THE DIFFERENCES IN RELATIONSHIPS OF INTELLIGENCE GENERAL
READING ABILITY, AND ACHIEVEMENT IN COMMUNICATIONS
AMONG COLLEGE FRESHMEN WITH HIGHER-LEVEL
AND LOWER-LEVEL CRITICAL
READING ABILITIES

A THESIS
SUBMITTED TO THE FACULTY OF THE SCHOOL OF EDUCATION,
ATLANTA UNIVERSITY IN PARTIAL FULFILLMENT OF THE
REQUIREMENTS FOR THE DEGREE OF
MASTER OF ARTS

BY
ERVA JEAN PARKER

SCHOOL OF EDUCATION
ATLANTA UNIVERSITY
ATLANTA, GEORGIA

JUNE, 1964
DEDICATION

To my mother, Mrs. Jessie M. Dorsey, whose love, interest, and care has helped me in attaining my desired goals; and to my friends whose encouragement and help has sustained me throughout the period of this research endeavor.

E. J. P.
ACKNOWLEDGEMENTS

The writer is indeed grateful to the many persons who have contributed in any manner to assist with the gathering, preparation, and presentation of the data included here. Special thanks go to the freshman class of Morris Brown College who were involved in this research. The writer wishes to express gratitude and appreciation to Mrs. Miriam Jellins, advisor, and Dr. Lynette Saine, co-advisor, for their guidance and patience throughout the conduction of this study, and to Miss Viola Mathews for her assistance in the typing of this thesis.

E. J. P.
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Chapter</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>DEDICATION</td>
<td>ii</td>
</tr>
<tr>
<td>ACKNOWLEDGEMENT</td>
<td>iii</td>
</tr>
<tr>
<td>LIST OF TABLES</td>
<td>iv</td>
</tr>
<tr>
<td>LIST OF ILLUSTRATIONS</td>
<td>vii</td>
</tr>
<tr>
<td><strong>Chapter</strong></td>
<td><strong>1</strong></td>
</tr>
<tr>
<td>I. INTRODUCTION</td>
<td></td>
</tr>
<tr>
<td>Rationale</td>
<td>1</td>
</tr>
<tr>
<td>Evolution of the Problem</td>
<td>4</td>
</tr>
<tr>
<td>Contribution to Educational Knowledge</td>
<td>5</td>
</tr>
<tr>
<td>Statement of the Problem</td>
<td>5</td>
</tr>
<tr>
<td>Purpose of the Study</td>
<td>5</td>
</tr>
<tr>
<td>Scope and Limitations of the Study</td>
<td>6</td>
</tr>
<tr>
<td>Definition of Terms</td>
<td>7</td>
</tr>
<tr>
<td>Locale of the Study</td>
<td>7</td>
</tr>
<tr>
<td>Method of Research</td>
<td>3</td>
</tr>
<tr>
<td>Subjects and Instruments Used</td>
<td>8</td>
</tr>
<tr>
<td>Research Procedure</td>
<td>8</td>
</tr>
<tr>
<td>Survey of Related Literature</td>
<td>9</td>
</tr>
<tr>
<td>A Summary of Information Providing Significant Basic Understandings for the Present Study</td>
<td>20</td>
</tr>
<tr>
<td>II. ANALYSIS AND INTERPRETATION OF DATA</td>
<td>22</td>
</tr>
<tr>
<td>Introduction</td>
<td>22</td>
</tr>
<tr>
<td>Procedures for Treatment of Data</td>
<td>24</td>
</tr>
<tr>
<td>Analysis and Interpretation of Intelligence Levels of the Total Population</td>
<td>25</td>
</tr>
<tr>
<td>Summary of the Analysis and Interpretation of Intelligence and Achievement Levels of the Total Population</td>
<td>30</td>
</tr>
<tr>
<td>Identification and Analysis of Higher-Level and Lower-Level Critical Reading Abilities of the Two Groups</td>
<td>31</td>
</tr>
<tr>
<td>Identification of Groups with Higher-Level and Lower-Level Critical Reading Abilities</td>
<td>32</td>
</tr>
</tbody>
</table>
Chapter II.

Analysis and Interpretation of Performances on Tests and Grades Made by Readers With Higher-Level Critical Reading Ability.................. 37
Analysis and Interpretation of Performances on Tests and Grades Made by Lower-Level Critical Readers.............. 39
Analysis and Interpretation of Differences in Intelligence, General Reading Ability, and Achievement in Communications 101 of Higher-Level and Lower-Level Critical Readers................................... 41
Analysis and Interpretation of Relationships of Intelligence, General Reading Ability, and Achievement in Communications 101 of Higher-Level Critical Readers............. 45
Analysis and Interpretation of Relationships of Intelligence, General Reading Ability, and Achievement in Communications 101 of Lower-Level Critical Readers........................................... 47

Summary of Analysis and Interpretation of Data......................................................... 49

III. SUMMARY, FINDINGS, CONCLUSIONS, IMPLICATIONS AND RECOMMENDATIONS................................. 51

Summary of the Rationale.......................................... 51
Basic Design and Methodology.................................. 52
Summary of the Related Literature........................... 53
Summary of the Findings...................................... 54
Conclusions..................................................... 56
Implications.................................................... 58
Recommendations.............................................. 59

BIBLIOGRAPHY................................................. 60

VITA............................................................. 63

APPENDIX...................................................... 64
LIST OF TABLES

Table                      Page

1. Frequency Distribution, Percentages, and General Statistical Measures Based on Freshman Performances on The Otis Quick-Scoring Mental Ability Test, Form Em-GAMMA................................. 26

2. Frequency Distribution, Percentages, and General Statistical Measures Based on Freshman Performances on The Iowa Silent Reading Test, Form AM...................................................... 28

3. Frequency Distribution, Percentages, and General Statistical Measures Based on Freshman Performances on The Iowa Silent Reading Test, Form BM................................................................. 29

4. Frequency Distribution, Percentages, and General Statistical Measures Based on Freshman Grades Made in one Semester of Study in Communications 101................................................................. 31

5. Frequency Distribution, Percentages, and General Statistical Measures Based on Freshman Performances on The Watson-Glaser Critical Thinking Appraisal Form Am......................................................... 33

6. Frequency Distribution, Percentages, and General Statistical Measures Based on Freshman Performances on The Critical Reading Questionnaire.............................................. 35

7. Scores and Mean Performances of Higher-level Critical Readers on Two Forms of the Iowa Silent Reading Test, The Watson-Glaser Critical Thinking Appraisal, The Otis Quick-Scoring Mental Ability Test, The Critical Reading Questionnaire, and One-Semester Grades from Communications 101........................................... 38

8. Scores and Mean Performances of Lower-Level Critical Readers on Two Forms of The Iowa Silent Reading Test, The Watson-Glaser Critical Thinking Appraisal, The Otis Quick-Scoring Mental Ability Test, The Critical Reading Questionnaire, and One-Semester Grades from Communications 101........................................... 40
<table>
<thead>
<tr>
<th></th>
<th>Table</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>9</td>
<td>Statistical Measures of Difference Between Mean Scores Made by The Higher-Level and Lower-Level Critical Readers on The Otis Quick-Scoring Mental Ability Test, Form EM-GAMMA</td>
<td>42</td>
</tr>
<tr>
<td>10</td>
<td>Statistical Measures of Difference Between Mean Scores Made by The Higher-Level and Lower-Level Critical Readers on The Iowa Silent Reading Test, Form, EM</td>
<td>43</td>
</tr>
<tr>
<td>11</td>
<td>Statistical Measures of Differences Between Mean Grades Made by The Higher-Level and Lower Level Critical Readers in Communications 101</td>
<td>44</td>
</tr>
<tr>
<td>12</td>
<td>Relationships of Intelligence, Reading Ability, and Achievement in Communications 101 of Higher-Level Critical Readers at The .05 Level of Confidence</td>
<td>46</td>
</tr>
<tr>
<td>13</td>
<td>Relationships of Intelligence, Reading Ability, and Achievement in Communications 101 of Lower-Level Critical Readers at The .05 Level of Confidence</td>
<td>47</td>
</tr>
</tbody>
</table>
LIST OF ILLUSTRATIONS

<table>
<thead>
<tr>
<th>Figure</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Chart Showing The Identification of Higher-Level and Lower-Level Critical Readers by Performance on The Watson-Glaser Appraisal and on The Questionnaire.</td>
<td>36</td>
</tr>
</tbody>
</table>
CHAPTER I
INTRODUCTION

Rationale.—Today, more than yesterday, the emphasis in education is to teach and guide students to deeper, more concentrated analysis of themselves and their environment. Reading is the avenue which leads students to the hidden depths of ideas and institutions. "Reading feeds and broadens our thinking. It gives a kind of credence to our ideas."¹ Reading, like other developmental skills, can be mastered only through a long process of growing and learning. All through the grades, teachers are aware of the task of teaching students to read, reason, and think critically. This is most important for the full development of the human mind. It is important also because students need the ability to search for truth, form individual opinions, and evaluate the information imparted to them. Through a process of sound interpretation and critical evaluation of information imparted through reading, students can enjoy breadth and depth of thought, thereby intelligently relating themselves to the environment.

Critical reading is thought to function relatively independent

of intelligence. Although this may be true, in order to engage in critical reading, students must possess reading skills which allow for a complete literal understanding of the material under consideration. The most important single factor influencing reading is general intelligence, which being an average of many phases of mental growth, is significantly related to other factors. This is in agreement with Bond and Tinker, who say that some aspects of reading come with inner maturation. Many important ingredients are learned and are therefore susceptible to guidance. Critical reading is thought to function primarily in relationship to experience, to reading background and to training. One task of instructors of reading, then may be, to determine how the possession of critical reading skills relate to reading ability and to overall proficiency in the manipulation of verbal skills.

The individual should be able to begin each sequential reading skill as is determined by his achievement in readiness. If students reach the college level and lack some skill in reading, there would have developed a disability and this would have become so apparent that progress in other academic achievement would suffer. Lack of


2 Albert J. Harris, How To Increase Reading Ability (New York: Longmans, Green, and Company, 1958), p. 87.


4 Spache, op. cit., p. 84.
reading ability contributes to low achievement in other areas.¹ Teachers are inclined to believe that when a student makes a gain in reading achievement, there will be gain in other academic subjects to the same extent. It is a known fact that intelligence has a causal relationship to school learning, and also that one must learn to read in order to succeed with informational materials.²

The concern in this study is with the relationship of academic achievement in a subject requiring reading, intelligence, and critical reading ability of college students. College and adult reading require not only the understanding of more difficult material, but more mature, critical reading necessitating independence in attacking unusual and technical words, reading between lines, reading for different purposes, and integrating what is read with previous experiences.³ Since critical reading is the process of giving considerable thought to what one reads, and since thinking power involves the process of analysis, judgment, weighing of ideas, and searching out relationships, it is obvious that there should be a relationship between intelligence and the ability to do critical reading. Through his intelligence, an individual exhibits personal

---


² Carrie M. Scott, "Intelligence and Gain In Reading As Related To Gains in the Subtest of the Stanford Achievement Test", Journal of Educational Research, LVI, No.9 (May-June, 1963), pp. 494-496.

behavior, in that he must suppress emotions and draw from the printed matter conclusions to fit his own judgments. According to Spache, the primary reason for instruction in critical reading is personal - to enable the reader to profit from books without the limiting effects of his own personal biases and prejudices. Critical reading is thinking with experiences and concepts in relation to printed matter.¹

Critical reading and thinking, intelligence, and general reading ability are important factors in achievement in communications classes. All subject areas require some reading and in communications, reading is studied as one of the four language arts.

Communications classes are designed to teach speaking, writing, listening, and reading on the college level. Students draw from their experiences the ability to communicate and learn to do so in these four areas. In doing so, they are exhibiting their intelligence as well as their critical reading and thinking abilities. It is hoped that after they have been exposed to such instruction in their classes they will have acquired the ability to communicate more intellectually, effectively, and critically to their best advantage.

Evolution of problem. — Since critical reading requires deep concentration and reasoning of a student, it is evident that in a communications class this type of reading can be utilized. The

researcher's interest evolved from working with freshmen in their reading classes. These students possessed varying abilities to do general reading and since general reading ability and intelligence influence achievement in other areas, communications achievement would be greatly affected or improved because this class consists of the language arts designed for the college level. This being true, brought to mind just how their intelligence had enabled them to acquire general reading abilities necessary for achievement in the class of communications.

Contributions to educational knowledge.--It was hoped that this study would be of educational value in the following ways:

1) That this research would lend itself to the development of suggestions for improving critical reading skills in students.

2) That this study would reveal pertinent information concerning the role of intelligence and reading ability in achievement in subject areas.

3) That this study would reveal pertinent information on the difference between students' ability and their acquired achievement in the communications classes.

4) That this research would help teachers to emphasize and improve critical reading skills in pre-college and college students.

5) That this study would show the importance of communications in the curriculum.

Statement of the problem.--This was a study to determine and compare the relationships of intelligence, general reading ability, and achievement in communications classes among two groups of college freshmen students who differed significantly in critical reading abilities.

Purpose of the study.--The general purpose of this study was to determine and compare any significant differences in various
relationships found among higher-level and lower-level critical readers.

More specifically, the purposes of this study were:

1) To determine higher-level and lower-level critical readers.

2) To determine the following relationships in readers with higher-level critical reading abilities:
   a) Tested intelligence and general reading ability
   b) Tested intelligence and achievement in communications
   c) Achievement in communications and general reading ability

3) To determine the following relationships in readers with lower-level critical reading abilities:
   a) Tested intelligence and general reading ability
   b) Tested intelligence and achievement in communications
   c) Achievement in communications and general reading ability

4) To compare freshmen with higher-level critical reading abilities with freshmen with lower-level critical reading abilities in terms of the following:
   a) Intelligence
   b) General reading ability
   c) Achievement in communications

5) To draw from the findings implications and recommendations which would lend themselves to the use in determining further information for research in this area.

Scope and limitations of the study.—This study was limited to freshman reading classes at Morris Brown College. Two classes were selected from those enrolled in reading in the second semester at the college. Further limitations may be inherent in tests used for measurement of mental ability in that it is a group test restricted to verbal procedures and probably did not reveal an accurate measurement of individual mental capabilities: The Otis Quick-Scoring Mental Ability Test is used for coarse classification without access to relevant information about the individual's
previous educational progress.\textsuperscript{1}

Definition of terms.—The following terms were used in the discussion of the study:

1) Critical reading—analyzing and giving thought to what one reads; the ability to draw inferences, make judgments, and state opinions individually.

2) Communications—an instructional class in the language arts—Reading, Writing, Speaking, and Listening—designed for the college level.

3) Intelligence—the ability to learn or understand from experience; the ability to acquire and retain knowledge; mental ability.\textsuperscript{2}

4) Reading ability—the ability to recognize printed or written symbols which serve as stimuli for the recall of meanings built up through the reader’s past experiences.

5) Readers with higher-level critical reading abilities—the group of students scoring above the mean on the \textsuperscript{Watson-Glaser Critical Thinking Appraisal.}

6) Readers with lower-level critical reading abilities—the group of students scoring below the mean of the \textsuperscript{Watson-Glaser Critical Thinking Appraisal.}

Locale of the study.—This study was conducted on the campus of Morris Brown College, Atlanta, Georgia. Morris Brown College is a small private college, chartered in 1885 under the patronage of the African Methodist Episcopal Church. It is a four-year liberal arts institution maintaining a cooperative relationship with the Atlanta University Center complex of institutions and is a member of the Southern Association of Colleges and Secondary


Schools and the Association of American Colleges. Over eighty percent of the students of the college are drawn from the state of Georgia, although the total enrollment lists students who come from approximately twenty states.

Method of research.---The method of research employed in this study was that of descriptive research utilizing comparative techniques. The researcher used this type of research because of its applicability to inquiry which seeks to provide descriptive data.

Subjects and instruments used.---Thirty-three Morris Brown College freshmen were used as subjects in this investigation. Bases for their selection were two-fold: (1) All had completed one semester of special reading instruction while enrolled in a corrective reading course designed for college freshmen with reading disabilities and (2) The same students had completed successfully one semester of a course called Communications 101.

The materials and instruments used for the study were the following:

1) The Iowa Silent Reading Test, Forms AM and BM
2) The Otis Quick-Scoring Mental Ability Test, Form Em-Gamma
3) The Watson-Glaser Critical Thinking Appraisal, Form Am
4) A devised critical reading questionnaire
5) The grades from a semester of study in the class of Communications 101

Research procedure.---The following procedural steps were used to achieve the purposes of the study:

1) Permission was obtained from the proper school officials
to conduct the study.

2) A review and presentation of related literature pertinent to the study was made.

3) The Watson-Glaser Critical Thinking Appraisal and the critical reading questionnaire were administered to the selected subjects.

4) Semester grades from the communications classes and the results of the Iowa Silent Reading and Otis Quick-Scoring Mental Ability tests were obtained from proper files.

5) The questionnaire and various test results data were assembled into appropriate tables and graphs as indicated by the purposes of the study.

6) Statistical treatment of the data was made by utilizing the measures of central tendency and correlation.

7) The findings, conclusions, implications, and recommendations were incorporated in the final thesis copy.

Survey of related literature.--The literature which appears to be pertinent to the present study and which seems most likely to make significant contributions to basic understandings is reviewed under four major headings: (1) reading and intelligence, (2) achievement and intelligence, (3) critical reading abilities, and (4) communications in the curriculum.

Reading and intelligence.--In the study by Thomas, an investigation of reading comprehension and its relationship to mental ability was made. He analyzed about 3000 intelligence scores and found that the number of scores that fell more than a year below the reading achievement median closely correlated with the number of cases that fell above the reading achievement median.¹

¹ George I. Thomas, "A Study of Reading Achievement In Terms of Mental Ability", The Elementary School Journal, XX (September, 1949), pp. 28-33.
Barbe and Grelk selected fifty-two tenth grade pupils and administered IQ tests and reading tests to determine the correlation between various factors in reading ability and the IQ. They found that high correlations existed between the intelligence test scores of high school students and each of the various reading scores, except between IQ and reading rate. This may have been caused by the manner in which reading rate is usually measured on standardized reading tests, or it may have happened that a rapid reading rate is not characteristic of the gifted student when he feels that the material is of great importance.¹

Emma E. Patton and others conducted a study of 266 pupils to determine the relationship between retardation and the measurement of intelligence. The data collected supported their hypothesis that low intelligence quotients obtained by retarded readers may reflect their reading retardation rather than a basic inability to learn.²

Since critical reading is the process of giving considerable thought to what one reads, and since thinking power involves the process of analysis, judgment, weighing of ideas, and searching out relationships, it is obvious that there should be a close relationship between intelligence and the ability to do critical reading. Evidence of this fact may be found in a number of studies.


Sochor, for example, found the correlation between critical reading, as she measured it, and verbal intelligence to be .69. Glaser, on the other hand, found the relationship between the Otis Quick-Scoring Intelligence Test and the Watson-Glaser Test for Critical Thinking to be .46. None of these correlations are so high as to indicate a complete going-togetherness between the two functions. High intelligence merely makes possible a high level of critical reading; it does not assure it.¹

Achievement and intelligence.—In Scott's discussion of her experiment, she states that it is a known fact that intelligence has a causal relationship to school learning, and also that one must learn to read in order to succeed with informational materials. She found that since the relationships were present when the intelligence scores were held constant, both intelligence and reading proficiency were influential factors in academic progress. In her findings she states that the teaching of reading needs to be general in developing skills and affording practice, and must also be specifically related to the other curriculum areas.²

Children with IQ's that are high, it has been assumed by many reading specialists, make better and greater progress in a

¹ A. Sterl Artley, "Critical Reading in Content Areas", Elementary English, XXXVI, No. 2 (February, 1959), p. 122.

remedial reading program than children with lower IQ's. The belief stems, perhaps, from the high positive correlation between achievement and intelligence as currently measured. In his summary, Chansky states that no empirical support was found for the belief that children with high IQ's make the greater progress in reading. It appears to the writer that there is a need to seek a criterion other than mental ability in making selections for classes in remedial reading. 1

Pipert and Archer selected a population of 126 ninth grade students for their study. The students were identified as underachievers and achievers. One of the purposes of the study was to determine differences between underachievers and achievers. The approaches used were: the grade point approach or grade point average (GPA) and an achievement test score as criterion for achievement. One question to be answered by this study was significant to the present study; that of, do they have similar competence in intellectual ability, and aspects of critical judgment? It was found that the underachievers, by GPA, were similar to the achievers but were significantly lower by achievement test than the achievers. 2

In a study by Anderson and Slivinske, it was found that there are two interesting aspects concerning intelligence and achievement

1

2
at the fourth, fifth, and sixth grade levels. These aspects were: (1) there is greater generality in the variation of intelligence and achievement as children progress from the fourth to the sixth grade, and (2) the language and non-language types of variation appear more distinguishable. It was also found that these grades were crucial grades in terms of underachievement and achievement in bright pupils. ¹

Critical reading abilities.--The term "critical reading" is used by most authorities in three ways: (1) as a major heading under "comprehension" with one or two headings relatively equivalent value, each heading including a number of stated or implied skills, (2) as higher-level comprehension abilities in general, or (3) as a rather specific comprehension ability. Regardless of how the term is used, it invariably represents reading comprehension that involves, (1) the facts as presented in the selection and (2) the use of higher-level mental processes. Research workers have unquestionably established the complexity of reading comprehension. Yet to be determined are how many abilities and skills are involved and specific information on their nature and development. Factors analysis have indicated three areas found in critical reading comprehension: (1) word factor, (2) verbal factor, and (3) abstract thinking. Such factors as deductive thinking, selection-rejection,

analysis-synthesis, and problem solving have also been found by research. The thinking necessary for comprehension would vary from the simple to the complex, depending on the word factor, the verbal factor, the reader, his ability to use the thinking processes needed, and his purpose for reading. The three continua operate in an interrelated manner at all times in any given reader, each influencing the others in a constantly changing pattern.  

Such researchers as Collier, Iiager, Howland, and Crossen have done experimental studies of the effects of certain types of materials on heterogeneous groups. These experiments were done to test persuasion and personality factors in critical reading. In Collier's research, he found that "even though individuals may be clearly aware of the nature of the propaganda - may even have an analytical approach to it - their attitudes may still be shaped in the directions favorable to the propaganda". Crossen was probing the students for attitudes toward Negroes. He found that "students who were initially biased against Negroes were significantly less able to read critically about Negroes than those who were indifferent to the subject". 

Roma Gans, in her article "Developing Critical Reading as a Basic Skill", cites five qualities of a mature critical reader. They are:

---


1) A critical reader sees relevance in what he reads.

2) He has the ability to evaluate authorship, authenticity, and source of material.

3) He possesses the ability to access ways in which words influence ideas.

4) He is able to select wisely what he reads.

5) He becomes able to stand up and be counted for his opinion of what he reads.¹

According to the writers, the following are three features involved in critical thinking:

1) Use of scientific methods including emphasis on evidence and nature of hypotheses.

2) The tendency to be inquisitive, critical, and analytical with respect to issues, personal behavior, etc., and the lack of susceptibility to propaganda.

3) Use of correct principles of logic.

Two major approaches have been advocated for the fostering of critical thinking. They are: "progressive education" which fosters a degree of self determination, flexibility of curriculum and freedom of behavior; and an emphasis on tools of critical thinking which are principles of logic and experimentation. This study was such as above and proved that there was some effectiveness in this program, although some of the tests used did not show significant differences.²


In the definition of the concept of critical reading and thinking, reference has been made to five abilities. They are:

1) The ability to define a problem.

2) The ability to select pertinent information for the solution of the problem.

3) The ability to recognize stated and unstated assumptions.

4) The ability to formulate and select relevant and promising hypotheses.

5) The ability to draw conclusions validly and to judge the validity of inferences.

In the writer's analysis of the deterrents to better performance, it was concluded that:

1) They tend to avoid real problems and their solving.

2) They apply only a limited stock of techniques to solve them.

3) They are satisfied with a partial solution.

4) They change the problem completely.

5) They escape from the problem entirely.

The first five factors are characteristics of the more "open-minded" while the last five are characteristics of the more "closed-minded" individuals. Kemp concluded that under favorable conditions, improvement in critical thinking was shown by those with "open-minds" more so than those with "closed-minds" and that this improvement is unlikely in the usual classroom situation.¹

Critical reading can be taught, but a mere knowledge of the

techniques of critical reading is not enough. A child needs training and guidance in their use. Critical reading requires critical thinking which is "essentially a matter of interpreting facts, applying generalizations, and recognizing errors in logic". Training in critical reading should be directed toward critical thinking in all media of communication.

Certainly an important teaching goal is that students become adept in detecting propaganda, bias, and prejudice; that they recognize the reading materials and advertisements which replace fact with opinion; that they detect questionable and dubious logic. Such abilities in critical reading skills will enable students to become intelligent consumers and enlightened citizens.

According to Smith and Dechant, five basic critical reading abilities can be found or formulated. They are:

1) The ability to detect propaganda.
2) The ability to recognize fact from opinion.
3) The ability to detect questionable logic and false analogies.
4) The ability to define and delimit problems.
5) The ability to draw inferences and observations.¹

Communications in the curriculum.--According to Dr. Farmer, years age, around the 1950's, it was discussed and agreed upon by the National Council of English Teachers and others that the

regular English classes of composition were not fulfilling their purposes of teaching students all the areas of the language arts. Specifically, one major criticism of the old English classes was that students were not given enough practice in using and participating in mass media, therefore, they were not being exposed to the general training in the language arts - speaking, listening, reading, and writing.

One area of mass media in which these children were not receiving adequate participation was the use of magazines, newspapers, and books. They were not practicing their skills of thinking critically about what they read. Also, practice in listening to gain information from such media as radio, movies, and television was not being adequately given. These media help to develop their skills and abilities in expression of ideas and understandings.

By participating in these media, they are developing their skills through experience which is one of the aims of present day education. Such activities as making book reports, expressing opinions of news articles in discussion periods, and giving one's opinion of a story or program viewed are means of using and participating in mass media. This is a transition from the old traditional school which emphasized books for books sake and academic achievement without experience.

After the change was made, English classes and the textbooks used were designed to teach the four language arts. Writing, here-to-fore, had been the major point of emphasis. Then with the introduction of more mass media, speaking, listening, and reading
became of more importance along with writing.

Over a period of years, it has been found the revised program of English called communications, was inadequate because of the following reasons: (1) English teachers were found to be incompetent in this area because of the fact that they did not have sufficient training, (2) students were not getting the proper instruction which would benefit them in becoming better communicators, and (3) teaching communications in English classes in high schools and colleges was of no significant advantage to students going on to graduate school because the graduate schools still taught the standard composition and literature.

Communication classes are now under discussion in many high schools and colleges because of their found effectiveness. According to Dr. Farmer, most communications textbooks used in these classes are not effective in that they do not include or emphasize the four language arts throughly or adequately. They still stress more grammar and composition than the other areas of the language arts. Dr. Farmer cites one book in which the material is more complete and the emphasis is more on the program of the language arts; the book is entitled *Fundamentals of Communications*, by Wayne N. Thompson.

More importance is now being given to the teaching of semantics and linguistics in exchange for the standard grammar lessons. These areas will develop better speaking and reading abilities as well as the other two areas of language arts. Linguistics will make rules of grammar more meaningful than they were formerly.
All the skills and abilities of communications cannot be gained in two semesters of study. Students enter the sophomore year in college with an inadequate proficiency in the four areas of the language arts. In order for students to profit fully from communications, more emphasis should be placed on each area individually during the two semester.¹

A summary of information providing significant basic understandings for the present study.--The relationship between reading and intelligence seems to have a high correlation and reading ability is found, in most cases, to be a determinant of intellectual expression. Although reading ability and intelligence have been found to be closely related, rate of reading is interpreted as having little relationship to intelligence. Intelligence, then, can be closely related with reading ability in that, from experimentation, it is found that low intelligence scores may be indicative of an inability to read and not the general aptitude to learn.

Authors agree somewhat about the relationship between achievement and intelligence in that various studies have found that intelligence along with reading ability affects academic progress. If a student cannot read, he cannot succeed in understanding informational materials. Limited academic achievement, then, may be a result of reading disability and not the results of a general inability to learn.

Writers agree that critical reading is a subheading under

¹ Interview with Dr. Beulah J. Farmer, Head of English Department, Morris Brown College, January 31, 1964.
comprehension. It is comprised of many skills but just how many is yet to be determined. Critical reading invariably represents comprehension that involves facts and use of higher-level mental processes. There are three major areas found in critical reading comprehension: word factor, verbal factor, and abstract thinking. Thinking for comprehension varies from the simple to the complex and critical reading and thinking involves deductive and inductive use of logic. Several authors have cited various qualities of a critical reader. These are five of the qualities that were found; a critical reader (1) sees relevance in what he reads, (2) he can recognize the influence of words to determine fact from opinion, (3) he can define and solve problems, (4) he recognizes the importance of drawing conclusions, inferences, and detecting false analogies, and (5) he is able to give unbiased opinions.

Communications is a class in the language arts for college students. In previous years, the English classes were composed of the teaching of the fundamentals of grammar, composition, and literature. In the present classes referred to as Communications rather than English, more emphasis is put on developing the student's speaking, listening, reading, and writing abilities. Although this is true of the classes there is still some question as to their effectiveness because in most cases the classes and the textbooks used fall short of their purposes which are to develop proficiency in the skills of communications. Evaluation of the classes is now being made in some schools where it is probable that semantics and linguistics may be added to give more assistance in developing the skills and abilities in communications.
CHAPTER II
ANALYSIS AND INTERPRETATION OF DATA

Introduction.—This section of the research report presents an analysis and interpretation of data collected for the purpose of determining and comparing significant differences in selected relationships among higher-level and lower-level critical readers found in a selected group of college freshmen. The data collected were results of their performances on (1) the Iowa Silent Reading Test, Forms AM and BM, (2) the Otis Quick-Scoring Mental Ability Test, Form Em-Gamma, (3) the Watson-Glaser Critical Thinking Appraisal, (4) a devised critical reading questionnaire, and (5) their grade results of one semester of study in the class called Communications 101, a course required of all freshmen at Morris Brown College.

The results of the Watson-Glaser Critical Thinking Appraisal and the devised critical reading questionnaire were used to determine the readers with higher-level and lower-level critical reading abilities. The mean score was used as a dividing point for obtaining the two groups. The Watson-Glaser is designed to provide problems and situations which require the application of some of the important abilities involved in critical reading and thinking. Its five subtests measure abilities for (1) drawing inferences, (2) recognizing assumptions, (3) making deductions, (4) interpretation, and (5) evaluation of arguments. For purposes
of interpretation, percentile equivalents for college students were given with a guide for classification in terms of levels of critical readers. The classification levels are: Level I, very high; Level II, high; Level III, average; Level IV, low; Level V, very low. Percentile equivalents for each level are: I - 94th percentile and above; II - 70-93rd percentiles; III - 32-69th percentiles; IV - 8-31st percentiles; and V - 1-7th percentiles.

Along with the Watson-Glaser Critical Thinking Appraisal, a questionnaire was devised especially for this investigation to help in substantiating the identification and classification of higher-level and lower-level critical readers. This questionnaire consisted of statements which required drawing inferences, making assumptions, drawing conclusions, determining moods, and reasoning inductively and deductively. This gave further indication as to the students' skill in utilizing critical reading and thinking ability. Since the questionnaire was not formally validated, it was used in addition to the previous test mentioned, for the sole purpose of corroborating the classification already made.

The Otis Quick-Scoring Mental Ability Test, Form Em-Gamma, was used to obtain an estimate of the students' general intelligence quotients. It measures intelligence by sampling a variety of mental functions that have repeatedly demonstrated usefulness for predicting school success.

---

To survey abilities in the performance of skills needed for silent reading, the Iowa Silent Reading Test, Forms AM and BM were used. This test measures reading ability by testing skills required for rate, basic comprehension, locating information, understanding poetry, knowledge of words and study skills in nine different subtests.

One criterion for the selection of the subjects was the completion of one semester's work in Communications 101, a course emphasizing skills in the language arts at the college level. The grades received by the subjects in this class served as a measure of student success in a selected required college course.

Procedures for treatment of data.—The statistical measures used in the analysis and interpretation of the data were confined to descriptive measures of central tendency and variability and to measures of and tests of significance for relationships. The necessary graphs, tables, and figures illustrative of the statistical measures have been included for the clarification of measures and relationships found.

Frequency distributions of all scores were made and the mean was computed for use as a representative score of the group. The median was used to show the mid-point of each set of scores, the mean was used to show the relative concentration of scores, and the standard deviation was used to show a measure of dispersion. The reliability of the statistical computations was determined in some instances by the use of the standard error of the mean. For determining degrees of correlation, Pearson's "r" was used. The "t" score was obtained to determine the significance of differences in relationships.
Analysis and interpretation of intelligence levels of the total population.—An analysis of the total group gave some indication of the status of the total group in terms of level of intelligence, reading achievement, and success in the completion of Communications 101. Such an analysis was important as a background against which a division into two levels of "critical readers" and the relationships sought in the study could be projected. Questions to be answered by the analysis were: (1) Was the group of normal intelligence, above or below? (2) Had the group achieved a proficiency in reading which could be considered standard, above or below when compared with the test norms? (3) Was the group judged as successful in the completion of Communications 101 and to what degree?

Frequency distribution, percentages, and statistical computations on the Otis Quick-Scoring Mental Ability Test, are presented in Table 1. The scores ranged from a low of 80 to a high of 112, the range being 34. The mean score was 97.86, the median score was 97.0, the standard error of the mean was 1.75. The standard deviation was 10.0. The mean score of 97.86 was interpreted as indicative of average intelligence, whereas the low score of 80 was interpreted as indicative of dull intelligence. A high score of 112 indicated high intelligence. It was concluded, therefore, that the total group of participants in this study was typically represented as normal intelligence, with a decided tendency to cluster within an area extending from "low average" to "superior" intelligence.

Table 2 presents quantitative and statistical data based on
TABLE 1

FREQUENCY DISTRIBUTION, PERCENTAGES, AND GENERAL
STATISTICAL MEASURES BASED ON FRESHMAN
PERFORMANCES ON THE OTIS QUICK-
SCORING MENTAL ABILITY TEST,
FORM Bm-GAMMA

<table>
<thead>
<tr>
<th>Score Interval</th>
<th>Frequency</th>
<th>Cumulative Frequency</th>
<th>Cumulative %</th>
<th>Normal %</th>
</tr>
</thead>
<tbody>
<tr>
<td>110-114</td>
<td>3</td>
<td>33</td>
<td>1.00</td>
<td>9%</td>
</tr>
<tr>
<td>105-109</td>
<td>4</td>
<td>30</td>
<td>.909</td>
<td>12%</td>
</tr>
<tr>
<td>100-104</td>
<td>8</td>
<td>26</td>
<td>.787</td>
<td>24%</td>
</tr>
<tr>
<td>95-99</td>
<td>7</td>
<td>18</td>
<td>.544</td>
<td>21%</td>
</tr>
<tr>
<td>90-94</td>
<td>5</td>
<td>11</td>
<td>.333</td>
<td>15%</td>
</tr>
<tr>
<td>85-89</td>
<td>3</td>
<td>6</td>
<td>.181</td>
<td>9%</td>
</tr>
<tr>
<td>80-84</td>
<td>3</td>
<td>3</td>
<td>.066</td>
<td>9%</td>
</tr>
</tbody>
</table>

Mean = 97.86
Median = 97.0
Standard Error of Mean = 1.75
Standard Deviation = 10.0
scores made on the Iowa Silent Reading Test, Form AM in September, 1963. The median scores for the nine subtests, which are regarded as the level of performance on the test, ranged from 144 to 173, a range of 29. The grade levels corresponding to these median scores ranged from a low of 7.0 to a high of 12.7. The mean for the group was 157.90; the median, 154.0; the standard deviation, 7.60; and the standard error of the mean, 1.3. The mean score for the group was represented by a percentile equivalent for college freshmen on the test norms of nine. On the basis of the average performance indicated by the mean and the average deviation, average group performance on the test is represented by a percentile range from four to nineteen. Average performance for this group, then, in reading was below standard for college freshmen as is measured by the Iowa Test.

The second form of the Iowa Test, Form BM, was administered at the end of one semester course in corrective reading for freshmen. A second criterion for the selection of the subjects was that they should have completed a semester in such a reading course. This form of the Iowa was administered in January, 1964, as one part of the student evaluation. Table 3 shows the frequency distribution, percentages of scores, percentile equivalents for college freshmen reported in the Iowa test manual and grade equivalents. The median scores ranged from 145 to 190. The grade levels corresponding to these scores ranged from a low of 7.2 to a high of 13+. The mean score for the group, 168.6, represented a percentile equivalent of 23. Considering the average performance of the group as indicated by the mean and the standard deviation,
TABLE 2

FREQUENCY DISTRIBUTION, PERCENTAGES, AND GENERAL STATISTICAL MEASURES BASED ON FRESHMAN PERFORMANCES ON THE IOWA SILENT READING TEST, FORM AM

<table>
<thead>
<tr>
<th>Score Interval</th>
<th>Frequency</th>
<th>Cumulative %</th>
<th>Percentile Equivalent (Coll. Fr.)</th>
<th>Grade Equivalent</th>
</tr>
</thead>
<tbody>
<tr>
<td>170-174</td>
<td>5</td>
<td>.99</td>
<td>30</td>
<td>12.4</td>
</tr>
<tr>
<td>165-169</td>
<td>5</td>
<td>.84</td>
<td>22</td>
<td>11.1</td>
</tr>
<tr>
<td>160-164</td>
<td>2</td>
<td>.69</td>
<td>14</td>
<td>10.0</td>
</tr>
<tr>
<td>155-159</td>
<td>3</td>
<td>.63</td>
<td>9</td>
<td>9.0</td>
</tr>
<tr>
<td>150-154</td>
<td>16</td>
<td>.54</td>
<td>6</td>
<td>8.2</td>
</tr>
<tr>
<td>145-149</td>
<td>1</td>
<td>.06</td>
<td>3</td>
<td>7.4</td>
</tr>
<tr>
<td>140-144</td>
<td>1</td>
<td>.03</td>
<td>1</td>
<td>6.8</td>
</tr>
</tbody>
</table>

Mean - 157.90
Median - 154.0
Standard Error of Mean - 1.3
Standard Deviation - 7.60
TABLE 3

FREQUENCY DISTRIBUTION, PERCENTAGES, AND GENERAL STATISTICAL MEASURES BASED ON FRESHMAN PERFORMANCES ON THE IOWA SILENT READING TEST, FORM BM

<table>
<thead>
<tr>
<th>Score Interval</th>
<th>Frequency</th>
<th>Cumulative %</th>
<th>Percentile Equivalents (Coll. Fr.)</th>
<th>Grade Equivalent</th>
</tr>
</thead>
<tbody>
<tr>
<td>190-194</td>
<td>1</td>
<td>.99</td>
<td>79</td>
<td>13+</td>
</tr>
<tr>
<td>185-189</td>
<td>0</td>
<td>.96</td>
<td>64</td>
<td>13+</td>
</tr>
<tr>
<td>180-184</td>
<td>4</td>
<td>.96</td>
<td>52</td>
<td>13+</td>
</tr>
<tr>
<td>175-179</td>
<td>6</td>
<td>.84</td>
<td>42</td>
<td>13+</td>
</tr>
<tr>
<td>170-174</td>
<td>4</td>
<td>.66</td>
<td>30</td>
<td>12.4</td>
</tr>
<tr>
<td>165-169</td>
<td>7</td>
<td>.54</td>
<td>22</td>
<td>11.1</td>
</tr>
<tr>
<td>160-164</td>
<td>7</td>
<td>.33</td>
<td>14</td>
<td>10.0</td>
</tr>
<tr>
<td>155-159</td>
<td>1</td>
<td>.12</td>
<td>9</td>
<td>9.0</td>
</tr>
<tr>
<td>150-154</td>
<td>2</td>
<td>.06</td>
<td>6</td>
<td>8.2</td>
</tr>
<tr>
<td>145-149</td>
<td>1</td>
<td>.03</td>
<td>3</td>
<td>7.4</td>
</tr>
</tbody>
</table>

Mean = 168.60
Median = 168.42
Standard Error of Mean = 3.24
Standard Deviation = 9.70
the writer noted a percentile range from 10 to 45. The gains for this group over the semester is indicated by a difference between the means of 10.70 score points. Despite the gains, this group performed below the 50th percentile point of the standardization sample. The total group of subjects selected for the investigation exhibited a less than average reading ability for college freshmen as measured by the Iowa test.

The results of the grades from one semester of study in the class of Communications 101 are presented in Table 4. Numerical point values of 1, 2, 3, 4, and 5 were given to each alphabetical grade of "F", "D", "C", "B", and "A", respectively. The grades ranged from 3 to 5 or "C" to "A". The mean grade was 3.00 or "C"; the median grade was 3.83 or "B"; the standard error of the mean was .15; and the standard deviation was .88 indicating a less than one point deviation from the mean. Eleven or 33 per cent of the students scored above the mean, twenty-two or 66 per cent scored at the mean, and no students scored below the mean.

Summary of the analysis and interpretation of intelligence and achievement levels of the total population.—Normal intelligence was shown for the total group, although there were some low scores indicating low normal intelligence and some scores indicating high normal intelligence. In reading ability, the entire population was below the standard or grade performance for college freshmen as measured by the Iowa test. The entire group exhibited average ability in success in Communications 101. The entire population did not exhibit performances that were of high quality in any area, thus, it can be concluded that this group is just average and not
TABLE 4

FREQUENCY DISTRIBUTION, PERCENTAGES, AND GENERAL STATISTICAL MEASURES BASED ON FRESHMAN GRADES MADE IN ONE SEMESTER OF STUDY IN COMMUNICATIONS 101

<table>
<thead>
<tr>
<th>Grade Score</th>
<th>Frequency</th>
<th>Cumulative Frequency</th>
<th>Cumulative %</th>
<th>Normal %</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 (A)</td>
<td>2</td>
<td>33</td>
<td>.999</td>
<td>6%</td>
</tr>
<tr>
<td>4 (B)</td>
<td>9</td>
<td>31</td>
<td>.939</td>
<td>27%</td>
</tr>
<tr>
<td>3 (C)</td>
<td>22</td>
<td>22</td>
<td>.666</td>
<td>66%</td>
</tr>
<tr>
<td>2 (D)</td>
<td>0</td>
<td>0</td>
<td>.000</td>
<td>0%</td>
</tr>
<tr>
<td>1 (F)</td>
<td>0</td>
<td>0</td>
<td>.000</td>
<td>0%</td>
</tr>
</tbody>
</table>

Mean = 3.00
Median = 3.83
Standard Error of Mean = .155
Standard Deviation = .885

extraordinary in the possession of intelligence or in the application of any of the skills of reading, thinking, and performing.

Identification and analysis of higher-level and lower-level critical reading abilities of the two groups.--The initial specific purpose of the study was to make an identification of readers with higher-level and lower-level critical reading abilities. This was accomplished through the use of two instruments, the Watson-Glaser Critical Thinking Appraisal, Form Am and a critical reading questionnaire devised especially for this investigation. The plan was to determine the mean score from the Watson-Glaser testing and to use this mean score for classification of the total population.
into two groups: readers with higher-level and lower-level critical reading abilities. The questionnaire was to be used to see if the general trend of the scores approximated the classification which had already been made from the Watson-Glaser Appraisal.

Identification of groups with higher-level and lower-level critical reading abilities.—Table 5 shows the frequency distribution of scores made on the Watson-Glaser Critical Thinking Appraisal, Form Am, and the cumulative percentages for the local groups as they compared with the national percentile equivalents and level classification for critical reading abilities as measured by this Appraisal.

The scores ranged from a low of 40 to a high of 72. These were the scores obtained out of a possible 99 answers. The range of scores was 32. The mean score was 60.27; the median score, 60.0; the standard error of the mean, 1.03; and the standard deviation, 5.9. As compared with the national percentiles, these scores fell in the middle of low ranges of percentile ranks but they spanned four of the five level classifications, high to very low level critical readers. The highest local score of 72 corresponded to the national percentile rank of 57, which was indicative of a high level classification. The lowest local score of 40 was represented by a percentile equivalent of 1. The local mean score of 60.27 corresponded to the national percentile rank of 15 and was indicative of a level four or low level critical reader. The national scores ranged from a low of 31 to a high of 87 with a range of 56, a median score of 70.5, and a mean score of 69.3 with the standard deviation being 5.9.
TABLE 5

FREQUENCY DISTRIBUTION, PERCENTAGES, AND GENERAL
STATISTICAL MEASURES BASED ON FRESHMAN
PERFORMANCES ON THE WATSON-GLASER
CRITICAL THINKING APPRAISAL-
FORM Am

<table>
<thead>
<tr>
<th>Scores</th>
<th>Frequency</th>
<th>Local %ile</th>
<th>National %ile for</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>College Freshmen</td>
</tr>
<tr>
<td>72</td>
<td>1</td>
<td>99.99</td>
<td>57</td>
</tr>
<tr>
<td>70</td>
<td>1</td>
<td>96.96</td>
<td>46</td>
</tr>
<tr>
<td>68</td>
<td>1</td>
<td>93.93</td>
<td>41</td>
</tr>
<tr>
<td>67</td>
<td>3</td>
<td>90.90</td>
<td>37</td>
</tr>
<tr>
<td>64</td>
<td>2</td>
<td>81.81</td>
<td>26</td>
</tr>
<tr>
<td>63</td>
<td>2</td>
<td>75.75</td>
<td>23</td>
</tr>
<tr>
<td>62</td>
<td>3</td>
<td>69.69</td>
<td>20</td>
</tr>
<tr>
<td>61</td>
<td>2</td>
<td>60.60</td>
<td>17</td>
</tr>
<tr>
<td>60</td>
<td>1</td>
<td>54.1</td>
<td>15</td>
</tr>
<tr>
<td>58</td>
<td>2</td>
<td>51.0</td>
<td>11</td>
</tr>
<tr>
<td>57</td>
<td>3</td>
<td>45.0</td>
<td>9</td>
</tr>
<tr>
<td>56</td>
<td>2</td>
<td>36.0</td>
<td>8</td>
</tr>
<tr>
<td>54</td>
<td>4</td>
<td>30.0</td>
<td>6</td>
</tr>
<tr>
<td>53</td>
<td>2</td>
<td>18.0</td>
<td>5</td>
</tr>
<tr>
<td>52</td>
<td>2</td>
<td>12.0</td>
<td>4</td>
</tr>
<tr>
<td>44</td>
<td>1</td>
<td>6.0</td>
<td>2</td>
</tr>
<tr>
<td>40</td>
<td>1</td>
<td>3.0</td>
<td>1</td>
</tr>
</tbody>
</table>

National Classification Levels
II - High
II - High
III - Average
III - Average
IV - Low
IV - Low
IV - Low
IV - Low
IV - Low
IV - Low
IV - Low
IV - Low
IV - Low
V - Very Low
V - Very Low
V - Very Low
V - Very Low

Mean = 60.27
Median = 60.00
Standard Error of Mean = 1.03
Standard Deviation = 5.9
The mean score of the local group performance on the Watson-Glaser Appraisal, which was 60.27, was used as the dividing line between higher and lower-level critical readers. In this division all scores above the mean were identified as higher-level critical readers and all scores below the mean were identified as lower-level critical readers. The percentage of higher-level critical readers was 45 per cent or fifteen students, one or 3 per cent fell on the mean, seventeen or 51 per cent fell below the mean. The one score falling on the mean was counted as part of the higher-level group.

Table 6 presents the frequency distribution and percentages of scores obtained on the critical reading questionnaire. The scores ranged from 4 to 16 of a possible 29 responses. The mean score was 9.86, the median score was 8.5, the standard error of the mean was 375. The standard deviation was 2.15. Eleven or 33 per cent of the scores fell above the mean, eight or 24 per cent of the scores fell at the mean interval and fourteen or 42 per cent of the scores fell below the mean.

Specific scores made by individual students on the questionnaire did not support the high-level or low-level classification of a number of the subjects which had been made by using the scores from the Watson-Glaser Appraisal. Some students scored low on the questionnaire and high on the Watson-Glaser, others scored high on the questionnaire and low on the Watson-Glaser. Figure 1 illustrates graphically that the classification made in terms of the Watson-Glaser Appraisal could generally be substantiated in that the attitude of the questionnaire scores of the students in the "lower-level"
TABLE 6

FREQUENCY DISTRIBUTION, PERCENTAGES, AND GENERAL STATISTICAL MEASURES BASED ON FRESHMAN PERFORMANCES ON THE CRITICAL READING QUESTIONNAIRE

<table>
<thead>
<tr>
<th>Scores</th>
<th>Frequency</th>
<th>Cumulative Frequency</th>
<th>Cumulative %</th>
<th>Normal %</th>
</tr>
</thead>
<tbody>
<tr>
<td>16</td>
<td>1</td>
<td>33</td>
<td>.999</td>
<td>3%</td>
</tr>
<tr>
<td>12</td>
<td>2</td>
<td>32</td>
<td>.910</td>
<td>6%</td>
</tr>
<tr>
<td>11</td>
<td>4</td>
<td>30</td>
<td>.909</td>
<td>12%</td>
</tr>
<tr>
<td>10</td>
<td>4</td>
<td>26</td>
<td>.787</td>
<td>12%</td>
</tr>
<tr>
<td>9</td>
<td>8</td>
<td>22</td>
<td>.666</td>
<td>24%</td>
</tr>
<tr>
<td>8</td>
<td>4</td>
<td>14</td>
<td>.424</td>
<td>12%</td>
</tr>
<tr>
<td>7</td>
<td>4</td>
<td>10</td>
<td>.303</td>
<td>12%</td>
</tr>
<tr>
<td>6</td>
<td>3</td>
<td>6</td>
<td>.180</td>
<td>9%</td>
</tr>
<tr>
<td>5</td>
<td>2</td>
<td>3</td>
<td>.09</td>
<td>6%</td>
</tr>
<tr>
<td>4</td>
<td>1</td>
<td>1</td>
<td>.03</td>
<td>3%</td>
</tr>
</tbody>
</table>

Mean - 9.86
Median - 8.5
Standard Error of Mean - .375
Standard Deviation - 2.15
FIGURE 1

CHART SHOWING THE IDENTIFICATION OF HIGHER-LEVEL AND LOWER-LEVEL CRITICAL READERS BY PERFORMANCE ON THE WATSON-GLASER APPRAISAL AND ON THE QUESTIONNAIRE

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
<td>10</td>
<td>11</td>
<td>12</td>
<td>13</td>
<td>14</td>
<td>15</td>
<td>16</td>
<td>17</td>
<td>18</td>
<td>19</td>
<td>20</td>
<td>21</td>
<td>22</td>
<td>23</td>
<td>24</td>
<td>25</td>
<td>26</td>
<td>27</td>
<td>28</td>
<td>29</td>
<td>30</td>
<td>31</td>
<td>32</td>
<td>33</td>
<td>34</td>
<td>35</td>
<td>36</td>
<td>37</td>
<td>38</td>
</tr>
</tbody>
</table>

Watson-GLASER Appraisal

Readers with higher-level critical reading abilities

Readers with lower-level critical reading abilities

Watson-GLASER Scores

Questionnaire Results
classification is a declining one. The over-all performance of the group so classified was lower than scores of the group classified as "higher-level". Percentage-wise, 33 per cent of the students scored high on the Watson-Glaser and low on the questionnaire; 22 per cent scored low on the Watson-Glaser and high on the questionnaire; 24 per cent scored low on the Watson-Glaser and low on the questionnaire; 3 per cent scored at the mean on the Watson-Glaser and 12 per cent scored at the mean on the questionnaire.

Analysis and interpretation of performance on tests and grades made by readers with higher-level critical reading ability.---Having identified the higher- and lower-level critical readers, the writer gave a description of each group in terms of the three variables to be studied. Table 7 presents scores and means for the higher-level critical readers on each of the tests, the questionnaire and class achievement being measured for relationships. For the Iowa Silent Reading Test, Form AM, the mean was 160.6; for Form BM the mean was 169.37; for the Otis Quick-Scoring Mental Ability Test the mean was 101.18; for the Watson-Glaser Critical Thinking Appraisal the mean was 63.9; the mean for the critical reading questionnaire was 9.4 and the mean for the grades in Communications 101 was 3.4.

The higher-level critical readers were of normal intelligence as revealed by the mean score of 101.18. The average performance for the first reading test was indicative of a grade equivalent of 9.6 and for the second, 11.3. This indicated a two-grade gain in reading achievement. Their performance on the Watson-Glaser revealed low achievement of skills in critical reading as compared to national
TABLE 7


<table>
<thead>
<tr>
<th>Student Number</th>
<th>Iowa Silent Reading Test Form AM</th>
<th>Iowa Silent Reading Test Form BM</th>
<th>Watson-Glaser Crit. Thinking Appraisal</th>
<th>Critical Reading</th>
<th>Otis Quick-Scoring</th>
<th>Grades in Communications 101</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>169</td>
<td>180</td>
<td>72</td>
<td>10</td>
<td>110</td>
<td>C (3)</td>
</tr>
<tr>
<td>B</td>
<td>173</td>
<td>181</td>
<td>70</td>
<td>11</td>
<td>112</td>
<td>C (3)</td>
</tr>
<tr>
<td>C</td>
<td>156</td>
<td>175</td>
<td>68</td>
<td>9</td>
<td>105</td>
<td>B (4)</td>
</tr>
<tr>
<td>D</td>
<td>154</td>
<td>162</td>
<td>67</td>
<td>7</td>
<td>93</td>
<td>C (3)</td>
</tr>
<tr>
<td>E</td>
<td>143</td>
<td>145</td>
<td>67</td>
<td>12</td>
<td>100</td>
<td>C (3)</td>
</tr>
<tr>
<td>F</td>
<td>168</td>
<td>171</td>
<td>67</td>
<td>10</td>
<td>99</td>
<td>C (3)</td>
</tr>
<tr>
<td>G</td>
<td>171</td>
<td>177</td>
<td>64</td>
<td>9</td>
<td>97</td>
<td>C (3)</td>
</tr>
<tr>
<td>H</td>
<td>155</td>
<td>166</td>
<td>64</td>
<td>11</td>
<td>95</td>
<td>C (3)</td>
</tr>
<tr>
<td>I</td>
<td>154</td>
<td>168</td>
<td>63</td>
<td>9</td>
<td>91</td>
<td>C (3)</td>
</tr>
<tr>
<td>J</td>
<td>169</td>
<td>168</td>
<td>63</td>
<td>7</td>
<td>106</td>
<td>A (5)</td>
</tr>
<tr>
<td>K</td>
<td>160</td>
<td>160</td>
<td>62</td>
<td>10</td>
<td>99</td>
<td>C (3)</td>
</tr>
<tr>
<td>L</td>
<td>169</td>
<td>181</td>
<td>62</td>
<td>12</td>
<td>109</td>
<td>C (3)</td>
</tr>
<tr>
<td>M</td>
<td>154</td>
<td>159</td>
<td>62</td>
<td>8</td>
<td>89</td>
<td>C (3)</td>
</tr>
<tr>
<td>N</td>
<td>169</td>
<td>175</td>
<td>61</td>
<td>9</td>
<td>110</td>
<td>B (4)</td>
</tr>
<tr>
<td>O</td>
<td>152</td>
<td>175</td>
<td>61</td>
<td>8</td>
<td>101</td>
<td>C (3)</td>
</tr>
<tr>
<td>P</td>
<td>154</td>
<td>164</td>
<td>60</td>
<td>9</td>
<td>103</td>
<td>B (4)</td>
</tr>
</tbody>
</table>

Mean: 160.6  Mean: 169.37  Mean: 63.9  Mean: 9.4  Mean: 101.18  Mean: 3.4 (C+)
norms. The critical reading questionnaire also revealed a low achievement in critical reading skills. The grades in Communications 101 revealed that the majority of students, labeled higher-level critical readers, achieved an average grade of "C" for the semester. The composite of these scores reveal that these higher-level critical readers were average in terms of intelligence and in terms of success in Communications 101. In reading ability they performed below average for college freshmen when compared with national norms.

Analysis and interpretation of performances on tests and grades made by lower-level critical readers.—For the lower-level critical readers the mean of the Iowa Silent Reading Test, Form AM was 156.2, the mean for Form BM was 168.23, the mean for the Otis Quick-Scoring Mental Ability Test was 94.8, the mean for the Watson-Glaser Critical Thinking Appraisal was 53.4, the mean for the critical reading questionnaire was 8.0, and the grades in Communications 101 was 3.4. These figures are shown in Table 8 which offers a comparative study of the performances of the group. Columns 1 and 2 show that the lower-level critical readers made an average three-grade level gain in silent reading achievement upon the second testing with the Iowa, Form BM. This supports the probability that some skills had been developed in the area of reading as a result of the freshman reading course taken during the first semester. The mean performance at the second testing of 168.23 represents a percentile equivalent of 23 for college freshmen. Column 5, which shows a mean intelligence quotient of 94.23, indicated a probable normal capacity. The mean score made on the Watson-Glaser, as shown in
**TABLE 8**

Scores and means performances of lower-level critical readers on two forms of the Iowa silent reading test, the Watson-Glaser critical thinking appraisal, the Otis quick-scoring mental ability test, the critical reading questionnaire, and one semester grades from Communications 101.

<table>
<thead>
<tr>
<th>Student Number</th>
<th>Iowa Silent Reading Test Form AM</th>
<th>Iowa Silent Reading Test Form BM</th>
<th>Watson-Glaser Critical Thinking Appraisal</th>
<th>Critical Reading Questionnaire</th>
<th>Otis Quick-Scoring Test</th>
<th>Grades in Communications 101</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>151</td>
<td>171</td>
<td>58</td>
<td>7</td>
<td>104</td>
<td>C (3)</td>
</tr>
<tr>
<td>B</td>
<td>151</td>
<td>164</td>
<td>56</td>
<td>11</td>
<td>88</td>
<td>C (3)</td>
</tr>
<tr>
<td>C</td>
<td>152</td>
<td>165</td>
<td>57</td>
<td>5</td>
<td>80</td>
<td>C (3)</td>
</tr>
<tr>
<td>D</td>
<td>157</td>
<td>169</td>
<td>57</td>
<td>8</td>
<td>81</td>
<td>B (4)</td>
</tr>
<tr>
<td>E</td>
<td>150</td>
<td>175</td>
<td>57</td>
<td>9</td>
<td>105</td>
<td>C (3)</td>
</tr>
<tr>
<td>F</td>
<td>154</td>
<td>154</td>
<td>56</td>
<td>7</td>
<td>82</td>
<td>B (4)</td>
</tr>
<tr>
<td>G</td>
<td>153</td>
<td>150</td>
<td>56</td>
<td>5</td>
<td>92</td>
<td>C (3)</td>
</tr>
<tr>
<td>H</td>
<td>154</td>
<td>166</td>
<td>54</td>
<td>6</td>
<td>101</td>
<td>B (4)</td>
</tr>
<tr>
<td>I</td>
<td>151</td>
<td>169</td>
<td>54</td>
<td>16</td>
<td>86</td>
<td>C (3)</td>
</tr>
<tr>
<td>J</td>
<td>156</td>
<td>171</td>
<td>54</td>
<td>9</td>
<td>102</td>
<td>C (3)</td>
</tr>
<tr>
<td>K</td>
<td>173</td>
<td>183</td>
<td>54</td>
<td>10</td>
<td>96</td>
<td>C (3)</td>
</tr>
<tr>
<td>L</td>
<td>150</td>
<td>160</td>
<td>53</td>
<td>9</td>
<td>94</td>
<td>B (4)</td>
</tr>
<tr>
<td>M</td>
<td>173</td>
<td>190</td>
<td>53</td>
<td>11</td>
<td>103</td>
<td>A (5)</td>
</tr>
<tr>
<td>N</td>
<td>171</td>
<td>175</td>
<td>52</td>
<td>8</td>
<td>96</td>
<td>B (4)</td>
</tr>
<tr>
<td>O</td>
<td>156</td>
<td>174</td>
<td>52</td>
<td>4</td>
<td>97</td>
<td>C (3)</td>
</tr>
<tr>
<td>P</td>
<td>154</td>
<td>163</td>
<td>44</td>
<td>6</td>
<td>91</td>
<td>B (4)</td>
</tr>
<tr>
<td>Q</td>
<td>151</td>
<td>160</td>
<td>40</td>
<td>6</td>
<td>101</td>
<td>C (3)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Mean</th>
<th>Mean</th>
<th>Mean</th>
<th>Mean</th>
<th>Mean</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>156.2</td>
<td>168.23</td>
<td>53.4</td>
<td>8.0</td>
<td>94.23</td>
<td>3.4</td>
</tr>
</tbody>
</table>
column 3, revealed that the lower-level group was below average in skills of critical thinking. This below average ability to do critical thinking was further substantiated by the low mean score made on the critical reading questionnaire. The mean score of 53.4 on the Watson-Glaser represented the 5th percentile on the national scale. As for achievement, shown in column 6, the lower-level critical readers' mean score of 3.4 revealed that they were achieving at the same average level as the higher-level critical readers. It can be said that in terms of national norms that these students were below average in reading ability, and that they were below average in critical reading ability and skills. They were average in tested intelligence. They were average in terms of achievement in Communications 101.

Analysis and interpretation of differences in intelligence, general reading ability, and achievement in Communications 101 of higher-level and lower-level critical readers. Table 9 presents measures of differences between higher-level and lower-level critical readers in terms of intelligence, as measured by the Otis Quick-Scoring Mental Ability Test, Form Em-Gamma. The mean score for the higher-level group was 101.18 and the mean for the lower-level group was 94.8. The difference between the means was 6.38. The computed "t" for the significant difference between the groups was found to be 2.43. This "t" was found to be of statistical significance at the .05 level of confidence.

Table 10 presents measures of differences between higher-level and lower-level critical readers in terms of general reading ability, as measured by the Iowa Silent Reading Test, Form BM. The mean
TABLE 9

STATISTICAL MEASURES OF DIFFERENCE BETWEEN MEAN
SCORES MADE BY THE HIGHER-LEVEL AND LOWER-
LEVEL CRITICAL READERS ON THE OTIS
QUICK-SCORING MENTAL ABILITY
TEST, FORM EM-GAMMA

<table>
<thead>
<tr>
<th>Statistical Measure</th>
<th>Higher-Level Group</th>
<th>Lower-Level Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>101.18</td>
<td>94.8</td>
</tr>
<tr>
<td>Difference</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Between Means</td>
<td>6.38</td>
<td></td>
</tr>
<tr>
<td>$S_{cm}$ Difference</td>
<td>2.61</td>
<td></td>
</tr>
<tr>
<td>&quot;t&quot;</td>
<td>2.43*</td>
<td></td>
</tr>
</tbody>
</table>

* significant at the .05 level of confidence

The mean score for the higher-level group was 169.37 and the mean score for the lower-level group was 168.23. The difference between the means was 1.14 and the standard error of the means difference was 3.39. The computed "t" for the significant difference between the groups was found to be .333. This "t" was found to be of no statistically significant difference at the .05 level of confidence.

Table 11 presents measures of difference between higher-level and lower-level critical readers in terms of achievement in Communications 101. The mean grade for the higher-level group was
### Table 10

Statistical Measures of Difference Between Mean Scores Made by the Higher-Level and Lower-Level Critical Readers on the Iowa Silent Reading Test, Form BM

<table>
<thead>
<tr>
<th>Statistical Measure</th>
<th>Higher-Level Group</th>
<th>Lower-Level Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>169.37</td>
<td>168.23</td>
</tr>
<tr>
<td>Difference between Means</td>
<td>1.14</td>
<td></td>
</tr>
<tr>
<td>$S_{em}$ Difference</td>
<td>3.39</td>
<td></td>
</tr>
<tr>
<td>&quot;t&quot;</td>
<td>0.333*</td>
<td></td>
</tr>
</tbody>
</table>

* not significant at the .05 level of confidence

3.14 or "C+" and the mean grade for the lower-level group was 3.14 or "C+". The difference between the means was 0.0 and the standard error of the mean difference was also 0.0. It was not necessary to compute a "t" for the significant difference between the groups, therefore, the difference in these two groups was 0 for Communications 101 and was of no statistical significance at any level of confidence.

In measuring for significant differences between higher-level and lower-level critical readers, the writer found that the means of
TABLE II

STATISTICAL MEASURES OF DIFFERENCES BETWEEN MEAN GRADES MADE BY THE HIGHER-LEVEL AND LOWER-LEVEL CRITICAL READERS IN COMMUNICATIONS 101

<table>
<thead>
<tr>
<th>Statistical Measure</th>
<th>Higher-Level Group</th>
<th>Lower-Level Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>3.4</td>
<td>3.4</td>
</tr>
<tr>
<td>Difference Between Means</td>
<td>0.0</td>
<td></td>
</tr>
<tr>
<td>$S_{em}$ Difference</td>
<td>0.0</td>
<td></td>
</tr>
<tr>
<td>$t^*$</td>
<td>0.0*</td>
<td></td>
</tr>
</tbody>
</table>

* no significance at any level of confidence

Each measurement were higher for the higher-level critical readers than the means for the lower-level critical readers but that not all differences were of statistical significance. The difference between the higher-level and lower-level means on the Iowa Silent Reading Test, Form BM was 1.14 in favor of the higher-level group. A $t^*$ was computed for the difference and the difference was found to be of no significant difference at the .05 level of confidence. The difference between the means on the Otis Quick-Scoring Mental Ability Test was 6.38 in favor of the higher-level group. A $t^*$ was computed for the difference and the difference was found to be significant at the .05 level of confidence. There was no difference
between the means in terms of achievement in Communications 101. From the description of the higher-level and lower-level groups it seems that readers with higher-level critical reading abilities and skills probably will show superiority in performance on tests of intelligence and reading achievement, but that those readers with higher-level critical reading abilities will not necessarily show superiority in a course such as Communications where all language skills are in focus.

Analysis and interpretation of relationships of intelligence, general reading ability, and achievement in Communications 101 of higher-level critical readers.--The measured relationship of the intelligence scores and general reading ability scores yielded a Pearson's coefficient of correlation of .85. This represented a high correlation between intelligence and general reading ability for the higher-level critical readers. When this coefficient was checked in the probability table it was far above the "r" of .244 required for significance at the .05 level of confidence as shown in Table 12.1

The measured relationship between intelligence and achievement in Communications 101 yielded a Pearson's coefficient of correlation of .63. This represented a moderate correlation between the intelligence and achievement for higher-level critical readers. When this coefficient was checked in the table of probability it was far above the "r" of .244 required for significance at the .05 level of confidence as shown in Table 12.

TABLE 12

RELATIONSHIPS OF INTELLIGENCE, READING ABILITY, AND ACHIEVEMENT IN COMMUNICATIONS 101 OF HIGHER-LEVEL CRITICAL READERS AT THE .05 LEVEL OF CONFIDENCE

<table>
<thead>
<tr>
<th>Variables</th>
<th>Coefficient &quot;r&quot;</th>
<th>Coefficient required for significance</th>
<th>Conclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intelligence and Reading Achievement</td>
<td>.85</td>
<td>.244</td>
<td>+</td>
</tr>
<tr>
<td>Intelligence and Class Achievement</td>
<td>.63</td>
<td>.244</td>
<td>+</td>
</tr>
<tr>
<td>Class Achievement and Reading Achievement</td>
<td>.60</td>
<td>.244</td>
<td>+</td>
</tr>
</tbody>
</table>

The measured relationship between achievement in Communications 101 and general reading ability yielded a Pearson's coefficient of correlation of .60. This represented a moderate correlation between the achievement in Communications 101 and general reading ability of higher-level critical readers. When this coefficient was checked in the table of probability it was far above the "r" of .244 required for significance at the .05 level of confidence as shown in Table 12.

In each instance, an appreciably high correlation was found for all the relationships and each relationship indicated significant differences.
In the three correlations for the higher-level critical readers a fairly high positive relationship was found in each instance, with the highest correlation existing in the relationship between intelligence and reading achievement.

Analysis and interpretation of relationships of intelligence, general reading ability, and achievement in Communications 101 of lower-level critical readers.--The measured relationship between intelligence and general reading ability yielded a pearson's coefficient of correlation of .58. This represented a moderate correlation between intelligence and general reading ability of lower-level critical readers. When this coefficient was checked in the table of probability it was above the "r" of .244 required for significance at the .05 level of confidence as shown in Table 13.

### TABLE 13

RELATIONSHIPS OF INTELLIGENCE, READING ABILITY, AND ACHIEVEMENT IN COMMUNICATIONS 101 OF LOWER-LEVEL CRITICAL READERS AT THE .05 LEVEL OF CONFIDENCE

<table>
<thead>
<tr>
<th>Variables</th>
<th>Coefficient &quot;r&quot;</th>
<th>Significant Coefficient required for significance</th>
<th>Significant Conclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intelligence and Reading Achievement</td>
<td>.58</td>
<td>.244</td>
<td>+</td>
</tr>
<tr>
<td>Intelligence and Class Achievement</td>
<td>.76</td>
<td>.244</td>
<td>+</td>
</tr>
<tr>
<td>Class Achievement and Reading Achievement</td>
<td>.85</td>
<td>.244</td>
<td>+</td>
</tr>
</tbody>
</table>
The measured relationship between intelligence and achievement in Communications 101 yielded a coefficient of correlation of .76. This represented a high positive correlation between the intelligence and achievement for lower-level critical readers. When this coefficient was checked in the table of probability it was far above the "r" of .214 required for significance at the .05 level of confidence as shown in Table 13.

The measured relationship between achievement in Communications 101 and general reading ability yielded a coefficient of correlation of .85. This represented a high correlation between the achievement in Communications 101 and general reading ability of lower-level critical readers. When this coefficient was checked in the table of probability it was far above the "r" of .214 required for significance at the .05 level of confidence as shown in Table 13.

In the three correlations for the lower-level critical readers a moderately high positive relationship was found in each instance with the highest correlation existing in the relationship between achievement in Communications 101 and reading ability.

From these correlations the writer concluded that those students who rated high in intelligence were also rated high in achievement, those who rated high in intelligence were rated high in reading achievement, and those who rated high in reading ability were rated high in class achievement. From this it can also be concluded that those students rating low in intelligence were rated low in reading achievement; those rating low in intelligence were rated high in class achievement; and those rating high in class achievement were low in reading achievement.
Summary of analysis and interpretation of data.--In order to satisfy the purposes of the study, higher and lower-level critical readers were determined and identified by means of the Watson-Glaser Critical Thinking Appraisal and a devised critical reading questionnaire. The higher-level critical readers were identified as those students scoring above the mean on the Watson-Glaser and the lower-level group was identified as being those students scoring below the mean on the Watson-Glaser. The critical reading questionnaire was used to further corroborate this identification of the two groups and the mean score of this measurement was used in the same manner as the Watson-Glaser.

Both groups were normal in average intelligence and both scored the same mean score in class achievement as measured by the grades in Communications 101. The groups also were below the reading grade for college freshmen. The higher-level critical readers scored higher on each measurement than the lower-level group.

Relationships within the groups revealed a high positive correlation between intelligence and general reading ability for the higher-level group and low positive correlation for the lower-level group. There was a moderately positive correlation between intelligence and achievement for the higher-level group and a high positive correlation for the lower-level group. A low positive correlation was found between achievement and general reading ability for the higher-level group and a high positive correlation for the lower-level group.

In measuring for significant differences, it was found that there was an important statistical difference between the groups in
terms of intelligence, the difference favoring the higher-level group; there was no statistically significant difference between the groups in terms of general reading ability; and there was no statistically significant difference of any number between the groups in terms of achievement in Communications 101. From this analysis it seems valid to conclude that higher-level critical reading abilities are manifested where there are relatively higher degrees of intelligence and where there are low degrees of intelligence lower-level critical reading abilities can be found.
CHAPTER III
SUMMARY, FINDINGS, CONCLUSIONS, IMPLICATIONS,
AND RECOMMENDATIONS

Summary of the rationale.--In today's education, more emphasis is being placed on developing the skills of critical reading and thinking. Students need to be able to analyze and think critically about what they read. They need the ability to search for truth, form individual opinions and evaluate the information imparted to them.

In order to engage in critical reading, students must possess reading skills which allow for a complete literal understanding of the materials under consideration. The most important single factor influencing reading is general intelligence. It is a known fact that intelligence has a causal relationship to school learning, and also that one must learn to read in order to succeed with informational materials.

Since critical reading is the process of giving considerable thought to what one reads, and since thinking power involves the process of analysis, judgment, weighing of ideas, and searching out relationships, it seems obvious that there should be a relationship between intelligence and the ability to do critical reading.

Critical reading and thinking, intelligence, and general reading ability are important factors in achievement in communications classes where all subjects require some reading at the college level.
Communications classes are designed to extend, refine, and consider in depth speaking, listening, reading, and writing skills. This extension of skills is brought about to a degree by thoroughly considering techniques used in interpreting and evaluating verbal material. Achievement in such a class, then, may be influenced by the student's intelligence, reading ability, or critical reading skills.

**Basic design and methodology.** This study was a descriptive study utilizing comparative techniques in its investigation into the relationships between intelligence, general reading ability, and achievement in a Communications class in readers with higher-level and lower-level critical reading skills.

The general purpose of the study was to determine and compare any significant relationships found among higher-level and lower-level critical readers. More specific purposes were:

1. The comparisons of relationships between tested intelligence and general reading ability, tested intelligence and achievement in Communications 101, and general reading ability and achievement in Communications 101 in higher-level and lower-level critical readers.

2. The comparison of higher-level and lower-level critical readers in terms of significant differences in intelligence, general reading ability, and achievement in Communications 101.

3. The drawing of findings, conclusions, implications, and recommendations which might lend themselves to further application or study in these areas.

Materials and instruments used in the study were: (1) **The Iowa Silent Reading Test**, Forms AM and BM, (2) **The Otis Quick-Scoring Mental Ability Test**, Form Em-Gamma, (3) **The Watson-Glaser Critical Thinking Appraisal**, Form Am, (4) A devised critical reading questionnaire, and (5) Grades from Communications 101.

The use of the Otis test presented one limitation for the study in that it is a group test restricted to verbal procedures,
thereby not yielding accurate measures of individual capacity.

Subjects for the study were limited to thirty-three college freshmen who attended Morris Brown College, Atlanta, Georgia, during the academic year, 1963-64. They were selected on the basis of having completed one semester of special reading instruction and one semester of a course called communications 101.

**Summary of the related literature.**—The related literature which made valuable contributions to the development of a frame of reference for this investigation was reviewed in terms of (1) reading and intelligence, (2) achievement and intelligence, (3) critical reading abilities, and (4) communications in the curriculum.

The most important single factor influencing reading is general intelligence. A high correlation between intelligence test scores and various reading test scores has been reported and it is thought that low intelligence quotients resulting from group intelligence tests may reflect disability and not a basic inability to learn.

Investigators have reported correlations of .69 between critical reading and verbal intelligence, correlations of .49 between scores from the Otis-Quick-Scoring Mental Ability Test and the Watson-Glaser Critical Thinking Appraisal in support of the theory that intelligence may exert influence in the development of high-level critical reading though not insuring it.

In the area of intelligence and achievement, some writers comment that intelligence has a causal relationship to learning. On the whole, inquiry into the matter has supported the contention that students with high intelligence quotients can make better and greater progress in reading and in academic subjects than students who possess low intelligence quotients.

The term "critical reading" has been used as a major heading under comprehension, as a specific comprehension skill or as a
higher-level comprehension ability involving higher-level mental processes. Some of the most agreed upon qualities and abilities of the mature critical reader are: (1) the ability to define a problem, (2) the ability to select pertinent information for the solution of a problem, (3) the ability to recognize stated and unstated assumptions, (4) the ability to formulate and select relevant and promising hypotheses, and (5) the ability to draw conclusions, inferences, and analyze inductive and deductive reasoning.

Communications is thought of as a course in the language arts designed for the college student. It has replaced many of the standard freshman English composition classes. In the present Communications classes emphasis is placed on developing the language arts. Although some English classes were changed, it seems that the present Communications classes are not satisfying their purposes, and there are indications of further change but no indication as to the nature of such a change has been made public.

Summary of the findings.---The findings of this research are presented in accordance with the purposes of the study.

1. In the interest of further division and analysis of the thirty-three subjects involved in the study, the following findings were pertinent:

a) The mean intelligence quotient of the total group was 97.86, with scores ranging from 80 to 112.

b) The mean reading score for the total group was 168.6, which was equivalent to the 23rd percentile as reported for college freshmen on the Iowa test. The scores ranged from 145 to 190, with percentile equivalents of 10 to 45.

c) The mean grade in Communications 101 was "C", with grades ranging from "A" to "C".
d) Performance on the Watson-Glaser Critical Thinking Appraisal yielded lower than national average results with a total group mean of 60.27 equivalent to the 15th percentile of the standardization sample. Scores ranged from 40 to 72, with percentile equivalents from 1 to 57.

e) The range of correct responses on the critical reading questionnaire for the total group was 4 to 16 of a possible 26 responses. The mean score was 8.5.

f) An analysis of performances on the two instruments used to judge critical reading skills revealed that 33 per cent of the group made high scores on the Watson-Glaser but low scores on the questionnaire; 22 per cent of the group made high scores on the questionnaire but low scores on the Watson-Glaser; 33 per cent of the group made high scores on both instruments; 24 per cent of the group made low scores on both instruments; 3 per cent of the group scored in the mean interval on the Watson-Glaser and 12 per cent of the group scored in the mean interval on the questionnaire.

2. Upon the division of the group into readers with "higher-level" and "lower-level" critical reading skills, using the mean score of the Watson-Glaser Appraisal as the dividing point, the separate groups could be described as follows:

a) The mean intelligence quotient of the higher-level critical readers was 101.18, with scores ranging from 89 to 112.

b) The mean reading score for the higher-level group was 169.37 which was equivalent to the 24 percentile as reported for college freshmen on the Iowa test. The scores ranged from 145 to 181, with percentile equivalents of 2 to 50.

c) The mean grade in Communications 101 was "C", with grades ranging from "A" to "C".

d) The mean intelligence quotient of the lower-level critical readers was 94.8, with scores ranging from 80 to 105.

e) The mean reading score for the lower-level group was 168.23 which was equivalent to the 23rd percentile as reported for college freshmen on the Iowa test. The scores ranged from 150 to 190, with percentile equivalents of to.

f) The mean grade in Communications for the lower-level group was "C", with grades ranging from "A" to "C".
g) With a "t" of 2.43, there was found to be a statistically significant difference in intelligence between higher- and lower-level critical readers.

h) With a "t" of .333, there was found to be no significant difference in general reading ability between higher- and lower-level critical readers.

i) Both groups achieved the same average grade in Communications 101.

3. An analysis of the relationships between intelligence, silent reading ability, and achievement in communications in readers with higher-level critical reading abilities yielded these findings.

a) There was a significant marked positive relationship between intelligence and general reading achievement. The "r" was .85 at the .05 level of confidence which requires a correlation of .241 for significant relationship.

b) There was a substantial positive relationship between intelligence and class achievement. The "r" was .63 at the .05 level of confidence which requires a correlation of .241 for significant relationship.

c) There was a substantial positive relationship between reading ability and achievement in Communications 101 with an "r" of .60 at the .05 level of confidence which requires a correlation of .241 for significant relationship.

4. An analysis of the relationships between intelligence, silent reading ability and achievement in communications in readers with lower-level critical reading abilities yielded these findings.

a) There was a substantial positive relationship between intelligence and reading achievement with an "r" of .58 at the .05 level of confidence which required a correlation of .241 for significant relationship.

b) There was a marked positive relationship between intelligence and achievement in communications with an "r" of .76 at the .05 level of confidence which requires a correlation of .241 for significant relationship.

c) There was a marked positive relationship between reading achievement and achievement in communications. The "r" was .85 at the .05 level of confidence which requires a correlation of .241 for significant relationship.

Conclusions.—Generally, none of the subjects selected for the study exhibited exceptional critical reading skills, reading ability,
or unusually high intelligence levels as measured by the instruments used in the study. Upon the division of the group in terms of the tested critical reading abilities, the writer felt that the following conclusions might be drawn pursuant to the findings of the investigation:

1. The group of readers with higher-level critical reading skills were of average to high average intelligence but exhibited some disabilities in reading in that they did not perform up to the expected level of achievement for college freshmen.

2. The group of lower-level critical readers were of dull normal to average intelligence and exhibited some disabilities in reading though not to a significantly greater extent than the higher-level critical readers.

3. Although the mean intelligence quotient of the higher-level critical readers was higher than that of the lower-level group, success in the class, Communications 101, was not significantly different; therefore, factors other than intelligence must be operant in the manipulation of language skills.

4. Since higher-level critical readers achieved at about the same level as lower-level critical readers in Communications 101, the differences in critical reading abilities did not operate to cause a greater degree of success in achievement in the total area of language arts.

5. The finding that readers with higher-level critical reading skills possessed higher intelligence quotients as a group than those readers with lower-level critical reading skills seemed to re-affirm findings of prior investigations that higher intelligence makes possible a higher level of critical reading though it does not assure this high level of development.

6. Since, on one of the two instruments of appraisal, some lower-level critical readers exhibited strengths in critical reading which were superior to those strengths in some higher-level critical readers, factors other than intelligence seemed to be influential in the development of critical reading skills.

7. A significantly high correlation between intelligence and general reading ability and a moderately high correlation between intelligence and class achievement in higher-level critical readers attested to the influence of intelligence
on reading ability and on achievement in communications though to a lesser degree on the latter.

8. The moderate correlation between reading achievement and achievement in Communications 101 among higher-level critical readers led to the conclusion that reading ability functions in such a class as only a part at the total content. To some extent this was as would be expected.

9. To an appreciable degree intelligence quotients resulting from use of Otis Quick Scoring Mental Ability Tests reflected high, average, and low reading efficiency of higher-level critical readers, but, only to a moderate degree was this relationship indicated among lower-level critical readers.

10. The high positive correlations between reading ability and achievement in "lower-level" critical readers gave support to conclusions that (1) a lower-level of critical reading ability in this group did not act as a deterrent to their success in achievement in Communication 101 but that (2) proficiency in the basic reading skills exerted more influence on the chances of success in such a class than did critical reading ability.

Implications.-- On the basis of the analysis and interpretation of findings of this study, the writer felt that the following implications were warranted:

1. The fact that some students with lower intelligence quotients performed on reading levels which were not significantly different from the reading levels of readers with higher intelligence quotients may indicate reading retardation among students with higher intelligence quotients.

2. Critical reading skills did not appear to have been developed in conjunction with proficiency in basic reading skills but appeared to be influenced to an undetermined extent by higher levels of intelligence.

3. Factors other than intelligence and higher-level critical reading abilities appeared to be operant in achievement in college-level communications courses.

4. Some critical reading skills are probably acquired in the normal course of training and from experience, but higher degrees of proficiency in critical reading do not appear to develop incidentally.

5. Critical reading skills are apparently specialized skills which operate in more specific situations
than to basic reading skills. This seemed implicit in the failure of higher-level critical readers to achieve to a higher degree in the communications situation and in general reading ability.

6. The moderate correlation between intelligence and reading ability as compared with the higher correlation between intelligence and achievement in Communications among lower-level critical readers may serve as evidence of the limitations of group intelligence measures requiring reading to obtain valid measures of mental ability. It would appear that where facets of communications other than reading are present, a closer estimate of capacity is possible.

**Recommendations.**—In the interest of further application and study of the findings of this study and more careful investigation into the implications aforesaid, the writer considered the following recommendations to be justifiable:

1. Individuals who evidence high average or superior ability, but whose performance in basic or specific aspects of reading is of average quality, or below, should be advised and encouraged to seek instruction in reading.

2. Reading instruction at every level should include specific planned activities designed to develop skills which will foster maturity in critical reading and thinking.

3. Study and instruction in any academic discipline should include planned activities designed to promote facility in the application of critical reading and thinking.

4. Where there is evidence of disability in reading, listening comprehension tests should be used to obtain estimates of mental capacity. This study should be extended to include such estimates in order to test the usefulness of such an instrument in research designs employing capacity as a variable.

5. An investigation should be made to determine the extent of influence of experience and background on the development of critical reading and thinking abilities.

6. A series of investigations should be made in order to determine the specific critical reading skills necessary for optimum development within particular content areas.
BIBLIOGRAPHY

Books


Periodicals

Artley, A. Sterl. "Critical Reading In The Content Areas", 
Elementary English, XXXVI, No. 2 (February, 1959).

Barbe, Walter and Crek, Werner. "Correlations Between Reading 
Factors and IQ", School and Society, LXXV (March, 1952).

Chansky, Norman M. "Age, IQ, and Improvement of Reading",

Eller, William and Dykstra, Robert, "Persuasion and Personality: 
A Factor in Critical Reading", Elementary English, XXXVI 
(March, 1959).

Kemp, C. Gratton. "Improvement of Critical Thinking In Relation 
To Open-Closed Belief Systems", Journal of Experimental 
Education, XXXII, No. 3 (March, 1963).

Patton, Emma et al. "Relationship Between Reading Retardation and 
the Measurement of Intelligence", Personnel and Guidance 
Journal, XXVI (September, 1959).

Pippert, Ralph and Archer, N. Sedney. "A Comparison of Two Methods 
for Classifying Underachievers With Respect to Selected 
Criteria", The Personnel and Guidance Journal, Vol. XLI, 
No. 9 (May, 1963).

Scott, Carrie M. "The Relationship Between Intelligence Quotients 
and Gain In Reading Achievement With Arithmetic Reasoning, 
Social Studies, and Science", Journal of Educational Research, 
LVI, No. 6 (February, 1963).

Scott, Carrie M. "Intelligence and Gain In Reading as Related to 
Gain in the Sub-test of the Stanford Achievement Test", 
Journal of Educational Research, Vol. 56, No. 9 (May-June, 
1963).

English, XXXVI (January, 1959).

Thomas, George I. "A Study of Reading Achievement In Terms of 
Mental Ability", The Elementary School Journal, 
(September, 1946).

Wallen, Norman E., Haubrich, Vernon F., and Reid, Ian E. "The 
Outcomes of Curriculum Modification Designed to Foster 
Critical Thinking", The Journal of Educational Research, 
LVI, No. 10 (July-August, 1963).
Unpublished Materials


Other Sources

___________. Personal interview with Dr. Beulah J. Farmer, Head of English Department, Morris Brown College, January 31, 1964.
VITA

Parker, Erva Jean

Education

Graduate of Central High School, Louisville, Kentucky, 1958. B. S. in Education, Knoxville College, Knoxville, Tennessee, 1962, with a major in History. All graduate study has been done at Atlanta University, Atlanta, Georgia.

Experience

Graduate assistant in Reading at Morris Brown College, 1962-1964.

Personal Information

Single; age 24 years; member of McKinley Methodist Church, Dayton, Ohio
CRITICAL READING QUESTIONNAIRE

DIRECTIONS: Read each item carefully noting the underlined statements; then fill in the appropriate blank with the alphabet that represents the best definitions for the underlined statements:

A - This is a statement whose truth is thought of as being securely established.
B - This statement is a judgment or belief without too much evidence or confidence.
C - This is not sufficient evidence to justify the statement.
D - If necessary, evidence could be collected to prove or disprove this statement.
E - This statement invites us to believe what is stated.
F - This statement conforms to a rule up to a point; then becomes a misstatement of facts.
G - This statement shows ideas that have been taken for granted.
H - This statement follows from another not directly in context.

EXAMPLE: G According to noted sports writers, boxing will soon be outlawed.

PART I.

1. If both white and grey mice are given careful exercise, after two years, white mice will have achieved more motor skills than the grey mice.

2. If more hydrogen test bombs are exploded, the fallout will ultimately destroy the race.

3. Because the committee awarded the prize to the chairman's daughter without considering the merits of the other contestants, they were guilty of unfairness.

4. Private schools make children snobbish, and they have no place in a democracy.

5. Algeria must be either free or enslaved by France.

6. As we entered the next town, we noticed that all the streets were wet. We assumed it had been raining.

7. Almost any prospective buyer can tell the difference between a natural pearl and a cultured pearl. Only a prospective buyer can tell this difference.

NAME ____________________________ DATE _________
APPENDIX
8. According to statistics, all America will be urbanized by 1980.

9. In 1958, Latin America had an estimated 250 million Communist Party members.

10. The new Public Housing Bill will probably be passed by the Senate but the House of Representatives will probably veto it.

11. Automation is on the increase; if it continues there will soon be twenty million unemployed.

12. Teachers make very comfortably salaries.

13. Everyone knows that when it thunders there has been lightning somewhere.

PART II. DIRECTIONS: Fill in the blank with the alphabet that represents the best definition of the statements. Use the following definitions.

A - This is inductive reasoning; going from the specific to the general.
B - This is deductive reasoning; going from the general to the specific.
C - This is logical.
D - This is illogical.

1. The U. S. believes that all world powers should disarm; the U. S. is a world power; therefore, the U. S. should disarm.

2. Some anger is not to be condemned; all anger is passion; therefore, some passion is not to be condemned.

3. All knowledge is desirable; no falsehoods are desirable; therefore, no knowledge is falsehood.

4. All girls are talkative; some Clark students are girls; therefore, some Clark students are talkative.

PART III. DIRECTIONS: Fill in the blanks with the alphabet which represents the appropriate definition of the statement. Use the following definitions:

A - These statements try to persuade one to be patriotic.
B - These statements are literary persuasion.
C - These statements are political persuasion.
D - These statements play one one's desires and wants.
E - These statements are not persuasive in any manner.
1. "If you read but one book a year, this should be your choice".

2. All classes of people are buying Pannador automobiles simply because this car is more comfortable and economical.

3. Tons of Communist literature, featuring anti-government and "hate America" themes are shipped to our country from Cuba. Help rid our country of this!

4. The Soviet satellite regime of Fidel Castro must be overthrown and replaced with a democratic government.

PART IV. DIRECTIONS: Choose the best response and write the appropriate alphabet in the blank. When requested, give your opinion of the statement.

1. "When in doubt, don't". Do you agree with this advice?
   a) YES  b) NO  c) PERHAPS

   Why?

2. "Judge only a bee by the first impression". Does this axiom have any significant meaning? State the meaning it has to you.
   a) YES  b) NO  c) PERHAPS

   Your statement of meaning is

3. "A man gets no more than he pays for, but the best things in life are free". Is this statement true or contradictory?
   a) TRUE  b) CONTRADICTORY  c) NEITHER

   Why?

4. "Though leaves are many, the root is one; through all the lying days of my youth, I swayed my leaves and flowers in the sun; now I may wither into the truth. The author's mood and tone is:
   a) restful  b) sad  c) happy  d) indifferent  e) none of these  f) all of these

5. "For the past is a shadow grown greater than its substance, and shadows have power to mock and betray us to the end of our days". The author's mood is:
   a) remorseful  b) frightened  c) reminiscent  d) a and c  e) all of these  f) none of these