

THE RELATIONSHIP BETWEEN
READING COMPREHENSION AND ACADEMIC PERFORMANCE
AT THE COLLEGE LEVEL

by

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CHAPTER I

INTRODUCTION

In working with student problems at Oregon State College, it became apparent from observation that there existed some relationship between ability to read, as measured by standardized tests, and academic performance. The problem then suggested was to investigate and discover whether objective evidence of this relationship could be found. Investigation of research in this field revealed that comparatively few studies have explored this specific area. Other factors, such as personality patterns, socio-economic background and general intelligence have been fertile fields of prior investigation.

The problem of isolating a single factor such as reading comprehension and investigating its relationship to Grade Point Average is evidently a difficult task. The factors mentioned previously and many other factors are usually operating within an individual, if not simultaneously, then sometime during his school program. The total factors, of which reading comprehension is but a single variable, can be seen operating in a complex and interrelated manner.

The scope of this study, however, is to investigate only reading comprehension in relation to Grade Point Average. Every effort has been made to delimit the study to this area. The questions to be answered then are: (1) To what degree does an individual's ability to read with comprehension influence his academic performance? (2) Can predictions from objective reading test scores be made regarding a student's probable academic success?

The method has been to select nationally recognized objective tests of acceptable validity and high reliability. These are the Cooperative Reading Comprehension Test C2 and sections of the OSUPT, which are the Reading Comprehension, Vocabulary, and the Word Reasoning section. Correlations were then calculated between the Cooperative Reading Comprehension total score and the three sections of the OSUPT, between GPA and the Cooperative Reading Comprehension and between GPA and sections of the OSUPT. The method of calculation was the Pearson Product Moment Correlation Coefficient, using the Marchant Calculator method.

The sample was selected from a group of 800 non-veteran students of both sexes at Oregon State College. All of the students had been administered tests at the Oregon State College Counseling and Testing Bureau. Two-

hundred seventy-six of these students had been administered both the Cooperative Reading Comprehension test and the OSUPT as a part of their test profile. Compilation of Grade Point Averages of these 276 freshmen and sophomores presented difficulties which lowered the sample to its final number of 208. These students making up the total sample used had in most cases completed between one and three years of study.

CHAPTER II

SUMMARY OF RELATED STUDIES

The college freshman arrives on the college campus capable of a level of reading which has been determined by his physiological and psychological experience. The numerous factors operating within these broad and overlapping categories influence the growth and development of the individual. They combine to produce a reading level that can either aid or handicap the college student in performing his college work.

The wealth of material that has been produced pertinent to physical defects as related to reading ability is indeed impressive. The major areas may be divided into ocular defects, auditory defects, and speech defects.

The physical disorders which can attack in or around the eyes are many and varied. It is interesting to note that Stephens (27, p.15) lists more than 15 different disorders that can cause reading disability. Some of these are myopia, presbyopia, and strabismus, commonly called near-sightedness, far-sightedness, and cross-eyedness respectively. The effects of these many possible disorders on reading performance have been studied extensively. Visual defects have been found to be distributed

among both good and poor readers. That most of these defects can be corrected by glasses or medical treatment is recognized by most of the eminent authorities dealing with visually handicapped persons.

Most authorities are fairly well agreed that the greatest influence of visual defects would take place during the period when an individual is learning the basic fundamentals of reading. There is no doubt that learning may be slowed or interrupted during this period. It is doubtful, however, if much blame can be attached to visual defects causing reading difficulty at the college level, for they can in most cases be quickly remedied. It is also probable that the reading level is fairly well established at this point in the individual's maturational development.

Speech and auditory defects also enter into consideration. It has been demonstrated (13, p.407) that various types of organic speech impediments do have an inhibitory and retarding effect on reading ability. This is also true of auditory defects. (23, p.204). However, as in the case of visual defects, these factors play their greatest role in the early developmental years. No studies have been found to indicate the extent these defects operate at the college level. The writer's opinion is that their role is not a prominent one. *

The other group of factors operating in regard to reading development can be classified as psychological in origin. An investigation of emotional background of 30 children of average intelligence who were poor readers (22, p.263) showed that over one-third had a family background that was creating emotional problems for the children. However, emotional blocks to reading are not always based in the home. It is probable that much of the success attributed to remedial reading techniques and methods in the school results from the establishment of good emotional rapport (5, p.125).

Many studies have been made on the problem of emotional interference with academic achievement on the college level. The evidence shows that individuals who are emotionally maladjusted to some degree have greater difficulty in achieving to their capacity as measured by tests of potential mental ability. One of the areas which seems directly affected is reading comprehension (14, p.149). The argument as to the cause and effect relationship among reading, achievement and emotional blockage is still in progress. A fair assumption would seem to be that * * the nature of a college student's adjustment to his environment may be a contributory factor in his ability to read with understanding.

In summary we can say that organic defects can and do interfere with reading. However, their chief effect is inhibition and retardation during the period when basic reading habits and skills are being established. There again effects may or may not carry over to the college level. Reading can be interfered with as a result of emotional blocking at any age level, and may be a factor in operation at the college level. *

Despite a large number of publications, books, teachers' manuals, and surveys, there has as yet been no one method decided upon as the best way to teach children to read.

There is, however, general agreement that the concept of "Multiple Causation" applies to most cases of poor reading. This concept has evolved from increasing recognition that reading ability is not a broad general factor, but rather is a composite of many complex skills. (30, p.158)

Thus we see a multiple of factors to account for a wide range of reading levels and reading difficulties. Some of these factors are more closely interrelated, while others have less to contribute in producing reading habits in college students.

One approach to the problem has been to seek evidence of a working relationship between reading ability and general intelligence. A study of the effect of reading ability upon general intelligence (12, p.412) presents data to indicate that reading ability and mental ability are not parallel in growth. Results indicated that 45.9% of seventh and eighth grade students checked had reading age levels a year or more above or below their mental age level. This would tend to show that many students may be credited with too high or too low a mental age level because of their reading age level. This study cited suggests that many of our intelligence tests are really reading tests in disguise. On the college level, Anderson and Dearborn (2, p.387) concluded, "There is a positive relationship between reading ability and college achievement even when only such differences as vary independently of intelligence are considered". They also indicated that among reading comprehension, rate of reading, and vocabulary, the first variable is probably the most important.

An old axiom, "Slow but thorough", would not apply in this case, as the faster readers also read with greater understanding. Results of a study by Tinker (30, p.159) clarify this point. He found that the critical factor when considering the relationship between reading

comprehension and speed of reading was the reading material involved in a given instance. High correlations between speed and reading comprehension are found when they are correlated on the same material (30, p.159). Tinker's point is that the comparative influence or importance of speed and comprehension for optimum results will vary with the type of material being studied. This and other studies (2, p.388) indicate that perhaps we are expecting too much of our general reading tests when we attempt to predict achievement in areas where the reading is dissimilar to that which is measured by a general reading test. Perhaps more valid predictions could be made if reading tests sampled specific subject areas demanding similar types of reading for college course work. Humber (19, p.17) justifies the use of the general content type of reading test now in use. In a study of these tests and several well known "scholastic aptitude tests" he presents data showing that reading efficiency is a better predictor of academic achievement than scholastic aptitude tests. Another study (25, p.406) concludes that it is evident that reading efficiency is an important factor in scores made on "verbal scholastic aptitude tests" (L score, A.C.E.). The author of the study suggests the use of this score to screen students into remedial reading courses.

In summation, it can be concluded that: (1) There are a multitude of factors, both physiological and psychological that influence the establishment of an individual's reading level. (2) Reading ability is not a general factor, but composed of many complex skills. (3) Many of our intelligence tests scores are influenced by an individual's reading ability. (4) That better predictions of achievement in specific course work could be made if reading tests content sampled those areas specifically. (5) In many cases reading age level is as good or better a measure for prediction of college achievement than "scholastic aptitude tests".

CHAPTER III

PRESENTATION OF DATA

The tests selected for use in this study were from a battery given as part of the procedure at the Oregon State College Counseling and Testing Bureau. They are widely known, and are accepted by many authorities in the field of reading and testing. (4, p.525)

The first test was the Cooperative English Test: Reading Comprehension C2, Form T. It has two parts, recognition vocabulary and paragraph reading. From the paragraph reading section, scores of speed of comprehension and level of comprehension are obtained. The latter has ninety comprehension items arranged in three repeating scales of equal difficulty. The time limit is forty minutes; fifteen minutes for the vocabulary section and twenty-five minutes for level of comprehension. Speed of comprehension score is obtained from a count of the total number of items correctly answered, while level of comprehension is determined by counting only items of the completed scales. This procedure tends to eliminate the influence of speed upon the comprehension score and make it a measure of power of comprehension. Many authorities are in doubt as to this being valid. Reliability coefficients range from $+ .82$ for level of comprehension to better than $+ .90$ for vocabulary and total scores. For

secondary and college groups correlations of between $+0.39$ and $+0.73$ with school grades have been reported (4, p.525). The test items, though well chosen, tend to run slightly towards literature (4, p.527). In the main, however, the items are of a general survey nature and include understanding of mood and purpose and meaning in context.

A second set of scores were obtained from the Ohio State University Psychological Test, Form 21. This is a well known test of scholastic aptitude. Three sub-test scores are combined to give a total score. The three sections are Vocabulary, Word Reasoning and Grammar, and Reading Comprehension. Verbal ability is stressed throughout.

The author has set up separate norms for the reading comprehension sub-test. A validity coefficient for the total score and college grades of $+0.68$ has been reported (15, p.323). The reliability (split-half) estimate ($N=300$) is $+0.93$. It is set up as a power test allowing each student to attempt all 150 items. The reading comprehension sub-test has been used more extensively in this study than the vocabulary or word reasoning, and the total score has not been used.

Grade Point Averages of non-veteran freshmen and sophomores are the criteria variable. In all but 32 cases the students whose scores were used had completed

at least one year and not more than three years of college. The total number of cases who had taken both tests and met the criteria for Grade Point Average was 208. No attempt was made to separate the schools of the college. Each school is represented in approximate proportion to its total enrollment.

The use of Grade Point Averages in this study as a measure of achievement has been under constant criticism from educators for many years. However, it remains as the generally accepted criteria for college success. The writer has used it, therefore, in the interest of reality and not necessarily because he is convinced of its validity as a criteria of achievement.

CHAPTER III
PRESENTATION OF DATA

This chapter presents the frequency distributions and their statistics as well as the coefficients of correlation between the variables. The coefficients and standard deviations have been calculated with a Marchant Calculator using the Pearson Product Moment method. The equations used follow.

$$r_{xy} = \frac{N(\text{Sigma } XY) - (\text{Sigma } X)(\text{Sigma } Y)}{\sqrt{[N(\text{Sigma } X^2) - (\text{Sigma } X)^2][N(\text{Sigma } Y^2) - (\text{Sigma } Y)^2]}}$$

The formula used for Standard Deviation is:

$$d_x = \sqrt{\frac{\text{Sigma } X^2}{N} - M_x^2}$$

TABLE I
DISTRIBUTION OF GRADE POINT AVERAGES
OF 208 FRESHMEN AND SOPHOMORE COLLEGE STUDENTS

<u>Score</u>	<u>Frequency</u>	<u>Percentage</u>
100-91	3	1
90-81	11	5
80-71	14	7
70-61	32	16
60-51	65	31
50-41	50	24
40-31	18	9
30-21	12	5.7
20-11	2	.9
10-1	1	.4
	208	100

M. 54 (2.16 GPA)

Md. 55 (2.20 GPA)

sd. 15.7 (.62 GPA)

It was necessary for purposes of calculation to reduce the range of the Grade Point Averages from 0-400 to 0-100. This contraction of the range is one of the less favorable factors of the statistical calculations. This data tends to approximate a normal distribution. The scores are heavily grouped around the central area. The mean and mode are at approximately the same point on the scale. Evidence of one of the factors in operation

throughout the study probably can be seen in the low percentage of scores falling at the very low end of the range. This is to some extent a function of the group selected in view of the fact that they have had at least one year in attendance at Oregon State College. This fact, therefore, presupposes a satisfactory grade point for these students. The overall Grade Point Average for non-veteran students computed for the school year 1949-1950 was 2.54. This is somewhat higher than the mean Grade Point Average of the student sample used here. However, this difference in mean Grade Point Average points up the fact that this sample is not a random sample for the student body as a group. It can be assumed, however, that those individuals who sought the services of the Counseling Bureau were in need of some kind of guidance. This need for guidance may have been due to lower academic performance than they had anticipated, or to rejection of the school program in which they had enrolled. These facts may have contributed to lowering of the mean Grade Point Average of the students making up this sample. However, there may be other contributory factors beyond the scope of this study.

TABLE II

DISTRIBUTION OF THE PERCENTILE SCORES
OF 208 COLLEGE FRESHMEN AND SOPHOMORES ON THE
COOPERATIVE READING COMPREHENSION TEST

<u>Percentile Score</u>	<u>Frequency</u>	<u>Percentile Total</u>
100-91	7	3
90-81	22	10
80-71	29	14
70-61	15	8
60-51	18	9
50-41	38	18
40-31	14	7
30-21	23	11
20-11	27	13
10-1	15	7
	<u>208</u>	<u>100</u>

M. 48

Md. 45

sd. \pm 26.4

The scores are spread more evenly throughout the range of this scale than are the Grade Point Average scores. The function of a time limit, which is a part of this test, may handicap the student in his reading ability by psychologically setting a situation which could force

the student to speed his reading beyond a point of optimum comprehension. This could partially explain the greater number of scores at the lower end of this distribution.

TABLE III
 DISTRIBUTION OF READING COMPREHENSION
 SCORES (OSUPT) OF 208 FRESHMEN AND
 SOPHOMORE COLLEGE STUDENTS

<u>Percentile Score</u>	<u>Frequency</u>	<u>Percentile Total</u>
100-91	25	12
90-81	49	24
80-71	23	11
70-61	21	10
60-51	19	9
50-41	27	13
40-31	15	7
30-21	10	5
20-11	10	5
10-1	9	4
	<hr/> 208	<hr/> 100

M. 62

Md. 85

sd. 26.9

This test allows every student to exercise maximum amount of ability. There are no time restrictions, and as a result the distribution is skewed toward the high end of the range. In a skewed distribution the mean does not accurately represent the distribution of scores. A more valid measure is the modal score in the distribution.

The modal score of this distribution is well above the modal or mean score found on the Cooperative Reading test. It is apparent, then, that the elimination of the speed factor on the OSUPT probably allows students of good as well as poor reading ability to increase their scores in this test, and thus shift the scores toward the upper quartile. Those students who then remain in the lower quartile appear to have difficulty with reading material which is not related to their rate of reading, but is a function of some other factor.

TABLE IV
 DISTRIBUTION OF WORD REASONING SCORES
 (OSUPT) OF 208 FRESHMEN AND
 SOPHOMORE COLLEGE STUDENTS

<u>Score</u>	<u>Frequency</u>	<u>Percentage</u>
100-91	13	6
90-81	18	9
80-71	22	11
70-61	21	10
60-51	23	11
50-41	26	12
40-31	21	10
30-21	27	13
20-11	20	10
10-1	17	8
	<u>208</u>	<u>100</u>

M. 48

Md. 45

sd. \pm 25.9

This sub-test of the OSUPT does not appear to discriminate either good or poor students as seen by the leveled distribution of scores throughout the entire range.

TABLE V
 DISTRIBUTION OF VOCABULARY SCORES
 (OSUPT) OF 208 FRESHMEN AND
 SOPHOMORE COLLEGE STUDENTS

<u>Score</u>	<u>Frequency</u>	<u>Percentage</u>
100-91	15	7
90-81	26	13
80-71	35	17
70-61	13	6
60-51	18	9
50-41	32	15
40-31	24	12
30-21	15	7
20-11	21	10
10-1	9	4
	<u>208</u>	<u>100</u>

M. 53

Md. 75

sd. ± 18.8

These scores do not follow the patterns found in the other sub-tests of the OSUPT. There is almost a bimodal distribution with one peak being at the median, and a near-mode to be seen at the upper quartile of the distribution. The difficulty level of the items may operate to split the distribution into this bimodal grouping. It is also possible that the lack of time limit may aid the average student in increasing his score toward the upper quartile.

INTERCORRELATIONS OF SCORES MADE BY FRESHMEN
AND SOPHOMORES ON THE COOPERATIVE READING
COMPREHENSION TEST AND SUB-TESTS OF THE
OHIO STATE UNIVERSITY PSYCHOLOGICAL TEST

(N = 208)

OSUPT	Coop. Reading Comprehension Test
Reading Comprehension	+0.649
Word Reasoning	+0.69
Vocabulary	+0.54

These intercorrelations indicate that both of the tests used are measuring to a large degree the same factor or factors. A higher degree of agreement would tend to support contention that both tests are measuring similar reading abilities. However, the problem of a time limit type of test versus a power type of test may produce a sufficiently greater difference in the tests, and thus lower the correlations. This possible explanation of these lowered correlations is given credence by examination of distribution tables II and III.

In addition, the dissimilarity of reading material making up the two tests may sample different reading areas and skills. This would produce lower intercorrelations if we assume that reading ability is not a general ability, but a group of related individual skills.

INTERCORRELATIONS OF THE COOPERATIVE READING COMPREHENSION
TEST AND THE VOCABULARY AND READING COMPREHENSION
SUB-TESTS OF THE OHIO STATE UNIVERSITY PSYCHOLOGICAL TEST
WITH GRADE POINT AVERAGES OF 208 FRESHMEN AND SOPHOMORE
COLLEGE STUDENTS

	GPA
Cooperative Reading Comprehension	+ .29
Reading Comprehension (OSUPT)	+ .476
Vocabulary (OSUPT)	+ .45

These coefficients, while not highly significant statistically, do furnish evidence of a definite positive relationship between reading comprehension and college achievement. In every case the relationship is positive. Performance on the Reading Comprehension sub-test of the OSUPT is evidently the most closely related ability to that of actual academic performance, although closely followed by vocabulary knowledge. Performance on the Cooperative Reading Comprehension test seems to have very little relationship to actual college achievement. This may be due to the time element involved, which operates to give the students who have the better vocabularies more time for the reading section on this test. There may be other factors operating within the test.

One of the desired functions of a standardized test is that it yield a score which will be valid for purposes of prediction. It was felt that possibly a coefficient of correlation of the upper quartile group of this study might lead to more positive evidence for prediction at the high end of the range. In view of the fact that the Reading Comprehension sub-test of the OSUPT yielded the highest full correlation with Grade Point Average, this test was selected. The upper quartile was composed of scores above the 80th percentile.

INTERCORRELATIONS OF THE UPPER QUARTILE SCORES ON THE
READING COMPREHENSION SUB-TEST OF THE OHIO STATE
UNIVERSITY PSYCHOLOGICAL TEST WITH GRADE POINT AVERAGES

N. 73

r. +.88

This data presents evidence of sufficiently high relationship of upper quartile scores and GPA to enable a "probable success" score to be established. Indications are that a student scoring above the 80th percentile on this sub-test will, all other factors remaining constant, be successful in achieving a satisfactory college Grade Point Average.

The number of cases in this sample is small. It is evident, therefore, that further investigation is needed with larger samples to confirm the relationship obtained.

CHAPTER IV

SUMMARY AND CONCLUSIONS

The data resulting from this study substantiates with objective evidence the existence of a relationship between reading comprehension and Grade Point Average at the college level. Coefficients of correlation calculated contribute evidence of this positive relationship. The coefficients of correlation for the full range of scores are not of a sufficiently high degree to permit prediction. The Reading Comprehension section of the OSUPT validates its use as a predictor of college achievement. The upper quartile of scores on this sub-test (80th percentile) indicates that this may be used in predicting those students who should be successful in their college programs.

It is evident that the standardized reading tests used have a definite value and a function in the counseling of students with academic problems related to reading disabilities. These tests can be used in screening those individuals who have basically weak reading habits and will require remedial assistance in order to succeed in their college programs. Guidance oriented to remedial work with reading abilities in the initial stages of a college program might well result in a lowered number of students who fail at the college level because of their lack of insight

into their difficulty.

Evidence is presented which points up a common fallacy in attempting to use general reading tests to predict college achievement. The correlations obtained, while of a positive nature, are not high enough for overall predictive purposes. A better avenue in the search for predictive instruments of reading ability related to college performance would be to relate the content material of a test to the reading content of specific courses in the curricula. This type of test would allow proper emphasis to be placed on both rate of reading and level of comprehension in accordance with specific course requirements.

This study, then, has presented data confirming the positive relationship of reading comprehension, as measured by standardized tests, and college achievement, as measured by Grade Point Average. The value of standardized tests as a screening instrument for students who will require remedial work with reading handicaps has been established. Indications are that there are fruitful areas for future research on the relationship of reading comprehension and grades in specific course work. This results from a growing awareness among workers in the field that reading is not a general skill, but a group of specific interrelated complex skills.

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