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ABSTRACT
                The hypothesis that there would be a significant
difference in correct responses between a group of junior college
retarded readers seeing words in context and another seeing isolated
words in favor of the words-in-context group was investigated. A
group of 42 retarded readers enrolled in reading and writing classes
of the academic skills lab in Mercer County Community College,
Trenton, New Jersey, was randomly divided into two groups. A
preliminary administration of the Gates-MacGinitie vocabulary and
comprehension tests was given to assure that there was no significant
difference in reading levels of the two groups. An
experimenter-devised trial test was given to 17 eighth-grade students
in which the context groups scored 61.5 percent and the isolated word
group, 50.8, which was a significant difference. On the 12-item
experimenter-devised test for the junior college subjects, the
context group responded correctly to 47.6 percent of the items and
the isolated word group to 49.2 percent, with means of 4.26 and 4.40,
respectively. It was therefore concluded that junior-college retarded
readers do not use context to gain word meaning. Suggestions for
further research, the experimental tests, tables, and a bibliography
are included. (BM)

JUNIOR-COLLEGE RETARDED READERS' USE

OF CONTEXT TO GAIN WORD MEANING

A THESIS

SUBMITTED TO THE FACULTY

OF THE GRADUATE SCHOOL OF EDUCATION

OF

RUTGERS UNIVERSITY

THE STATE UNIVERSITY OF NEW JERSEY

BY

JOYCE R. SEARS

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ABSTRACT

No studies have been reported on junior-college retarded readers' use of context to gain word meaning from a written passage. As more retarded readers enter community colleges through "open-admissions" policies, the need for such information exists.

This study attempted to answer the question: Do junior-college retarded readers use context to get word meaning to any significant degree? The hypothesis set forth was that there would be a significant difference in correct responses between a group seeing words in context and another group seeing words in isolation; that the word-in-context group would identify more words correctly.

Forty-two students enrolled in reading and writing classes of an academic skills lab in an urban community college were randomly assigned to two groups. Each group was given a 12-item test, one test asking for meanings of words in passages and the other for meanings of words without any context.

The context group responded correctly to 47.6 percent of the test items, with a mean score of 4.26; while the word group answered 49.2 percent correctly, with a mean score of 4.40. The context group did not score as high as did the word group, although the difference between mean scores of the two groups was not significant.

The major finding of this study was that this group of junior-college retarded readers did rot use context to gain word meaning; in fact, use of context lowered their word identification scores, though not significantly.

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CHAPTER I

THE PROBLEM

Background of the Problem

Comprehension is fundamental to reading. This
means that words must be assigned meaning, and meaning
shifts from context to context, from individual to indi-
vidual. The context in which words occur as well as the
past experiences of the reader determine meaning. Inves-
tigators have examined the use of context clues by ele-
mentary school children, by adolescents generally, and
by college and graduate students. In each of these, both
the reading ability and the years of experiences fall
roughly into the same categories: high, middle, and low.

But no studies have been done to ascertain the
extent and significance of the older retarded reader's use
of context clues to gain word meaning from a written pas-
sage. He is low in reading ability and high in years of
experience. Indeed, there is a question of whether this
type of reader even uses the context at all.

Older students (adults) who are retarded in read-
ing have needs different from those of children learning
to read. Similarly, retarded readers who are mature have

needs different from those of good readers who are mature.
Research offerings on the older, or mature, retarded
reader are incomplete. As more of these readers find
their ways into instructional situations with the expan-
sion of community colleges and "open-admissions" policies,
the need for such information clearly exists.

Statement of the Problem

This study sought information about junior-college
retarded readers; specifically, it investigated their use
of context in reading to determine whether these readers
assign meanings of words better when the words are shown
in context or without any context. In context situations
the precise cognitive processes used to get meaning are
covert and difficult to determine; the final selection of
meaning given to the unknown word, however, does offer the
investigator some insight into these readers' word-meaning
abilities and their subsequent ability to comprehend, or
failure to comprehend, the thought of a passage.

This study, then, attempted to find out whether
junior-college retarded readers use context clues to any
significant degree. To investigate that topic, this spe-
cific question was posed: Do junior-college retarded read-
ers identify more words correctly when words are seen in
context than when the same words are seen without any
context?

To answer the above question, the study examined the responses of two randomly chosen groups of junior-college retarded readers to a selected list of words, one group seeing the words alone and the other the same words within a passage. The difference between the two groups in the number of words correctly identified was compared to see whether or not there was any significant difference between the word-in-context group and the word-in-isolation group.

The following hypotheses were proposed:

1. The word-in-context group would identify more words correctly than the word-in-isolation group.

2. There would be a significant difference in correct responses between a group seeing words in context and another group seeing words alone.

Definition of Terms

Junior-college retarded readers. Individuals, over 18 years of age, in a community college, who are reading between fifth- and eleventh-grade level.

Context clue. An aid to discovering the meaning of an unknown word within a passage.

Inference clue. An aid in the passage which provides logical evidence for selecting a particular meaning.

Limitations of the Study

The following limitations should be considered regarding any conclusions drawn from this study.

The sample population was small and was drawn from students in one community college in New Jersey. These students were required to take reading improvement in an academic skills lab; enrollment was based on failure to meet minimal requirements for college entrance. Results of the study describe only students over 18 years of age, in an urban setting,.who had to enroll in a course as a prerequisite for junior college matriculation.

The testing instrument evaluated use of only one kind of context clue, that which required the reader to infer meaning from the whole text or passage and demanded complex thinking processes. Total ability to use context clues cannot be generalized beyond this use of inference clues.

All testing was done by one investigator.

I.Q. scores were not available for the subjects.

Overview of the Study

The next chapter of this study surveys the literature in the subject of context clues in three subsections: (1) the influence of context on meaning, (2) classifications of context clues, and (3) students' use of context to get meaning from a passage. Five studies are described,

with two saying that low-level readers and older students
do use the context to get word meaning, and three suggest-
ing that they do not.

Chapter III describes the procedures followed in
the study: the junior college subjects--their description,
selection, and assignment to groups; the word-in-context
and word-in-isolation tests--the method of text construc-
tion and selection; a trial test; the final test adminis-
tration; and finally, the statistical plan used to deter-
mine whether or not there was any significant difference
between the scores of the word-in-context and word-in-
isolation groups.

Chapter IV contains tables, along with discussion
and possible explanation of results, and includes the fol-
lowing: the word-in-context and word-in-isolation groups'
vocabulary, comprehension, and word-identification scores;
both groups' responses to individual items and total
responses on the word-identification test; and the dif-
ference between word-identification mean scores of the
two groups. The hypotheses set forth in Chapter I were
that there would be a significant difference between the
two groups, and that the context group would score higher.
The rejection of both hypotheses is discussed, explained,
and related to other studies of student use of context.

The last chapter summarizes the findings of the

study, offers tentative conclusions to the above-mentioned

hypotheses, and makes suggestions for further research in

the area of context clues and junior-college retarded

readers.

CHAPTER II

REVIEW OF THE LITERATURE

Since this study investigated getting meaning
from context, discussion of the literature begins with
how different writers view the function of context and
its influence on word meaning. The second section
describes context clue classifications found in the
literature, for this study involved ability to infer
meaning from the text of a passage, and inference is
a categorized clue.

Not found in the literature are any studies
specifically about junior-college retarded readers'
use of context. Yet because these junior-college
students' reading levels are low, section three pre-
sents three studies of how other low-level readers
(i.e., children) use context. Also, because these
students' maturity-level, or age, is high, two stud-
ies done with older students were reviewed. It is
interesting to note the differing results of these
investigations, as well as their different designs.
This study somewhat resembled one of those reviewed.

The Influence of Context on Meaning

A writer's meaning must make sense to a reader. How much sense will vary, depending on how precisely the words of a passage are understood. Thorndike's (1934) word classification stresses the importance of verbal context in gaining meaning, as he describes (1) words which usually have the same meaning; (2) words that have several distinct meanings, with the one intended determined by context; (3) words whose meanings fluctuate, with fine shades of meaning dependent on context and reader experience; and (4) words so varied that their meaning must be grasped through the meaning of the total context. This dependence of word meanings on context is rephrased by Richards (1936) as a scale extending from "stable positions" to "movement among meanings [p. 48]."

Variations of word meanings prompt Gray (1952) to discuss "types of meaning" in efficient reading. Gray's "types" rely on immediate verbal context and reader experience. These "types" include (1) literal meaning, varying with the passage itself and the background of the reader; (2) related meaning, expanding the literal meaning with what a reader already knows; (3) implied meaning, which is not actually stated but has to be inferred by the reader from what the author says in the selection; and (4) evaluative meaning, which suggests

thoughtful reaction or inquiry by the reader toward a
passage.

Context is defined by Good (1959) as the

> textual material in which a particular word, phrase,
> or statement is found . . . by extension of meaning,
> the environment or particular circumstances in which
> anything occurs or is found [p. 126].

Context can provide associations for the reader as he
searches for a paragraph meaning, or the paragraph mean-
ing can influence individual word meanings. Huey (1908)
writes:

> With first incipient thought of a word's isolated
> utterance there is . . . a suggestion of its mean-
> ing . . . and more cr less of the word's significance
> is . . . felt with this or immediately thereafter.
> . . . Indeed there seems to be a flash of the rela-
> tion of this meaning to the preceding context-meaning.
> . . . The total meaning . . . has begun to realize
> itself [pp. 168-169].

Gray (1952) notes:

> Meaning associations . . . are fused into a chain or
> pattern of ideas. . . . The reader may encounter new
> words or discover that meanings previously associated
> with certain words do not fit into the present con-
> text. . . . He searches . . . for the specific mean-
> ings implied by the passage [p. 10].

Context is a series of _interrelated_ words, requir-
ing that each meaning be given a weight or force in rela-
tion to the other meanings, with the reader selecting that
which suits his purpose (Thorndike, 1917). The role of
context as an interrelationship constituting the dynamics
of series of meanings is labeled by Richards (1936) as
"interanimation" or interpenetration.

As Gray (1952) suggested earlier, interaction of

meaning can move even beyond words, to the reader himself

(Goodman, 1967), becoming

> an interaction between thought and language . . .
> involving partial use of available minimal language
> cues selected from perceptual input on the basis of
> the reader's expectation . . . [pp. 126-127].

Meaning of a passage, then, is dependent on its

own textual content and on the larger context in which

it appears. Words are influenced by surrounding words,

through interaction with each other and with the reader.

The context frequently supplies clues to the meaning which

it has itself established. While the concept of context

may sometimes be broad, as when one includes the reader's

past experiences with a word, nevertheless, as Zahner

(1940) notes, "the 'verbal context' is . . . the clue to

the present situation [p. 91]."

Classifications of Context Clues

Because in order to read it is necessary to get

meaning from a context, investigators have attempted to

categorize those elements in the context that provide

clues to meaning.

Most classifications of context clues have been

based on what writers ought to provide the reader (Harris,

1940) or on what clues are believed to exist in written

passages (Artley, 1943; Deighton, 1963; Dulin, 1970;

Goodman, 1965; McCullough, 1943, 1945, 1958; Seibert,

1945). However, Ames (1966) and later Quealy (1969), who

used Ames's scheme, relied on introspection to develop a

chart of context clues. Rather than identify clues and

then examine students' use of these signs as previous

studies had done, Ames developed his classification of

aids from what students themselves said they used as

clues to meaning.

Goodman (1965) makes general divisions in clas-

sifying clue systems; in addition to elements within words

themselves (i.e., configuration and sight words) are clues

he identifies (a) in language, (b) external to language,

and (c) within the reader. Prior and subsequent classi-

fications of others appear to fit into these three main

areas, although unquestionably there is some overlapping

and some ambiguity, as different writers may identify

essentially the same clue in dissimilar ways. Neverthe-

less, in Table 1 are general categories which have been

used by other classifiers of context clues.

No clear trend or chronological pattern to clas-

sification of clues emerges, except that similes-metaphors

and roots-affixes are not found in current descriptions.

Otherwise, the old categories survive, with some additional

areas of language patterns and structure. Most often clas-

sified are Definition, Synonym, Comparison-Contrast, and

TABLE 1

CONTEXT CLUE CLASSIFICATION

External to Language

    Typographical, footnotes, parentheses
      (Artley, 1943; Dulin, 1970; Harris, 1940)

    Pictorial Illustrations, Charts, Graphs
      (Artley, 1943; Goodman, 1965; Harris, 1940;
    McCullough, 1958)

In Language

    Word Elements: roots, prefixes, suffixes
      (Artley, 1943)

    Signal Words
      (Artley, 1943; Deighton, 1959)

    Familiar Expressions
      (Ames, 1966; McCullough, 1943, 1945, 1958; Seibert,
    1945)

    Definition and/or Direct Explanation
      (Ames, 1966; Artley, 1943; Deighton, 1959; Dulin,
    1970; Harris, 1940; McCullough, 1945, 1958; Seibert,
    1945)

    Simile and Metaphor
      (Artley, 1943; Harris, 1940)

    Synonyms
      (Ames, 1966; Artley, 1943; Dulin, 1970; Harris,
    1940; McCullough, 1943, 1945, 1958; Seibert, 1945)

    Compare and Contrast
      (Ames, 1966; Dulin, 1970; Harris, 1940; McCullough,
    1943, 1945, 1958; Seibert, 1945)

    Summary
      (McCullough, 1943, 1945, 1958)

TABLE 1 (continued)

Appositive Phrase
  (Ames, 1966; Artley, 1943; Dulin, 1970)

Modifying Phrases and Clauses
  (Ames, 1966; Artley, 1943)

Language Patterns: sentence and paragraph
  (Ames, 1966; Goodman, 1965; Seibert, 1945)

Tone and Mood
  (Ames, 1966; Artley, 1943; Dulin, 1970; McCullough,
  1943, 1945, 1958)

Inference
  (Ames, 1966; Artley, 1943; Dulin, 1970; Seibert,
  1945)

Combination
  (Dulin, 1970; McCullough, 1943)

Within Reader

Background of Experience
  (Ames, 1966; Artley, 1943; Goodman, 1965;
  McCullough, 1943, 1945, 1958; Seibert, 1945)

Background of Experience. Either authors' writings contain essentially the same clues today as in the 1940's or there are not many new-found clues (with the exception of linguistic elements). Perhaps classifications remain merely because no one has changed them to any extent.

Much was written in the area of context clues in the 1940's (Artley, 1943; Harris, 1940; McCullough, 1943, 1945, 1958; Seibert, 1945); the only one besides McCullough to enter the area in the 1950's was Deighton in 1959 (Deighton, 1963), and his reactions to clues were largely negative except for recognizing the importance of signal words. But in the late 1960's and in 1970 there appeared much activity (Ames, 1966, 1970; Dulin, 1970; Goodman, 1965; Quealy, 1969).

The need for more investigations to determine which of these clues to teach is acknowledged by Ames (1970), so that teaching will not be of clues already successfully mastered or of those which seldom appear in writing. While Ames advises making students aware of the power of context, he urges caution in using present clue classifications as absolute criteria in assessing use of aids.

Inference, the categorized element used in this study, would appear to fit into the In Language area. Yet a reader's background of experience (Within Reader)

would certainly influence his inference pattern. Infer-
ence could actually be a catchall term for most of the
In Language and Within Reader categories used, for pas-
sages in this study may rely on tone and mood, for exam-
ple, to enable the reader to infer a meaning. Similarly,
ideas to compare and contrast and signal words to guide
passage organization could be considered inference aids.
To grasp any meaning not explicitly stated in a context
requires the reader to make deductions, or to infer.

Students' Use of Context

The literature clearly indicates that context
influences meaning and frequently provides identifiable
clues. This leads one to look for how much students
really make use of such context aids.

Using context clues in the junior college is dis-
cussed by Edwards (1959), who points out the need for
adequacy in this skill for this heterogeneous population,
many of whom do not have a high degree of verbal skill.
No studies of junior-college retarded readers' actual use
of context are found in the literature. These students,
it will be recalled, are low in reading ability and are
older readers. Therefore, three studies of low-level
readers (elementary- and intermediate-grade children) are
followed by two studies of older readers (college fresh-
men) to show findings of various investigations of use

of context clues.

A study by Elivian (1938) examined the ability of sixth-grade children to get the meaning of 73 difficult sixth-grade words written into four separate stories. Each stimulus word was defined in the context by direct definition, by synonym, and by inference, or repetition, throughout each story. Elivian found that the group did not have much ability in using the definition clue provided in the context.

Gray and Holmes (1938), in their study of whether context can provide a full grasp of meaning, reached a similar conclusion; namely, that a specific context aid will not necessarily be used in each instance. Students in their study of specific word meanings read a passage that did not clarify meaning and then one where the context contained an appositional definition. Gray and Holmes concluded that clues in the context provided no guarantee that students would know specific word meanings.

On the other hand, Goodman (1965) suggests that elementary school children probably attempt to use context clues. In his study of first-, second-, and third-grade children, he compared word recognition on lists and then the same words in stories. He found that children could read many words in stories that were missed on

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lists. Never was a word right on the list and missed in the story. Although children made mistakes because they were still relying heavily on individual word cues and were using language cues ineffectively, Goodman shows that they did try to use context to gain meaning.

Seibert (1945), who investigated context reading for a look at inferences and mental processes, reports that college freshmen could guess correctly 60 percent of word meanings, which enabled them to grasp paragraph meaning. She had students guess words which had been deleted from sentences and paragraphs. Students also received some preliminary training in guessing words from context. She concludes that context ability in one's native language does indeed exist. Seibert identifies the mental processes involved in using inference clues to get meaning from context, and some of these are pertinent to the present study: association of ideas, which includes clues in a setting and in sentences that are to follow; and use of deduction, which sometimes involves elimination, as well as use of clues found in the general meaning of the passage.

Gibbons (1940) might question context ability in one's native language, for she found that by the time students are college freshmen some use context clues, but with varying degrees of accuracy. Gibbons' study required

students to analyze different contexts in which four dif-
ferent words appeared. Within the context, for example,
one word was a synonym, or the meaning was implied. Of
the 234 students she tested, 48 percent were unable to
use context for getting correct meanings. Gibbons states
that one of the abilities on which context clue ability
depends is the ability to infer meaning from context.

These are only a few of the many studies illus-
trating that investigators of low-level readers and older
students reach no agreement on whether or not low-reading-
level students and older individuals use context to ascer-
tain meaning. All agree, though, that students in any
group vary widely in their use of context. Whether junior-
college retarded readers use context is debatable from the
literature. Goodman (1965), because of his success with
very low-level readers, and Seibert (1945), because of her
belief in native-language ability to use context, would
vote "yes." Elivian (1938) and Gray and Holmes (1938),
after seeing low-level readers unable to use provided
clues, and Gibbons (1940), after noting that nearly half
of her older subjects could not use clues, would unques-
tionably vote "no." This points the way toward inquiry
into the area with junior-college retarded readers.

In summary, then, examination of the literature
indicates that word meanings are dependent on context and

context provides clues to meaning. Most of these cate-
gorized clues rely on the ability to make inferences,
often classified as a separate clue itself.

How much students use inference to gain meaning
probably varies with individual readers; it certainly
varies with their investigators. Two studies, one with
low-level readers and one with college-level students,
suggest that students do use context. Three studies, two
with low-level readers and one with college freshmen, say
that context generally is not used. Evident in all of
these studies is the diversity in use of context at all
levels, which is not surprising since individuals and
their reading abilities vary widely within any group.
Because better readers use more reading skills, context
being one of them, it is logical that better readers
are better users of context. Hence, if reading level
increases with age, older pupils should be more profi-
cient than younger ones. Proficiency aside, however,
Goodman (1965) suggests that young children do use con-
text. This study examined whether or not another group
of low-level readers, those in junior college whose read-
ing levels did not increase with their ages, use context
to gain meaning.

This study resembled Goodman's (1965) in the word-
alone and word-in-context design. Seibert's (1945) is

also particularly relevant because, like hers, this study
demanded the skills required for making inferences.

CHAPTER III

PROCEDURE

To determine whether or not junior-college
retarded readers use context clues, one group of these
readers saw a list of words in isolation and the other
group saw the same words in a passage. The difference
between the mean scores of the two groups in the number
of words correctly identified was computed to see whether
or not there was any significant difference between the
two groups.

In other words, a significantly higher score for
the word-in-context group would suggest that junior-
college retarded readers did use context to gain meaning.
No significant difference, or a significantly higher score
for the word-alone group, would suggest that the students
did not use context, or perhaps misused it.

Subjects

Participating in this study were students enrolled
in reading and writing courses of the academic skills lab
of Mercer County Community College in Trenton, New Jersey.
The college is a 2-year, publicly supported coeducational
institution, classified as a 2-year community college.

Two criteria were established for selection of
students for the study: first, that they be currently
enrolled in the lab; and second, that their reading level
be at least 5.0 grade level. The first obviously insured
availability of students for testing, and the second pro-
vided some assurance that students could read the passages
in the context test.

Minimum reading level was determined by checking
lab scores on the Gates-MacGinitie Silent Reading Test,
scores of vocabulary and comprehension. Even though a few
scores were not recent ones, they could point out those
students who might not be able to read the passages. It
is possible, of course, that some students, those who may
have improved their scores since they were tested and who
could have read the passages, were not included in the
population sample. No student reading much beyond 10.0
grade level remains in the lab; hence, total reading
scores (vocabulary and comprehension) were between 5.0
and 11.0.

Forty-two day and evening students (13 males and
29 females) reading above 5.0 grade level actually partic-
ipated in the study, 21 each in the word-in-context group
and the word-in-isolation group. Ages ranged from 18 to
51, with a mean age of 26.4. No I.Q. scores were avail-
able for the students. These 42 students meeting the

stated criteria were randomly assigned to groups as they came to the lab. It should be added that attendance in the lab is voluntary.

Tests

In order to determine whether these students use context to get word meaning, it was essential that a test be used where word meanings were dependent on a passage; in other words, the same word in different context would have a quite different meaning.

Passages used in this study were originally developed by Davis (1944a, 1944b) to investigate the thinking processes involved in basic reading comprehension skills. Davis used the passages with high-school students. Selections from among abbreviated versions of these passages were made (1) subjectively, or on the basis of what was felt could be read without too much difficulty by low-reading-level students; and (2) on the basis of correct responses of the students originally taking the test, i.e., easy items. All passages required what Davis (1944b) calls "the ability to determine from the context the meaning of an unfamiliar word that is most appropriate in its contextual setting [p. 185]." This, it seems, is a reasoning process demanding inference on the part of the reader from the context surrounding the unknown word.

The purpose of the multiple-choice word-in-isolation

test was to establish unfamiliarity with a specific word

meaning. Stimulus words were the same as in the context

test and the correct responses were the same. These cor-

rect answers had to be reasonably defensible without the

context of a passage and have distracters that were

clearly not defensible. If students did not know a word

in a list, but did know it in context, it could be rea-

sonably assumed that context was being used to get the

word meaning. Both tests may be found in Appendix A.

Trial Tests

Two 15-item trial tests, one consisting of pas-

sages and the other of words, were given to 17 eighth-

grade students, ages 12 to 14, mean age 13.4, in a class-

room situation. Context was definitely victorious over

word-in-isolation in Items 2, 5, 6, 11, 12, and 13. Iso-

lation won out over context in Items 14 and 15 (see Table

2).

The total correct responses are also shown in

Table 2. For the word-in-isolation group, of a total of

120 possible correct responses, there were 61 correct, for

a percentage of 50.8. For the word-in-context test, of a

total of 135 possible correct responses, there were 83

correct, for a percentage of 61.5.

Both tests appeared to be satisfactory measures,

with the items generally acceptable in range of difficulty,

TABLE 2

TRIAL TEST NUMBER AND PERCENTAGES OF CORRECT RESPONSES
TO INDIVIDUAL ITEMS AND TOTAL CORRECT RESPONSES
FOR GROUPS A AND B

Item number	Word-in-context (Group A) (n = 9)		Word-in-isolation (Group B) (n = 8)	
	Number correct	Percentage	Number correct	Percentage
1	6	66.6	5	62.5
2	8	88.8	3	37.5
3	8	88.8	8	100.0
4	5	55.5	5	62.5
5	5	55.5	1	12.5
6	5	55.5	2	25.0
7	8	88.8	8	100.0
8	0	00.0	1	12.5
9	2	22.2	3	37.5
10	4	44.4	4	50.0
11	8	88.8	4	50.0
12	8	88.8	1	12.5
13	7	77.7	2	25.0
14	4	44.4	7	87.5
15	5	55.5	7	87.5
Total correct possible		135	Total correct possible	120
Total correct		83	Total correct	61
Percentage correct		61.5	Percentage correct	50.8

except for Items 8 and 9. These were eliminated from the
final tests, along with Item 2, as this keyed response on
the isolation test was not clearly defensible (not a dic-
tionary definition). Copies of the context and word tests
used in the trial examination may be found in Appendix B.

The trial testing provided a useful estimate of
the acceptability of items on both context and word tests.
Understood was the probability that since the tests were
not excessively easy for eighth-grade non-retarded read-
ers, even with the removal of two decidedly difficult
items and one non-defensible item, they would prove dif-
ficult for lower-level readers. It was felt that some
items of the tests were difficult enough to be discrim-
inating and others were easy enough to allow correct
responses.

Administration of Tests

Two 12-item tests, one scoring getting word mean-
ing from a context and the other identifying any of the
specific word meanings already known, were given to 42
junior-college retarded readers while they attended their
reading and writing classes. Six daytime and one evening
class were involved. As students were working individu-
ally in these courses, no group situation existed for
testing. Rather, each student in the experiment was given
the assigned test by the investigator early in the class

period and asked to complete it and return it as soon as convenient, taking all the time needed and using no aid like a dictionary.

Treatment of Data

This study sought to establish whether or not there was any difference between word-in-context and word-in-isolation scores (word identification scores); that is, whether or not students gave meaning to more words in context than alone. It is interesting first to see whether any significant difference existed between the two randomly selected groups in reading ability. The difference between the mean vocabulary scores of the two groups was found. Then, to see whether the difference between the mean vocabulary score of Group A and the mean vocabulary score of Group B deviated significantly from zero to a t value was computed and used to enter a level of significance table. The same procedure was followed with mean comprehension scores to show any possible difference in ability between the two groups. Finally, mean word identification scores (R-W/4) were treated in the same manner to see whether any difference between the word identification mean scores of the two groups was statistically significant. Formulas are found in Davis (1964) (see Appendix D).

Correlation coefficients were computed to show

relationships between word identification scores and stan-
dardized vocabulary and comprehension scores for both
Group A and Group B (Appendix D).

This chapter first discussed the subjects in this
study, 42 junior-college retarded readers enrolled in a
reading lab and reading above level 5.0, but below level
11.0. Then followed descriptions of the two tests used,
one consisting of passages to measure the ability to
recognize and assign meaning to words in context, and the
other a multiple-choice vocabulary test to measure the
ability to recognize the same words without any context.
A trial run of the two tests with eighth-grade students
and the final administration of the tests to the subjects
of the study were next explained. Finally discussed was
how the data were to be treated to determine whether or
not there was a significant difference between the mean
scores of the word-in-context and word-in-isolation
groups. This difference would help to answer the ques-
tion posed by this study: Do junior-college retarded
readers use context clues to any significant degree?

CHAPTER IV

FINDINGS AND DISCUSSION

This study examined the frequency of responses of
two randomly assigned groups of junior-college retarded
readers to words in context and words alone, in an effort
to determine whether or not these readers use context to
gain meaning. A search of related literature revealed
that there have not been any studies of junior-college
retarded readers' use of inference from the context to
grasp word meaning.

The procedures of the study were as follows:
Preceding the actual study, a trial test for each group
was administered to eighth-grade non-retarded readers,
which proved useful in the adoption of the final test
items. Then these word identification tests, one requir-
ing the reader to assign specific meaning to words in con-
text, and the other to words alone, were each given to one
group of junior-college retarded readers. Before adminis-
tering the word identification tests, any significant dif-
ference in reading abilities between the two groups was
ascertained by determining mean vocabulary and mean com-
prehension standardized test scores for both groups and

subjecting each of these to a $\underline{t}$ test.

Then the frequency of correct responses on the word identification tests, with correction for guessing (R-W/4), determined mean scores for both groups. The two means were then compared to see whether or not there was any significant difference between them. To establish this, a value was computed and used to enter a level of significance table.

The hypotheses set forth in the study were that the context group would know a greater number of words and that there would be a significant difference between the two groups' word identification scores.

Presentation of Data

Data on the two groups, A and B, are found in Table 3 and Table 4. Subjects were classified by age, sex, Gates-MacGinitie vocabulary score, Gates-MacGinitie comprehension score, and word identification score. Roughly, the reading level of students described in Tables 3 and 4 was somewhere between 5.0 and 11.0 (average of vocabulary and comprehension scores). The purpose of this study was to determine whether or not junior-college retarded readers used context to any significant degree to gain word meaning. Vocabulary and comprehension mean scores of each group were pertinent in determining similarities between Group A and Group B in reading

TABLE 3

GROUP A JUNIOR-COLLEGE RETARDED READERS, WORD-IN-CONTEXT,
BY SEX, AGE, GATES-MACGINITIE VOCABULARY AND
COMPREHENSION SCORES AND WORD
IDENTIFICATION SCORES

Subject No. [a]	Sex[b]	Age[c]	Vocabu-lary[d]	Compre-hension[e]	Word identi-fication (R-W/4)[f]
1	F	20	7.9	4.8	4.5
2	F	36	6.6	5.8	0.8
3	F	21	7.7	5.3	0.8
4	M	19	6.6	5.5	5.8
5	M	24	8.6	5.5	5.8
6	F	24	11.0	4.6	4.5
7	F	42	11.0	6.0	2.0
8	F	39	6.9	5.8	3.3
9	F	19	6.2	4.2	4.5
10	F	19	8.3	5.3	4.5
11	F	47	12.9	5.5	4.5
12	F	24	5.8	5.1	4.5
13	M	33	10.5	8.9	3.3
14	M	20	7.0	9.3	8.3
15	M	20	6.6	5.5	5.8
16	F	20	7.7	7.2	-0.8
17	F	36	5.5	5.1	2.0
18	F	23	9.5	6.2	0.8
19	M	20	10.1	8.6	8.3
20	F	20	6.2	5.5	3.0
21	M	18	8.6	7.2	8.3

[a]$N = 21$

[b]7 male; 14 female

[c]Mean = 25.8; S.D. = 9.0

[d]Mean = 8.15; S.D. = 1.95

[e]Mean = 6.04; S.D. = 1.38

[f]Mean = 4.26; S.D. = 2.73

TABLE 4

GROUP B JUNIOR-COLLEGE RETARDED READERS, WORD-IN-
ISOLATION, BY SEX, AGE, GATES-MACGINITIE
VOCABULARY AND COMPREHENSION SCORES
AND WORD IDENTIFICATION SCORES

Subject No.[a]	Sex[b]	Age[c]	Vocabu- lary[d]	Compre- hension[e]	Word identi- fication (R-W/4)[f]
1	F	51	7.3	4.1	2.0
2	M	24	6.2	4.5	2.0
3	M	19	4.1	7.2	0.8
4	F	18	6.6	6.5	2.0
5	F	34	8.6	5.5	2.0
6	F	27	4.9	6.0	4.5
7	F	35	8.6	5.3	5.8
8	F	39	7.9	3.7	3.3
9	F	23	9.5	4.3	9.5
10	F	26	6.9	4.1	3.3
11	F	36	4.9	5.3	7.0
12	M	22	8.6	3.7	7.0
13	F	33	11.5	5.3	5.8
14	M	18	12.9	8.0	7.0
15	M	19	8.9	5.3	5.8
16	F	19	12.2	7.6	2.0
17	F	23	8.9	8.0	4.7
18	M	25	8.6	12.9	9.5
19	F	19	6.2	7.8	3.3
20	F	35	7.7	7.6	4.5
21	F	18	5.8	6.0	0.8

[a]$N = 21$

[b]6 male; 15 female

[c]Mean = 26.8; S.D. = 6.4

[d]Mean = 7.61; S.D. = 2.25

[e]Mean = 6.13; S = 1.99

[f]Mean = 4.40; S = 2.85

ability.   Mean scores of the word identification tests

showed whether or not context of a passage was used to

identify unknown words.

The predominance of females (14 in Group A and 15

in Group B) over males (7 in A and 6 in B) is interesting.

This suggests that either there were simply more females

enrolled in the skills lab, or more females in the lab

were reading above the 5.0 level and were thus included

in the study.   The wide range in age in both groups is

evident from the tables, with Group A's mean age 25.8,

standard deviation 9.0, and Group B's mean age 26.8,

standard deviation 6.4.

The mean vocabulary score for Group A was 8.15,

with a standard deviation of 1.95, and for Group B was

7.61, standard deviation 2.25.   The mean comprehension

score for Group A was 6.04, with a standard deviation of

1.38, and for Group B was 6.13, standard deviation 1.99.

The mean word identification test score (R-W/4) for Group

A was 4.26, with a standard deviation of 2.73, and for

Group B was 4.40, standard deviation 2.85.

The data, then, show that Group A was somewhat

younger, with more variations in age, and had a slightly

higher vocabulary score, slightly lower comprehension

score, and a slightly lower word identification score

than Group B.   None of the mean score differences were

statistically significant. Statistical computations are
found in Appendix D.

Additional information on word identification
scores is shown by the number of actual correct responses
to seeing words in context (Group A) and seeing words in
isolation (Group B). Numbers and percentages of actual
correct responses for both groups for the twelve items,
individually and totally, are presented in Table 5. The
reader is referred to Appendix A to examine any specific
item numbered in the table.

Three items showing strong indication that con-
text was used successfully include Item 7, where only
28.6 percent knew the word alone while 42.9 knew it in
context; and Items 8 and 9, which were correctly identi-
fied by only 33.3 percent of the isolation group but by
76.2 and 57.1 percent of the word-in-context group.

The word-in-isolation group scored definitely
higher on six items, easy Items 2, 3, 6, and 11; moder-
ately difficult Item 5; and difficult Item 10. This
would suggest, since the students knew these words alone
--over 70 percent knew the four easy items without any
context--that either the context served to confuse or
mislead them, or they were unable to select a precise
meaning from among choices close in meaning.

Two items showed only slightly higher scores one

TABLE 5

JUNIOR-COLLEGE RETARDED READERS' NUMBER AND PERCENTAGES
OF CORRECT RESPONSES TO INDIVIDUAL ITEMS; AND TOTAL
CORRECT RESPONSES FOR GROUPS A AND B

Item number	Word-in-context (Group A) (n = 21)		Word-in-isolation (Group B) (n = 21)	
	Number correct	Percentage	Number correct	Percentage
1	4	19.0	6	28.6
2	9	42.9	15	71.4
3	12	57.1	15	71.4
4	6	28.6	6	28.6
5	9	42.9	12	57.1
6	13	61.9	15	71.4
7	9	42.9	6	28.6
8	16	76.2	7	33.3
9	12	57.1	7	33.3
10	5	23.8	7	33.3
11	12	57.1	16	76.2
12	13	61.9	12	57.1
	Total correct possible	252	Total correct possible	252
	Total correct	120	Total correct	124
	Percentage correct	47.6	Percentage correct	49.2

way or the other, 1 and 12; scores for Item 4 were the
same. Students evidently knew these words alone as well
as in context; hence, whether the response depended on
context is not shown by these items. Apparently the con-
text here was not confusing.

The total number of actual correct responses pos-
sible for each group was 254. Group A made 120 correct
responses, for a total of 47.6 percent correct on the con-
text test. Group B answered 124 correctly, for a total of
49.2 percent correct on the word test. These figures are
also in Table 5.

Examination of the test scores shows clearly that
while these two randomly selected groups did not differ
significantly in reading ability, the isolation Group B
scored slightly higher than the context Group A on word
identification tests.

A look at some of the responses actually selected
by students is interesting. Itemized responses on the
context test appear in Appendix C. In what way might the
context have been confusing? Item 10, which asks for the
meaning of "generous," referring to a dinosaur's mouth,
received only five correct responses of "wide," but ten
choices of "kindly." The author used the phrase "generous
mouth" in place of "generous-sized mouth." Because stu-
dents were unaware of the elimination of the word "-sized,"

they assigned an out-of-context meaning to "generous."
Yet size references are found throughout the passage:
"long thick tail . . . immense stomach . . . neck like a
fat snake . . . a peanut-sized head . . . tiny eyes." The
passage described the Brontosaurus as having "an expres-
sion at once shy and childishly eager and cheerful. His
tiny eyes sparkled . . . and a smile caressed his gener-
ous mouth." Perhaps words such as "childishly" and
"caressed" led readers to assign a gentle meaning to
"generous." It is also possible, of course, that the
readers simply reasoned that since generous people are
frequently considered to be kind people, the same would
apply to a dinosaur's mouth. Either the context actually
misled with impressionistic words having a too-strong
influence, or stereotyped meaning was given the word with-
out reference to the actual context.

Item 2 asks for the meaning of "perform" after a
passage which begins with the phrase "animal sounds," and
continues with "a monkey . . . scream[s] with fright . . .
[and] katydids make their monotonous music. . . ." The
word "perform," referring then to tree toads, received
eleven responses of "act," instead of the keyed response
"make sounds." At first glance it seems that here stu-
dents simply did not use the context. Yet a quick refer-
ence to Table 5 (p. 35) shows that in Group B 15 responded

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correctly without any context at all. Perhaps because the
passage mentioned stimulating animal sounds for recording
--this last word "recording" may have led to the response
"act," suggesting a more formalized presentation than just
"make sounds." To "perform" would mean to "act" (on a
stage or in a show), if the student did not consider the
narrow quality of the act, which is to "make sounds."
Perhaps students did not know that tree toads make sounds
as their principal performance.

In Item 1, 13 students answered "valuing" instead
of "experiencing" for the meaning of "appreciating"
("recognizing") in the passage. The interpretation "valu-
ing" is possible from the context. "Appreciating" meaning
"experiencing" leads into the latter part of the paragraph
where the author describes why she was not "experiencing"
loneliness, hence was happy; experiences are described.
"Appreciating" meaning "valuing" suggests that loneliness
was not valued by the author because it was commonplace
with her. Group B did not do well on this word either
(Table 5, p. 35)--maybe "appreciating" was simply a dif-
ficult word to read: confusing with other words, not
phonetically regular, and totally abstract.

Other items that call for mention are Item 3,
where five students thought that "motioned" meant "looked,"
which does not fit structurally because of "to the" and

what follows--if "to" became "at," "looked" could be
defended; Item 4, where students did not know the phrase
"in order" as "appropriate" and chose all distracters;
Item 7, where students did not know the meaning of "air"
as "tune" and selected all distracters about equally; and
Item 5, where more students thought that "information
. . . that bears on the . . . question" meant information
that "supports" rather than "concerns"--"support" may be
a more concrete word, though obviously it is imprecise in
meaning and incorrect here.

Correlations among scores on the word identifica-
tion test, Gates-MacGinitie vocabulary test, and Gates-
MacGinitie comprehension test for Group A and the same
relationships for Group B are shown in Table 6. While
these must be interpreted cautiously because of the small
number of subjects, it is nevertheless interesting to see
how word identification scores for each group, context and
isolation, compare when related to reading skills.

For both groups there was a higher correlation
between word identification and vocabulary (0.77 and 0.82)
than between word identification and comprehension (C.53
and 0.67). Correlations were higher for Group B, except
for the correlation between the vocabulary and comprehen-
sion scores themselves; this correlation was higher for
Group A. The relatively low correlation between the

TABLE 6

PRODUCT-MOMENT CORRELATION COEFFICIENTS AMONG VOCABULARY,
COMPREHENSION, AND WORD IDENTIFICATION SCORES FOR
GROUP A AND GROUP B

	Group A			Group B		
	Word identi-fication	Vocab-ulary	Compre-hension	Word identi-fication	Vocab-ulary	Compre-hension
Word identi-fication	1.00	0.77	0.53	1.00	0.82	0.67
Vocabu-lary	0.77	1.00	0.99	0.82	1.00	0.84
Compre-hension	0.53	0.99	1.00	0.67	0.84	1.00

context group's comprehension and word identification

(0.53) is striking. The isolation group's higher correla-

tion between word identification and vocabulary (0.82)

than between word identification and comprehension (0.67)

should also be pointed out.

Discussion

These findings, that a randomly assigned group of

junior-college retarded readers did not use context to

gain word meaning, did not agree with Goodman's (1965)

work with low-level readers in elementary school grades

one, two, and three. He found that low-level readers used

context to get word meaning. It should be pointed out,

however, that Goodman's study actually showed use of con-

text in word recognition (decoding), rather than context

relying on inference or deduction demonstrated in this

study. Also, his study, while it may have included poten-

tial retarded readers, was not limited to such. In this

study all subjects were retarded in reading. There may be

some factor common to lack of development of reading skill

and concomitant lack of growth in thinking or deduction

skill that would explain the difference between young low-

level readers and older low-level readers.

Results of this study did not support Seibert's

(1945) findings with older students. Her correct responses

were 60 percent, higher than the 47.6 percent found in

this study. Of course, Seibert's students, regular col-
lege freshmen, were undoubtedly better readers, certainly
not all retarded readers as those in this study were.
Seibert's theory of a native language ability to use con-
text would not be supported by results of this study.
These junior-college low-level readers were not using
context; certainly they were not relying on actual read-
ing ability since they were retarded in reading; there-
fore, since they failed to use context, evidently they
did not possess a native language ability in inference
making either. Perhaps this native language ability is
the common factor suggested in the preceding paragraph.
Goodman's young children had it--maybe young children do.
This opens the area of why, if indeed young children have
native language ability, some appear to lose it as they
become older and retarded in reading.

Gibbons' (1940) study suggested that 48 percent
of college students in her sample were unable to use con-
text. The 47.6 percent of students responding correctly
in this study left 52.4 percent unable to use context,
rather close to Gibbons' report.

This study agrees with early, largely subjective
studies of low-level readers (Elivian, 1938; Gray & Holmes,
1938), which found that generally children did not use
context to gain word meaning. Unless most children used

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context, these writers felt, like Gibbons, that use was inadequate.

Depending on one's point of view, one can determine the relative extent of usage of context in this study. The fact remains that 47.6 percent used the context, yet 49.2 percent used something other than context to gain word meaning, for the latter group correctly identified words without using any context. It is possible that the isolation group's higher word identification score could be attributed to some basic differences in intellect between the two groups. That there was no significant difference in vocabulary and comprehension as measured by a standardized reading test was established. While the differences were not statistically significant, the isolation group did score higher in comprehension but lower in vocabulary.

The fact that the words were known in isolation but unknown within a context leads one to examine comprehension abilities, for the passages where context failed must not have been fully understood.

Cautious interpretation of relationships among word identification, vocabulary, and comprehension suggest that the comprehension skills measured in a standardized reading test were not the same as those required to make inferences in getting word meanings from a context

(0.53). Further, vocabulary skills were probably used more by the isolation group than by the context group. Perhaps context confused vocabulary knowledge.

It is also possible that the context test was simply more difficult than the isolation test because it required more complex thinking processes (making inferences). Still, some items were easier for one group, some for the other, and a few were of approximately the same difficulty. The fact that the context test required more reading and more time, despite the clues to meaning offered, should be considered, since reading passages is more difficult for retarded readers than reading single words and multiple-choice definitions. Perhaps for these readers it is easier to find a meaning than a precise meaning, even when clues are present, for careful reading and thinking are required for precision.

Chapter IV has presented the findings of this study, which compared junior-college retarded readers' ability to give precise word meaning to words in context and to words alone. Data tables of both groups' age, sex, standardized vocabulary and comprehension scores, and word identification scores, along with percentages of actual correct responses to items on both tests, were presented and discussed. Also, relationships among word identification, vocabulary, and comprehension scores were

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mentioned. The context group was slightly younger and had lower word identification and comprehension mean scores, but a slightly higher vocabulary mean score. Percentages of correct responses to items resulted in 47.6 percent correct for the context group and 49.2 percent for the isolation group. Correlations of word identification, vocabulary, and comprehension scores were higher for the isolation group than for context group; the lowest correlation was between reading comprehension and word identification for the context group.

Statistical computations to determine whether or not the differences between group mean scores were significant, not mere chance deviations from zero, estimated the difference between the groups' vocabulary, comprehension, and word identification mean scores to be not significant. The results indicated that students in this study did not use the context of a passage to gain word meaning.

How these findings related to studies with low-level readers and older readers was discussed because no other studies of junior-college retarded readers' use of context have been carried out. These results support findings of Elivian (1938), Gray and Holmes (1938), and Gibbons (1940).

Finally offered was some explanation for the

results of the study, which might include the students

themselves and the testing instruments that were used.

CHAPTER V

SUMMARY AND SUGGESTIONS

This study has examined the responses of 42 junior-
college retarded readers to words found within the context
of a passage and to words in isolation. A search of the
literature indicated that word meanings are dependent on
context, and context provides clues to meaning, often
requiring inference on the part of the reader. This
investigation was a search for information about this
particular reading skill, use of context to infer mean-
ing, with regard to junior-college retarded readers. No
studies of these students' use of context were found in
the literature.

Summary

The question posed in the study was, do junior-
college/adult retarded readers use context clues to any
significant degree? To answer this question, students
enrolled in reading and writing courses in a junior-
college academic skills lab were randomly assigned to two
groups, Group A, or the word-in-context group, and Group
B, or the word-in-isolation group. No students enrolled
in the lab reading above 10.8 grade level were in the

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study. Students in the reading course reading below 5.0
level were not included in the study because of probable
difficulty in reading the passages on the context test.
Of the 42 students in the study, 13 were male and 24 were
female; ages ranged from 18 to 51, with a mean age of
26.4.

Each group was given one 12-item multiple-choice
test, either one consisting of passages containing spe-
cific words whose meanings could be inferred from the con-
text, or one made up of a list of the same specific words,
each word followed by multiple-choice answers. The same
answer was keyed as correct on both tests. Tests were
given to day and evening students, who worked individually
in the lab, and they were given unlimited time to complete
the tests.

The mean word score (R-W/4) for Group A was 4.26,
standard deviation 2.73, and for Group B, 4.40, standard
deviation 2.85. Group A was slightly younger than Group
B, with a mean age of 25.8 compared with B's 26.8. Group
A's mean vocabulary score was 8.15 and B's 7.61; A's mean
comprehension score was 6.04 and B's 6.13. These differ-
ences were not statistically significant.

Group A answered 47.6 percent of the items cor-
rectly. Group B responded correctly to 49.2 percent of
the questions. Three items were answered correctly with

greater frequency by Group A, six by Group B, and three
about equally by both groups. Product-moment correlation
coefficients for Group A showed the relationship between
word identification and vocabulary to be 0.77; that
between word identification and comprehension, 0.53; and
that between vocabulary and comprehension, 0.99. Corre-
lations for Group B showed the relationship between word
identification and vocabulary to be 0.82; that between
word identification and comprehension, 0.67; and that
between vocabulary and comprehension, 0.84.

The difference between word identification mean
scores for Group A and Group B was found to be not a sig-
nificant difference, but rather was probably determined
by chance factors. This was determined by computing a
$\underline{t}$ value and entering a level of significance table. In
other words, there was no significant difference between
Group A's score on the context test and Group B's score
on the isolation test.

This suggests that this group of junior-college
retarded readers did not use context to gain word mean-
ing, which is in keeping with findings of Elivian (1938)
and Gray and Holmes (1938) with low-level readers, and
with Gibbons (1940) with college freshmen.

The hypotheses set forth in Chapter I were that
the context group would score higher than the isolation

group in word identification and that there would be a significant difference between the two groups. Both hypotheses were rejected.

Conclusions

The major finding of this study was that while 47.6 percent of the junior college retarded readers in this population sample used context to get word meaning, an even higher percentage (49.2) grasped word meaning without any context at all. There was no statistically significant difference between the two groups in reading ability as measured by standardized vocabulary and comprehension test scores. These junior-college low-level readers apparently lacked the ability to make inferences from a passage and consequently use context to gain specific word meaning.

Suggestions for Further Research

Questions for future study should include the following:

1. Does any pattern of emotional, physical, or intellectual disorder appear among those junior-college retarded readers scoring low in use of context?

2. What does analysis of errors among the group failing to use context reveal about thinking patterns of junior-college retarded readers?

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APPENDIX A

TESTS USED IN THE STUDY

Read each passage; then decide which choice is closest in meaning to the numbered word or phrase <u>as it is used in the passage</u>. Circle your answer.

As a little girl, I ran footloose on our sandy farm, not appreciating the loneliness of being an only child because I was my father's constant companion from the time I could tag along the furrows of a plowed field or hold up my tin pail for him to milk into.

1. "appreciating" (line 3)
   A valuing
   B experiencing
   C liking
   D developing
   E increasing

There are various ways to stimulate animal sounds for recording. Showing a monkey a live snake will make him scream with fright. Tree toads will perform if they hear someone sawing away on a piece of bronze--but that spoils the record. Katydids will make their monotonous music if they can hear other katydids making love in the distance.

2. "perform" (line 6)
   A dance
   B act
   C make love
   D make sounds
   E move around

As the procession neared the palace, the King signed to the first officer of the guard, who then rode up and saluted.

3. "signed" (line 2)
   A motioned
   B wrote
   C called
   D looked
   E pointed

That night I spent a good half hour at the dressing table. After what had happened in the afternoon, tears would have been in order, but I kept telling myself that red swollen eyes would only make me look worse.

4. "in order" (lines 5 and 6)
   A following
   B on schedule
   C inevitable
   D properly arranged
   E appropriate

Before writing anything in the exam book, I try to recall and organize in my mind all the information from the source materials I have read that bears on the first question. Then I do the same thing for the second question, and so on.

5. "bears on" (line 6)
   A pierces through
   B takes up
   C supports
   D concerns

Schooners are fore-and-aft rigged vessels--that is, their sails are slung from a gaff sticking out at one

side of the mast and are
spread at the bottom by a
boom.   The gaffs and booms
are secured in such a way
that the sails may be
turned fore, aft, or to
one side.

6. "secured" (line 8)
   A protected
   B obtained
   C fastened
   D locked
   E made safe

In a Viennese museum was
exhibited the piano used by
Beethoven.   An American girl
walked casually toward it
and ran off a careless air.
Turning to the attendant,
she asked whether there had
not been great pianists to
inspect the instrument.   He
replied that a short time
ago Paderewski had made a
pilgrimage to this shrine.
"Paderewski!" said the girl.
"Surely he must have played
something beautiful on it."
"On the contrary," responded
the guard, "he did not feel
worthy to touch it."

7. "air" (line 5)
   A draft
   B appearance
   C manner
   D attitude
   E tune

Anyone who weighs the
evidence will conclude that
the Bible is a unique book,
which can be explained only
as coming to us, through
man, from the mind of an
all-powerful, wise, and
loving God.

8. "weighs" (line 1)
   A places on a scale
   B exactly balances
   C carefully considers
   D estimates
   E lifts

Rose and Leon walked
slowly across the campus.
Ever after she remembered
the bright hues of the trees
and the crackling of the
leaves underfoot.   Every-
thing seemed exciting.   Leon
expected to enter the army
in a few weeks.   That gave
deeper color to what he
said.

9. "color" (line 10)
   A charm
   B strangeness
   C significance
   D thought
   E brilliance

The drawing showed the
Brontosaurus with a long
thick tail, an immense stom-
ach, a neck like a fat
snake, and topping all this
off, a peanut-sized head.
The awkward beast wore an
expression at once shy and
childishly eager and cheer-
ful.   His tiny eyes sparkled
and a smile caressed his
generous mouth.

10. "generous" (last line)
    A kindly
    B openhanded
    C wide
    D loose
    E gaping

Before the child has cut his first permanent teeth, he is ripe for the attentions of the orthopedist. His spine is distorted, his feet are flat, and his entire muscular tone, essential for erect posture, has been destroyed.

11. "ripe" (line 3)
    A spoiled
    B mature
    C mellow
    D ready
    E prepared

It wasn't enough for Mrs. Porter, our housekeeper, that having devised a schedule, she should maintain it. She had to be ahead of herself. "I can't abide things hanging over me," she used to say.

12. "abide" (line 6)
    A stay with
    B tolerate
    C wait for
    D get used to
    E stop

Select the word that <u>most nearly means the same</u> as the
underlined word.   Circle your answer.

1. <u>appreciating</u>
   A producing
   B experiencing
   C declining
   D initiating
   E appearing

2. <u>perform</u>
   A prefer
   B refuse
   C not move
   D make sounds
   E be silent

3. <u>signed</u>
   A motioned
   B ignored
   C sinned
   D weighed
   E exhaled

4. <u>in order</u>
   A remote
   B in tune with
   C delayed
   D disarrayed
   E appropriate

5. <u>bears on</u>
   A growls
   B dares
   C signals
   D concerns
   E listens

6. <u>secured</u>
   A prayed
   B succeeded
   C fastened
   D injured
   E scurried

7. <u>air</u>
   A ball
   B son
   C mistake
   D gun
   E tune

8. <u>weighs</u>
   A drops
   B gains
   C carefully considers
   D strengthens
   E moves precisely

9. <u>color</u>
   A faith
   B culture
   C significance
   D unit of heat
   E generalization

10. <u>generous</u>
    A selfish
    B simple
    C wide
    D common
    E garish

11. <u>ripe</u>
    A spoiled
    B gone to seed
    C raw
    D ready
    E common

12. <u>abide</u>
    A shorten
    B tolerate
    C rub off
    D rub on
    E wait

APPENDIX B

TRIAL TESTS

Read each passage; then decide which choice is closest in meaning to the numbered word or phrase <u>as it is used in the passage</u>. Circle your answer.

As a little girl, I ran footloose on our sandy farm, not appreciating the loneliness of being an only child because I was my father's constant companion from the time I could tag along the furrows of a plowed field or hold up my tin pail for him to milk into.

1. "appreciating" (line 3)
   A valuing
   B experiencing
   C liking
   D developing
   E increasing

As we walked down the hospital steps, I could see that Grandmother wasn't feeling her best. "Look," I said, "it's cold and you're tired. Let's try to get a bus and then"-- I felt in my pocket and found a few coins--"and then let's get some salami at the market." Grandmother loves salami.
   "Do you think we could manage a bottle of beer?" she asked.
   I felt the coins again. "I think so."

2. "manage" (line 14)
   A drink
   B enjoy
   C afford
   D carry
   E control

There are various ways to stimulate animal sounds for recording. Showing a monkey a live snake will make him scream with fright. Tree toads will perform if they hear someone sawing away on a piece of bronze--but that spoils the record. Katydids will make their monotonous music if they can hear other katydids making love in the distance.

3. "perform" (line 6)
   A dance
   B act
   C make love
   D make sounds
   E move around

As the procession neared the palace, the King signed to the first officer of the guard who then rode up and saluted.

4. "signed" (line 2)
   A motioned
   B wrote
   C called
   D looked
   E pointed

That night I spent a good half hour at the dressing table. After what had happened in the afternoon, tears would have been in order, but I kept telling myself that red swollen eyes would only make me look worse.

5. "in order" (lines 5 and 6)
   A following
   B on schedule
   C inevitable
   D properly arranged
   E appropriate

Before writing anything in the exam book, I try to recall and organize in my mind all the information from the source materials I have read that bears on the first question. Then I do the same thing for the second question, and so on.

6. "bears on" (line 6)
   A pierces through
   B takes up
   C supports
   D concerns
   E presses down on

Schooners are fore-and-aft rigged vessels--that is, their sails are slung from a gaff sticking out at one side of the mast and are spread at the bottom by a boom. The gaffs and booms are secured in such a way that the sails may be turned fore, aft, or to one side.

7. "secured" (line 8)
   A protected
   B obtained
   C fastened
   D locked
   E made safe

Two months after his marriage to Maria, Mr. Haines was killed when, as she explained, he was struck on the head by a sausage grinder that fell from a shelf. It is idle to speculate whether the shelf had been jiggled. The coroner, although later he admitted "things looked a little queer, officially found that Haines died accidentally. Maria received his

$4,000 life insurance.

8. "found" (line 12)
   A discovered
   B learned
   C understood
   D observed
   E ruled

The bandit chief has two rules. The first was: Never rob a man, unless by stealth, without killing him, and therefore, never rob with violence unless you can "take care of" the victim. His second rule was: Never leave a corpse where it will be found.

9. "take care of" (line 7)
   A murder
   B bribe
   C look out for
   D hide
   E watch over

In a Viennese museum was exhibited the piano used by Beethoven. An American girl walked casually toward it and ran off a careless air. Turning to the attendant, she asked whether there had not been great pianists to inspect the instrument. He replied that a short time ago Paderewski had made a pilgrimage to this shrine. "Paderewski!" said the girl. "Surely he must have played something beautiful on it."
   "On the contrary," responded the guard, "he did not feel worthy to touch it."

10. "Air" (line 5)
    A draft
    B appearance
    C manner

D   attitude
E   tune

Anyone who weighs the evidence will conclude that the Bible is a unique book, which can be explained only as coming to us, through man, from the mind of an all-powerful, wise, and loving God.

11. "weighs" (line 1)
    A   places on a scale
    B   exactly balances
    C   carefully considers
    D   estimates
    E   lifts

Rose and Leon walked slowly across the campus. Ever after she remembered the bright hues of the trees and the crackling of the leaves underfoot. Everything seemed exciting. Leon expected to enter the army in a few weeks. That gave deeper color to what he said.

12. "color" (line 10)
    A   charm
    B   strangeness
    C   significance
    D   thought
    E   brilliance

The drawing showed the Brontosaurus with a long thick tail, an immense stomach, a neck like a fat snake, and topping all this off, a peanut-sized head. The awkward beast wore an expression at once shy and childishly eager and cheerful. His tiny eyes sparkled and a smile caressed his generous mouth.

13. "generous" (last line)
    A   kindly
    B   openhanded
    C   wide
    D   loose
    E   gaping

Before the child has cut his first permanent teeth, he is ripe for the attentions of the orthopedist. His spine is distorted, his feet are flat, and his entire muscular tone, essential for erect posture, has been destroyed.

14. "ripe" (line 3)
    A   spoiled
    B   mature
    C   mellow
    D   ready

It wasn't enough for Mrs. Porter, our housekeeper, that, having devised a schedule, she should maintain it. She had to be ahead of herself. "I can't abide things hanging over me," she used to say.

15. "abide" (line 7)
    A   stay with
    B   tolerate
    C   wait for
    D   get used to
    E   stop

Select the word that <u>most nearly means the same</u> as the
underlined word. Circle your answer.

1. <u>appreciating</u>
   A producing
   B experiencing
   C declining
   D initiating
   E appearing

2. <u>manage</u>
   A soothe
   B mangle
   C afford
   D strike
   E damage

3. <u>perform</u>
   A prefer
   B refuse
   C not move
   D make sounds
   E be silent

4. <u>signed</u>
   A motioned
   B ignored
   C sinned
   D weighed
   E exhaled

5. <u>in order</u>
   A remote
   B in tune with
   C delayed
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7. <u>secured</u>
   A prayed
   B succeeded
   C fastened
   D injured
   E scurried

8. <u>found</u>
   A searched
   B lost
   C missed
   D knew
   E ruled

9. <u>take care of</u>
   A murder
   B debate
   C know
   D dislike
   E suspect

10. <u>air</u>
    A ball
    B son
    C mistake
    D gun
    E tune

11. <u>weighs</u>
    A drops
    B gains
    C carefully
         considers
    D strengthens
    E moves precisely

12. <u>color</u>
    A faith
    B culture
    C significance
    D unit of heat
    E generalization

13. <u>generous</u>
    A selfish
    B simple
    C wide
    D common
    E garish

14. <u>ripe</u>
    A spoiled
    B gone to seed
    C raw
    D ready
    E common

15. <u>abide</u>
    A shorten
    B tolerate
    C rub off
    D rub on
    E wait

APPENDIX C

CONTEXT TEST RESPONSES

71

Read each passage; then decide which choice is closest in meaning to the numbered word or phrase <u>as it is used in the passage</u>. Circle your answer.

As a little girl, I ran footloose on our sandy farm, not appreciating the loneliness of being an only child because I was my father's constant companion from the time I could tag along the furrows of a plowed field or hold up my tin pail for him to milk into.

1. "appreciating" (line 3)
13 A valuing
 4 Ⓑ experiencing
 4 C liking
 0 D developing
 0 E increasing
 0 F no answer

There are various ways to stimulate animal sounds for recording. Showing a monkey a live snake will make him scream with fright. Tree toads will perform if they hear someone sawing away on a piece of bronze--but that spoils the record. Katydids will make their monotonous music if they can hear other katydids making love in the distance.

2. "perform" (line 6)
 0 A dance
11 B act
 0 C make love
 9 Ⓓ make sounds
 1 E move around
 0 F no answer

As the procession neared the palace, the King signed to the first officer of the guard, who then rode up and saluted.

3. "signed" (line 2)
12 Ⓐ motioned
 3 B wrote
 0 C called
 5 D looked
 1 E pointed
 0 F no answer

That night I spent a good half hour at the dressing table. After what had happened in the afternoon, tears would have been in order, but I kept telling myself that red swollen eyes would only make me look worse.

4. "in order" (lines 5 and 6)
 3 A following
 1 B on schedule
 4 C inevitable
 6 D properly arranged
 6 Ⓔ appropriate
 1 F no answer

Before writing anything in the exam book, I try to recall and organize in my mind all the information from the source materials I have read that bears on the first question. Then I do the same thing for the second question, and so on.

5. "bears on" (line 6)
 1 A pierces through
 0 B takes up
10 C supports
 9 Ⓓ concerns
 1 E presses down on
 0 F no answer

Schooners are fore-and-aft rigged vessels--that is,

their sails are slung from
a gaff sticking out at one
side of the mast and are
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are secured in such a way
that the sails may be turned
fore, aft, or to one side.

6. "secured" (line 8)
 3 A protected
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13 © fastened
 2 D locked
 2 E made safe
 1 F no answer

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exhibited the piano used by
Beethoven. An American girl
walked casually toward it
and ran off a careless air.
Turning to the attendant,
she asked whether there had
not been great pianists to
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replied that a short time
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pilgrimage to this shrine.
"Paderewski!" said the girl.
"Surely he must have played
something beautiful on it."
    "On the contrary,"
responded the guard, "he
did not feel worthy to
touch it."

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 2 A draft
 2 B appearance
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 9 Ⓔ tune
 1 F no answer

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evidence will conclude that
the Bible is a unique book,
which can be explained only
as coming to us, through

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8. "weighs" (line 1)
 3 A places on a scale
 1 B exactly balances
16 © carefully considers
 1 D estimates
 0 E lifts
 0 F no answer

Rose and Leon walked
slowly across the campus.
Ever after she remembered
the bright hues of the
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ing. Leon expected to
enter the army in a few
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9. "color" (last line)
 5 A charm
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 1 D thought
 1 E brilliance
 0 F no answer

The drawing showed the
Brontosaurus with a long
thick tail, an immense
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expression at once shy and
childishly eager and cheer-
ful. His tiny eyes sparkled
and a smile caressed his
generous mouth.

10. "generous" (last line)
10 A kindly
 2 B openhanded
 5 © wide
 2 D loose

_1_ E   gaping
_1_ F   no answer

Before the child has cut his first permanent teeth, he is ripe for the attentions of the orthopedist. His spine is distorted, his feet are flat, and his entire muscular tone, essential for erect posture, has been destroyed.

11. "ripe" (line 3)
 _0_ A   spoiled
 _3_ B   mature
 _1_ C   mellow
 _12_ Ⓓ   ready
 _5_ E   prepared
 _0_ F   no answer

It wasn't enough for Mrs. Porter, our housekeeper, that having devised a schedule, she should maintain it. She had to be ahead of herself. "I can't abide things hanging over me," she used to say.

12. "abide" (line 6)
 _2_ A   stay with
 _13_ Ⓑ   tolerate
 _1_ C   wait for
 _5_ D   get used to
 _0_ E   stop
 _0_ F   no answer

APPENDIX D

STATISTICAL COMPUTATIONS

Word Identification Scores*

	Group A			Group B	
Sub-ject	Word identi-fication	Word identi-fication^2	Sub-ject	Word identi-fication	Word identi-fication^2
1	4.5	20.25	1	2.0	4.00
2	0.8	0.64	2	2.0	4.00
3	0.8	0.64	3	0.8	0.64
4	5.8	33.64	4	2.0	4.00
5	5.8	33.64	5	2.0	4.00
6	4.5	20.25	6	4.5	20.25
7	2.0	4.00	7	5.8	33.64
8	3.3	10.89	8	3.3	10.89
9	4.5	20.25	9	9.5	90.25
10	4.5	20.25	10	3.3	10.89
11	9.5	90.25	11	7.0	49.00
12	4.5	20.25	12	7.0	49.00
13	3.3	10.89	13	5.8	33.64
14	8.3	68.89	14	7.0	49.00
15	5.8	33.64	15	5.8	33.64
16	-0.8	0.64	16	2.0	40.00
17	2.0	4.00	17	4.7	22.09
18	0.8	0.64	18	9.5	90.25
19	8.3	68.89	19	3.3	10.89
20	3.0	9.00	20	4.5	20.25
21	8.3	68.89	21	0.8	0.64
N=21	Σ89.5	Σ540.43	N=21	Σ92.6	Σ580.96

Mn = 4.26   Mn = 4.40

$$S_A = \sqrt{\frac{\Sigma x^2}{N} - \left(\frac{\Sigma X}{N}\right)^2}$$

$$= \sqrt{\frac{540.43}{21} - 4.26^2} \qquad\qquad = \sqrt{\frac{580.96}{21} - 4.40^2}$$

$$= \sqrt{25.73 - 18.15} \qquad\qquad = \sqrt{27.66 - 19.36}$$

$$= \sqrt{7.58} \qquad\qquad\qquad = \sqrt{8.30}$$

$$S_A = 2.73 \qquad\qquad\qquad S_B = 2.85$$

*R-W/4

Word Identification Scores t Test

$$\bar{A} = \frac{\Sigma R - W/4}{N}$$
$$\bar{B} = \frac{\Sigma R - W/4}{N}$$

$$\bar{A} = 4.26$$
$$\bar{B} = 4.40$$

Hypothesis: $\bar{A} > \bar{B}$ rejected.

But is $\bar{B} > \bar{A}$?

$$t = \frac{\bar{B} - \bar{A}}{\sqrt{\dfrac{S_B^2}{N_B - 1} + \dfrac{S_A^2}{N_A - 1}}}$$

$$= \frac{4.40 - 4.26}{\sqrt{\dfrac{2.85^2}{20} + \dfrac{2.73^2}{20}}}$$

$$= \frac{0.14}{\sqrt{\dfrac{8.12}{20} + \dfrac{7.45}{20}}}$$

$$= \frac{0.14}{\sqrt{0.41 + 0.37}}$$

$$= \frac{0.14}{\sqrt{0.78}}$$

$$= \frac{0.14}{0.88}$$

$$t = 0.16 \ \text{(not significant)}$$

Vocabulary Scores

	Group A			Group B	
Sub-ject	Vocabu-lary	Vocabu-lary^2	Sub-ject	Vocabu-lary	Vocabu-lary^2
1	7.9	62.41	1	7.3	53.29
2	6.6	43.56	2	6.2	38.44
3	7.7	59.29	3	4.1	16.81
4	6.6	43.56	4	6.6	43.56
5	8.6	73.96	5	8.6	73.96
6	11.0	121.00	6	4.9	24.01
7	11.0	121.00	7	8.6	73.96
8	6.9	47.61	8	7.9	62.41
9	6.2	38.44	9	9.5	90.25
10	8.3	68.89	10	6.9	47.61
11	12.9	166.41	11	4.9	24.01
12	5.8	33.64	12	8.6	73.96
13	10.5	110.25	13	4.5	20.25
14	7.0	49.00	14	12.9	166.41
15	6.6	43.56	15	8.9	79.21
16	7.7	59.29	16	12.2	148.84
17	5.5	30.25	17	8.9	79.21
18	9.5	90.25	18	8.6	73.96
19	10.1	102.01	19	6.2	38.44
20	6.2	38.44	20	7.7	59.29
21	8.6	73.96	21	5.8	33.64
N=21	Σ171.2	Σ1476.78	N=21	Σ159.8	Σ1321.52

Mn = 8.15   Mn = 7.61

$$S_A = \sqrt{\frac{\Sigma X^2}{N} - \left(\frac{\Sigma X}{N}\right)^2}$$

$$= \sqrt{\frac{1476.78}{21} - 8.15^2} \qquad\qquad = \sqrt{\frac{1321.52}{21} - 7.61^2}$$

$$= \sqrt{70.32 - 66.42} \qquad\qquad\qquad = \sqrt{62.93 - 57.41}$$

$$= \sqrt{3.90} \qquad\qquad\qquad\qquad\quad = \sqrt{5.02}$$

$$S_A = 1.95 \qquad\qquad\qquad\qquad\quad S_B = 2.25$$

Vocabulary Scores t Test

$$t = \frac{\overline{A} - \overline{B}}{\sqrt{\dfrac{S_A^2}{N_A-1} + \dfrac{S_B^2}{N_B-1}}}$$

$$= \frac{8.15 - 7.61}{\sqrt{\dfrac{3.80}{20} + \dfrac{4.95}{20}}}$$

$$= \frac{0.54}{\sqrt{0.19 + 0.25}}$$

$$= \frac{0.54}{\sqrt{0.44}}$$

$$= \frac{0.54}{0.66}$$

$$t = 0.82 \text{ (not significant)}$$

Comprehension Scores

Sub-ject	Group A		Sub-ject	Group B	
	Compre-hension	Compre-hension^2		Compre-hension	Compre-hension^2
1	4.8	23.04	1	4.1	16.81
2	5.8	33.64	2	4.5	20.25
3	5.3	28.09	3	7.2	51.84
4	5.5	30.25	4	6.5	42.25
5	5.5	30.25	5	5.5	30.25
6	4.6	21.16	6	6.0	36.00
7	6.0	36.00	7	5.3	28.09
8	5.8	33.64	8	3.7	13.69
9	4.2	17.64	9	4.3	18.49
10	5.3	28.09	10	4.1	16.81
11	5.5	30.25	11	5.3	28.09
12	5.1	26.01	12	3.7	13.69
13	8.9	79.21	13	5.3	28.09
14	9.3	86.49	14	8.0	64.00
15	5.5	30.25	15	5.3	28.09
16	7.2	51.84	16	7.6	57.76
17	5.1	26.01	17	8.0	64.00
18	6.2	38.44	18	12.9	166.41
19	8.6	73.96	19	7.8	60.84
20	5.5	30.25	20	7.6	57.76
21	7.2	51.84	21	6.0	36.00
N=21	Σ126.9	Σ806.35	N=21	Σ128.7	Σ872.21

Mn = 6.04 $\qquad\qquad\qquad$ Mn = 6.13

$$S_A = \sqrt{\frac{\Sigma X^2}{N} - \left(\frac{\Sigma X}{N}\right)^2}$$

$$= \sqrt{\frac{806.35}{21} - 6.04^2} \qquad\qquad = \sqrt{\frac{872.21}{21} - 6.13^2}$$

$$= \sqrt{38.39 - 36.48} \qquad\qquad\quad = \sqrt{41.53 - 37.57}$$

$$= \sqrt{1.91} \qquad\qquad\qquad\qquad = \sqrt{3.96}$$

$$S_A = 1.38 \qquad\qquad\qquad\qquad S_B = 1.99$$

Comprehension Scores t Test

$$t = \frac{\overline{A} - \overline{B}}{\sqrt{\dfrac{S_A^{\,2}}{N_A-1} + \dfrac{S_B^{\,2}}{N_B-1}}}$$

Since $\overline{B} > \overline{A}$, test:

$$\frac{\overline{B} - \overline{A}}{\sqrt{\dfrac{S_B^{\,2}}{N_B-1} + \dfrac{S_A^{\,2}}{N_A-1}}}$$

$$= \frac{6.13 - 6.04}{\sqrt{\dfrac{1.99}{20} + \dfrac{1.38}{20}}}$$

$$= \frac{0.09}{\sqrt{0.10 + 0.07}}$$

$$= \frac{0.09}{\sqrt{0.17}}$$

$$= \frac{0.09}{0.41}$$

$$= 0.22 \text{ (not significant)}$$

Age

Sub- ject	Group A		Sub- ject	Group B	
	Age	Age^2		Age	Age^2
1	20	400	1	51	2601
2	36	1296	2	24	576
3	21	441	3	19	361
4	19	361	4	18	324
5	24	576	5	34	1156
6	24	576	6	27	729
7	42	1764	7	35	1225
8	39	1521	8	39	1521
9	19	361	9	23	529
10	19	361	10	26	676
11	47	2209	11	36	1296
12	24	576	12	22	484
13	33	1089	13	33	1089
14	20	400	14	18	324
15	20	400	15	19	361
16	20	400	16	19	361
17	36	1296	17	23	529
18	23	529	18	25	625
19	20	400	19	19	361
20	20	400	20	35	1225
21	18	324	21	18	324
N=21	$\Sigma 544$	$\Sigma 15680$	N=21	$\Sigma 563$	$\Sigma 16677$

Mn = 25.8   Mn = 26.8

$$S_A = \sqrt{\frac{\Sigma X^2}{N} - \left(\frac{\Sigma X}{N}\right)^2}$$

$$= \sqrt{\frac{15680}{21} - 25.8^2} \qquad\qquad = \sqrt{\frac{16677}{21} - 26.8^2}$$

$$= \sqrt{746.67 - 665.64} \qquad\qquad = \sqrt{760.81 - 718.24}$$

$$= \sqrt{81.03} \qquad\qquad\qquad\qquad = \sqrt{41.57}$$

$$S_A = 9.0 \qquad\qquad\qquad\qquad\qquad S_B = 6.4$$

Product-Moment Correlation Coefficients

$$r_{AB} = \frac{v_A + v_B - v_{(A-B)}}{2S_A S_B}$$

$$v = V\left(\frac{N}{N-1}\right)$$

W.I.$_A$	S=2.73	V=7.58	v=7.95
W.I.$_B$	S=2.85	V=8.30	v=8.63
Vocab$_A$	S=1.95	V=3.90	v=4.09
Vocab$_B$	S=2.25	V=5.02	v=5.25
Comp$_A$	S=1.38	V=1.91	v=2.01
Comp$_B$	S=1.99	V=3.61	v=3.79

Group A

Word identification
and vocabulary

$$r = \frac{7.95 + 4.09 - 3.86}{2(2.73)(1.95)}$$

$$= \frac{8.18}{10.64}$$

$$r = 0.77$$

Word identification
and comprehension

$$r = \frac{7.95 + 2.01 - 5.94}{2(2.73)(1.38)}$$

$$= \frac{5.02}{7.54}$$

$$r = 0.53$$

Vocabulary and
comprehension

$$r = \frac{4.09 + 2.01 - 2.08}{2(1.95)(1.38)}$$

$$= \frac{4.02}{4.04}$$

$$r = 0.99$$

Group B

Word identification
and vocabulary

$$r = \frac{8.63 + 5.25 - 3.38}{2(2.85)(2.25)}$$

$$= \frac{10.50}{12.82}$$

$$r = 0.82$$

Word identification
and comprehension

$$r = \frac{8.63 + 3.79 - 4.84}{2(2.85)(1.99)}$$

$$= \frac{7.58}{11.34}$$

$$r = 0.67$$

Vocabulary and
comprehension

$$r = \frac{5.25 + 3.79 - 1.46}{2(2.25)(1.99)}$$

$$= \frac{7.58}{8.96}$$

$$r = 0.84$$