiving implied or suggested meanings
 4. Synthesis and evaluation
 5. Integrating the meanings thus obtained with one's previous knowledge and experience.

It is the practice to give the students a comprehensive overview of the course, covering the above principles, at the first session. The next several sessions are devoted to the identification of some of the common poor reading habits; vocalization, regression, etc.

It is important to point out that the reading program places special emphasis on the development of the student's functional vocabulary. To meet this need, a unique method for teaching vocabulary was developed at Cornell. In a controlled study, it was found to be highly successful.

Most of the exercises used in class for practices are taken from the reading manual developed by Dr. Marvin D. Glock. This manual contains lectures on the principles of good reading,

according to the Cornell instructor, also a wide variety of interesting reading selections, and sets of provocative questions which challenge student understanding and application of reading principles.

Some mechanical devices are used in the reading program. The reading accelerators are used to aid the student in eliminating some of the poor reading habits such as regressions and word-by-word reading, and to practice the techniques and principles of good reading as set forth in the classroom instruction. Speed reading films are shown every other class meeting. The tachistoscope slides are shown for approximately five minutes during four sessions which are interspersed over the course. Finally, devices and materials developed by the present director are used to demonstrate certain reading techniques.

At the end of nine weeks, the students are tested on an alternate form of the Cooperative Reading Test. This test is used as a source of information of a diagnostic nature. The personnel of the reading program go over each item on every test to find some pattern which might indicate a weakness in reading. This system of identifying specific areas of reading weaknesses; providing practice material to correct these deficiencies, and explaining how to overcome these problems in daily reading assignments is a powerful motivational device which frequently provides the momentum for the transfer of classroom learning to actual situations beyond the classroom.

The Reading Program for a State College, Talequah, Oklahoma. According to a report by Earnest A. Jones, Central State College, Edmond, Oklahoma, a study was made in 1952 of the reading abilities of college freshmen in Oklahoma. (43: 7-14) It was found that of the 8,249 cases under consideration, 5,168 or 62.6 per cent scored below the fiftieth percentile; 1,359 or 16.47 per cent scored in the sixth and seventh deciles; and 1,722 or 20.88 per cent scored in the top three deciles. As a result of this study, a reading program was installed at one of the state colleges participating in the study. Its enrollment at the time was approximately 1,200 students. This is a description of the procedure used.

During the first semester on campus, all freshmen were given a complete reading diagnosis consisting of the Iowa Silent Reading Test, the Michigan Vocabulary Profile Test, Keystone Visual Survey Tests, Self Analysis of Reading Habit, an opthalmograph and spelling test. Although the reading clinic did not administer them, audiometer tests, phonetic inventories, and voice recordings while reading were also administered to each freshman. These data were available to the reading clinic.

Under recommendations to the student, entries were made on the diagnosis sheet as to whether the student should enroll in developmental reading, come to the reading clinic for conference, or to invite him to take advantage of the services to improve his reading, spelling, or study habits.

A letter of transmittal explaining the data was sent to each student with the consolidated diagnosis report. The self analysis contained fifty questions designed to reveal the student's current reading habits and attitudes toward reading. A pamphlet of fifty corresponding suggestions for improvement, marked according to the student's self-analysis, accompanied the report. The student was directed to pay close attention to the marked items and invited to study all of them. Although the report was self-explanatory and rather comprehensive, many students sought conferences in the laboratory. Many, counselled by their advisers, were channeled into the developmental reading courses.

The developmental reading course which was offered carried an English number, met for five fifty-minute periods per week, and earned three hours of elective credit for the student.

At the outset it was made clear to the students that there was no magic in the mechanical equipment or the workbooks, nor could the instructor cause the student to read more efficiently. It was further explained that all of these factors would help tremendously, but unless the student had a sincere desire to improve and was willing to work hard toward that end, it was useless to enroll. Time was taken to completely interpret the diagnosis and to answer the questions of students. The attempt was made to assure that each student understood the full implication of the data. The

first assignment was to select a full-length, fiction-type book with the qualifications that it must be easy to read, and of high interest level to him. He was required to read at least thirty minutes per day, seven days per week until the book was completed. When it was completed, another selection was to be made. This procedure was continued throughout the course. A record form was supplied each student and kept in his laboratory file. On this form he entered, for each book read, the title, number of pages, date started and date completed. No instructions were given as to how the student was to do this reading at this time. Careful check was maintained to assure that each student was keeping up this practice reading.

The class activities described hereafter were set up and students participated in them as directed by the instructor. Using the diagram data as a guide, the instructor suggested whether the student would do each of these exercises, when, how long, and at what intervals.

The spelling instruction began with adult approach to the study of Kottmeyer's film, "Goals in Spelling." This was for those students whose diagnosis revealed an elementary grade equivalent in spelling or any who felt need, regardless of diagnosis. Spelling Magic, Books I and II, for outside class work was suggested. Text assignments were made in Learning to Spell by Julia McCorkle and College Handbook of

Composition by Woolley and Scott. Several mimeographed sheets on phonic structural analysis were also used. This work covered a period of two weeks, on the average.

Initial instruction in vocabulary development was started with Keystone's Minnesota Efficient Reading Tachistoslides. These were projected and studied in detail until the students had learned the fourteen words containing the most frequently met prefix and stem elements. They were also required to learn their variant forms and meanings.

This work was concurrent with outside class assignments in Lewis' Word Power Made Easy. It was also suggested that The Automatic Vocabulary Builder by J. L. Stephenson be kept in the student's pocket and a page a day completed at odd times. This assignment outlasted the duration of the course.

At the end of three weeks a comprehensive vocabulary test was given and those who were low were given re-assignments and asked to continue work in Reading and Vocabulary Development by Christian O. Weber.

At the beginning of the sixth week, exercises were started in comprehension and concentration. A lecture was given on the art of concentration through mental control of the sense organs, and on associative memory.

The students were asked to select a book from the shelves or bring one to class of their own and portions of sessions were used to practice the following exercises:

1. Psychological Conditioning

When you sit down to read, spend a few seconds or minutes to ask yourself, and answer, such questions as:

- a. Why am I doing this?
- b. For whom am I doing this?
- c. What good will it do me?
- d. Should I do it now?

The purpose of this meditation is to relax tensions of the body and build attitudes that are conducive to success in reading or study.

2. Concentration

You are able to concentrate by controlling your sense organs. Literally shut off outside distractions, sights, noises, odors, etc. by use of nerve control. You must acquire the ability to concentrate if there is to be comprehension.

3. Comprehension through Concentration

Begin with psychological conditioning, use concentration as mentioned and begin reading. Just as soon as you are aware that your operation is entirely mechanical -- stop reading! Go back, pick up the sequence of thoughts and never read without concentration and comprehension again.

4. Listing Distractions

While you are reading, take time to jot down

the distracting thought. Number these items. Note the number of items per thirty minutes of reading. Note the importance of each item. You will probably find very few of them important. If you find that they are important, it is probable that you should put off reading until a more suitable time. The number of items should diminish with each passing week.

SRA's Better Reading Books by Elizabeth Simpson were used for comprehension as well as A Manual of Reading Exercises for College Freshmen by Luella C. Pressey. This was primarily for developing phrase reading, rhythm of eye fixations, recognition of relative importance of words, and recognition of natural phrases.

During this same time the tachistoscope was used with the overhead projection and Keystone Tachistoslides. Initially, digits were used beginning with one digit at 1/100 of a second exposure time. Then phrase and sentence reading was used. As soon as a perceptual span averaging 3.5 words at 1/100 of a second fixation was developed, this work was discontinued. The daily tachistoscope sessions were of about ten minute durations.

If and when it was considered appropriate, based on each student's individual progress, the Iowa High School Reading Training Films with comprehension tests were used. None was allowed to view the films unless proficiency in all areas

such as rate, comprehension, perceptual span, and duration of fixation had been attained. Unless comprehension was ninety per cent or better on the test given after each viewing, students were not allowed to continue the series. Resumption was then based on comprehension and student's choice.

Various reading pacers were used, both to increase and decrease rate. For those whose rate was initially high without adequate comprehension they were used to decrease rate. Careful check was maintained on a twice weekly rate and comprehension test. If comprehension began to drop, use was discontinued.

This procedure continued until the end of the fourteenth week. At this time students were given instruction in flexibility of speed and study techniques. Several How to Study tests were used. Students were encouraged, now, to bring their regular college texts to class for use in practice.

The key to success seemed to be careful supervision to assure that each student did not use any gadgets or exercises until he was ready, and to see that they were discontinued when they had served their purpose.

During this last week of the course, a complete diagnosis was administered, using equivalent forms of the same tests as were used for the original diagnosis. The following gives the gains made in terms of median scores of the ninety-eight students completing the course during three semesters.

Iowa Silent Reading Test

Grade Percentile -- from sixteen to thirty-seven.

Comprehension Percentile -- from forty-five to
ninety-six.

Michigan Vocabulary

Total Score Percentile -- from two to thirty-one.

Opthalmograph

Average Duration Fixation -- from .22 sec. to .12
sec.

Average Span of Recognition -- from 1.16 words to
2.38 words.

Spelling

Grade Equivalent -- from 8.5 to 11.1

SRA

Rate -- from 212 to 570.

Comprehension -- from sixty-five per cent to ninety
per cent.

Summary

Strang, McCullough, and Traxler say that, on the whole, college reading programs have been more adequately appraised than those on lower educational levels. (100:62) Every program seems to get results. Improvement in reading is reported for programs using machines and for non-machine programs, for large and small classes, for instruction and for drill programs, and for group therapy.

Reading programs differ in organization. Some are machine or skills oriented; others are broader and stress insights, skills, and counseling; and still others utilize a clinical approach where psychotherapeutic methods are employed.

Most reading programs are divided into three divisions: diagnosis, training, and evaluation. Diagnoses are sometimes made by using test results only. Others add to test results such diagnostic devices as an eye-movement camera, tele-binocular for locating visual deficiencies, health reports, history of difficulties, psychological tests, personality tests, hand-eye coordinator, personal information questionnaire, etc. Most reading programs employ some of these devices, but it would probably be difficult to locate one program which uses them all.

Reading training varies according to the goals or purposes of the program. Some programs are designed for helping students achieve academic achievement in certain subjects while others are designed to improve general reading ability. If the chief aim is to develop self-confidence, and to develop a more integrated individual, then counseling procedures would, no doubt, be practical.

There are widespread methods used in evaluating results of a program. Many programs use percentile gains in comprehension, vocabulary, and rate; others measure gains in terms of higher grade levels; and still others measure gains in

terms of improved grade-point averages. Very few emphasize outcomes of training in such intangibles as self-perception, self-confidence, etc.

This section has described the general characteristics of reading programs and a few specific programs.

PART III

Reading Training and Academic Success

Although there will be some overlapping in this section of the literature, an attempt has been made to trace experimental studies from about 1930 to the present concerning reading training and academic success. Some of the earlier researchers provided the groundwork for experiments being carried on today. The most significant findings in the area have derived from studies made during the past fifteen years which have attempted, with varying degrees of success, to control the complex and interacting variables which contribute to scholastic achievement.

In 1930, Pressey and Pressey made a comparison of four hundred and twenty-two college freshmen who had taken a remedial course and four hundred and twenty-two students who had not taken such a course in terms of academic work. (79: 203-211) Each student was paired on the basis of intelligence, initial reading score, sex, age, and college. Results showed a significant rise in grade averages for the group who had taken remedial reading. It seemed quite evident from this investigation that reading training is more likely than not to transfer to the preparation of lessons and to general understanding of college work.

Parr administered a reading program at the University of Iowa in 1928-29. (74:324-336) Twenty low-ranking reading ability students took a remedial reading course and were

compared with other low-ranking ability students in terms of comprehension. When the second-semester grade-point average was compared, eighty per cent of the twenty students who took reading made gains. In the two control groups more losses than gains were made. Forty-five per cent of the experimental group made grade-point averages during the period of remedial instruction which were higher than they had ever earned before; whereas, only eleven and thirteen per cent, respectively, of the members of the two control groups made such averages. About four times as many experimental students as control students made their highest grade-point averages during the second semester, when the remedial instruction was given.

In 1930, Thompson found that eighteen per cent of the Teachers College freshmen at the University of Nebraska had less reading ability than the average child in the tenth grade. (103:156-158) Thompson concluded in his study that college freshmen as a group do not improve in reading ability after a semester of college work. Remedial reading classes improved the students' ability to read in a short time. The evidence further suggested that poor reading is a potential factor in the failure of freshmen to succeed in the first year of college work.

According to Robinson, college freshmen scoring in the lowest tenth in comprehension on the Iowa Silent Reading Examination were given clinical treatment of their reading

difficulties in 1930-31. (85:843-846) Afterwards, they showed a marked improvement in reading ability and school success. Intelligence and cooperation, two independent factors, determined the amount of gain with training. Robinson suggested that students who are willing to work should be selected in order from those with the highest intelligence downward until the remedial quota is filled. A further conclusion was that a clinical method is more efficient than a class method and should be used in remedying specific reading difficulties.

College freshmen in Syracuse University with reading performances below the tenth grade level in the reading section of the Ohio State Psychological Examination were selected for a remedial reading program, and were compared with others who did not take reading. (75:624-630) These students showed a gain in reading skill of three grade levels in the period of one full semester. Although an evaluation in terms of scholarship was not available, earlier investigations of this type at Syracuse showed positively the superior scholastic achievement of students who have had remedial work when compared with students of similar abilities.

McCallister investigated the effects of reading instruction on ninety-six poorly prepared college readers in comparison with the same number of poor readers who did not take a reading course. (53:311-313) Students who attended the reading classes attained higher marks. However, McCallister pointed out that other influences besides the reading instruction may have affected the result but the conclusion was

reached that improvement in reading ability was a contributing influence in the differences attained.

McGann used the Nelson-Denny Reading Test to show gains in reading skills gained by college freshmen taking a remedial reading course. (61:183-186) The tabulation of scores showed a definite trend toward rapid improvement in three months. The class work also showed great improvement because the students were gaining confidence with added skill. Further conclusions were that remedial reading, when provided at the beginning of the freshman year, can help to eliminate failure which results from lack of good reading and study habits, and aid in the development of better scholarship during the years to come.

Freshman engineering students who ranked low in reading ability were given aid by the reading laboratory at the Carnegie Institute of Technology during the school years 1939-40 and 1940-41. (96:621-623) When compared with equally low-ranking students who were not given reading instruction, the group receiving instruction made more improvement in grade-point averages. It was concluded that, while the improvement was not great in some instances, remedial work can be of help if carefully organized and supervised.

Kilby studied the effect of a remedial program upon scholastic improvement in Yale University freshmen in 1943. (45:513-534) He found that freshmen who received remedial reading instruction earned significantly higher final grade

averages than did untrained students of equal predicted grade status. The combination of procedures used was of value in improving the abilities needed for study in verbal type courses. The effect of the remedial instruction upon particular courses could not be determined.

Preston and Botel found low relationships between college achievement and each of the following factors: reading skill as measured by the Iowa Silent Reading Test; college aptitude as measured by the Scholastic Aptitude Test; and maturity as determined by veteran status. (80:363-371) They agree with Thornton that such things as persistence, emotional adjustment, attitudes, interest, and level of aspiration are perhaps important in prediction of success. (104:266-273)

At Western Michigan College, Dorothy McGinnis made a study which showed quite conclusively that students who enrolled in the Reading Laboratory not only made a marked and statistically significant gain in reading as measured by an objective test, but also made statistically significant higher point-hour-ratios than an equivalent group of students who did not do corrective work in reading. (62:166-173)

Many researchers who have reported gains in reading skills or academic achievement feel that students profit more by volunteering to take a reading course than those who are forced to enter such a program. One study gave evidence that the students who were assigned to a probationary status, and were required to participate in the University of Maryland

study skills program, were benefited academically. (5:231-234) Also, the great majority of these students recognized and stated the benefits they felt they received despite the opportunity to be abusive. It appears that compulsory training does help many achieve their immediate goals despite the stigmatization suffered in varying degrees by students when first placed on probation.

At Baylor University, Barbe found significant gains were made in remedial reading at the college level. (4:229-237) The gains which were made were still significant six months after the end of remedial work indicating relative permanency. The grade-point average indicated a positive significance in the value of improving students' grades.

A study by Smith and Wood concerned changes in reading performance, permanence of gains and concomitant changes in academic status of clients of a university reading service. (97:151-159) Significant gains in performance (though not necessarily in skill) result for those aspects of reaching which are emphasized in training. Performance gains are maintained and, possibly, increased after a lapse of time (sixty weeks) with no formal training when continued practice is encouraged. Significant superiority in academic status (increasing with time) is demonstrated by experimental subjects over both control and representative freshmen subjects when study and examination skills are emphasized during the training period.

Forty-eight matched pairs of college freshmen formed the population for an experiment in reading improvement at New Mexico College of Agriculture and Mechanic Arts. (107:134-135) One group who had remedial reading showed approximately twice as much change in reading as the control group. Fisher's student "t" device was utilized and produced a critical ratio of 4.07 which was significant at the .01 per cent level of confidence. A difference in first-semester mean grade-point average was found between the remedial and control groups. The difference of .40 between grade-point averages produced a critical ratio of 3.00 which was significant at the .01 per cent level. If one assumes that grade-point average is a reputable demonstration of academic ability, a substantial gain favored the remedial group.

McDonald's study of students who completed the Cornell Reading Program showed that they significantly surpassed students in the control group in regard to cumulative grade-point average for the three semesters of study. (58:171-181) They also made significantly more grade-point averages above 70 than did students in the control group and there were significantly fewer dropouts for the entire period of the study than for either the control group or the remainder of the freshman class.

This investigation suggests that students who completed the reading program significantly surpassed students in the control group in academic performance. (60:104-109) It

indicates the influence of the reading program as a whole. In view of the vital role that vocabulary plays in reading, it does not seem unreasonable to conclude that the vocabulary development program contributed to this influence, and so to see in these results confirmation of the findings reported earlier.

In 1950, Robinson stated that current remedial practices at the college level revealed consistent shortcomings with respect to validation of techniques. (84:93-96) Academic criteria have been generally disregarded in the evaluation of remedial work, and other methods, facile but less relevant, employed to demonstrate supposed improvement. Motivational factors involved in the student selection of remedial course work have been completely neglected in appraisals found in the literature.

Results of a combined questionnaire-and-interview survey of student attitude toward a non-credit and volunteer course in remedial reading, in Yale University, were reported. Initial motivation ranged widely. Less than half the group investigated displayed original motivation which was considered instructionally advantageous; the majority of students participated either through coercion or as a means of avoiding certain environmental demands. In an evaluation of a classroom remedial program by means of scholastic performance, an attempt was made to take into account the initial motivation of participating subjects. Following the training

period the remedial students showed average academic gains approaching significance over the control group.

At the University of Miami, Mouly took an experimental group of one hundred and fifty-five students who took remedial reading for one semester and equated the results by means of an analysis of covariance with a control group of one hundred and sixty-four students. (66:459-466) The one hundred and sixty-four students were either excused from the program for experimental reasons or who, in various ways, avoided taking the course.

Honor-point ratios for the period of two years for those still in attendance or for the period of their attendance for the students who had attended at least one full semester were calculated for both experimental and control groups and adjusted for initial differences in reading and psychological test scores. Only slight differences were found in the average honor-point ratio and rate of drop-out. However, when only that portion of the experimental group which had successfully completed the remedial reading program is compared with the control group, significant differences in favor of the former are found. It was concluded that a remedial reading program can result in an improvement in academic grades for those students who take the course seriously.

An important unknown factor in the study was the effect upon academic grades of the differences in personality characteristics, if any, between those students who obliged by

taking the required remedial reading course as compared with those in the control group who, although also required to take the course, intentionally or unintentionally avoided doing so. This would also tend to be a disturbing factor in institutions where the remedial reading program was on a voluntary basis.

Subjects used in an experiment by Reed were eighteen pairs of hospital contract nursing students who were freshmen at Wayne University in 1956. (81:257-264) Reed concluded that short-term training in reading does not yield material differences in fundamental comprehension and vocabulary skills or in grade averages. However, this course was only held for nine weeks, so Reed stated that it would be rather surprising if, as the result of so short a reading training course that substantial differences were made in academic achievement. He felt that more attention should be directed to the appropriate matching of experimental and control subjects.

In September, 1957, there were four hundred and forty-three freshmen enrolled in regular reading classes in Morgan State College. (49:20-32) In eight weeks there was a ten point increase between the medians of the first and second tests. At the end of the semester, there was a median gain of thirteen points. A study of the three upper-score brackets in the final test shows that seventy-five students out of seventy-eight reached or exceeded the fiftieth percentile. Whereas only fifteen or 3.4 per cent read at or above the

fiftieth percentile at the beginning of the course, the number increased to one hundred and four at mid-semester and to one hundred and seventy-nine or forty-one per cent at the end of the semester.

The students were divided into four groups for instruction. Group I were students who began the course reading at a level expected of college freshmen. The course helped these able readers to improve themselves, as the group gained from percentile fifty-nine to percentile seventy. Group II were freshmen whose initial performances were low, but who had the ability to improve themselves quite rapidly. Beginning at the fourteenth percentile their median score increased to the equivalent of the sixty-second percentile in eight weeks. Group III were the "high" students in the three-level program. They were not severely handicapped in reading to begin with as their median score initially was equivalent to the thirty-second percentile. However, it increased to the fifty-ninth percentile at the end. The median of Group IV, the "intermediate" level, began at a relatively low level, the nineteenth percentile, but increased to the forty-eighth percentile. This group achieved a level only slightly below that of freshmen. Group V was the problem group. Its number, two hundred and thirty-one, was larger than any of the other groups. Although, it increased its median score from the twelfth to the twenty-fourth percentiles its final level of achievement was unsatisfactory. A study of individual

scores revealed, however, that fifty-two out of two hundred and thirty-one attained the fiftieth percentile or better. Nevertheless, the majority must still be considered to be "retarded" readers and "problem" students, in all likelihood.

Bloomer reported an experiment in which two groups of students composed of forty students each were put into an experimental and a control group. (14:110-118) Each was given the Diagnostic Survey Reading Test before the twelve-week experiment began. Grade-point ratios for the first semester of work for the students in both groups were determined. These were correlated with initial test scores, which represented gains in reading ability. By means of a multiple regression equation, the predicted college average for the group was calculated from high school grades in academic courses and scores in the American Council of Education Psychological Examination. An "academic gains score," representing over- or under-academic achievement was determined from the difference between the predicted college average and the actual grade-point ratio. This was also correlated with the initial test scores and gains in reading ability.

The results of the initial administration of the Diagnostic Reading Survey Test, to the experimental and control groups, indicated no significant difference between the groups at the onset of the experiment.

When gains between the pre- and post-tests were considered, the experimental group showed significant gains over

the control group in number of words per minute and in comprehension. On the other hand, the control group gained in vocabulary scores at a greater rate than the experimental group.

No differences appeared between the groups in achieved grade-point average at the end of the semester. However, when the achieved grade-point average was corrected for the predicted college average, the resulting "academic gain scores" indicated a highly significant difference in favor of the experimental group. In addition, at the end of the first semester, three of the experimental group left school, whereas six of the control group departed. Further, while thirteen of the experimental group were reported on probation at the end of the first semester, twenty of the control group were on probation. A significant chi square of 5.76 indicated that a greater proportion of the experimental class was retained and not on probation.

Pallone made a study in which twenty students participated in a pilot developmental reading program in 1959. (73: 654-657) Students were tested at the beginning and termination of the course on parallel forms of the ETS Cooperative Reading Test. Approximately ten days after the completion of the course, they underwent the August SAT-Verbal, and these scores were compared with scores obtained in March, 1959. In each case, significant gains appeared. It was surmised that these gains were attributable to real and measurable

improvement in reading skills as an effect of the developmental program.

The long-term developmental program ran from September, 1959, to March, 1960. At the end of the course, significant gains were shown by (a) those who had participated in the long-term program and (b) by those who had taken both programs. Normal expectations in gains during the final secondary year are about thirty-five points in SAT-V, while the two groups gained 109 and 121.9 respectively, considerably higher than predictions of College Board officials would have one expect.

Students initially toward the upper end of the scale tended to show considerably less improvement in scores than those below the national median.

The results of this study indicated a high relation between reading skills and SAT-V scores. There was also evidence that some students reach a saturation level fairly early, possibly within an initial period in which they, typically, grasp new methods quickly, then remain somewhat stable.

Feinberg, Long, and Rosenheck initiated a non-credit Freshman Study Methods course in 1960 at The City College's Bernard M. Baruch School of Business and Public Administration. (29:95-100) Resistance developed because of the mandatory requirement of the course. An informal attitude survey highlighted the students' resistance of a course they were forced to take without credit. The retesting met strong

opposition. It was concluded that the Study Course did not produce any statistically significant changes, due perhaps to the hostility and lack of cooperation. It was further concluded that best results of a reading course are secured when students recognize their own need for training.

Students in a pre-college course in developmental reading at the University of Colorado were given before and after testing with the California Analogies and Reasoning Test.

(56:549) Section I of the student-readers received Form A of the test at the beginning of the course, and Form B at the ending. Section II of the readers received the tests in reverse order.

The mean gain for students taking test Form A at the beginning of the course and Form B at the ending was eight percentile rankings based on thirteenth graders. The mean gain for those taking the tests in the opposite order was fourteenth percentile rankings based on thirteenth graders.

Thus, the mean gain for all persons participating in the investigation was eleventh percentile rankings. There seemed to be a likely relationship between a person's ability to read and how well he performs on a certain test designed to evaluate college aptitude. This conclusion perhaps becomes more significant when it is realized that most of the persons participating in the study were not considered problem readers.

At the onset of a study by Olson and Others at the University of Maine, the control group (no reading instruction) was superior to the experimental group on all sub-tests of the Nelson-Denny Reading Test as well as the Otis I.Q. (71:75-82)

The mean scores on the Nelson-Denny Reading Test indicated that the experimental group attained parity with the control group in comprehension and reading rate. The control group retained its superiority in both vocabulary and total score.

The analysis of covariance indicated that the experimental group made significantly greater gains than the control group on all sub-tests on the Nelson-Denny Reading Test, except the vocabulary test.

The University of Kentucky initiated a study which indicated improvement in both speed and comprehension for the majority of students. (86:126-129) The findings of an overall improvement of nine per cent in words per minute and twenty-six per cent in comprehension have convinced the staff of the Counseling Service of the value of the time spent by both teachers and students.

Cranney reported seven studies of college reading programs operating in 1961-62. (23:77-88) The Reading Dynamics Program was reviewed using student data collected before and after training by instructors of the Institute. Various

magazines and newspaper reports had reported students reading at ten thousand words per minute and upwards. Utilizing camera and comprehension checks, the researcher found that students show a small average rate gain of twenty to twenty-five per cent; in the test selections the average rate was between four hundred to six hundred words per minute, with the fastest at nine hundred words per minute. In skimming exercises various groups covered eighteen hundred to twenty-four hundred words per minute; gains in comprehension were less than five per cent -- averaging about seventy per cent; and comprehension in skimming was weak -- averaging about fifty per cent after training. Contrary to some reports, the researcher, using eye movement records, found the students generally making one fixation per line while skimming and not reading large portions of the page at a single fixation.

Little also studied this program and found significant gains on both fictional and non-fictional materials. (51: 13-15) No significant gains were achieved in comprehension and, in the case of fictional materials, a significant negative difference was reported by the experimental group. Reliabilities of the experimenter-constructed tests ranged from .46 to .69.

A five-year project financed by a Carnegie grant and sponsored jointly by the Brooklyn Public Library and Brooklyn College was described by Siegal. (94:258-262) Significant

gains in both speed and comprehension were reported for most groups and were retained after a six-month interval. The greatest gains in reading achievement appeared to be associated with level of intelligence and age, the brighter and younger students making the greater gains.

Summary and Conclusions

There have been a great many studies concerning the relationship of reading training and academic success. Nearly all of these report positive statistical correlation even though the studies have attempted to deal with different variables.

The first part of the review of the literature dealt with reading ability and scholastic success. The findings in this area vary according to the size of correlation. Reading ability appears to be related to college success to a degree.

The second part of the literature described reading programs in general, and described a few typical programs in detail. Most programs have three major functions: diagnosis, training, and evaluation. Many reading devices are used and a wide array of materials are employed to achieve particular purposes.

The following are some general conclusions resulting from this study:

1. Many investigators found reading ability related to reading performance.

2. Some studies of reading ability and performance suggest that verbal sections of test results correlate more highly with reading scores than non-verbal scores.
3. The effects of reading training were found to be of positive significance in many studies; others revealed no significance or a negative significance.
4. There was no study which showed an unequivocal relationship between reading and intelligence.
5. Many authorities believe personality factors, such as persistence, emotional adjustment, attitudes, interest, and level of aspiration play a significant role in results obtained. However, no conclusive evidence has been reported to date.

Adams has concluded, along with many others, that no matter what kind of reading program exists, it will fail without trained, interested, and creative teachers. (1:396-401) The need to change the student's self-concept is extremely important in providing impetus to whatever methods are applied. Screening through diagnostic testing and interviewing before admitting a student into the reading program gives admission to such a course some status and removes the "dumping ground" attitude toward Reading Skills classes.

CHAPTER III

DESIGN OF THE STUDY

This chapter includes a statement of the null hypotheses, a description of the population used in the study, the tests and testing procedures, the reading course at Cdessa College, and a description of the methods of statistical analyses used to test the hypotheses.

The Null Hypotheses

- I. There is no significant difference in grade-point averages made by college students who take a developmental reading course and those who do not take a reading course in Cdessa College, Cdessa, Texas.

The alternative hypothesis is that students who take a course in developmental reading make better grade-point averages than those who do not take such a course.

- II. There is no significant difference in the number of males who take developmental reading than in the number of females who take developmental reading at Cdessa College, Cdessa, Texas.

The alternative hypothesis is that there are more males than females who take developmental reading at Cdessa College, Cdessa, Texas.

The Population

The forty pairs of students used in this study were chosen

from two hundred and ninety-three freshmen who entered Odessa Junior College, Odessa, Texas in the fall of 1963 and who attended Odessa College for at least two semesters.

Students who completed a course in developmental reading (the experimental group) were matched with those who did not take reading (the control group) on five variables: Nelson-Denny Reading Test score, verbal SCAT score, class load, sex, and age. The data are given in Table I.

Since most students with a high level of reading ability do not take a course in reading improvement, very few of these were used in the study. On the other hand, few students below the eighth grade reading level were selected since most of these students do take the reading course. Therefore, the population used in the study, in general, represents average and below average students in terms of initial scores on college entrance examinations.

The mean reading score, SCAT score, class load, and age are given for males and females for both the experimental and control groups in Table III. Inspection of this table will show that the groups appeared to be evenly matched.

Tests and Testing Procedures

Before the beginning of each academic year all students planning to enter Odessa College are given a battery of tests. The Nelson-Denny Reading Test is used to survey reading rate, vocabulary, and comprehension skills. According to the authors this test serves predictive, screening and broadly diagnostic purposes. (67:3) For screening and for prediction of

TABLE I. READING RAW SCORES, SCAT SCORES, CLASS LOAD, SEX, AND AGE OF FORTY MATCHED PAIRS

Pairs	Reading Score		Verbal S.C.A.T.	Class Load	Sex	Age
	Raw Score	Grade Level				
1. A *	89	14.0+	290	19	M	19
B	93	14 +	293	18	M	19
2. A	118	14 +	302	24	F	19
B	122	14 +	309	26	F	19
3. A *	90	14 +	303	32	M	23
B	90	14 +	299	31	M	19
4. A *	78	13.3	293	36	M	19
B	78	13.3	293	25	M	19
5. A *	76	13.1	293	22	F	20
B	75	13.1	291	24	F	20
6. A *	75	13.1	286	29	M	20
B	75	13.1	303	28	M	20
7. A *	74	13.0	303	21	M	20
B	74	13.0	293	29	M	19
8. A *	72	12.8	292	31	F	19
B	73	12.9	291	26	F	20
9. A *	73	12.9	284	27	F	19
B	73	12.9	290	31	F	20
10. A *	72	12.8	292	15	M	20
B	71	12.7	287	18	M	19
11. A *	71	12.7	280	27	M	19
B	71	12.7	291	32	M	18
12. A *	67	12.4	288	30	F	19
B	69	12.6	290	26	F	20
13. A *	69	12.6	287	23	F	25
B	67	12.4	298	16	F	24
14. A *	69	12.6	294	25	M	20
B	67	12.4	296	24	M	19

* Had Reading Course

TABLE I. (Continued)

Pairs	Reading Score		Verbal S.C.A.T.	Class Load	Sex	Age
	Raw Score	Grade Level				
15. A *	64	12.1	271	18	M	20
B	62	11.9	293	18	M	20
16. A *	62	11.9	277	21	F	21
B	63	12.0	280	18	F	20
17. A *	61	11.7	295	23	F	19
B	60	11.6	302	24	F	19
18. A *	60	11.6	293	32	F	20
B	60	11.6	284	26	F	23
19. A *	59	11.4	284	23	M	19
B	60	11.6	287	20	M	20
20. A *	58	11.3	292	31	M	19
B	59	11.4	302	26	M	19
21. A *	56	11.0	292	30	F	20
B	58	11.3	287	26	F	19
22. A *	57	11.1	277	23	F	19
B	56	11.0	267	18	F	19
23. A *	57	11.1	283	21	F	19
B	60	11.6	287	16	F	19
24. A *	56	11.0	292	25	M	20
B	56	11.0	284	22	M	19
25. A *	56	11.0	300	20	F	25
B	57	11.1	306	23	F	25
26. A *	56	11.0	288	22	M	20
B	56	11.0	283	23	M	21
27. A *	55	10.9	263	21	F	19
B	55	10.9	267	24	F	19
28. A *	54	10.7	284	23	M	20
B	54	10.7	273	24	M	20
29. A *	54	10.7	290	23	F	19
B	54	10.7	284	27	F	19

TABLE I. (Continued)

Pairs	Reading Score		Verbal S.C.A.T.	Class Load	Sex	Age
	Raw Score	Grade Level				
30. A *	52	10.4	281	32	M	19
B	55	10.9	293	32	M	19
31. A *	55	10.9	269	24	F	19
B	59	11.4	273	27	F	19
32. A *	50	10.2	283	26	F	20
B	55	10.9	281	25	F	20
33. A *	51	10.3	289	20	F	19
B	54	10.7	281	19	F	19
34. A *	51	10.3	284	24	M	19
B	51	10.3	292	25	M	19
35. A *	48	9.9	288	18	M	19
B	48	9.9	290	21	M	22
36. A *	47	9.8	279	22	M	20
B	47	9.8	271	24	M	21
37. A *	47	9.8	292	18	M	21
B	47	9.8	287	22	M	23
38. A *	38	8.8	269	18	F	21
B	38	8.8	260	21	F	20
39. A *	37	8.6	257	26	M	19
B	37	8.6	279	29	M	19
40. A *	33	8.2	279	27	M	22
B	33	8.2	267	24	M	20

TABLE II. MEAN AGE AND CLASS LOAD (NUMBER OF SEMESTER HOURS) OF STUDENTS ENROLLED AND NOT ENROLLED IN READING

	Enrolled		Not Enrolled	
	Male (N=21)	Female (N=19)	Male (N=21)	Female (N=19)
Mean Age	20.76	19.05	20.62	19.68
Mean Class Load	24.43 s.hrs.	24.16 s.hrs.	24.52 s.hrs.	23.32 s.hrs.
TOTAL	Enrolled (N=40)		Not Enrolled (N=40)	
Mean Age	19.91		20.15	
Mean Class Load	24.29 s. hrs.		23.92 s. hrs.	

TABLE III. MEAN SCAT AND READING RAW SCORES OF STUDENTS ENROLLED AND NOT ENROLLED IN READING

	Enrolled		Not Enrolled	
	Male (N=21)	Female (N=19)	Male (N=21)	Female (N=19)
Mean Reading	60.952	62.474	61.143	63.58
Mean SCAT	286.24	264.53	288.33	285.74
TOTAL	Enrolled (N=40)		Not Enrolled (N=40)	
Mean Reading	61.675		62.05	
Mean SCAT	275.39		287.04	

academic success, the total score is most useful. For diagnosing individual problems, strengths, and weaknesses, the subtest scores in vocabulary, comprehension and rate are most useful. Students who rank below the eleventh grade level on the total score are not compelled to take developmental reading, but are strongly urged to do so by the academic counselors or the dean. Some students volunteer to take the reading course even though they already have a high level of reading ability.

The Cooperative School and College Ability Test is also part of the battery of tests given to each freshman. It is used extensively by colleges and universities in order to measure capacity for academic ability. Satisfactorily reliable part and total scores are provided to yield a verbal score, a quantitative score, and a total score. (18:645)

Goldman found the contents of the verbal portion of the Wechsler Adult Intelligence Scale and the items included in the Cooperative School and College Ability Tests (SCAT) to have a striking similarity. The corrected correlation of .89 between the verbal halves of the WAIS and the SCAT which was obtained in this study strongly suggests these two sets of test items are measuring very nearly the same abilities.

The verbal score of the SCAT was used in this study as well as the total score of the Nelson-Denny test in matching pairs. There appeared to be, in most cases, a high degree of

correlation between verbal ability and reading score. This relationship was discussed in the previous chapter.

In addition to the initial Nelson-Denny Reading Test, which was administered to all entering freshmen, the students who enrolled in developmental reading were given an alternate form of the Nelson-Denny test at the end of the semester. The other group did not have such a test.

As an adjunct to this study, twenty-three of the students who took reading and thirty-six who did not take reading were given an alternate form of the Nelson-Denny Test in the spring of 1965. This was almost two years after the first test was given. The purpose was to determine if the gains made by the group who had taken reading were significantly higher than those who did not take reading.

The academic success of the student was measured by the academic grade in each course. The grades ranged from A, which was given a value of three honor points, to D and F, which were given values of zero honor points. Although grades cannot be considered to be absolutely reliable they are constantly used in awarding prizes or in determining probationary status, for determining admission to another college or to a graduate school, and even in estimating acceptability for employment. (22:428-430) Clark concluded in his study that the ratio of the weighted standard deviation of student averages to the standard deviation of all grades, using the credit hour as the unit, can be taken as an indication of the reliability of individual grade-point averages.

Reading Course at Odessa College

The Developmental Reading Course at Odessa College is very similar to those reported in the literature. The general objectives are to help the student develop basic skills and to provide practice in various kinds of reading material. If the student can achieve a better reading background he will also gain self-confidence and become a better adjusted individual personally as well as academically.

There are twelve sections of Developmental Reading. The classes meet for one hundred and forty minutes per week for eighteen weeks or one semester. The course is entitled "English III" and carries one hour of credit. Usually this is non-transferable to a senior college but may, in some instances, be counted as an elective credit.

The enrollment is limited to sixteen students per section so that individual help may be given to each student and so that the teacher may become well acquainted with each student's problems.

At the beginning of the semester a series of tests are further administered for diagnostic purposes. In addition to the Nelson-Denny Reading Test, one form of the Diagnostic Reading Test is given which yields a rate score, two types of comprehension scores, vocabulary, and total score. One form of the Word Clues Test is also given in order to determine the placement level for assigning materials in vocabulary building. A diagnosis is also made concerning structural and

phonetic analyses skills which enables the teacher to pinpoint the student's lack of understanding in basic skills. With all of these test data, the teacher can diagnose any difficulty a student may be having in skills. At the end of the course, alternate forms of all of these tests are given to see how much gain the student has made. The test scores are used at the beginning to assign various graded materials to each student.

Before the students actually begin working, discussions are held concerning ways in which all people read and habits which many poor readers have established over a long period of time. Sometimes bad reading habits disappear simply by becoming aware that they are bad habits. Suggestions are also given for ways of approaching various textbook materials such as biology, sociology, etc. Methods of organizing materials for study, and finding main ideas in paragraphs and other reading selections are discussed. Other suggestions are given concerning the development of power of retention and concentration. It is necessary, at the beginning, to motivate and challenge the student so that he will be enthusiastic about the opportunity being presented to him.

The reading center is equipped with various reading workbooks, library books, mechanical devices, and other materials designed to help any individual improve his reading skill regardless of reading ability level. The student is assigned the proper materials for increasing his skill in all needed

areas. Most of the time students work individually, but small group work and work involving the class as a whole are used also.

The mechanical devices, the pacer, and the Controlled Reader filmstrip machine, are used to motivate the student to read faster and more correctly. The pacer forces the student to read one line ahead of a moving metal plate which comes down over a page of print. The student may adjust the machine to any speed, but he must be understanding adequately what he is reading. The Controlled Reader is a filmstrip which is shown to students at a fixed rate set by the instructor. The students are forced to follow a bead of light from left to right in order to read the material. After reading, a comprehension test is given. Immediately after using one of the visual devices, the student reads without the aid of a device and tries to follow the same pattern as when using the device. Reading at a slightly faster rate of speed will often improve comprehension and develop better habits of concentration. The student is not allowed to day-dream while reading since he is being timed and must comprehend at the same time.

Vocabulary is taught by means of assigning the proper level of programmed learning vocabulary workbooks. The students are responsible for learning to pronounce each word, spell the word, and know its meaning. Small group discussions are held each week so that the instructor may check on pronunciation, etc.

Mimeographed forms are given to each student enabling

him to keep his own scores for the mechanical devices and work materials.

At the end of each of the three six-week periods, the student and instructor make an evaluation of each pupil's progress. Conferences are held which give the students an opportunity to discuss problems, viewpoints, criticisms, etc. that may be hampering progress. Each student is required to have a given amount of work done. All work materials are thoroughly checked and suggestions for improvement are made.

At the end of the course alternate forms of the tests used at the beginning are given. An evaluation is made of the student's progress in terms of gains made on the tests as well as classroom performance, improved attitudes, increased interest, and other tangible and intangible indications of progress made.

More progress is made in the area of rate of reading than any other. This is desirable if proper gains in comprehension have been made also. The students gain, on an average, about two scholastic years' growth in sixteen weeks.

Methods of Statistical Analyses

The first statistical technique utilized in the study was the matched pairs "t" test to determine the significance of the mean difference between the experimental group and the control group.

The "t" test was selected because the data could be construed to have met most of the assumptions associated with a

parametric test. The conditions which must be satisfied to make the "t" test the most powerful one are given as follow by Siegal:

1. The observations must be independent. That is, the selection of any one case from the population for inclusion in the sample must not bias the chances of any other case for inclusion, and the score which is assigned to any case must not bias the score which is assigned to any other case.
 2. The observations must be drawn from normally distributed populations.
 3. These populations must have the same variance (or, in special cases, they must have a known ratio of variances).
 4. The variables involved must have been measured in at least an interval scale, so that it is possible to use the operations of arithmetic on the scores.
- (94:26-31)

All of the above conditions (except No. 4, which states the measurement required) are elements of the parametric statistical model. With the possible exception of the assumption of equal variances, these conditions are ordinarily not tested in the course of the performance of a statistical analysis. Rather, they are presumptions which are accepted, and their truth or falsity determines the meaningfulness of the probability statement arrived at by the parametric test.

Since these conditions were met, there was reason to believe that the parametric "t" test was the most logical choice for the data under analysis.

The second statistical method selected was the chi square to test the null hypothesis that there are no more males than females who take reading. This method was chosen because the hypothesis under test concerned a comparison of observed and expected frequencies in discrete categories. According to Siegal, research is frequently undertaken when the researcher is interested in the number of subjects, objects, or responses which fall in various categories. (95:43) The chi-square test is suitable for data like these. The number of categories may be two or more. The technique is of the goodness-of-fit type in that it may be used to test whether a significant difference exists between an observed number of objects or responses falling in each category and an expected number based on the null hypothesis.

An assumption made in the chi-square test is that the individual observations which make up the frequency in any one cell are independent of one another. (55:99-100) A further limitation on the application of the chi-square test is that no more than twenty per cent of the expected frequencies may have values of less than five. It appeared that the chi-square test would be the most logical one to use in this study.

CHAPTER IV
ANALYSIS OF THE FINDINGS

Through the application of the treatment discussed in the previous chapter certain results relevant to the problem were obtained. It is the purpose of this chapter to describe the findings.

The first null hypothesis which was formulated stated that there was no difference in grade-point averages of those students who had taken a reading course and those who had not. The matched pairs "t" test is reported for testing this hypothesis.

Matched Pair "t" Test

The grade-point average for each student in the forty pairs was calculated. The results are shown in Table IV. The mean difference for the matched pairs was then calculated and utilized in the following formula for a matched pairs "t" test given by Hays. (39:333-335)

TABLE IV GRADE-POINT AVERAGES AND DIFFERENCES FOR
EACH STUDENT IN THE FORTY MATCHED PAIRS.

Matched Pairs		Grade-Point Average	Difference
1.	A *	1.3	
	B	.7	+ .6
2.	A	3.0	
	B	1.5	+1.5

* A - Students who participated in the reading program.

TABLE IV. (Continued)

Matched Pairs		Grade-Point Average	Difference
3.	A B	1.9 1.3	+ .6
4.	A B	2.2 1.9	+ .3
5.	A B	1.1 1.8	- .7
6.	A B	1.2 1.0	+ .2
7.	A B	1.1 1.1	0
8.	A B	1.2 1.5	- .3
9.	A B	1.7 1.6	+ .1
10.	A B	.9 0	+ .9
11.	A B	.8 .9	- .1
12.	A B	2.3 1.8	+ .5
13.	A B	1.1 1.9	- .8
14.	A B	2.2 1.3	+ .9
15.	A B	.5 .7	- .2
16.	A B	.8 .3	+ .5
17.	A B	1.2 2.6	-1.4

TABLE IV. (Continued)

Matched Pairs		Grade-Point Average	Difference
18.	A	2.0	
	B	1.2	+ .8
19.	A	.7	
	B	.6	+ .1
20.	A	2.3	
	B	1.1	+1.2
21.	A	1.2	
	B	1.0	+ .2
22.	A	1.6	
	B	1.2	+ .4
23.	A	.6	
	B	.6	0
24.	A	1.1	
	B	.5	+ .6
25.	A	.8	
	B	1.8	-1.0
26.	A	.7	
	B	.8	- .1
27.	A	.6	
	B	1.3	- .7
28.	A	1.0	
	B	1.0	0
29.	A	.9	
	B	.6	+ .3
30.	A	1.2	
	B	1.1	+ .1
31.	A	.8	
	B	.6	+ .2
32.	A	1.6	
	B	.2	+1.4

TABLE IV. (Continued)

Matched Pairs		Grade-Point Average	Difference
33.	A	1.2	
	B	1.3	- .1
34.	A	.9	
	B	.9	0
35.	A	.3	
	B	.4	- .1
36.	A	.5	
	B	0	+ .5
37.	A	1.0	
	B	.7	+ .3
38.	A	.2	
	B	.1	+ .1
39.	A	.5	
	B	.9	- .4
40.	A	1.2	
	B	1.2	0

$$M_D = \frac{\sum D}{N}$$

$$S_D^2 = \frac{\sum D^2}{N} - M_D^2$$

$$\text{est. } \sigma_{M_D} = \frac{SD}{\sqrt{N - 1}}$$

$$T = \frac{M_D - E(M_D)}{\text{est. } \sqrt{M_D}}$$

$$df = N - 1$$

The obtained value of the statistic ($t = 8.938$, $df = 39$) was statistically significant beyond the $\alpha = .001$ level.

The Chi-Square Test

The second null hypothesis stated that there are no more males than females who take the developmental reading course. The chi-square method of treatment was used to test this hypothesis. The observed and expected frequencies for females enrolled and not enrolled in reading are presented in Table V.

The chi-square was determined by the use of the following formula: (95:43)

$$\chi^2 = \sum \frac{(O - E)^2}{E}$$

$$df = (r - 1) (k - 1)$$

r = no. of rows

k = no. of columns

$$\therefore df = 1$$

It was found that $\chi^2 = 1.157$ ($df =$) which was not statistically significant. Therefore, in this study, the null hypothesis that sex is independent of taking or not taking a reading course could not be rejected.

Interpretation of the Findings

Table VI shows the mean grade-point averages for the males and females in the forty matched pairs and is further sub-divided into those who did and did not take reading. It can be seen that the difference for the males between those in the experimental group and those in the control group was

TABLE V. OBSERVED AND EXPECTED FREQUENCIES OF MALES AND FEMALES ENROLLED AND NOT ENROLLED IN READING.

	R	NR	
M	O = 53	O = 131	
	E = 57.1	E = 126.7	184
F	O = 38	O = 71	
	E = 33.9	E = 75.1	109

TABLE VI. MEAN GRADE-POINT AVERAGE FOR FORTY MATCHED PAIRS OF MALES AND FEMALES ENROLLED AND NOT ENROLLED IN READING.

	E	NE	D
M	1.114	.866	.248
F	1.258	1.205	.053
D	.144	.339	.195

appreciably greater than the same comparison for females. This would suggest that males improve more than females with the aid of a developmental reading course. However, a statistical analysis of this was not made because it would tend to be misleading. This is because the males in the experimental group were appreciably lower than the females in that group. Therefore, the differences between the reading and non-reading groups for males and females appeared not to be comparable. The fact that the differences between reading and non-reading for the males were greater than the differences for the females may be due simply to the fact that the male non-readers had a substantially lower grade-point average.

As an adjunct to this study, twenty-three students who had the reading course and thirty-six students who had not were given an equated form of the Nelson-Denny Reading Test in the spring of 1965. This was almost two years after they took the first Nelson-Denny Test in the fall of 1963. This study was made for three reasons. The first was to discover whether or not the students who took the reading course improved and secondly, whether or not they retained the gains made at the end of the reading course. The third reason was to investigate whether or not the group who had not taken reading improved reading skills simply by virtue of being in school. Results of the mean gain scores are given in Table VII.

TABLE VII. MEAN GAIN SCORES FOR STUDENTS ENROLLED AND NOT ENROLLED IN READING ON THE NELSON-DENNY READING TEST GIVEN TWO YEARS AFTER INITIAL TEST.

	Enrolled		Not Enrolled	
	Males (N=16)	Females (N = 7)	Males (N = 22)	Females (N = 14)
Vocabulary	14.06	10.29	-2.45	.063
Comprehension	11.69	10.43	- .09	1.0
Rate	36.88	29.71	-2.14	15.43
Total Gain	13.25	8.14	-1.05	2.32

	Enrolled (N = 23)	Not Enrolled (N=36)
Vocabulary	12.18	- .047
Comprehension	11.06	.083
Rate	33.69	6.645
Total Gain	10.69	- .065

It can be seen that the students who had reading showed much more gain in all four areas than the students who did not have reading. A statistical analysis of the difference between the gain scores on each variable would obviously be significant, but such an analysis would be misleading. Most of the students who did not take reading were already very good students and had reached the upper limits of the standardized test. The ones who did take reading were below average students and had much more room to show a large gain in all areas.

Interpretation of the Findings

The first null hypothesis was that students who take developmental reading do not make a higher grade-point average

than those who do not. This hypothesis was rejected. The research hypothesis was supported by finding that those enrolled in developmental reading did make higher grade-point averages.

The grade-point average for those enrolled in reading was 1.186 while the grade-point average for the other group was 1.035. The results indicate that improvement of reading skills does substantially influence level of academic achievement. While the mean reading and SCAT scores were somewhat higher for those not enrolled in reading, the other group surpassed them in grade-point average. The average class load for those enrolled in reading was 24.29 semester hours while the other group took 23.92 semester hours of credit. If either group had any initial advantage, it was the group who was not enrolled in reading. Therefore, any statement as to the statistical significance would tend to be conservative assuming these variants to be relevant.

There appeared to be a relationship between the reading scores and the grade-point averages. The males had an initially lower mean reading score and also a lower grade-point average than the females. This may be interpreted that reading scores do influence academic achievement.

One would anticipate, according to other studies that have been made, that the verbal scores on the SCAT would be lower also for the males. However, this was not true and the SCAT scores appeared not to be as significant as the

initial reading scores for predicting academic success.

Students, however, who had both a high initial reading score and high verbal SCAT score appeared to have substantially higher grade-point averages than those with low scores on both tests. This would indicate again that these two variables are important in relation to academic achievement.

The high achievers also took a greater number of semester hours credit, in most cases, than low achievers. Good basic reading skills apparently determine the number of credits a student can successfully carry during a semester.

The second null hypothesis given was that there are no more males than females who take developmental reading. The various claims to sex differences would lead one to expect that a greater number of males would take reading than females. There was no statistical difference found in this study. The ratio between the number of males taking reading was nearly equal to that of the females. This is not to say, however, that among those who did take reading that the females did not perform better than the males. There are some indications that this, in fact, may be the case. (See Table VI.)

In addition to working with the forty matched pairs, the decision was made to collect other data in order to support the study of grade-point averages discussed previously. Twenty-three students who had taken reading in the fall of 1963 and thirty-six students who had not taken reading were

given another form of the Nelson-Denny Reading Test in the spring of 1965. Many of these students were the same ones used in the matched pairs study. It was impossible to use exactly the same population since many of the students were attending school elsewhere or had dropped out of school completely.

This test was given in order to substantiate the fact that students enrolled in reading do make important gains in the areas of vocabulary, comprehension, and rate. Freshman norms were used in determining the percentile for the first test given in 1963. In 1965, sophomore norms were compared with the earlier percentile scores. These determined the gains made on the Nelson-Denny Test as shown earlier in Table VII.

An inspection of this table will show that on the average those who took reading improved their scores on each of the variables, vocabulary, comprehension, rate, and total score much more than those who did not take reading. However, as mentioned before, while a statistical analysis of the data would undoubtedly be significant, the results would be misleading due to the fact that the group who had reading had more room to improve. The students in the group who did not take reading, for the most part, already had a high level of reading ability and could not improve much more because they had reached the upper limits of the test.

The largest gain made in each group was in rate of reading. Since there is so much more assigned reading in college than in high school, the students may have found that they were forced to read faster to cover the assigned materials. The group who took reading had a mean gain score in reading rate of 33.8 while the other group only gained 1.97.

In vocabulary the mean gain score for the group inrolled in reading was 12.91 while the other group regressed -.047 per cent. It was difficult to understand this regression. Perhaps the students were motivated on the first test to perform well because the test was part of a battery of college entrance examinations. They took the second test largely as a favor to the instructor and realized that this score would not affect their status in any way.

The group who was enrolled in reading increased 11.06 per cent in comprehension, while the other group increased .083 per cent. Comprehension is probably the best indicator on the test of scholastic performance. These figures indicate that, as a result of receiving help in comprehension skills, the group who took reading made substantially higher gains than did the other group.

The results obtained in the entire study support the hypothesis that students with average, below average, and even low reading ability can improve their basic reading skills in a carefully planned program of improvement.

CHAPTER V

SUMMARY AND CONCLUSIONS

Summary of the Study

The purpose of this study was to determine the effects of a one-semester, one-credit reading improvement course upon academic achievement. The reading course is usually taken by freshmen who score below the eleventh grade level as measured by the Nelson-Denny Reading Test. Academic achievement is measured by grade-point average in required or "solid" subjects.

The experimental population was drawn from a total available freshman population of five hundred and ninety students who took the college entrance examinations in the fall of 1963. Out of this population, two hundred and ninety-three students attended Odessa College for at least two semesters. The forty pairs, the experimental and control groups, were chosen from this population.

The students in the experimental group enrolled in a freshman English course emphasizing the improvement of reading skill. Control students were not enrolled in the course. Classes met either two eighty-minute periods or three fifty-minute periods for eighteen weeks. The training was given to the experimental group in six different sections taught by one instructor in the fall of 1963. Besides the improve-

ment of reading skill, the experimental training was also designed to improve study skills, to attain a better attitude toward reading, and to develop self-confidence through the formation of a better self-concept.

The forty pairs were matched on five variables: initial reading score, SCAT score, class load, age, and sex. The groups appeared to be evenly matched. If either group had an initial advantage the control group did since the mean reading score and SCAT score were higher.

Grade-point averages for both groups were calculated and a mean difference found. A "t" test was used to examine the hypothesis and a significant difference was found in favor of the experimental group. Therefore, it seems quite likely that the reading course does have some effect upon grade-point average.

Another part of the study concerned sex differences in reading ability. It was hypothesized that more males would take the reading course than females. A chi-square analysis was used which showed no statistical differences between the number of males taking reading and females taking reading.

As an adjunct to the study, twenty-three students who had taken reading and thirty-six students who had not taken reading were compared in terms of gain scores on the Nelson-Denny Reading Test given initially in the fall of 1963 and again in the spring of 1965. The scores were expressed in terms of percentile gains on comprehension, vocabulary, rate,

and total score on the Nelson-Denny Reading Test. Some of these students were the same as those in the forty pairs. It was impossible to use exactly the same population since some of the students had either dropped out of school completely or were attending school elsewhere.

The twenty-three students who had taken the reading course made much higher gains than those who did not take reading and apparently, had retained the skills they had been taught. However, the group who did not take reading was on a much higher level of ability and did not have as much room to improve. Most of the students had already reached the upper limits of the test. For this reason, no statistical test was computed since it would probably be misleading.

Limitations of the Study

Conclusions drawn from the findings of this study should be considered with strict regard for the following limitations:

1. The findings refer to the specific population studied: forty pairs of students selected from a population of two hundred and ninety-three students entering Odessa Junior College in the fall of 1963 and remaining for at least two semesters. Conclusions which may be drawn are applicable only to this population or to similar populations.
2. Conclusions resulting from the statistical analysis of mean scores can be supported only to the extent that the tests from which the scores were secured were valid and reliable measuring instruments.

3. No method of random sampling was employed in the study as such a procedure was impossible for practical reasons. The forty students chosen for the study who did take reading were the only ones available for matching with the forty students who did not take reading.
4. The purpose of the study was to determine the influence of the reading course in terms of grade-point average. No study was made of such factors as level of aspiration, initiative, personality traits and psychological functions.
5. The students who did not take reading and were on a low ability level either could not take the reading course because of conflicts or simply did not desire to improve their reading skills. This might suggest that these students were not highly motivated to succeed in college and perhaps were only in school because of pressure from home.
6. It was suggested in the literature that the students who take reading are given a great deal of individual attention and consideration. This may account for part of the significance because an attempt was made to motivate the students, to encourage them, to help them solve personal problems, and to help them with any academic difficulty. Reading classes were kept small, sixteen per class, so that

the instructor could know every student very well. No attention was given to the control group except in a general orientation course where one hundred or more students were enrolled.

7. It was impossible to secure an intelligence quotient for each student. However, some studies reported in the literature gave evidence that the verbal subtest on the SCAT seemed to be measuring identical factors found in the Wechsler Intelligence Test.
8. The number participating in the study was quite small. The results would not be applicable to the high level ability students since there were not enough of these students in the experimental group to match with those in the control group.
9. The results would not be applicable to the extremely low ability group since there were no students in the control group available for matching.
10. Although every effort was exerted to match students on five variables, it is possible that some may not have been matched properly or closely enough. The data gathered from the administrative offices of the college were assumed to be correct.
11. There is no absolute way of knowing how reliable grade-point averages are. Only subjects which carried three semester hours of credit or more were

chosen for determining grade-point averages. No consideration was given to the type of curriculum in which the student was enrolled. It is possible that some students were taking subjects much harder than others.

12. No study was made of the number of dropouts in either group. This perhaps suggests the need for further study.

Conclusions

In the light of the apparent limitations outlined previously, the following conclusions can be drawn from the findings of this study.

1. There is a significant difference in mean grade-point average between students enrolled in a reading class and students not enrolled in a reading class at the .001 level in favor of the experimental group. This finding would suggest that gains in reading are quickly reflected in the students' academic life.
2. The difference between mean grade-point averages for the males in the experimental group and those in the control group was appreciably greater than the same comparison for females. This would suggest that males improve more than females with the aid of a developmental reading course. However, this might be misleading because the males were

appreciably lower than the females in the experimental group.

3. There was no significant difference in the number of males not taking reading versus males taking reading in proportion to the population. This is contrary to a number of studies which suggest that more males need reading than females due to maturation or other factors.
4. There was evidence to show that students who do take reading make higher gain scores as measured by the Nelson-Denny Reading Test on rate, comprehension, vocabulary, and total score. As suggested in the limitations of the study, students in the experimental group have more gains to make than most students who do not take reading.
5. Since the students who had reading did better on gains in reading as well as on grade-point average, it is reasonable to assume that the materials and procedures used in the reading program are of value. This may be due in part to the nature of materials and methods used. The course has been directed primarily toward the accomplishment of academic achievement and not merely to an increase in reading rate.
6. There is reason to assume that mechanical instruments and devices are useful adjuncts to the development of skill in reading, but cannot be

regarded as taking the place of a teacher or directed teaching procedures.

7. Students who did take the reading course retained their gains for a period of almost two years. This suggests that if skills are practiced, they will be retained over a relatively long period of time.

Educational Implications

1. There were indications that time and money spent on a college improvement reading program is worthwhile.
2. The program seems to benefit the below-average reader. However, no study was made concerning the mediocre reader or the above average reader. Some students observed in this study were on a high level of reading ability, but made very poor grade averages. Perhaps these students need training in other aspects of comprehension such as organizing materials, searching for main ideas, drawing conclusions, etc.
3. Even if the below-average students do make high percentile gains on standardized tests, often the gains are not sufficient to bring them up to grade level. They are still unable to compete with those who are very efficient readers.

4. A study should be made of the number of dropouts in the reading program to determine the role it plays in keeping students from withdrawing.
5. Parallel studies could be made of other programs for the purpose of comparing the effects of different combinations of activities and types of instructional treatment.
6. A further study should be made of personality factors and attitudes as they effect reading improvement.
7. The factor of motivation appears to be important and should be investigated.
8. Further investigation should be given to factors which inhibit the response of some students to training given in reading.
9. Possibly the most important implication is that reading instructors will have to accept the task of dealing with the whole phenomenal field of the individual to bring about needed changes in achievement, attitudes, and environment.

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