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The Cloze Procedure and Informal Reading Inventory: A Correlative Study

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THE CLOZE PROCEDURE AND INFORMAL READING INVENTORY:

A CORRELATIVE STUDY

A Thesis

Presented to

the Graduate Faculty

Central Washington State College

In Partial Fulfillment

of the Requirements for the Degree

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by

Robert Elzenga

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This study compared the cloze procedure and informal reading inventory at reading levels ranging from third through seventh grade. Twenty-four elementary students, judged by their teachers as not having reading difficulties, were selected from fourth, fifth, and sixth grade classes and administered the two test instruments. The correlations, at each reading level, were not significant at the .01 level, as determined by the Pearson Product-Moment formula.

Recommendations included the use of more subjects and suggestions for additional research.

Chapter 1

INTRODUCTION

THE PROBLEM

The diagnosis of reading difficulties is a necessary prerequisite to the remediation of reading difficulties. Strang reports that:

Diagnosis . . . is the basis for a diagnostic curriculum, that is, a curriculum based on diagnosis. Appropriate instruction stems from and is interwoven with accurate and pertinent diagnostic information (19:3).

The need for a diagnostic instrument is also given by Strang:

Tests add precision and completeness to the teacher's classroom observation. When the teacher uses tests, he attempts to control the stimuli to which students respond. Since a test presumably presents a common stimulus to all students, comparisons of their differing responses are possible (19:123).

In speaking of diagnostic instruments, Kress and Johnson report that the informal reading inventory (IRI) is reliable to determine reading achievement. They also state that the reading IRI can only be administered individually to each child (10:1). However, it is well known that because of the individualized, one-to-one nature of the test, the IRI takes more time to administer than is available for most classroom teachers. Therefore, its use is limited.

Another diagnostic instrument to determine reading achievement, coming into prominence, is the cloze procedure. This procedure, according to Bormuth, like the IRI, has been reported to be a useful diagnostic tool to determine reading achievement (6:226-231). But unlike the IRI, the cloze procedure, According to Strang, is a group administered test (19:126-131). Therefore, it is not as time consuming to administer as the IRI, yet purports to measure levels of reading comparable to the IRI. Since the cloze procedure and the IRI appear to be useful determiners of reading levels and achievement, it was the purpose of this study to investigate the correlation between the IRI and the cloze procedure to determine if they can be used interchangeably to test achievement levels of children.

To determine if there was a correlation, this investigation hypothesized that there is no significant correlation between the IRI and the cloze procedure, at the .01 level of significance, using the Pearson Product-Moment Correlation formula, since the two tests were constructed from a different base. The two tests are used for the same purpose so it was of interest to see if there might be a correlation; therefore, the null hypothesis was used.

DEFINITIONS

The following terms will be used throughout the context of the investigation.

Cloze Procedure

The cloze procedure, as defined by Strang, is a measure of readability and comprehension in which students are instructed to insert missing words that have been systematically omitted in a passage, usually every fifth or tenth word (19:131).

Independent Level of Reading

Independent level of reading, as defined by Silvaroli, is the level at which the student reads comfortably without the hazards of unfamiliar vocabulary and concepts (17:xii-xiv).

Instructional Level of Reading

Instructional level of reading, as defined by Silvaroli, is the level at which the student can read with at least 95 percent accuracy in word recognition and 75 percent comprehension (17:xiv).

Frustrational Level of Reading

Frustrational level of reading, as defined by Silvaroli, is the level at which the student reads with less than 95 percent comprehension (17:xiv).

Informal Reading Inventory

Informal reading inventory (IRI) is defined as a procedure to evaluate a student's oral reading performance as he deals with materials varying in difficulty. By questioning and recording word recognition errors, at each difficulty level, the student's independent, instructional, and frustrational reading level can be determined.

Sentence Length

Sentence length (SL) is defined as the average number of words in each sentence of written material. Sentence length was computed by counting the total number of words in the material and dividing that by the total number of sentence in the material. This definition does not apply to the term "sentence length" used in the description of the Fry Readability Formula.

Multi-Syllable Word

Multi-syllable word (MSW) is defined as any word containing at least two syllables.

Percent of Multi-Syllable Words

Percent of multi-syllable words (%MSW) is defined as the percent of words in written material having at least two syllables.

LIMITATIONS

This investigation was limited to twenty-four students selected by a reading specialist, from fourth, fifth, and sixth grade classes in a Central Washington school district.

The investigation was further limited to using the cloze procedure and IRI for measuring reading abilities ranging from third grade through seventh grade.

The Fry Readability Formula was the only instrument used to determine levels of readability.

ORGANIZATION OF THE THESIS

In this chapter, two diagnostic test instruments useful in determining reading achievement were suggested. The purpose of the investigation to determine correlation between the cloze procedure and the IRI was presented. The null hypothesis was stated, and definition of terms and limitations of the study were given.

The remaining chapters are organized as follows: Chapter 2 reviews literature pertinent to the development of the investigation; Chapter 3 describes the subjects, materials, testing conditions, and procedures for the organization and administration of the investigation; Chapter 4 reports the results of the investigation; and Chapter 5 provides discussion, recommendations, summary, and conclusions of the investigation.

Chapter 2

REVIEW OF LITERATURE

This chapter will review past studies of the informal reading inventory (IRI) and cloze procedure, and literature pertinent to the organization and administration of this investigation.

LITERATURE PERTINENT TO THE INFORMAL READING INVENTORY

Betts stated the importance of informal reading inventories in 1936 when he reported that:

Oral reading tests, either formal or informal, from standard readers, provide needed evidence. An experienced examiner can note use of context clues and deficiencies in word analysis as well as tendencies to reverse forms, to repeat, to omit and to substitute (3:98).

Kress and Johnson gave four purposes of the IRI: (1) the IRI can determine the child's independent, instructional, and frustrational reading level; (2) the IRI can determine a child's specific strengths and weaknesses; (3) the IRI can help the learner become aware of his levels of achievement and his strengths and weaknesses; and (4) the IRI can provide an evaluation of progress (10:3-5).

In regards to questions used in the IRI, Kress and Johnson suggest that five questions--two inferential, one vocabulary, and two

factual--be included in each block. They further suggest that the actual number of questions would vary directly with the length of the selection and its density of ideas (10:34).

Bond and Tinker report that care must be taken in making out the inferential and fact questions. The questions should be stated in clear and simple language and there must be enough of them to sample the content of the reading selection (4:199-200).

In regards to the scoring of the IRI, Kress and Johnson report that of all the symptoms suggested as indications of reading difficulties only four are usually counted in computing the word recognition score--substitutions, insertions, omissions, and requests for examiner aid. The clinician should count the number of such errors. In computing the comprehension score for each selection at every level of material, Kress and Johnson suggested dividing the number of questions answered correctly by the total number of questions asked. This will give the examiner a percent score (10:38).

Concerning the construction of the IRI, Bond and Tinker suggest that the materials used to ascertain independent, instructional, and frustrational levels should: (1) be constructed from a carefully graded series of basic readers, that the child has not read from before, (2) be selections of 100 to 150 words chosen from each successive book in the series, (3) be selected at about twenty pages from the beginning

of the first book at that grade, and (4) include questions involving both ideas and facts constructed on each level (4:198).

In administering the IRI, Kress and Johnson report:

Before any reading is done, a definite readiness for the particular selection should be established. In the course of this readiness, a purpose for reading should be brought out. The examiner must be careful not to reveal so much in the way of vocabulary used in the selection or ideas contained that he gets no opportunity to measure the child's actual reading performance. Instead, some orientation should be given which will give the child a reason for reading, and a set in the right direction. As soon as this is accomplished, the selection designed for oral reading at sight is read aloud by the child in order for him to accomplish the established purpose. The examiner . . . keeps a careful record of the exact way the selection was read. Each . . . error is recorded. As soon as the reading has been completed the comprehension check is administered (10:19).

In regards to the selection of suitable passages for IRI's, Maginnis reported that a problem exists in the selection of the IRI passages. He suggests that the assumption that a short selection taken from the latter part of a third grade reader representing material typical of that faced during the latter part of the third grade may be erroneous. As a partial solution to this problem, he suggests the application of the Fry Readability Formula (see Appendix C). Maginnis reports that this formula judges difficulty on the basis of sentence length and word length in terms of syllables. He further reports that the validity of the graph is based on the fact that grade level ratings were arrived at through "plotting lots of books" which publishers had designated to be at certain grade levels (11:516-517).

In an analysis of the limitations of readability formulas, Ball reported that:

. . . the very objectivity of formulas has imposed . . . limitations with regard to the lack of measurement of concepts, interest, content, style, format, and possible other characteristics of printed matter relevant to readability . . . (2:19).

LITERATURE PERTINENT TO CLOZE PROCEDURE

The cloze procedure was first reported by Taylor in 1953 as a tool for measuring the readability of a given passage (20:19-26). Schoelles reported that the cloze procedure is based on the Gestalt theory of closure, that the whole is more than the sum of the parts. To develop the cloze procedure, selected passages have every Nth word deleted which allows the reader to seek closure through context by replacing the missing word. Using his background, motivation, self-concept, experience, linguistic abilities, intelligence, and word attack knowledge, he arrives at the author's message. This, reports Schoelles, is reading. Schoelles also stated that the cloze procedure has been used to measure and teach comprehension (16:1).

Bloomer studied the effects of training in a series of cloze procedure exercises upon reading comprehension. The students were instructed to fill in blank spaces in written text. The investigation, involving students in forty-nine classrooms, concluded that reading comprehension was not improved (5).

In a related study by Early, using the cloze procedure to teach comprehension skill at the secondary level, it was concluded that use of the cloze procedure did help students' comprehension skills (7:1-13).

In another study, using the cloze procedure to improve the comprehension of junior college readers, Smith found that the use of the cloze procedure was effective for (1) demonstrating the process of comprehension--how words combine with words into wider units of meaning, (2) demonstrating the part grammatical knowledge plays in comprehension, (3) pointing out to students their own deficiencies in the comprehension process, and (4) promoting discussion about particular reading selections and about the process of reasoning which is reading comprehension (18:1-9).

Geyer investigated the effectiveness of the cloze procedure as a predictor of a student's ability to comprehend social studies material when compared with I.Q. scores, previous social studies grades, and standardized reading test scores. The cloze procedure was not found to be any better than the other variables in predicting comprehension levels at the .01 level of significance. However, it was significant at the .05 level (8:1-10).

Hater and Kane investigated the cloze procedure as a measure of the reading comprehensibility and difficulty of mathematical English. It was pointed out that the cloze procedure cannot be applied to mathematical English material as readily as it can to ordinary English since

this technique is not defined to include deletions of mathematical symbols, and mathematical English has no definite ordering of words. It was found that the cloze procedure used with mathematical English passages was a highly reliable measure and predictor of the comprehensibility of mathematical English passages for grades seven through twelve (9:1-25).

In Bormuth's summary of the studies of the validity of the cloze procedure he indicated that: (1) cloze procedures provide a valid measure of a student's reading comprehension ability, and (2) the cloze procedure is a valid method of measuring comprehension difficulties of passages (6:433). Bormuth is supported by the studies of Rankin (14), Smith (18), Potter (13), and Weintraub (21).

Bormuth further reported that the cloze procedure may be administered either with or without the student reading the passage from which the test was made. He also stated that users of the cloze procedure should score correct only those responses that exactly match the deleted word if validity is to be considered, and that minor misspellings should be disregarded (6:432).

In a study by Anderson investigating the use of exact-length blanks in the cloze procedure, no significant difference was found between the mean scores of subjects on the cloze procedure using blanks of uniform length and mean scores of subjects on the cloze procedure using blanks of the same length as the deleted words. Anderson

concluded that both versions of the cloze procedure were equally valid as measures of general reading comprehension (1).

Bormuth suggests deleting every fifth word because it is simple and economical to use. He further explained that in a deletion system that leaves less than four words of content between items, a student's ability to answer an item will depend heavily upon his correct answering of the adjacent items (6:432).

Potter suggests that (1) an every Nth mechanical mutilation system be used, (2) not more than 20 words in every 100 be deleted, (3) passage length is at least 250 words, (4) at least 50 words are deleted in order to insure adequate sampling of passages, and (5) the exact word deleted is indicated as the most useful and efficient scoring criteria (13).

COMPARISON OF THE IRI AND CLOZE PROCEDURE

Only one study was found by the investigator concerning the correlation of the IRI and cloze procedure. In this study by Ransom, the two test instruments using the Pearson Product-Moment Correlation, correlated at the .01 level of significance on the independent, instructional, and frustrational reading levels when given to a total population in grades one through six (15:477-482). By contrast, this study has focused upon the correlation of the IRI and cloze procedure in terms of significant reading achievement level assessment.

SUMMARY

This chapter has reviewed literature pertinent to the cloze procedure and IRI, and literature pertinent to the organization and administration of this investigation.

Chapter 3 will describe the subjects, materials, testing conditions, and procedures for the organization and administration of this investigation.

Chapter 3

THE STUDY

This chapter describes the subjects, materials, testing conditions, and procedures for the organization and administration of this investigation.

SUBJECTS

The subjects for this investigation were selected by a reading specialist from fourth, fifth, and sixth grade classes in a Central Washington school district. Criteria used was that all students involved in the investigation were free of reading problems and were considered by the teachers as "normal," "average" readers.

Permission to use the students was granted by the school district through the reading specialist. Testing dates and time were arranged by the reading specialist and the school principals.

Eight students were selected from the fourth, fifth, and sixth grade levels. A total of twenty-four students were used. There were ten boys and fourteen girls in the group.

MATERIALS

The materials used for the IRI were selected from Silvaroli's Classroom Reading Inventory (see Appendix A). The grade level of each selection was determined by the Fry Readability Formula (see Appendix C). These selections ranged in readability from third grade through seventh grade levels. The five selections ranged from 98 to 128 words in length and covered a variety of subject matter. After each selection there were five questions concerning vocabulary, factual information, and interpretation.

Silvaroli's inventory was selected for several reasons: (1) it was readily available during the administration of the investigation, and (2) it is a well-known instrument used by teachers.

After the materials for the IRI were selected, the materials for the cloze procedure were selected from current reading textbooks (see Appendix B), using the Fry Readability Formula as the only criterion for selection. The cloze procedure materials ranged in readability from third grade through seventh grade levels. Every fifth word after the first sentence was deleted. Each test was at least 250 words in length and contained fifty deletions.

For ease of reading and to provide room to write responses, the tests were triple spaced and the blanks were twelve pica spaces in length.

To insure anonymity, each test was coded with a number located in the upper right corner. The numeral in the ones column indicated the grade level.

The reading levels, ranging from third grade through seventh grade, were selected so that correlations could be made at least one grade above and below the grade level of the subjects, to provide for a greater sampling of reading abilities.

Deletions on the cloze procedure followed these suggestions of Bormuth (6) and Potter (13): (1) every fifth word after the first sentence is deleted, (2) passage length is at least 250 words, (3) at least 50 words are deleted, and (4) scoring correct just the exact word deleted.

Exceptions to the deletion procedure, as suggested by Bormuth and Potter, were as follows:

1. Test No. 103.

a. The first word in the 16th paragraph was unintentionally deleted.

2. Test No. 25.

a. The 13th word in the second paragraph was unintentionally deleted.

b. The first word in the third paragraph was unintentionally not deleted.

c. The 46th word in the third paragraph was not deleted because it fell on a proper noun that did not occur in another place in the story.

3. Test No. 96.

a. The 20th word in the third paragraph was unintentionally typed in after the blank that represented it. Because only responses that exactly match the deleted word were scored correct and because the exact word was given after the blank, any word written in the blank was scored incorrect. If the blank was left empty then it was scored as a correct response.

4. Test No. 107.

a. The 85th word in the second paragraph was not deleted because it fell on a proper noun that did not occur any other place in the selection.

Even though there were some irregularities in the deletions, retesting was not necessary because all the cloze tests were at least 250 words in length and contained exactly fifty deletions. In the instances where there were fewer than four words of content appearing between blanks, the student did not have to depend heavily upon his correct answering of the adjacent items to give a correct response. This is consistent with the recommendations of Bormuth (6) and Potter (13).

TESTING CONDITIONS

The testing sessions with the cloze test were done in two forty-five minute periods. This was done to minimize the influence of student fatigue during testing. If a student was not able to complete

all five tests during the morning session, he returned in the afternoon for the second session. All students finished within two sessions.

The tests using the cloze procedure were administered in large groups. The fourth and fifth grade students were tested in an activity room free from outside interference during the testing sessions. The sixth grade students were tested in an empty classroom. Noise from the hallway could be heard during the testing sessions.

The testing with the IRI was conducted individually with the fourth, fifth, and sixth graders. The fourth and fifth grade children were tested in a room free from outside interference during the testing sessions. The sixth grade students were tested in an empty classroom. Again, noise from the hallway could be heard during the testing session.

PROCEDURES

Permission to use students and testing times and dates were granted by the school district through the reading specialist and school principals.

The students were first given the IRI from the Silvaroli Classroom Reading Inventory. This inventory was administered individually to each student. The selections were given to each student in order of increasing difficulty. After the oral reading of each selection, the student was asked the five comprehension questions prepared by Silvaroli. The student was scored on the number of word

recognition errors and the number of comprehension questions answered correctly. The administration of the IRI to each student was conducted in one session. At the beginning of his testing session, each student was told he would be reading five short stories and after each story he would be asked five questions about the story. He was then told that his reading would not be timed. Before he read each selection, an introductory statement about the story, prepared by Silvaroli, was read to him.

After an interval of four or more days, the cloze procedure was administered to large groups in two forty-five minute sessions. If a student did not finish all the cloze tests in the morning session, he returned for the afternoon session. The fourth and fifth grade students were tested together as a group and the sixth grade students were tested as a group. The cloze procedure was presented to the students in order of increasing difficulty. The students were instructed to read the test and fill in the blanks with the correct word. They were told that spelling errors would not count and if they were unable to fill in a blank to skip it and continue to the next blank. They were also told that they would have as much time as they needed to complete the tests. The tests were scored according to the number of responses that exactly matched the original copy.

The scoring and tabulation of the raw data from the IRI testing was conducted immediately after the administration of the IRI to each

child. The number of word recognition errors--omissions, substitutions, reversals, and requests for examiner aid, was recorded for each student at each readability level. The number of comprehension questions answered correctly was also recorded for each child at each readability level. In instances where one question required two responses, each response was scored .5. If any question was answered totally correct, it was scored 1.0.

The scoring and tabulation of raw data of the cloze tests was conducted after all students had completed the tests. Each response that exactly matched the original copy was scored as one correct response. This scoring procedure was consistent throughout all the cloze tests except for Test No. 96, the 20th blank located in the third paragraph. If there was no response for that blank, it was scored correct. This was done because the correct response for that blank was unintentionally typed in after the blank. Because only responses that exactly match the deleted word were scored correct and because the exact word was given after the blank, any word written in the blank was scored incorrect.

Each student's raw data from the IRI and cloze tests, at each readability level (RL), were then recorded on a chart in the appropriate RL column by his name.

Using this raw data, correlations were determined using the Pearson Produce-Moment Correlation formula at each readability level

between the word recognition scores and the cloze scores. The comprehension scores and cloze scores were similarly compared at each readability level. The resulting correlations were then used as a basis for analysis.

The Pearson Produce-Moment Correlation formula used to determine the correlations was:

$$r = \frac{\Sigma XY - \frac{(\Sigma X)(\Sigma Y)}{N}}{\sqrt{\left[\Sigma X^2 - \frac{(\Sigma X)^2}{N} \right] \left[\Sigma Y^2 - \frac{(\Sigma Y)^2}{N} \right]}}$$

SUMMARY

This chapter has described the subjects, materials, testing conditions, and procedures used in the organization and administration of the investigation. The next chapter will focus upon the analysis of the results of the investigation.

Chapter 4

RESULTS

This chapter presents the data of the study and the analysis of the data .

Each student's raw data , from the IRI and cloze tests , at each reading level (RL) were recorded on a chart. Using this raw data , correlations were computed, using the Pearson Product-Moment Correlation formula , between the comprehension (COMP) scores and cloze scores , at each reading level , and the word recognition (WR) scores and cloze scores at each reading level .

Table 1 shows the raw data obtained from the administration of the cloze procedure and IRI. The cloze scores , WR scores , and the COMP scores at each RL are shown .

In analyzing the raw data from Table 1 there appears to be an inconsistent pattern of WR and COMP scores , for each child , at each RL. For example , the scores in some instances for each child show higher COMP scores at the seventh RL than at the third RL. Because the material increased in difficulty from the third RL through the seventh RL , it was expected there would be a consistent pattern of increase in WR errors and decrease of COMP scores as the child read material

Table 1
Word Recognition, Comprehension, and Cloze Scores
Raw Data

Subject		Reading Level				
		3	4	5	6	7
D.B.	WR	2	2	1	1	3
	COMP	4.5	3	3	2	3
	Cloze	19	24	21	20	7
C.B.	WR	1	6	4	2	5
	COMP	5	4.5	5	3.5	4.5
	Cloze	34	23	23	27	8
K.W.	WR	1	5	0	5	3
	COMP	5	2	5	4.5	2
	Cloze	35	26	25	26	10
D.P.	WR	2	1	1	10	8
	COMP	4.5	5	4.5	4	3
	Cloze	25	17	18	18	3
E.O.	WR	2	1	0	3	1
	COMP	5	3	3.5	3.5	2.5
	Cloze	33	21	28	25	12
L.C.	WR	1	0	1	1	4
	COMP	4.5	5	3.5	2	4
	Cloze	29	21	28	29	11
K.S.	WR	1	5	0	3	6
	COMP	4	5	4	3	4
	Cloze	33	23	24	31	9
S.P.	WR	1	2	5	4	6
	COMP	4	4	4.5	2.5	2.5
	Cloze	33	22	22	23	12
M.S.	WR	0	7	1	1	0
	COMP	4.5	4.5	4	2.5	5
	Cloze	35	29	21	34	10
D.J.	WR	2	5	3	9	8
	COMP	4.5	5	4	1.5	4
	Cloze	34	24	26	27	6
D.B.	WR	2	1	1	1	3
	COMP	5	5	5	5	4.5
	Cloze	34	22	29	30	11
J.W.	WR	6	8	0	3	6
	COMP	5	5	5	5	3
	Cloze	28	29	23	23	5

Table 1 (Continued)

Subject		Reading Level				
		3	4	5	6	7
J.W.	WR	0	1	0	2	1
	COMP	3	2	3	2	2
	Cloze	30	25	17	25	13
L.K.	WR	2	3	2	1	3
	COMP	5	4	3	4	5
	Cloze	29	21	23	27	9
K.V.	WR	2	3	1	7	2
	COMP	5	4	5	4	4
	Cloze	25	27	23	28	8
K.R.	WR	3	2	1	5	3
	COMP	3	5	4.5	4.5	3
	Cloze	31	24	21	21	8
M.D.	WR	3	2	1	5	3
	COMP	5	5	5	4.5	4
	Cloze	34	30	21	35	18
C.K.	WR	1	2	1	3	0
	COMP	5	5	5	4	4
	Cloze	38	29	27	29	12
C.L.	WR	5	1	3	2	1
	COMP	4	3	4	3.5	3
	Cloze	24	20	24	25	15
B.S.	WR	4	4	2	3	6
	COMP	5	5	4	4	3
	Cloze	33	25	24	28	17
J.N.	WR	1	2	1	2	2
	COMP	5	4.5	4	4	2
	Cloze	36	28	24	36	8
J.W.	WR	0	1	0	2	2
	COMP	4	4	4	4	4
	Cloze	32	34	26	31	10
J.B.	WR	2	4	1	7	4
	COMP	4.5	5	5	3.5	3.5
	Cloze	37	28	23	37	14
B.C.	WR	3	9	4	8	4
	COMP	5	4	4.5	5	4
	Cloze	30	27	28	27	14

increasing in difficulty. The inconsistent pattern that resulted could indicate a deficiency in the IRI to determine exactly the student's independent, instructional, and frustrational RL.

Further analysis of the raw data shows that the cloze scores have a similar inconsistency to WR and COMP scores, except for the sixth and seventh RL's. The cloze scores on the sixth RL range from 18 to 37 while the cloze scores on the seventh RL range from 3 to 18 correct responses. This shows a reduction of correct responses at the seventh RL compared with the cloze scores on the sixth RL.

Table 2 shows the correlations of the COMP scores of the IRI and the cloze scores using the Pearson Product-Moment Correlation formula, at each RL.

Table 2
Comparison of Comprehension Scores,
of IRI, and Cloze Scores

Reading Level	N	r
3	24	.483 ^a
4	24	.057
5	24	.148
6	24	.098
7	24	-.161

^aCorrelation significant at the .02 level.

Analysis of Table 2 indicates that at the third RL there was a correlation at the .02 level of significance. The correlations at the

fourth, fifth, sixth, and seventh RL's are not significant at the .10 level of significance. This indicates that COMP scores and cloze scores at the third RL approach the .01 significance level while the positive correlations at the fourth through sixth RL's are not significant at the .10 significance level. The negative correlation at the seventh RL is not significant at the .10 significance level.

Table 3 shows the correlations of WR scores of the IRI, with the cloze scores using the Pearson Product-Moment Correlation formula, at each RL.

Table 3
Comparison of Word Recognition Scores,
of the IRI, and Cloze Scores

Reading Level	N	r
3	24	-.359 ^a
4	24	.079
5	24	.079
6	24	-.187
7	24	-.109

^aCorrelation significant at the .09 level.

An analysis of Table 3 shows negative correlations on the third, sixth, and seventh RL's when WR scores and cloze scores are compared. The negative correlation on the third RL is significant at the .09 level. The negative correlations of the sixth and seventh RL's are not significant at the .10 level. This indicates that the negative

correlations at the third, sixth, and seventh RL's of WR and cloze scores are not significant at the .01 level.

A further analysis of Table 3 shows positive correlations on the fourth and fifth RL's when WR scores, from the IRI, and cloze scores are compared. These correlations are not significant at the .10 level indicating that none of the comparisons of WR scores and cloze scores from RL's three through seven are significant at the .01 level.

The results of the investigation show that the highest correlation is at the third RL when COMP scores, of the IRI, and cloze scores are compared. This correlation, though not significant at the .01 level, is significant at the .02 significance level. The least significant correlation, though not significant at the .10 level, is on the fourth RL when COMP scores, of the IRI, and cloze scores are compared. Negative and positive correlations are noted at the other RL's when WR and COMP scores, of the IRI, are compared with the cloze scores. None of these correlations approaches the .01 level of significance.

Chapter 5

DISCUSSION, RECOMMENDATIONS, SUMMARY, AND CONCLUSIONS

DISCUSSION

None of the correlations comparing the word recognition scores and comprehension scores of the IRI with the cloze scores, at each reading level, were significant at the .01 level of significance. Therefore, the null hypothesis was accepted.

Several factors could have affected the results of this investigation. The Silvaroli Classroom Reading Inventory can be questioned. If one accepts the idea that inferring or interpretation is the process by which a student provides meanings that go beyond the literal meanings given in written material, then the following questions, labeled by Silvaroli as inferential, may be questioned as being inferential.

1. "Smart Birds," Form A, Part II: Question 5--"A bird's gizzard works somewhat like what part of your body?"

2. "Sky Diving," Form A, Part II: Question 2--"Why is sky diving like being in a dream?"

3. "A Beaver's Home," Form A, Part II: Question 5--"How does the flooded lower room help the beaver?"

In the story "Conestoga Wagon," Form B, Part II: Question 3-- "What are some ways of travel found today?," the student is not required to read the story to answer the question. Therefore, it may not be a valid question to measure a student's comprehension of the story.

In the story "Sky Diving," Form A, Part II: Question 4-- "When diving, do sky divers climb walls?," the student is required to give either a "yes" or "no" response. Justification for an answer is not asked for; therefore, guessing could influence the validity of this question as a measure of a student's comprehension of the story.

Kress and Johnson suggested that the number of questions should vary directly with the length of the selection (10:34). The number of questions in the Silvaroli Classroom Reading Inventory remain at five even though the length of the passages used in this investigation ranged from 98 to 128 words. Therefore, the number of questions following the oral reading of each selection may not have provided an adequate measure of the student's comprehension of the story.

Because the cloze tests were constructed from different sources, different writing styles could have affected the readability measure obtained from the Fry Readability Formula. The Fry Readability Formula, according to Maginnis, judges difficulty of written material on the basis of sentence length and word length in terms of syllables (11:516-517).

Table 4 shows the sentence length (SL), number of multisyllable words (MSW), and the percent of MSW (%MSW) in each 250 word

selection from the cloze procedure and each selection from the IRI, at each readability level (RL).

Table 4

Comparison of Sentence Length, Number of Multiple Syllable Words and %MSW at each Readability Level in Cloze Procedure and IRI

Reading Level	Cloze Procedure			IRI		
	SL	MSW	%MSW	SL	MSW	%MSW
3	8.1	35	14%	11.1	14	14%
4	9.6	39	16	10.0	23	23
5	14.7	33	13	10.9	23	23
6	13.8	35	14	11.7	20	16
7	20.8	59	24	13.8	38	35

An analysis of Table 4 shows that for the cloze procedure the increase and decrease of SL, MSW, and %MSW between levels three through six was not great. The increase in SL, MSW, and %MSW between levels six and seven does not appear to be in proportion with the differences in SL and MSW at levels three through six.

The increase and decrease of SL and MSW between levels three through six on the IRI was not great, but was inconsistent. The increase in SL, MSW, and %MSW between levels six and seven does not appear to be in proportion to the differences in SL, MSW, and %MSW at levels three through six.

A comparison of the SL between the IRI and cloze procedure show that at levels three and four the IRI SL was greater. At levels five through seven the SL's of the cloze procedure were greater.

The %MSW, levels four through seven, on the IRI, were greater than the %MSW, levels four through seven, on the cloze procedure.

The %MSW on the cloze procedure and IRI, at level three, were equal.

The results from Table 4 could indicate different writing styles between the selection from the IRI and cloze procedure.

The request for students who were "normal," "average" readers and the use of only twenty-four subjects in the investigation could have provided an inadequate sampling of reading abilities, thus affecting the comparisons of WR scores and COMP scores, of the IRI, with the cloze scores.

Some of the selections from the IRI may not have been of sufficient length. Bond and Tinker recommend selections of from 100 to 150 words (4:198). The length of the selection from Silvaroli's Classroom Reading Inventory used in this investigation ranged from 98 to 128 words.

In regards to the cloze procedure, the cloze scores for level seven (see Table 1, pages 23 and 24) show a marked decrease in the number of correct responses compared with the scores of level six. This could indicate several possibilities: (1) the differences in the SL and number of MSW at levels six and seven on the cloze procedure

(see Table 4, page 30) could have accounted for the marked decrease in cloze scores (see Table 1, pages 23 and 24) between the sixth and seventh levels; (2) some of the students appeared to be fatigued during the level seven testing and may have been frustrated in reading seventh grade material; and (3) the Fry Readability Formula may have given an inaccurate readability because of the differences of SL, MSW, and %MSW between the IRI materials and the cloze materials.

RECOMMENDATIONS

As a result of this study, the following recommendations are suggested:

It is recommended that the cloze tests and IRI's be constructed from separate sections of the same selection. This will further assure that the readability of the two tests are equivalent.

A more valid measurement of a student's comprehension on a particular selection may occur if more than five questions are asked following each readability level of the IRI.

A random sampling of children with a wider range of reading abilities is recommended to increase the potential for significant correlations, and to further insure significant correlations a larger population of subjects should be used.

Replication of this study is recommended incorporating the above recommendations.

SUMMARY

Since the literature reports the IRI and cloze procedure as useful determiners of reading achievement, it was the purpose of this investigation to determine the correlation between the cloze procedure and the IRI in terms of the achievement levels of children. It was hypothesized that there is no significant correlation between the IRI and cloze procedure using Pearson Product-Moment correlation.

The study was limited to twenty-four "normal," "average" readers from fourth, fifth, and sixth grade classes in a Central Washington school district. The students were given equivalent selections of the cloze procedure and IRI with readability levels ranging from third through seventh grade as determined by the Fry Readability Formula.

Definition of terms used in the investigation and literature pertinent to the administration and organization of the cloze procedure and IRI was presented.

A description of the subjects, cloze and IRI materials, and testing conditions were given.

The procedure involving group and individual testing was described. Results of the investigation were correlated using the Pearson Product-Moment Correlation formula. The factors correlated were the COMP scores and WR scores, of the IRI, with the cloze scores

on each readability level. The results indicated that the null hypothesis was verified.

Factors affecting the investigation were discussed and recommendations for further investigation in this area were made.

CONCLUSIONS

This study hypothesized, using the null hypothesis, that there would be no significant correlation between informal reading inventory and cloze procedure at the .01 significance level, using Pearson Product-Moment correlation. Since the null hypothesis was verified and there was no significant correlation between the two tests, the investigator suggests the following explanations that may have caused the lack of significant correlation.

Though appearing to measure comprehension and word recognition, the two tests may actually measure different aspects of reading. In the informal reading inventory, the student is asked questions by the examiner concerning information in the selection, whereas in the cloze procedure the student is required to ask his own questions to arrive at a correct response. Therefore, the questions in the informal reading inventory give a clue to the reader to direct him to a response. In contrast, the cloze procedure does not give an external cue but requires the reader to direct his own response using clues from the context of the material he is reading. The two tests may require different skills

to attain a measure of comprehension. One requires the ability to answer questions prepared by a questioner and the other requires the ability to independently formulate questions with only context within the material itself as a cue.

The Fry Readability Formula may have been inappropriately used to determine reading levels. The possible presence of different writing styles in Silvaroli's inventory and cloze procedure materials may have affected the readability measures. Therefore, the reading levels of the materials compared in this study may not have been equivalent, even though they externally were alike according to the formula used.

The questions used in the selections of Silvaroli's inventory pertaining to comprehension were at times outside the immediate reading material. This was especially noticed in the "inferential" questions. The investigator questioned the validity of some inferential questions as testing inference. Doubt can also be cast on the validity of a question requiring only a "yes" or "no" response because of the guessing factor. In the cloze procedure the answers had to be formulated through comprehension of the use of context and the inherent quality of the material itself.

In future research, in this area, the following recommendations should be considered:

It is recommended that an informal reading inventory other than Silvaroli's inventory be used in correlative studies with the informal reading inventory and the cloze procedure.

It is further recommended that in studies comparing the informal reading inventory and cloze procedure selections from the same material be used to help insure equivalent readability.

It is further recommended that studies involving the determination of reading levels use more than one readability formula. The use of more than one formula may help the researcher determine, more accurately, the reading levels, especially when different writing styles are present.

It is recommended that careful study be made of the questions used in informal reading inventories to insure they are pertinent only to the content of the material.

Careful attention should also be given to the length of selections used in the informal reading inventory to provide enough information and concepts so that enough questions may be formulated to insure valid measurement of comprehension.

It is recommended that further research and analysis be conducted on the skills used in informal reading inventories and cloze procedures to determine what skills are necessary, in each instrument, to attain a measure of comprehension.

Replication of this study is recommended, on a larger scale, using the above variations.

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APPENDIX A

SELECTED ITEMS FROM SILVAROLI'S
CLASSROOM READING INVENTORY

READING INVENTORY--THIRD GRADE¹

MOTIVATION:

Some people say birds are smart and some say they are silly. See if you will agree with the author when he says that most birds are smart.

SMART BIRDS

Everyone knows that birds like to eat seeds and grain. Birds also like to eat little stones called gravel. Birds have to eat the gravel because they don't have teeth to grind their food. The gravel stays in the bird's gizzard which is something like a stomach. When the bird eats seed the gravel and the seed grind together. All of the seed is mashed up.

Tame birds must be given gravel. Wild birds find their own gravel on the road sides. Now you can see how smart birds are.

COMPREHENSION CHECK

- (F) 1. ____ Name two things birds like to eat.
(Seeds, grain, gravel stones, sand)
- (F) 2. ____ Why do birds have to eat sand or gravel?
(Grind their food)
- (V) 3. ____ What does the word "grind" mean?
(Crush, make smaller, etc.)
- (I) 4. ____ What do you think would happen to birds that can't get any gravel in their food? (Probably die, get sick)
- (I) 5. ____ A bird's gizzard works somewhat like what part of your body? (Stomach)

¹Silvaroli's Classroom Reading Inventory, Inventory Record, Form A, Part II (Three)(100 words).

READING INVENTORY--FOURTH GRADE¹

MOTIVATION:

The Conestoga Wagon was a kind of covered wagon that people used long ago. I wonder how people who traveled in these wagons might have felt? Read the story to find out more about this wagon and how people traveled.

THE CONESTOGA WAGON

People riding in wagon trains did not have our easy ways of traveling. Their trip was made in what was called a Conestoga Wagon. These were good wagons, but they were not comfortable. The wagons were large. They had broad wooden seats. Sitting on these seats was a weary task. The bumping and churning of the ride could be compared to being on a ship in rough water. When this old wagon reached a river the wheels were removed. Then the wagon was made into a flat boat. These are but a few of the interesting facts about these old wagons.

COMPREHENSION CHECK

- (F) 1. ____ What made riding in a Conestoga Wagon unpleasant?
(Bumps, sitting on wooden seats, etc.)
- (F) 2. ____ According to the story, riding on a wagon was like what other type of ride?
- (I) 3. ____ What are some ways of travel found today?
(Airplane, car, train, etc.)
- (F) 4. ____ How did the people get the wagon across deep streams?
(Used the wagon as a flat boat by taking off the wheels)
- (V) 5. ____ What does the word "weary" mean?
(Tired, uncomfortable, etc.)

¹Silvaroli's Classroom Reading Inventory, Inventory Record, Form B (optional), Part II (Four) (101 words).

READING INVENTORY--FIFTH GRADE¹

MOTIVATION:

Everything changes, even sports. A new growing sport is called Sky Diving. Have you ever seen a Sky Diver in action? (TV, movies, etc.) If so, then you might enjoy reading this selection to find out more about this new sport.

SKY DIVING

An exciting new sport in the world today is sky diving. Sky divers do tricks, make falls and take interesting pictures. This sport takes you away from your everyday life into a wonderful world you have never known. It is almost like being in a dream. Once out of the airplane, you feel as if you can climb walls or float over mountains.

Sky divers work to develop each of their jumps. Men and women are interested in sky diving. In fact, more people learn to sky dive each year. This relaxing sport is one of man's newest adventures.

COMPREHENSION CHECK

- (F) 1. _____ Tell two things that sky divers do.
(Tricks, make falls, take pictures)
- (I) 2. _____ Why is sky diving like being in a dream?
(You float, weightlessness, falling, etc.)
- (F) 3. _____ Is it true that only men are sky divers?
(No, it is false; no, women too)
- (F) 4. _____ When diving, do sky divers climb walls? (No)
- (V) 5. _____ Sky divers "work to develop each jump"--what does this mean? (Do it many times, practices, learn more about it, improves, etc.)

¹Silvaroli's Classroom Reading Inventory, Inventory Record, Form A, Part II (Four) (98 words).

READING INVENTORY--SIXTH GRADE¹

MOTIVATION:

This story tells about a different type of school. Read to find out more about this special school.

AN UNDERWATER SCHOOL

A team of experts proved that seals had a keen sense of hearing. These men trained blind seals to expect food when they heard sounds. The seals always began snapping when a shrill signal was sounded.

It was proved that even a soft signal, a considerable distance away, could make these sea mammals respond. That should make the fisherman who splashes his oars, or talks loudly, start thinking.

The same team of experts also trained seals to recognize different sounds. One bell-tone meant food, two bell-tones meant no food. In the beginning, the seals made mistakes when the two-bell tones were sounded. They were given a light tap after each mistake. The seals were good learners. They easily learned to tell the difference between the sounds.

COMPREHENSION CHECK

- (F) 1. ____ What animals or sea mammals did the experts train? (Seals)
- (F) 2. ____ What did the seals do when they heard the shrill signal?
(Begin snapping, came for food)

¹Silvaroli's Classroom Reading Inventory, Inventory Record, Form A, Part II (Five) (128 words).

Reading Inventory--Sixth Grade (Continued)

- (I) 3. _____ Why was it necessary to use blind seals?
(Unable to use sight for clues)
- (F) 4. _____ When the seals made mistakes, what happened?
(They were given a light tap)
- (F) 5. _____ What did the seals learn?
(To tell the difference between bell sounds and when to come)

READING INVENTORY--SEVENTH GRADE¹

MOTIVATION:

This story is about a beaver and his unusual home. Read this story to learn more about the beaver's home and his problems with it.

A BEAVER'S HOME

A beaver's home, called a lodge, always has a flooded lower room. These homes are built in large ponds or streams. Mud and sticks are the main building materials. One room is built above the water level and another room is located under water. The only way a beaver can get into the house is to submerge and enter through an opening in the flooded room. This room serves two purposes: a storage area and a sanctuary from enemies.

Occasionally the lower room becomes dry because the beaver's dam has been destroyed. This energetic animal has to quickly repair the dam, or begin building a new home in another place.

COMPREHENSION CHECK

- (F) 1. ____ What is the name of the beaver's home? (Lodge)
- (F) 2. ____ Where do beavers build their homes? (Ponds or streams)
- (V) 3. ____ What does the word "submerge" mean?
(Go under water, duck under, dive, etc.)
- (I) 4. ____ What would happen to the beaver if there wasn't water in the stream? (Home would dry up, couldn't live, etc.)
- (I) 5. ____ How does the flooded lower room help the beaver?
(Storehouse, escape from enemies, helps him get into house)

¹Silveroli's Classroom Reading Inventory, Inventory Record, Form A, Part II (Six) (110 words).

APPENDIX B

CLOZE TESTS

CLOZE TEST--GRADE THREE¹

No. 103

All the boys and girls in Fred Hill's block were talking about pet parades.

"We could have a PET parade of our own," FRED said.

"It could be A neighborhood parade," said Henry. "WE could take our pets."

"I have a puppy," Jane Ann SAID.

"I have a fish," SAID Henry.

They went home TO tell their mothers and FATHERS about it.

"All the BOYS and girls in the NEIGHBORHOOD are going to take THEIR pets and parade around THE outside of the park,"

FRED said to his mother. "WE will start right here AT our front door."

"I WILL go along," said his MOTHER.

"I want to go," SAID Fred's little sister, Amy. AMY wore a fur cap WITH a long tail.

"Mom," FRED said. "It's summer. If YOU take Amy to the PARADE, make her take off THAT fur cap. It's too HOT for fur."

"It's not TOO hot for me," said AMY. "I like it."

¹"Neighborhood Parade," Ginn 360, Level seven (Boston: Ginn & Co., 1969), pp. 142-144.

CLOZE TEST--GRADE THREE (Continued)

"And SHE can't walk in the PARADE," Fred said. "She's too LITTLE."

"Your sister and I WILL follow you along the SIDEWALK," his mother said.

Then FRED thought of something. "Mom," HE said. "I don't have A pet."

"Maybe Mrs. Gray WILL let you borrow her CAT," his mother said.

SATURDAY morning was a good MORNING for the parade. There WASN'T a cloud in the SKY. Right after breakfast Fred HURRIED to see Mrs. Gray.

"MRS. Gray," he said. "We're GOING to have a parade TODAY. We're going to take OUR pets. Can I borrow YOUR cat for a little WHILE?"

"I'm sorry, Fred," Mrs. GRAY said.

CLOZE TEST--GRADE FOUR¹

No. 224

Once upon a time there was a little old house away up in the mountains. In it lived a GIRL named Hetty and her BROTHER Hank.

Never in all THEIR lives had Hetty or HANK had a pair of SHOES. In the summer it DIDN'T matter. In the winter THE snow made their feet BLUE with cold. It was THEN that Hetty and Hank NEEDED shoes.

They each wanted A beautiful shining paid that SANG, "Creaky - squeaky - creaky - squeaky," EVERY time they walked.

They ASKED their mammy to buy THEM some of these beautiful SHOES. She said, "You can't FIND shoes like that in THESE hills! Such shining shoes COME from the town, away DOWN, down at the foot OF the mountain."

They asked THEIR pappy, but he said, "THERE'S not fifty cents in THIS household to buy anything. WE'VE everything we need right HERE in these hills."

Hetty AND Hank felt very sad, BUT they did not give UP.

"Let's ask our granny," SAID Hetty. This they did.

"SOME shining shoes?" Granny sang OUT. "I'll tell you how YOU can get them."

¹"Down, Down the Mountain," Better Than Gold (New York: The Macmillan Company, 1966), pp. 53-55.

CLOZE TEST--GRADE FOUR (Continued)

"How? HOW?" cried Hetty and Hank.

"PLANT some turnip seeds," said GRANNY. "When they have grown INTO fine big turnips, you CAN take them to town. YOU can trade them for SHINING, creaky, squeaky shoes."

"Thanky' GRANNY, that's what we'll do," CRIED Hetty and Hank.

They RACED away and planted some TURNIP seeds right next to PAPPY'S corn patch.

It was EVENING when Hetty and Hank GOT home. They found Mammy WAITING for them. She gave THEM a nice supper and PUT them to bed.

CLOZE TEST--GRADE FIVE¹

No. 25

Once upon a time a woman was frying some pancakes. As she turned a CAKE in the pan, she SAID to her little boy, " IF you were a bit OLDER, I would send you TO the sawmill with some OF these cakes for your FATHER'S dinner. But as it IS, he must wait till SUPPER for them."

"Oh, do LET me take them," said THE boy, whose name was Karl. "DO let me go." And he begged and begged, till AT last his mother selected THE brownest and crispest pancakes. SHE put them on a PLATE with a napkin over THEM and bade her son TAKE them to the mill.

It was a lovely day WITH not a cloud in THE sky. Karl set out JUST after eleven o'clock. The PATH that led to the MILL where Karl's father worked WAS straight enough, and plain ENOUGH, but it ran through THE wood that was CALLED Enchanted. Fairies lived there, SO some people thought, and GOBLINS that liked to do MISCHIEF. Never before had Karl BEEN allowed to go there ALONE.

As he hurried along WITH the pancakes, he glanced INTO every leafy thicket. He WAS half fearful and half HOPEFUL that he'd

¹"The Plate of Pancakes," More Roads to Follow (Glenview, Ill.: Scott, Foresman & Co., 1964), pp. 207-208.

CLOZE TEST--GRADE FIVE (Continued)

see a FAIRY or a goblin hidden AMONG the leaves. But not ONE fairy or goblin did HE see.

When Karl came TO some bushes where sweet BERRIES were growing, a remarkable THING happened. A voice seemed TO whisper to him, "Stop! STOP! Stop and eat."

Karl WAS far from terrified by THE sound. But he was ASTONISHED.

CLOZE TEST--GRADE SIX¹

No. 96

The young forest ranger was the first to spot the thin smoke rising above the trees. As he sped toward THE scene in his jeep, HE reported the fire on HIS two-way radio. When HE arrived, he saw it WAS a "surface fire"--the KIND that burns dry leaves, TWIGS, grass, and underbrush on THE floor of the forest.

QUICKLY, the ranger began to USE his fire extinguisher. But THE area was very dry, AND the fire was spreading TOO fast. He would try TO keep the blaze from CLIMBING up into the pine TREES. Then, with the help OF others who were now ON the way, he might HAVE a chance of stopping IT.

Suddenly flames licked at THE trunk of a dry PINE tree, and ran up IT. The tree "crowned" in _____ an explosion of fire as ITS top burst into flame.

ANOTHER and then another pine TREE exploded into flaming torches. IN a few seconds, the RANGER was completely surrounded by A wall of fire. He DID not panic. With his FIRE extinguisher he sprayed chemicals IN a wide circle around HIM. Working as quickly as POSSIBLE, he scraped a hole IN the soft ground with

¹"Forest Rangers on the Job," Goals in Reading (New York: Harcourt, Brace and World, Inc., 1970), pp. 225-226.

CLOZE TEST--GRADE SIX (Continued)

THE shovel he had brought FROM the jeep. Then he LAY down in the hole, RAKED the dirt over him, AND buried himself. Of course, HE made sure he could BREATHE. There he stayed until THE fire passed over him. WHEN it had moved on, HE climbed out of the HOLE without so much as A scorched eyebrow.

This story IS true. The forest ranger HAD been in a spot like this before, and he knew exactly what to do.

CLOZE TEST--GRADE SEVEN¹

No. 107

In the year 1835 people came from their houses to bend back their heads and search the dark night sky for a glimpse of a flaming visitor leaving a brilliant trail across the heavens. This was a comet CALLED Halley's, in honor of AN English astronomer who had PREDICTED its seventy-six year ORBIT .

"Look! Look! The comet." THOSE who knew what it WAS pointed and exclaimed and WONDERED how Edmund Halley could HAVE known that it would RETURN when predicted. Those who DID not know turned away FRIGHTENED and thought that it MUST be a sign that THE end of the world WAS at hand. On the EDGE of the frontier, where A great river divided the CONTINENT of America, where the UNITED States ended and the PRAIRIES and wild plains began, THE tiny crossroads village OF Florida, Missouri, looked upward TOO .

Jane Clemens, standing beside HER husband at the window, DREW her gray wool shawl CLOSER about chill shoulders and BENT forward to see the FIERY visitor in the sky. SHE could hear the excited VOICES of her sister and HER sister's husband, John Quarles,

¹"The Real Tom Sawyer," Galaxies (Boston, Mass.: Houghton-Mifflin and Company, 1971), pp. 487-488.

CLOZE TEST--GRADE SEVEN (Continued)

AND their children as they JOINED the neighbors in the FROZEN mud of the road.

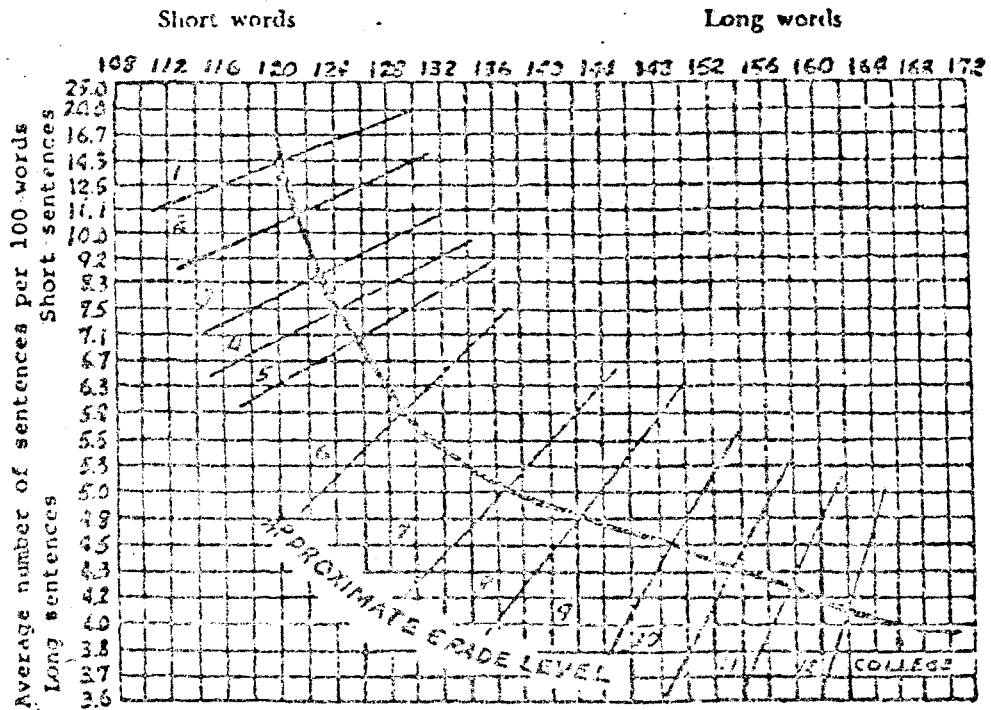
TWO weeks later, on November 30, WHILE the shining comet still SWEPT across the darkness, a SON was born to Jane AND John Marshall Clemens. They NAMED him Samuel Langhorne Clemens, AND called him "Little Sam." THIS was a small and SICKLY baby, and there was SOME doubt that he would LIVE to grow up. He JOINED a family poor in PURSE and rich in pride. BROTHER Orion was an awkward TEN year-old; sister Pamela, GENTLE and helpful, looked after SMALL Margaret and Benjamin.

APPENDIX C

FRY READABILITY FORMULA

Graph for Estimating Readability

by Edward Fry, Rutgers University Reading Center
Average number of syllables per 100 words



DIRECTIONS: Randomly select 3 one hundred word passages from a book or an article. Plot average number of syllables and average number of words per sentence on graph to determine area of readability level. Choose more passages per book if great variability is observed.

DIRECTIONS FOR USING THE READABILITY GRAPH

1. Select three one-hundred-word passages from near the beginning, middle and end of the book. Skip all proper nouns.
2. Count the total number of sentences in each hundred-word passage (estimating to nearest tenth of a sentence). Average these three numbers.
3. Count the total number of syllables in each hundred-word sample. There is a syllable for each vowel sound; for example: cat (1), blackbird (2), continental (4). Don't be fooled by word size; for example: polio (3), through (1). Endings such as -y, -ed, -el, or -le usually make a syllable, for example: ready (2), bottle (2). I find it convenient to count every syllable over one in each word and add 100. Average the total number of syllables for the three samples.
4. Plot on the graph the average number of sentences per hundred words and the average number of syllables per hundred words. Most plot points fall near the heavy curved line. Perpendicular lines mark off approximate grade level areas.

Example

	Sentences per 100 words	Syllables per 100 words
100-word sample Page 5	9.1	122
100-word sample Page 89	8.5	140
100-word sample Page 160	<u>7.0</u>	<u>129</u>
	3) <u>24.6</u>	3) <u>391</u>
Average	8.2	130

Plotting these averages on the graph we find they fall in the 5th grade area; hence the book is about 5th grade difficulty level. If great variability is encountered either in sentence length or in the syllable count for the three selections, then randomly select several more passages and average them in before plotting.

How Accurate is the Score?

If you want a non-technical answer, it is "probably within a grade level."