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AUTHOR

Robbins, Ruth H.

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ABSTRACT

Ten reading skills were selected to represent literal, interpretive, and critical reading. An objective test was constructed for each of eight skills, and published tests were used for the remaining two. Complete data were available on 220 upper intermediate children. Using a series of multiple regression analyses it was concluded that a hierarchical relationship existed which specified an ascending order from the literal, to the interpretive, to the critical. Three characteristics underlying the ability to read critically were subjectively identified: the ability to interact with an author; to use criteria for judgment; to suspend judgment. Characteristics of the children which may have influenced their functioning on the tests were studied. The language aptitudes of understanding verbal concepts and organizing data for recall had the greatest impact. Of equal importance was a teacher-group interaction which apparently resulted in three patterns of achievement: above capacity; below capacity; scattered functioning. Chronological age, sex, grade level had limited or no effect. (Author)

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TITLE: RELATIONSHIPS BETWEEN CRITICAL READING AND SELECTED MEASURES OF LITERAL AND INTERPRETIVE READING.

AUTHOR: Ruth H. Robbins, Ph.D.
Director, Educational Services
Illinois Institute of Technology
Institute for Psychological Services
3440 S. State Street
Chicago, Illinois 60616

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RELATIONSHIPS BETWEEN CRITICAL READING AND SELECTED MEASURES OF LITERAL AND INTERPRETIVE READING

THE PROBLEM

Reviewing critical reading from the standpoint of research and actual classroom practice, it is suggested that there appear to be three conditions which may have acted as deterrents to the teaching of this vital skill:

Condition 1: Lack of consensus as to what critical reading is.

This seems to have had the most serious repercussions. To try to implement or interpret research findings on "critical reading" when different investigators are calling it different things is virtually impossible.

Condition 2: Lack of understanding as to how critical reading relates to other dimensions of a reading process.

This is partially related to condition 1 in that it would be difficult to understand how critical reading can relate to other dimensions of a reading process unless it, critical reading, is defined. The second aspect of condition 2, "other dimensions of a reading process", also has not been clearly defined in the literature.

Condition 3: A dearth of evaluation instruments.

This is a natural outgrowth of conditions 1 and 2. How can tests be developed with any degree of behavioral validity when there is so little consensus as to the content of the behavior? Another reason for the lack of evaluative procedures lies

in the difficulty of developing instruments that measure higher cognitive processes. In this current age of accountability, teachers are going to attend to the kinds of reading skills their children are going to be tested on; if critical reading is not tested (and it rarely is), it is in danger of not being taught.

The issue is: whether these conditions can be satisfied so as to achieve some understanding of the nature of critical reading. It is the intent of the investigator to deal with these three deterrents: a definition of critical reading will be formulated; how one aspect of critical reading relates to other dimensions of a reading process will be studied; evaluation instruments will be developed.

PURPOSE OF THE STUDY

The purpose of this study was to investigate the relationships between one purpose for reading critically and two other dimensions of a reading process: literal and interpretive reading. The following hypothesis guided the investigation:

Hypothesis: The ability to perform three levels of a reading process is characterized by a hierarchy which specifies an ordering from the literal to the interpretive to the critical.

If a hierarchical relationship existed it could then be assumed that the ability to function at the literal and interpretive levels would underlie the ability to function at the critical level. Contingent upon results from testing the hypothesis, the investigator was prepared to ask:

Question: Are there identifiable aspects in the ability to function on selected measures of literal and interpretive reading that underlie the ability to function on one facet of critical reading?

The data used to test the hypothesis and to investigate the question were the responses of upper intermediate age children to a battery of reading tests. These tests measured the ability of the children to function on selected reading skills representative of literal, interpretive, and one aspect of critical reading. The characteristics of this population in terms of chronological age, aptitude, sex, grade, and teacher were identified and the influence of these characteristics on the children's ability to function on the tests was also studied.

BACKGROUND OF THE STUDY.

In the three hundred year history of changing purposes for reading instruction in America, only in the past twenty years has critical reading really been emphasized. Research in this area has been also relatively recent, somewhat sparse, and slow to become manifested in classroom practices. Early research was concerned with the question of teachability and much subsequent research centered on the influence of such factors as intelligence and age on the ability to read critically. Very limited research has been done from the standpoint of exploring the nature of critical reading or what position it occupies in a reading process.

The concept of a hierarchical reading process was mentioned as early as 1935 (Gray & Leary). A hierarchical relationship of critical reading to other areas of a reading process was implied by W. S. Gray (1960). In "The Aspects of Reading", Gray visualized four aspects of a reading process: a central circle, word perception; from which emanated three concentric bands representing comprehension, evaluation, assimilation.

No studies were located which dealt with the concept of a hierarchical reading process including a critical level, and only three studies which explored a hierarchical comprehension process. Blacke, Aaron & Westbrook (1967) found a progression from the ability to identify stated meaning to implied meaning. Hackett (1968) identified a simple to complex sequence of language skills but her data were based on listening rather than reading responses. Chapman (1971) found five comprehension skills to approach a global structure when tested independently; a hierarchical structure when tested within passages. Three studies had been designed to examine critical reading as a separate level of reading comprehension: Sochor (1952), McCullough (1957), Maney (1958). All found critical reading to be independent of the ability to read literally.

These few studies were available to provide background for the hypothesis of this investigation. The results were not conclusive concerning a hierarchy in reading comprehension and only the studies by Sochor and Maney provided any insight as to the relationships between literal and critical reading.

The question asked in this study, had to do with the existence of basic characteristics underlying the ability to read critically. Only four pertinent studies were available: Gans (1940), Wolf (1967), Follman (1969, 70, 71, 72), and Rust (1960).

Gans, using factor analytic techniques, concluded that reference type reading was a composite of three factors: reading ability; a selection-rejection pattern; and a type of delayed recall. In a three year USOE Project, Wolf and others sought to determine if critical reading could be taught to elementary age children while maintaining

their normal progression in other reading skills. The Ohio State Critical Reading Tests were written for the study and the results of a hierarchical factor solution suggested that there was no general factor and no major or group factors. Follman, using a combination of tests at the fifth and twelfth grade levels, concluded that verbal intelligence defined critical reading and critical thinking. Rust could find no common factors among three published critical thinking tests.

This limited research has served to confuse rather than clarify. Between Follman and Rust alone at least six different constructs of critical reading were represented; how could results be other than conflicting. Follman had more test items than students, and since his students were admittedly weak readers, they probably had difficulty reading the tests. Research dealing with aspects of critical reading is not only sparse, but seriously hampered by lack of consensus in terminology.

Of related interest to the purposes of this study were the influence of sex, intelligence, chronological age and general reading on the ability to read critically.

Wolf (1967), Davis (1969) and Glaser (1941) found no sex differences in the ability to read critically. Intelligence was found to be related to critical reading by Sochor (1952), Gans (1940), Wolf (1967), Glaser (1941), Nardelli (1957), and Davis (1969). The effect of chronological age was reported in terms of grade level by Davis and Wolf; both found upper grade students did better than lower grade students and concluded that age was a factor. Glaser, Nardelli, Wolf, Davis and Sochor all found that their measures of general reading were highly correlated with

what they were calling critical reading. Only Gans concluded that her reading reference tests were not entirely the same as general reading although they had many skills in common.

RATIONALE AND PROCEDURES

The procedure followed to achieve the purpose of the study consisted of four steps: development of a reading model; construction of the experimental tests; collection of the data; analysis of the data.

Development of a Reading Model

Because of the lack of consensus concerning critical reading, it was necessary to develop a model of reading (Figure 1) to provide a priori reasoning for the selection of reading skills about which data could be collected.

The first step was to define critical reading which definition constitutes the reader's purpose for reading. When reading for a specific purpose the reader can use that purpose as a guide to determine the kind of information he needs to bring to and obtain from the printed material. The purpose for reading, as set forth in the definition of critical reading, can be used to specify reading stages and the representative reading skills the reader may utilize to accomplish the purpose.

Definitions of critical reading and critical thinking proposed by various authors, were analyzed by breaking them into thought units and comparing the units for over-lapping and unique ideas. The final working definition specified one purpose for which a reader may critically evaluate material: to judge the truthfulness of the author's point of view.

Reading Levels and their StagesReading Skills

I. Literal

Translation

1. The ability to know the meaning of a word. (Vocabulary)
2. The ability to identify the expressed main idea in written material. (Main Idea)
3. The ability to note details in written material. (Noting Details)

II. Interpretive

Identification.

1. The ability to extract the author's point of view from written material. (Point of View)

Investigation of

the data

2. The ability to differentiate between fact and the author's point of view. (Fact and Opinion)
3. The ability to detect ideas which the author has implied in written material. (Inference)
4. The ability to select data which are pertinent to support the author's point of view. (Pertinence)

the author

5. The ability to appraise the competence of an author to write his point of view. (Competence)

Collation

6. The ability to determine whether the author has presented sufficient data to support his point of view. (Sufficiency)

III. Critical

Judgment

1. The ability to judge the truthfulness of the author's point of view. (Critical Reading)

Figure 1 - - A reading model

This definition, later restated as a reading skill, consisted of one objectively testable reading behavior.

The second step was to describe the reading levels a reader could go through to accomplish the purpose specified by the working definition. Stages, descriptive of the process a reader could use within a given level were to provide the framework from which representative reading skills would be selected. Authorities descriptions of steps in critical reading were studied but their usefulness was limited. Consequently, the reading levels and their descriptive stages were specified on the basis of a logical analysis of what a reader could do in order to accomplish the purpose of reading critically.

Three levels with concomitant stages were identified. The first level was the "Literal" level and consisted of the reader's understanding the exact, word-for-word meaning intended by the author. The second level was "Interpretive" and consisted of the reader's interpreting beyond the meaning stated on the page, but on the basis of it. The final level was called "Critical" and involved the reader's making a decision as to one purpose for reading critically: judging the truthfulness of the author's opinion.

The third step was the identification of reading skills, representative of stages of a reading process. Skill listings of authorities were surveyed but the final selection was based on the same sort of logical analysis used in setting up stages of a reading process.

The proposed model of reading provided a construct of a reading process and the representative reading skills which could enable a reader to judge the truthfulness of the author's point of view. This construct

served the purpose of ordering the writer's thinking and simultaneously setting up the writer's expectations of what would happen. Another investigator may have ordered his thinking along entirely different lines with consequently different anticipated and actual outcomes.

Development of the Tests

The primary step in test planning is to identify the purpose of the proposed evaluation. The objectives to be gained from the type of evaluation designed for this study were inherent in the purpose of the study itself: to provide data on the basis of which insight may be gained concerning relationships between critical reading responses and selected literal and interpretive reading responses of upper intermediate age children.

At this point it had to be decided which method of evaluating the identified reading skills would best meet the purposes of this study. Two alternatives presented themselves: use the test stem as the base from which the ten different reading behaviors would be derived, resulting in one test measuring all ten behavior; or use each reading behavior as the base to be applied to a variety of test stems, resulting in ten tests each measuring one behavior. During the initial pilot studies both methods of test writing were investigated.

Taking into account the advantages and disadvantages of both alternatives that arose during the pilot studies, the alternative of multiple stems was considered. The major disadvantage of the multiple stems was the inability to test the hierarchy on the criterion of progressive levels of difficulty. This meant that any conclusions as to a hierarchical relationship between the levels could only be inferred from the degree that the relationships

conformed to the proposed model. The risk involved in using the single stem, however, seemed to outweigh the need to qualify any hierarchical relationship that may appear using the multiple stems. It was decided that an inferred hierarchical relationship based on valid tests was preferred to a hierarchical relationship meeting the difficulty criterion but based on tests of questionable validity. This choice, then, represents a limitation of the study.

Social studies was selected as the content for the items as it is the one area that upper-intermediate age children are probably the most comfortable with. An attempt was made to equalize the number of items within any one test to represent the various (History, Geography, Anthropology, Economics, Political Science) disciplines of the social studies.

Each test consisted of approximately forty multiple-choice items and was to be administered during a given social studies period. The readability was kept at the upper primary level in an attempt to preclude the masking influence of perceptual difficulties in measuring the identified mental processes. The construction and refinement of the test items was accomplished on the basis of pilot research.

Only two available published tests were considered appropriate: the word meaning sub-test from the Stanford Achievement Test Battery to measure Vocabulary; Note Details from the Gates Basic Reading Tests to measure Noting Details. Pilot studies were conducted with upper-intermediate age children until a fairly reliable test for each of the remaining eight skills was developed. The reliabilities on the final tests were in the low and middle .80's except for Competence which was .68.

The test battery was administered to all fifth and sixth grade children in a white middle-class suburban school district by their social studies teachers. Of the eleven social studies sections in the district, two received the battery of tests in the order presented on the model, the remaining in a rotated manner to offset the learning effects of test taking. Upon completion of the one month testing, the responses were punched on IBM cards and the tests scored using the TSSA2 Program. A series of multiple regression analyses, an analysis of variance (Anova) and an analysis of covariance (Cova) were used to analyse the complete data from 220 children.

ANALYSIS OF THE DATA

Data were gathered by administering a battery of reading tests representative of literal, interpretive, and critical reading. The hypothesis was tested by a statistical analysis to determine if hierarchical differences existed between the levels. The question was answered by a qualitative analysis of the characteristics of the ability to function on the literal, interpretive, and critical tests.

The Hierarchy

A hierarchy is an arrangement of objects in a graduated series. In this study three levels of a reading process were identified and placed in ascending order: literal → interpretive → critical. If a hierarchical relationship existed, the reader would be able to move from the literal, through the interpretive to the critical, but he would not be able to skip from the literal to the critical without being able to function on the interpretive.

Using the Mesa 99 program, a series of multiple regression analyses was done. The first step was to determine whether the ability to function on the literal tests was related to the reader's ability to function on the interpretive tests, the results of this regression may be found in Table 1. The second step was to determine whether the ability to function on the interpretive tests was related to the reader's ability to function on the critical test, the results of this regression may be found in Table 2. The third step was to determine if there was a chaining of the levels. If there was, the ability of the reader to function on the literal tests would not be related to his ability to function on the critical test unless the linking effect of the interpretive tests was absent. The results of the multiple regression analysis used to study the relationships between the literal tests and the critical test in the presence of the interpretive tests is found in Table 2; and in the absence of the interpretive tests in Table 3.

Referring to Table 1, it can be observed that functioning on the three literal skills was highly related to the ability of the reader to function on the interpretive skills. This does not mean that on the basis of a given literal score one could assume how a reader would function on a given interpretive skill, but it does indicate that ability to function on the interpretive skills had a great deal in common with his ability to function on the literal skills; functioning on the interpretive level was connected with functioning on the literal level.

The two exceptions to this were Vocabulary and Noting Details.

In an analysis of the tests it was found that there was a lack of commonality of service and content words between Vocabulary and Pertinence. If either test had tapped more into the content orientation of each other

TABLE 1

PAW REGRESSION COEFFICIENTS AND THEIR STANDARD ERRORS:
LITERAL ON INTERPRETIVE

		Point of View	Fact & Opinion	Interence	Pertinence	Competence	Sufficiency
Vocabulary	RRC ^a	.248 ..	.150 .	.178 ..	.096	.148 ..	.215 ..
	SE ^b	.062	.060	.049	.078	.057	.061
Main Idea	RRC	.445 ..	.193 ..	.325 ..	.177 .	.131 .	.311 ..
	SE	.067	.066	.054	.085	.062	.067
Noting Details	RRC	.161 ..	.062	.207 ..	.182 .	.155 .	.157 ..
	SE	.062	.060	.049	.078	.057	.061

^aRRC = Raw Regression coefficient.^bSE = Standard Error.. = $p < .05$... = $p < .01$.

a significant interaction may have occurred. Noting Details utilized a paragraph form in contrast to Fact and Opinion which utilized sentence strings thus requiring a different reading strategy. Neither of these explanations fully account for the apparent lack of interaction and it was concluded that these two exceptions were probably due to test characteristics rather than complete lack of mutuality.

A regression of the literal and interpretive skills on Critical Reading is found in Table 2. It can be observed that the ability to function on the interpretive skills was generally associated with the ability of the reader to function on Critical Reading. This does not indicate that given the ability to function on the interpretive assures the ability to function on the critical but that the ability to function on the critical was highly related to the ability to function on the interpretive.

Combining this interaction with the results from Table 1, it has been found that the ability to function on the literal generally related to the ability to function on the interpretive and that the ability to function on the interpretive was generally related to the ability to function on the critical. Before moving into a discussion as to whether the levels were linked together in ascending order it is appropriate to first explore the one exception to the general association of the interpretive to Critical Reading, Inference.

Inference was the only interpretive skill that had no apparent connection with Critical Reading. This contradicts the opinion of many authorities concerning the importance of this skill and empirically does not make sense. However, in studying the test, it can be observed that Inference was written so that the reader needed to make an inference

TABLE 2

RAW REGRESSION COEFFICIENTS AND THEIR
STANDARD ERRORS: LITERAL
AND INTERPRETIVE ON
CRITICAL READING

		Critical Reading
Vocabulary	RRC ^a SE ^b	.048 .055
Main Idea	RRC SE	.119 .065
Noting Details	RRC SE	-.013 .054
Point of View	RRC SE	.155 .064
Fact & Opinion	RRC SE	.223 .. .063
Inference	RRC SE	-.000 .083
Pertinence	RRC SE	.097 .050
Competence	RRC SE	.158 .070
Sufficiency	RRC SE	.175 .. .063

^aRRC = Raw Regression coefficient.

^bSE = Standard Error.

• = $p < .05$.

.. = $p < .01$.

but he was not asked to infer an author's opinion. Inference was written in this way to separate it from Point of View, where the author always implies his point of view. Of the six interpretive tests, Inference was the only test in which the reader was not asked to interact with the author's opinion. It may have been this lack of reader-author interaction which may have accounted for Inference not relating to Critical Reading.

Having ascertained that the literal had a relationship with the interpretive, which in turn had a relationship with the critical, it is now appropriate to see if a chaining effect was also present. The effect of a chaining characteristic would be to lock-in the affiliation between the levels: the reader could move from the literal through the interpretive to the critical, but he could not skip from the literal to the critical.

Returning to Table 2, it was found that there was no connection between the ability of the reader to function on the literal and the critical in the presence of the interpretive skills. Taking this at face value could lead one to conclude that the literal skills had no relationship with Critical Reading. However, keeping in mind that the literal skills did have an affiliation with the interpretive skills which in turn had an affiliation with Critical Reading, it would seem that some ability to function on the literal was needed to function on the critical as transferred through the interpretive. To see if this were indeed the case, a multiple regression analysis of the literal on the critical, without the mediating effect of the interpretive skills was performed; the results may be found in Table 3.

RAW REGRESSION COEFFICIENTS AND THEIR
STANDARD ERRORS: LITERAL
ON CRITICAL READING

		Critical Reading
Vocabulary	RRC ^a SE ^b	.193 .. .049
Main Idea	RRC SE	.316 .. .056
Noting Details	RRC SE	.085 .049

^a RRC = Raw Regression Coefficient.

^b SE = Standard Error.

• = $p < .05$.

•• = $p < .01$.

Combining the results from Table 3 with the findings derived from Table 2, it was found that the literal skills by themselves were associated with the ability to function on Critical Reading but when the interpretive skills were present, the significance of the association waned. This was because the relationship of the literal skills to Critical Reading was only via the interpretive skills. The relationship of the interpretive skills was so more profound with Critical Reading that when the interpretive skills were present they over-shadowed the association with the literal skills and the connection with the literal skills did not appear until the interpretive skills were absent, as in Table 3.

When the mediating effects of the interpretive skills were removed, Main Idea and Vocabulary were related to Critical Reading but Noting Details was not. By comparing the raw regression coefficients and their standard errors in Tables 2 and 3, it can be seen that the relationship between Noting Details and Critical Reading did indeed increase when the interpretive skills were dropped. This suggests that the association between Noting Details and Critical Reading was mediated by the interpretive skills but was not strong enough to be significant.

Summary

On the basis of the data presented in Tables 1, 2, and 3, it has been found that the type of hierarchical relationship anticipated by the investigator existed between the literal, interpretive, and critical reading levels. It was concluded that the literal, interpretive, and critical levels were in ascending order and that the ability to function at the critical level was dependent upon the ability to function at the interpretive level which was in turn dependent upon the ability to function at the literal level.

Interpretation of Findings

Having determined that a hierarchical relationship existed between literal, interpretive, and critical reading, it is now feasible to study characteristics of the ability to function on the literal and interpretive tests which may have enabled the reader to function on Critical Reading. This can be done by subjectively analyzing the results from the multiple regression analyses. Why the influence occurred in the magnitude it did, can be conjectured by subjectively analyzing what each test may have contributed to the ability to function on Critical Reading.

Vocabulary on Critical Reading

Vocabulary was not associated with Critical Reading until the mediating effects of the interpretive skills were held constant. At this point Vocabulary was highly significant, so it can be assumed that Vocabulary required some reading behavior that was needed to function on Critical Reading.

Vocabulary at times measured the knowledge of specific content words none of which occurred on Critical Reading, but Vocabulary also measured an ability to know and handle word meaning. The facet of Vocabulary that accounted for the affiliation with Critical Reading when the interpretive skills were removed, was probably the ability to know word meaning. But Vocabulary contained so little of this influential skill, that when the interpretive skills were present, no significant connection with Critical Reading was apparent.

Main Idea on Critical Reading

Main Idea, like Vocabulary, did not effect Critical Reading until the mediating effects of the interpretive skills were held constant; but

by referring to the standardized regression coefficients, it can be seen that the degree of relationship appeared larger for Main Idea (.146) than for Vocabulary (.064).

On Main Idea, the reader had to decide which of three statements best described the major premise of the paragraph. On Critical Reading the reader was asked to judge the degree of truthfulness of a series of statements related to the paragraph. On both Main Idea and Critical Reading the reader had to make a decision; the difference between the two tests residing in the purpose of the decision. On Main Idea the purpose of the decision was to identify the main idea and on Critical Reading it was to judge the truthfulness of a main idea. The aspect of Main Idea which accounted for the affiliation with Critical Reading may have been the ability to identify the main ideas of written material.

Noting Details on Critical Reading

Noting Details was not associated with Critical Reading even when the mediating effects of the interpretive skills were held constant. However, the standardized regression coefficients did increase from -.015 (interpretive skills present), to .103 (interpretive skills absent) suggesting that there was some influence.

When functioning on Noting Details, the reader frequently only needed to match words and phrases, there was little or no need for interaction with the thinking of the author and very little reasoning on the part of the reader. This does not mean that the ability to note details would be of no value on Critical Reading or on any of the interpretive skills if it were measured in a different manner. It is hypothesized that the ability to note details did not appear

to enhance the reader's ability to make an evaluative judgment because it did not require the reader to utilize his own thinking or to interact with the author.

Point of View on Critical Reading

Point of View, which had a significant relationship with Critical Reading, required the reader to decide which of three statements best expressed the author's implied point of view. The functioning common to Point of View and the majority of Critical Reading items may have been the ability of the reader to identify what the author wanted him to know but didn't specifically tell him. Critical Reading differed from Point of View in that the reader, after identifying the point of view, had to go a step beyond and make an evaluative decision of acceptance, rejection or suspended judgment.

Fact and Opinion on Critical Reading

Fact and Opinion had a highly significant relationship with Critical Reading. The ability to distinguish fact and opinion seemed to be basic to judging the truthfulness of an author's opinion. It would seem that to function effectively on Critical Reading, the reader had to make a fact or opinion determination on every statement before arriving at a final decision.

Inference on Critical Reading

Inference did not have any significant association with Critical Reading, and in fact the standardized regression coefficient was $-.000$. This was probably because Inference was written in such a manner that the reader did not have to interact with an author's opinion while making an inference. This was done deliberately to differentiate

Inference from Point of View and in so doing it may have made Inference appear more similar to "translation" than the interpretive skills and thereby only indirectly related to Critical Reading.

The premise that Inference did not appear to be related to Critical Reading because of the way the test was written, is of great importance to an understanding of Critical Reading. Inference was the only interpretive test that did not require the reader to interact with the author's opinion and it was the only test that appeared not related to Critical Reading. On the basis of default, it seems that the ability to interact with an author and his opinion was basic to Critical Reading. When this personal involvement was missing a basic reading skill, such as measured on Inference, was not associated with the reader's ability to function on Critical Reading.

Pertinence on Critical Reading

Pertinence had a significant effect on Critical Reading and the common reading behavior may have been the ability to judge whether a statement contained information which would help the reader assess an author's opinion. It is hypothesized that the ability to judge the truthfulness of an author's opinion is in part dependent upon the reader's ability to judge accurately the degree of pertinence of the statements the author uses to support his opinion.

Competence on Critical Reading

Competence had a significant relationship with Critical Reading and it was probably affiliated with all of the Critical Reading type items. On Competence, the reader was required to judge the truthfulness of any given statement, as on Critical Reading, but he was to use the qualification of the author as his only criterion. On Critical Reading the reader was not given biographical data to help him make his judgment,

as on Competence, but he very well may have used the author's writing style to help him judge. What was common to the two tests was judging truthfulness on the basis of criteria. It is hypothesized that Competence was associated with Critical Reading possibly because both tests required the reader's ability to use criteria in making a judgment.

Sufficiency on Critical Reading

Sufficiency had a highly significant relationship with Critical Reading as indicated by the second highest standardized regression coefficient (.189). In analyzing Sufficiency it was found that the difficulty of an item was not so much determined by the use of the criterion of judging sufficiency of data but how long the reader had to wait before he could make the judgment. It was this quality of suspended judgment that may have made Sufficiency so unique. It is proposed that the skill unique to Sufficiency was the ability to suspend judgment and that it was this skill that accounted for at least in part the exceptionally high relationship of Sufficiency to Critical Reading.

General Reading

Of related interest was the influence of literal, interpretive, and critical reading on General Reading, as measured by the paragraph meaning sub-test of the Stanford Achievement Test. A summary of the results of the multiple regression analysis may be found in Table 4.

It can be observed that all three literal skills, Sufficiency and Inference had a relationship with General Reading. At least two thirds of the items on General Reading were related to noting details, main idea, and vocabulary; the remaining one third items measured inference in the

TABLE 4

RAW REGRESSION COEFFICIENTS AND THEIR
STANDARD ERRORS: LITERAL,
INTERPRETIVE, AND CRITICAL
ON GENERAL READING

		General Reading
Vocabulary	RRC ^a SE ^b	.489 ** .078
Main Idea	RRC SE	.248 ** .093
Noting Details	RRC SE	.257 ** .076
Point of View	RRC SE	.027 .093
Fact & Opinion	RRC SE	.030 .094
Inference	RRC SE	.260 .118
Pertinence	RRC SE	.044 .072
Competence	RRC SE	.198 .101
Sufficiency	RRC SE	.231 .092
Critical Reading	RRC SE	-.006 .107

^aRRC = Raw Regression Coefficient.

^bSE = Standard Error.

* = $p < .05$.

** = $p < .01$.

same way as the test Inference. The relationship of Sufficiency was attributed to the fact that the format of General Reading was similar to Sufficiency in that the reader may have tended to wait till the end of the item before making a decision. If that were the case, the skill common to Sufficiency and General Reading was probably not the ability to judge the sufficiency of data but the ability to suspend judgment which may have been unique to Sufficiency.

Critical Reading did not appear to be related to General Reading perhaps because the skills needed to function on General Reading were mainly literal. The skills really important to Critical Reading, such as the ability to interact with an author, were not needed on General Reading.

Summary

The major purpose of this study was to examine relationships ~~between one purpose for reading critically and selected measures of~~ literal and interpretive reading. On the basis of a series of three multiple regression analyses it was concluded that the relationships between the literal, interpretive, and critical reading measures constitute a hierarchy in that the literal skills were generally related to the ability to function on the interpretive skills and the interpretive skills were generally related to the ability to function on the critical reading measure. The hierarchical relationship was further confirmed by the fact that the literal skills were not related to the ability to function on the critical reading measure when the mediating influences of the interpretive skills were included in the analysis.

The specific qualities of the literal and interpretive skills which enabled the reader to function well on the critical reading measures were identified subjectively and on the basis of degree of contribution as defined by the standardized regression coefficients. On the basis of this analysis three behavior strands appeared to be important to the ability to function on Critical Reading:

1. The ability to interact with the author.

This is a subjective behavior which would have been extremely difficult to measure on objective tests, and probably would not have appeared so strikingly if it had not been for the particular construction of Inference. It had been hypothesized that the interpretive tests would be related to the critical reading measure but the significant contribution of the interpretive tests to an understanding of critical reading was revealed by the one interpretive test which was not related to Critical Reading.

2. The ability to use criteria for judgment.

This ability was directly involved on Sufficiency, Competence, and Pertinence and indirectly on Point of View, and Fact and Opinion. The ability to use criteria for making a decision involves a pliability on the part of the reader to make a judgment on the basis of externally imposed standards.

3. The ability to suspend judgement.

This behavior was probably common to all the tests but

its importance became evident on Sufficiency. This is ironical as the writer had originally tried to measure this ability, found it too difficult, and subsequently dropped the skill from the model.

A return can now be made to the major purpose of the study. By combining the findings related to the hypothesis and the question, the major purpose can be restated to read: to investigate the interaction between the reader and selected measures of literal, interpretive, and critical reading.

A first interactional quality became manifest when hierarchical differences materialized between the three levels. The distinction between the literal and interpretive levels was characterized by the introduction of personal involvement on the part of the reader at the interpretive level.

A second interactional quality appeared as the reader moved from the interpretive to the critical. At this point his initially simple personal involvement had to broaden to encompass personal interaction with the author: the reader had to involve himself and his thinking with that of the author.

A third interactional quality appeared as the reader had to make a decision about the author's material. This involved the reader's freedom and flexibility of thinking about his interaction with the author. In order to make a decision concerning the truthfulness of the author's opinion the reader had to be able to suspend judgment until the application of criteria enabled him to arrive at an evaluative decision.

In this analysis, the ability to judge the truthfulness of an author's opinion demands the ability of the reader to invest his own thinking and to personally interact with an author while maintaining freedom and flexibility of thought.

INFLUENCING CONDITIONS

The extra-test attributes of the children which may have influenced their functioning on the tests were also studied. The statistical procedure used was dependent upon whether the trait was essentially quantitative or qualitative in nature.

Quantitative Characteristics

The affiliation of the quantitative characteristics with the reading tests was estimated first. The use of a multiple regression analysis (Table 5) showed the relationship between an attribute and any given reading test while the remaining were held constant. The quantitative data constituted five attributes: Chronological Age and four aptitude measures; Logical Reasoning, Numerical Reasoning, Verbal Concepts, and Memory.

Chronological Age

Chronological Age specified the actual age of a child in units of time. Chronological Age was an index of what had occurred in the life of a child in terms of time units. Studying the relationship of Chronological Age to the reading tests became a problem of determining which facet of the life experience represented by Chronological Age was pertinent to functioning on a given test.

Looking at Table 5, it can be observed that Chronological Age had an association with Vocabulary, General Reading and Critical Reading, that was not influenced by aptitude which was held constant. It is suggested that the relationship with Vocabulary was a reflection of the life experience of the child. The test General Reading was in many respects similar to the type of classroom reading activities that sixth graders may have had

TABLE 5

RAW REGRESSION COEFFICIENTS AND THEIR STANDARD ERRORS:
CHRONOLOGICAL AGE AND APTITUDE MEASURES ON LITERAL,
INTERPRETIVE, CRITICAL, AND GENERAL READING

		Vocab- ulary	Main Idea	Noting Details	Point of View	Fact & Opinion	Infer- ence	Perti- nence	Compe- tence	Suffi- ciency	Critical Reading	General Reading
Chr.	RRC ^a	.203	.072	-.010	.087	.135	.011	.077	.091	.060	.158	.312 ..
Age	SE ^b	.086	.088	.085	.089	.075	.069	.093	.069	.081	.078	.111
Log.	RRC	.041	.025	.058 ..	.042	.032	.026	.004	.035	.053 ..	.035	.082 ..
Eng.	SE	.021	.021	.020	.022	.018	.017	.023	.017	.019	.019	.027
Num.	RRC	-.000	-.031	.003	-.031	.003	-.013	-.019	.019	.010	.001	.025
Eng.	SE	.023	.023	.022	.023	.019	.018	.024	.018	.021	.020	.029
Vor.	RRC	.132 ..	.101 ..	.093 ..	.071 ..	.056 ..	.078 ..	.052	.025	.070 ..	.066 ..	.183 ..
Con.	SE	.024	.025	.024	.025	.021	.019	.026	.019	.023	.022	.031
M.V.	RRC	.089 ..	.074 ..	-.004	.086 ..	.012	.054 ..	.053	.039	.035	.043	.123 ..
	SE	.022	.022	.021	.023	.019	.017	.023	.017	.020	.019	.028

^aRRC = Raw Regression Coefficient.

^bSE = Standard Error.

.. = $p < .05$.

.. = $p < .01$.

one year more practice with than the fifth. The relationship with Critical Reading seemed to be related to the more mature mental organization of the older child as it is not likely that the association reflected additional critical reading experience in the classroom or the home.

Aptitude

The children in the study had been given the California Short-Form Test of Mental Maturity when they were in fourth grade. It was decided to use the individual sub-test scores as this gave a more discreet understanding of the contribution of each of these sub-tests on the ability to function on the reading tests.

Logical Reasoning: Logical Reasoning had a significant but not highly significant association with the ability to function on the tests.. Perhaps if the format for testing Logical Reasoning had been words instead of pictures, a higher degree of commonality may have resulted.

Numerical Reasoning: Numerical Reasoning was not related to the ability to function on any of the reading tests. This was in keeping with what is known about a numerical factor but was nonetheless of value to this study as it pointed out that the ability to function on the reading tests was not related to a child's numerical ability.

Verbal Concepts: Looking at Table 5, it can be seen that Verbal Concepts had the most association with the reading tests. A ranking of the standardized regression coefficients showed that Verbal Concepts had a greater relationship with General Reading and the literal skills than the interpretive skills and Critical Reading. It is hypothesized that the reason Verbal Concepts was less effective at the interpretive and Critical Reading levels was because the reader was utilizing a higher level linguistic process than that of just isolated word knowledge.

Memory: Memory had a significant relationship with eight of the eleven tests. The tasks common to Memory and these tests appeared to be the ability to discern important information and to organize it in a meaningful manner for recall. This was supported by the fact that the tests not influenced by Memory were characterized by their lack of requiring these skills.

Qualitative Characteristics

The association of Sex, Grade, and Teacher with the tests was estimated second. An Anova and Cova were done to determine the relationships of the characteristics and to estimate the specific association of each level with a given trait. By using the Anova, the interactions of the traits were sorted out so that while studying the interactions of one, the remaining were held constant. A summary of the results may be found in Tables 6, 7, and 8.

Sex

On the basis of Table 6, it can be seen that the only sex association was attributed to the fifth grade boys who were functioning well above the mean for Vocabulary. However, the real influence may have been the inability of the fifth grade girls to function up to their capacity or grade level. If they had been able to utilize their superior aptitude, the mean scores for the girls may well have been higher than the boys.

Grade

It can be observed from Table 7 that the association of Grade was mainly on the literal skills and General Reading but once the relationships of chronological age and aptitude were held constant, this

TABLE 6

SUMMARY OF ANOVA AND COVA:
RELATIONSHIP OF SEX
TO THE TESTS

	GTS ^a		TGS	
	Anova	Cova	Anova	Cova
Vocabulary	n.s.	**	n.s.	**
Main Idea	n.s.	n.s.	n.s.	n.s.
Noting Details	n.s.	n.s.	n.s.	n.s.
Point of View	n.s.	n.s.	n.s.	n.s.
Fact & Opinion	n.s.	n.s.	n.s.	n.s.
Inference	n.s.	n.s.	n.s.	n.s.
Pertinence	n.s.	n.s.	n.s.	n.s.
Competence	n.s.	n.s.	n.s.	n.s.
Sufficiency	n.s.	n.s.	n.s.	n.s.
Critical Reading	n.s.	n.s.	n.s.	n.s.
General Reading	n.s.	n.s.	n.s.	n.s.

^aTwo orderings are represented:

GTS = Grade, Teacher, Sex;

TGS = Teacher, Grade, Sex.

* = $p < .05$.

** = $p < .01$.

n.s. = not significant.

TABLE 7

SUMMARY OF ANOVA AND COVA:
RELATIONSHIP OF GRADE
TO THE TESTS

	STG ^a		TSG	
	Anova	Cova	Anova	Cova
Vocabulary	**	n.s.	**	n.s.
Main Idea	n.s.	n.s.	n.s.	n.s.
Noting Details	**	.	**	.
Point of View	n.s.	.	n.s.	.
Fact & Opinion	**	n.s.	**	n.s.
Inference	n.s.	n.s.	n.s.	n.s.
Pertinence	n.s.	n.s.	n.s.	n.s.
Competence	n.s.	n.s.	n.s.	n.s.
Sufficiency	n.s.	n.s.	n.s.	n.s.
Critical Reading	n.s.	.	n.s.	.
General Reading	**	n.s.	**	n.s.

^aTwo orderings are represented:

STG = Sex, Teacher, Grade;

TSG = Teacher, Sex, Grade.

. = $p < .05$.

** = $p < .01$.

n.s. = not significant.

association dropped. The apparent relationship between Grade with Point of View and Critical Reading would be most difficult to interpret as there were no particular curricular emphases on these skills at either grade level.

Teacher

In that Teacher (Table 8) had a significant relationship, it was decided to determine if there were any identifiable achievement patterns from the standpoint of the aptitude of the different groups. Three types of patterns seemed to appear: a tendency to function above capacity; to function below capacity; a scattered functioning. The reason behind the first two types of patterns may be that the brighter children tended to do better because of an interaction with the teacher; bright children tend to make different intellectual demands. The same rationale may hold true for the weaker students. Of significance, however, is that this was not true for all sections, suggesting that with some groups of children one can't assume achievement on the basis of potential. The scattered patterns seemed to suggest that if the section achieved well on any of the interpretive level skills they usually functioned well on at least half of the literal levels skills; perhaps a reflection of the hierarchical relationship.

Summary

The confounding effects of the qualitative and quantitative traits of the children have been examined. The ability to function on the tests was greatly dependent upon the reader's ability to manipulate and react to language as measured on the CTMM. The most important language skill was the ability to understand word meaning; followed by the ability to identify, organize, and recall information. The association with Teacher was highly significant and a subjective analysis suggests that this

TABLE 8

SUMMARY OF ANOVA AND COVA:
RELATIONSHIP OF TEACHER
TO THE TESTS

	SGT ^a		GST	
	Anova	Cova	Anova	Cova
Vocabulary	**	**	**	**
Main Idea	**	**	**	**
Noting Details	**	**	**	**
Point of View	**	n.s.	**	n.s.
Fact & Opinion	**	**	**	**
Inference	**	**	**	**
Pertinence	**	**	**	**
Competence	**	*	**	*
Sufficiency	**	**	**	**
Critical Reading	**	*	**	*
General Reading	**	**	**	**

^aTwo orderings are represented:

SGT = Sex, Grade, Teacher;

GST = Grade, Sex, Teacher.

* = $p < .05$.

** = $p < .01$.

n.s. = not significant.

affiliation may have been a reaction on the part of the teachers to the learning requisites of the different groups. Life experience seemed to enable a child to increase his functioning only on Vocabulary, General and Critical Reading. The academic experience aspect of Grade had no apparent relation to the tests and the connection to Sex was limited to the fifth grade girls not functioning up to their potential on Vocabulary.

FINDINGS

A hierarchical relationship was found to exist between literal, interpretive, and critical reading as originally anticipated by the writer. It was found that the ability to function on the literal contributed to the ability to function on the interpretive, and that the ability to function on the interpretive contributed to the ability to function on the critical. It was also found that the literal was associated with the critical only in the absence of the interpretive; the interpretive functioned as the link between the literal and the critical. This chaining quality also seemed to have a cumulative effect in that the association of the interpretive with the critical was greater than that of the literal; the association of the literal with the critical was controlled by the interpretive; but the relationship of the interpretive with the critical was not controlled by the literal.

Having confirmed the existence of a hierarchical relationship, a study of test result patterns was made to identify the characteristics of the reader which may have enabled him to function at any given level and to move to the next level. On the subjective analysis it was suggested

that at the literal level the reader's task was basically that of translation and it seemed not necessary for the reader to deal with an author. The only "action" required was that of identifying stated material.

At the interpretive level, however, the reader not only had to be able to deal with the stated material but it appeared he also had to contend with the concept that the material was written by an author who was expressing a point of view. The "action" now required by the reader could have been that of "reaction" to the author's opinion.

Approaching the critical level, the reader may have had to take a third "action". At the literal level his "action" was limited to that of translation; at the interpretive level he may have needed in addition to translation, a "reaction" to the author and his opinion. At the critical level the reader could have expanded his "reaction" to embrace "interaction" with the author as he tried to judge the truthfulness of the opinion presented. It is in the use of criteria and suspending judgment that the reader seems to engage in an "interaction" with an author rather than just "reaction" to a given opinion. In summary, an interpretation of the findings disclosed three abilities needed to function on the Critical Reading Test: to become personally involved; to use criteria; to suspend judgment.

LIMITATIONS

The Reading Model

The Model provided a needed construct for guiding the research but in so doing limited the research in terms of this same construct:

1. A hierarchical reading process, as shown in this study, is limited to literal, interpretive, and critical levels as construed by the writer.

2. The relationships between the three levels are circumscribed by the specific reading skills which were identified to represent those levels.
3. The characteristics of the reader which apparently enabled him to function on Critical Reading were dependent upon the reading skills specified in the Model.

The Testing Program

Several limitations are inherent in the tests used and the testing program itself:

1. Each skill was measured by a single test in contrast to a single test measuring all the skills.
2. The relationships of the skills to each other, and subsequently the relationships between the levels, was limited by the reader's need to apply a given behavior to a range of content in contrast to applying different behaviors to a single area of content. Therefore, a hierarchy per se could not be tested but only inferred from the relationships observed which were generally in accord with the theoretical model.
3. The content of the test items was social studies and any transfer of the results to other content areas must be done with this qualification.
4. The two types of testing format, paragraph as differentiated from single sentences, disclosed the possible use of different reading approaches.

The Population

The population may be generalized as white middle-class suburban children, ten and eleven years of age. The results may be applicable to similar groups, but not with groups with significant age or cultural variations from the population used.

IMPLICATIONS FOR RESEARCH AND INSTRUCTION

The significance of this study is two fold: the use of a theoretical model to guide research was shown to be effective; the findings have a

application for implementing further research and classroom instruction.

Further Research

One hypothesis was presented in this study; findings related to the hypothesis as well as other findings give rise to many questions upon which further research can be based.

The Hierarchy

A hierarchical relationship was found to exist between literal, interpretive, and critical reading but this finding is limited by the aspects of the Reading Model, the tests used, and the population.

The study needs to be replicated posing such questions as:

1. Does the same hierarchical relationship exist using different age groups? Is the relationship between literal, interpretive, and critical reading as distinct with older students as with younger?
2. Does the same hierarchical relationship exist using different content areas? Is there a difference between literal, interpretive, and critical reading that appears in science or literature in contrast to social studies?
3. Does the same hierarchical relationship appear when the purpose of critical reading differs? If the purpose requires the reader to judge the significance of an author's opinion rather than the truthfulness of an opinion, does the reader still move from the literal, through the interpretive, to the critical?
4. Does the same hierarchical relationship exist when different reading skills are used to represent the three levels? Would substituting or adding such skills as the ability to note sequence at the literal level, or identifying tone and mood at the interpretive level, alter the hierarchical pattern?
5. Is the concept of a hierarchy teachable? Are children having been taught a method, as proposed in the Reading Model, better critical readers?

Characteristics of the Critical Reader

The analysis of the findings suggested that when functioning at three levels of a reading process the reader became personally involved, used criteria for judgment, and suspended judgment. It can be asked:

1. Does the quality of personal involvement stay the same when the purpose for critical reading changes? Is the reader involved in the same sort of author-reader interaction when he judges the worth of literature as when he judges the truthfulness of an opinion?
2. What is the difference in the reader's ability to make an inference on material that requires personal involvement and material that does not?
3. What is the difference in the quality of a critical reader's judgment when he uses criteria for judgment and when he does not? Of the criteria for judgment used in this study which one, or combination of them, is most effective in enabling the reader to make a critical reading judgment?
4. How do the criteria change when the purpose for critical reading changes? Should the reader use the same criteria for judging worth of material as he does for judging truthfulness?
5. What are the factors that enable a reader to suspend judgment?

Teaching Skills

What are the dynamics within a group of students which could stimulate a teacher to teach in such a manner as to enable these students to become more effective critical reader; to become less effective critical readers?

The Process of Reading

1. How does the reading process differ when different written formats are used such as paragraphs in contrast to sentences? Is the ability to function on a skill such as determining the pertinence of data different when dealing with sentences or paragraphs?
2. How does language aptitude or chronological age influence the ability of the child to handle words, sentences, paragraphs?

Developmental Characteristics

The children in this study were ten and eleven years old and the age range was not really very great. The results of the study as such can then only apply to this age group. All aspects of the study need to be examined with different age groups and questions such as the following could be posed:

1. Do different age groups function differently on the tests? Is the ability to read critically partly influenced by age to the degree that the older child may have a different mental organization?
2. The children in this study had difficulty making fine discriminations such as "can't judge". Is this ability to "decide not to decide" different with older children than with younger? At what age can the child handle such combinations as "true, false, and maybe"?
3. The children in this study had difficulty handling more than two units of information as on Sufficiency. How much information can children of different ages handle?

Instruction

A Reading Model

Perhaps one of the more important findings was that the rationale of a reading process, as proposed in the model, was substantiated. The Reading Model specifies the stages of a reading process and the representative reading skills that would enable a reader to accomplish one purpose for reading critically. Pending the results of further research, the model thus suggests a step-by-step procedure by which a child can be taught to read critically.

The Hierarchy

The cardinal rule in teaching is to move from the concrete to the abstract, the simple to the complex and the findings of a hierarchical

relationship support this. The child should not be expected to make higher level interpretations unless he exhibits an understanding of what is directly stated on the printed page. On the other hand the child should realize that he needs to understand the material before he can expect himself to pass judgment on the material. In that the levels were found to be dependent upon each other, it is important that the teacher not assume that a child can function at a critical level if he is functioning well at interpretive or literal levels.

Personal Involvement

In order to read critically the child should be able to personally involve his own thinking with that of the author. This suggests that the child be free to think his own thoughts and to challenge the thoughts of the author.

If learning is moving from the concrete to the abstract, one implication stemming from Personal Involvement may be that the child should move from a "live" author to a "published" author. It is vitally important that children understand that books are written by live people, and one simply cannot assume that they have this understanding.

The Use of Criteria

In order to make a sound critical judgment, the child needs the proper "tools". Through teaching the child how to use criteria as a base for judgment, the child may feel more comfortable with his own thinking and experience less awe of the printed word.

Suspending Judgment

The child should feel free to suspend judgment. If he has been shown how to apply criteria and to utilize his own thinking; he may not be so quick to jump to a conclusion of judgment. Children who have been encouraged to respect their own judgment may be more likely and willing to take the necessary time to arrive at a proper evaluation.

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