

1976

# The Cloze Procedure as a Testing and Teaching Device

Suzanne Gibbs

*Eastern Illinois University*

This research is a product of the graduate program in [Elementary and Junior High School Education](#) at Eastern Illinois University. [Find out more](#) about the program.

---

## Recommended Citation

Gibbs, Suzanne, "The Cloze Procedure as a Testing and Teaching Device" (1976). *Masters Theses*. 3480.  
<https://thekeep.eiu.edu/theses/3480>

This is brought to you for free and open access by the Student Theses & Publications at The Keep. It has been accepted for inclusion in Masters Theses by an authorized administrator of The Keep. For more information, please contact [tabruns@eiu.edu](mailto:tabruns@eiu.edu).

THE CLOZE PROCEDURE AS A

TESTING AND TEACHING DEVICE

(TITLE)

BY

SUZANNE GIBBS

THESIS

SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS  
FOR THE DEGREE OF

MASTER OF SCIENCE IN EDUCATION

IN THE GRADUATE SCHOOL, EASTERN ILLINOIS UNIVERSITY  
CHARLESTON, ILLINOIS

1976

YEAR

I HEREBY RECOMMEND THIS THESIS BE ACCEPTED AS FULFILLING  
THIS PART OF THE GRADUATE DEGREE CITED ABOVE

June 14, 1976  
DATE

ADVISER

June 15, 1976  
DATE

DEPARTMENT HEAD

PAPER CERTIFICATE #2

TO: Graduate Degree Candidates who have written formal theses.

SUBJECT: Permission to reproduce theses.

The University Library is receiving a number of requests from other institutions asking permission to reproduce dissertations for inclusion in their library holdings. Although no copyright laws are involved, we feel that professional courtesy demands that permission be obtained from the author before we allow theses to be copied.

Please sign one of the following statements:

Booth Library of Eastern Illinois University has my permission to lend my thesis to a reputable college or university for the purpose of copying it for inclusion in that institution's library or research holdings.

June 15, 1976  
Date

I respectfully request Booth Library of Eastern Illinois University not allow my thesis be reproduced because \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

\_\_\_\_\_  
Date

\_\_\_\_\_  
Author

## TABLE OF CONTENTS

### PART I. CLOZE AS A TESTING DEVICE

#### Chapter

I.	Introduction . . . . .	1
	Statement of the Problem	
	Possible Solution to the Problem	
	Purpose of this paper	
II.	Definition and Explanation of Cloze . . . . .	3
	Definitions of Cloze and Cloze Procedure	
	Origin of Cloze as a Result of Three Concepts	
	Comparison of Cloze to Readability Formulas	
	Comparison of Cloze to Conventional Sentence	
	Completion Tests	
	View of Cloze in Light of the Repetitive	
	Nature of Language	
III.	Deletion Systems Used in Constructing Cloze	
	Tests . . . . .	18
	Every nth Deletion Pattern	
	"Important " Word Deletion Pattern	
	"Easy" vs. "Hard" Deletion Patterns	
IV.	Methods Used to Score and Interpret Cloze	
	Tests . . . . .	25
	Exact Replacement Method	
	Synonym Replacement Method	
	Frames of Reference Established for Cloze Tests	
V.	Various Uses of Cloze Tests . . . . .	35
	Measure of General Reading Ability	
	Measure of Specific Reading Ability	
	Indication of Ongoing Progress of a Student	
	Diagnosis of Particular Reading Weaknesses	
	Measure of Ability to Detect an Author's Style	
	Indication of Intelligence	
	Indication of Existing Information	
	Measure of English-Proficiency	
	Measure of Mathematical Verbal Problem Solving	

Determiner of Reading Materials Appropriate  
for Science Instruction  
Determiner of Reading Materials Appropriate  
for Social Studies Instruction

PART II. CLOZE AS A TEACHING DEVICE

VI. Introduction . . . . .	48
Review of Research on Cloze as a Teaching Technique Criticisms of Past Research	
VII. Various Uses of Cloze Exercises . . . . .	54
To Encourage Children to Respond to Reading To Help Children Avoid Relying Too Much on Phonics in the Decoding Process To Improve the General Reading Comprehension of Children To Provide Motivation and Proper-Level Instruc- tional Materials for Reading in Conjunction with the Language-Experience Approach To Provide Instruction in Particular Skills, Depending on What Deletion Pattern is Used To Teach the Skill of Using the Context	
VIII. This Author's Experience with Cloze . . . . .	72
Description of Population Sample and how the Groups were Formed Explanation of how Cloze Exercises were Constructed Description of Type and Purpose of Instruction Students Received Description of Pretesting and Posttesting Discussion of Various Factors Which Enter Into the Teaching of Cloze Further Discussion of Redundancy as Applicable to Cloze Introduction of "Openure"--the Opposite Phenomenon of Cloze	
IX. Conclusion . . . . .	88
. . . . .	
Appendix . . . . .	91
Bibliography . . . . .	103

LIST OF TABLES

1.	Equivalent Cloze and Multiple Choice Test Percentage Scores . . . . .	31
2.	Equivalent Cloze and Multiple Choice Percentage Scores . . . . .	32
3.	Cloze Test Percentage Scores Comparable to 75% and 90% Criterion Multiple-Choice Scores . . . . .	32
4.	Summary of Cloze Teaching Studies . . . . .	50
5.	The Readability Level of Each of Three Story Passages as Determined by Two Readability Formulas . . . . .	75
6.	Pretest and Posttest Scores: Number of Incorrect Answers . . . . .	80
7.	Total Pretest and Posttest Scores and Differences Between Them . . . . .	81

PART I

CLOZE AS A TESTING DEVICE

## CHAPTER I

### INTRODUCTION

Much attention today is centered on the problem of determining the readability of various materials teachers use in the reading instruction of students. The search for a suitable way of finding how readable materials are has consumed much time of many researchers. Spending so much time on this problem can very easily be justified. There has to be some way of matching a child's reading instructional level with the materials from which he is taught to read. If a child is to learn to read, he must be instructed from materials which are neither too easy nor too hard for him. If the materials are too easy for him, he is bored, his materials presenting no challenge to him. Just as serious is the misjudgment of putting a child in reading materials that are too hard for him. The child becomes frustrated and instruction becomes useless.

The attention given to readability has focused primarily on devising formulas which determine the readability level of a book, story, article, etc. To date several readability formulas, modifications, and further refinements of these formulas exist. Examples of writings on these formulas are Farr and Jenkins (1949), Farr and Jenkins (1951), Flesch (1948), Klare (1953), Powers and Kearl (1958), Spache (1974),



Burmeister (1976), Dale and Chall (1948), Fry (1968), and McLaughlin (1969). However, readability formulas are not perfect. The application of all these formulas to one piece of literature will yield highly variable results. For example, Schlieff (1973) applied several formulas to Newsweek magazine and obtained these results:

Dale-Chall (1948)	7.8
Flesch (1948)	11.48
Farr-Jenkins Paterson (1950)	6.91
(Revised by Powers, Sumner and Kearl)	
Gunning (1952)	18.1
McElroy (1953)	18.57

Even after a readability level--questionable in itself--is found for a piece of writing, the reading level of the child must by some means be found so that it can be determined whether or not the readability level of the reading material matches the child's reading ability level. Therefore, it is necessary to give the child a standardized reading test, an informal reading inventory or some other device in order to make the match. But in 1953 was introduced the cloze procedure, the advantage of which is that the child, performing on his level of reading ability, interacts with the material itself. Thus it was thought that much of the time and effort used in matching child with materials could be eliminated. It is the purpose of Part I of this paper to define cloze, to trace its history, and to appraise cloze as a diagnostic device.

## CHAPTER II

### DEFINITION AND EXPLANATION OF CLOZE

Tests based on the concept of cloze can be used in an effort to determine what materials are suitable for a student's reading instruction. A test for this purpose is constructed by mutilating an excerpt from each text the teacher has available for instruction. Mutilation is accomplished by randomly deleting usually every fifth word and replacing those words with blanks of equal length. Sheets are distributed to each student with instructions to read each mutilated passage and fill in all blanks by guessing from the context of the remaining words what the missing words should be. For each separate passage is totaled the number of times original words were correctly replaced. These totals are considered readability scores. Then the cloze totals of the various passages can be contrasted. The passage with the highest score is considered most readable, the one with the second-highest score next-most readable, etc. Of course, statistical tests must show significant differences among the test scores if the passages are to be considered in a range from most difficult to least difficult for the reader. Since its introduction cloze has had a long history of research to determine whether this method is a valid and reliable one for determining if materials are suitable for the instruction of individual students.

Wilson Taylor originated cloze. When he introduced the cloze procedure in 1953, he presented experimental evidence to support the conclusion that it is an effective and reliable method of pretesting and contrasting the relative readabilities of various samples of English prose. He advanced the cloze procedure as a new tool for measuring the effectiveness of communication. This tool was looked upon as a new approach to readability. It was so used in three pilot studies and two experiments. The results of the new method were repeatedly shown to conform with the results of the Flesch and Dale-Chall devices for estimating readability. Findings showed that the readability rank order given three passages by both the Flesch and Dale-Chall formulas was maintained by cloze scores obtained under a variety of conditions (different word-deletion systems, different presentation orders, and different scoring methods).

Wilson Taylor (1953) defined a "cloze unit" as "any single occurrence of a successful attempt to reproduce accurately a part deleted from a 'message' (any language product) by deciding, from the context that remains, what the missing part should be." He defined "cloze procedure" as "a method of intercepting a message from a 'transmitter' (writer or speaker), mutilating its language patterns by deleting parts, and so administering it to 'receivers' (readers or listeners) that their attempts to make the patterns whole again potentially yield a considerable number of cloze units."

At the heart of the cloze procedure, then, is a functional unit of measurement which Wilson Taylor named a "cloze," pronounced like the verb "close" and derived from "closure," which is a term gestalt psychology applies to the human tendency to complete a familiar but unfinished pattern--for example, to "see" a broken circle as a whole one by mentally closing up the gaps. A person can mentally complete the broken circle because its shape or pattern is so familiar. Although much of it actually is missing, it can be recognized anyway. The relation between "closure" and "cloze" is obvious. Readers applying the cloze procedure to a mutilated sentence fill in those words that make the finished pattern of language symbols fit the apparent meaning, even though the symbols are not complete and the meaning as expressed is implicit.

Wilson Taylor (1953) gave credit to three concepts which helped him arrive at the notion of cloze: "total language context," Osgood's "dispositional mechanism," and statistical random sampling.

Wilson said that language behavior depends on "total context." The total context of any language behavior includes everything that tends to guide, motivate, help, or hinder that behavior. It includes verbal factors, which involve grammatical skills and a multitude of symbols. It also includes non-verbal ones such as fears, desires, past experience and intelligence. He cited the work of Marks and Taylor (1951) as presenting evidence that the influences

of varying intensities of both verbal and non-verbal contextual factors on the generation of language elements can be measurable by quantitative methods.

The notion of cloze procedure was also given impetus by the learning theory of communication of Osgood (1951, 1952, 1953) who related the "redundancies" and "transitional probabilities" of language to the development of "dispositional mechanisms" that play a large part in both transmitting and receiving messages. The sentence that Taylor cites as an example of redundancy is "A man is coming this way now." "Man coming" means the same as "A man is coming this way now." The latter, more like ordinary English, is redundant because it indicates the singular number of the subject three times (by "a," "man," and "is"), the present tense twice ("is coming" and "now"), and the direction of action twice ("coming" and "this way"). Such repetitions of meaning--such internal ties between words--Osgood said make it possible to replace "is," "this," "way," or "now," should any one of them be missed. Osgood also related that there exist "transitional probabilities." Some words are more likely than others to appear in certain patterns or sequences. Taylor cites two examples. "Merry Christmas" is a more probable combination than "Merry Birthday." "Please pass the \_\_\_\_\_" is more often completed by "salt" than by "sodium chloride" or "blowtorch." Some transitions from one word to the next, then, are more probable than others.

The redundancies and transitional probabilities of language are reflected in what Osgood named "dispositional language habits." In learning to use a language, an individual develops an enormous number of complex verbal skill patterns--"bundles of skill sequences"--which stand for numerous kinds and shades of meaning and tend to become so automatic that they "run themselves off" in certain situations. Out of his personal experiences and circumstances each person develops his own set of habits. To the extent that his set is similar to the sets of others in his culture, he can communicate easily because they have learned similar meaning-language relationships, the same patterns of symbols accompanying the same meanings. But within the same culture any two sets of language habits can differ considerably. One person becomes more disposed to run off particular sequences than another does. To the same extent, the related sets of redundancies and transitional probabilities can also differ. Habits of expression are mostly responsible for translating an individual's meaning into an organized series of language symbols when he attempts to communicate with others. Similarly, his habits of reading or listening cause him to anticipate words, almost automatically, when he is receiving messages. When he sees the start of a phrase that looks familiar, he immediately tends to complete it in his own way even when the written phrase actually ends differently. A reader understands with little effort when words come in sequences

that best fit his existing receiving habits. When the symbols appear in less familiar sequences, comprehension is slower and less sure. And sufficiently improbable patterns make a reading passage seem like nonsense because they do not relate to anything in his experience.

The third concept that contributed to Taylor's idea of cloze is that of random deletion. Taylor said that some words in a passage are unquestionably easier to replace than others. However, a random deletion method ignores the differences between specific words and appears to be defensible when cloze procedure is used for contrasting readabilities. If enough words are struck out at random, the blanks will represent proportionately all kinds of words as they occur in the passage.

Taylor (1953, 1957) stressed that cloze is not another readability formula. In no way does it resemble the element-counting devices of Flesch, Dale-Chall, and others devised previously to 1953. Nor do they resemble the formulas devised since 1953. Cloze is not a formula at all. The basis for the formulas is an assumed high correlation between ease of comprehension and the frequency of selected kinds of language elements--short sentences, short words, familiar words, certain parts of speech, the active voice, concrete terms, dependent clauses, etc. Readability formulas are insensitive to a reader's previous knowledge of the topic under discussion. They cannot allow for the effects of the uses of common words which are not idiomatic, nonsense

combinations of words, awkward and confusing sentence structure, or pronouns without definite antecedents. Polysyllabic words of five, six, or seven words of high abstraction are often easier for the average reader than are some one syllable words. Compound sentences or sentences with compound verbs are not necessarily two or three times as difficult as their component parts in simple sentences. Sentences with figures of speech or unusual construction are usually more difficult than sentences with no figures of speech or usual construction even though they contain the same words. Readability formulas do not reflect the difficulty of the content of the reading material. Nor obviously, can the formula predict the reader's interest in the content. As Spache (1970) and others suggest, all reading difficulty is basically a reaction of the reader rather than entirely inherent in the reading material.

John Bormuth, the leading researcher since Taylor's introduction of cloze, has also compared cloze to readability formulas. Bormuth (1967) stated that early researchers felt a need to make their formulas so simple they could be used even by people who have little technical knowledge of language. For example, to determine the complexity of a word the analyst either counted its syllables or looked it up to see if it was on a list of words thought to be easy. To determine the grammatical complexity of a sentence, the analyst counted the number of words or sometimes the number of prepositions in the sentence. Though the readability formulas are simple to use, they greatly over-simplify the



wide variety of language features that influence comprehension difficulty. The over-simplification contributed to the fact that the old formulas were inaccurate. Therefore, the bases upon which the readability formulas are assumed may be directly contradicted. Although readability formulas are extremely useful, they are not the final and complete answer to problems of estimating readability. The question becomes "Is cloze an answer to problems of estimating readability?"

In contrast to the readability formulas, the cloze procedure counts no such elements. But it does seem to measure readability. And it does so by taking account of the influences of many other factors which readability formulas do not consider. Wilson Taylor (1953) said that one could think of cloze procedure as "throwing all potential readability influences in a pot, letting them interact, then sampling the result." Quite obviously, then, the cloze method has little in common with standard readability formulas. It does not count elements, but rather the successful acts of reproduction. Taylor (1957) said that cloze seems innocent of three of the charges Lorge (1949) makes against the formulas. Lorge asserted that the formulas do not take account of meaning, the sequential nature of language expression, or the maturity levels of particular subjects or groups. The cloze procedure evidently does. Cloze has been upheld over readability formulas throughout its history. For example, Schlieff and Wood (1973) also state that the

readability level under the cloze procedure is based on comprehension and the reader's ability to handle the linguistic structures of the written material. So cloze does seem to measure elements which even very strong advocates of readability formulas such as Spache (1970) admit readability formulas cannot.

Then cloze bears no similarity to readability formulas. Does cloze resemble conventional sentence completion tests? John Bormuth (1968) says that on close inspection it can be seen that many of the items in cloze readability tests are identical to those found in reading comprehension tests made by conventional methods and that the processes required to fill cloze blanks are probably not different from those required to answer conventionally made items. A wh-question is made by deleting a word or phrase and inserting the wh-phrase in its place. Then the sentence is transformed so that it begins with the wh-phrase. As in cloze tests the correct answers to the questions are the words or phrases deleted.

Wilson Taylor (1953) himself said that it was obvious that cloze procedure is something like the sentence completion test, similar in that the subject is presented with incomplete sentences and there are blanks to be filled in from context. But Taylor also said that the typical sentence completion test is for measuring a person's knowledge of specific and more or less independent points of information. Therefore, the words to be deleted are evaluated beforehand and selected

for that purpose. And for every new topic some well-versed person must construct and try out a new test based on another set of information. Cloze procedure does not evaluate and select words to be deleted beforehand. Furthermore, cloze procedure deals with contextually interrelated series of blanks, not isolated ones. Still further, Taylor said, the cloze method does not deal directly with specific meaning. Instead, it repeatedly samples the extent of likeness between the language patterns used by the writer to express what he meant and those possibly different patterns which represent the reader's guesses at what he thinks the writer meant.

John Bormuth (1968) likewise recognized several important differences between items made by cloze and items made by conventional test-making procedures. First, in a cloze readability test only one word is deleted at a time, while in conventional tests whole phrases and clauses may also be deleted. Further, in cloze readability tests, structural words--articles, prepositions, conjunctions, auxiliary verbs, etc.--may be deleted. But in conventional tests only lexical words consisting roughly of verbs, nouns, adjectives, and adverbs may be deleted by themselves.

A second major difference that Bormuth pointed out is the fact that cloze readability tests are made only from the sentences in the text while conventional test items may be made either from sentences in the text or from the sentences that can be derived from the text. A sentence may be derived by any, or all, of three processes. The simplest

type of derived sentence is obtained by transforming the sentence. For example, Bormuth cited the sentence The boys rode the horses which can be transformed into "Horses were ridden by the boys and then transformed again into questions such as By whom were the horses ridden? Sentences can also be derived by substituting synonymous words or phrases for the words or phrases in the sentence in the text. Finally, derived sentences may be obtained by explicating the statements implied by the fact that two sentences appear together. For example, he says, the sentences The boys got home first followed by They rode horses implies the sentence Riding the horses caused the boys to get home first. Only conventional test items can be made from sentences derived from but not actually in a text.

The third major contrast is the fact that cloze readability tests are taken by students who may have not read the undeleted version of the passage. Cloze tests may be administered either with or without the student reading the passage from which the test was made. Research shows that the two methods are about equally valid. Taylor (1956) found that scores on cloze tests administered after students had read the passage had slightly higher correlations with scores on comprehension tests. Rankin's studies (1957) showed the same results. But the data in both studies showed that this effect probably was the result of scores being somewhat more variable than when the students had not read the passage, an effect that is more economically and easily

obtained by simply adding a few items to a test. Therefore, because of the savings in testing time and preparation of materials and because results which are just as valid can be obtained, it is the most desirable procedure to give the tests to students who have not read the passages from which the tests are made.

Bormuth says that probably too much has been made of these contrasts between cloze and conventional tests. The student has eighty percent of the text on which to base his responses so his responses very much depend on his ability to understand the text. Also, the fact that he has not read the original text may require that he use processes similar to those required to answer questions made from derived sentences plus a sensitivity to the author's style and the tone of the passage. However, the contrasts do exist. A person who is contemplating use of cloze procedure as a testing device should be aware of both the similarities and differences that exist between the cloze device and the other more traditional devices of formulas and sentence completion tests.

Since Taylor's introduction of cloze much has been made of "redundancy" as a way of explaining why a reader is able to supply blanks with words in a cloze test. Previously in this paper reference has been made to the importance of redundancy in determining dispositional mechanisms, as defined by Osgood. This idea has remained important throughout the history of cloze. By some the term "anaphora,"

rather than "redundancies," is used. "Anaphora" refers to words or phrases which refer back to an earlier word or phrase in a passage. Regardless of what term--redundancies or anaphora--is used, what is referred to is the repetitive nature of language.

Repetitions in writings do indeed exist. A student of Walt Whitman can familiarize himself very quickly with the style of the author because of the repetitions of phrases at the beginnings of his lines of poetry.

Welcome are all earth's lands, each for its kind,  
 Welcome are lands of pine and oak,  
 Welcome are lands of the lemon and fig,  
 Welcome are lands of gold,  
 Welcome are lands of wheat and maize, welcome  
 those of the grape. . .

Walt Whitman,  
 "Song of the Broad-Axe"

A reader of the Beatitudes in the Bible can soon predict the beginning of a new line after reading a few. In other writings the repetitions may not be nearly as obvious, but they do indeed exist. One does not have to resort to poetry to find evidence of the repetitive qualities of writings. They exist in prose also.

As Bormuth (1967) said, modern researchers are looking beyond the word and the sentence to find the features of language that operate over longer segments of text to influence comprehension. He points to a study by Rosenberg (1966) who found indications that passages containing words which people tend to associate with each other are easier to recall. Again, one is reminded of the transitional

probabilities of Osgood to which Taylor (1953) refers. Coleman and Aquino (1967) also, he says, have done anaphoric analyses which yield variables that predict passage difficulty. The use of anaphora indicates the extent to which a passage deals in depth with a single topic.

Weaver and Kingston (1963) also considered redundancies in writing. They thought that if language is fifty to seventy-five percent redundant, as most estimates assert, cloze units should be completed about this proportion of the time. However, their study did not fulfill this expectation. Most redundancy estimates are arrived at, however, by guessing letters rather than by guessing words, they said. The expectation that words would be less redundant than letters (and thus less predictable) seems justified. The underlying ability here seems to be the recognition of redundancy characteristics of language. They named this factor, therefore, "redundancy utilization."

The task of a reader using the cloze technique is to generate words for the blank spaces which meet the syntactic and semantic constraints of the sentence. Ammon (1975) feels, and rightly so, that listeners generate and reconstruct spoken language. How else can it be explained that a listener can supply a speaker with a word for which he is groping? Of all the thousands of words at his disposal he can choose one! Readers also generate and reconstruct written language. As is the case with listening, the reader generates language on three levels: phonetic, syntactic, and semantic. Simultaneous

generation on these three levels produces overlapping, or redundant information which enables the reader to make more accurate determinations of what newly encountered words might be. By attending to syntactic and semantic features, the reader requires less visual information and is able to predict what the unread materials might be. Syntactic clues help the reader decide what part of speech the word might be. When both semantic and syntactic features are considered, the choices are further narrowed. By adding information from phonics and supplying the initial consonant, the choices are even further reduced. Semantic and syntactic features provide redundant information which with minimal phonic cues enables the reader to predict quite accurately what the word might be.



## CHAPTER III

### DELETION SYSTEMS USED IN CONSTRUCTING A CLOZE TEST

Cloze, a method by which a passage is mutilated by deletions, has been subjected to various deletion patterns. When Taylor (1953) first introduced cloze, he said that he had explored the word-deletion question "Wouldn't a deletion system be more sensitive and more reliable if it dealt only with words classified, say, by their importance to meaning or their familiarity as gauged by tabled frequencies of use?" Each of three passages in his study was mutilated by three different systems: every-fifth, every-tenth and random ten percent. Almost entirely different sets of words were taken out by the different deletion methods. There was no overlap at all between the every-nth systems. The random ten percent system took out only two of the same words deleted by each of the every-nth ones. His study showed that some conditions were more "efficient" than others. He concluded that more needed to be determined about the comparative advantages of random vs. every-nth systems.

Later, Taylor (1956) found that there seems to be little advantage in preclassifying words and limiting deletions to them. He also found that an every-fifth-word deletion system apparently spaces blanks as far apart as they need to be. Analysis with the aid of Dr. William G. Madow, mathematical

statistician, indicated that a subject's performances on successive blanks created by every-fifth-word deletion are statistically independent.

In 1957 Wilson Taylor reported the results of a study which tested the hypothesis that the cloze scores of individual subjects would correlate significantly with their performances on (a) carefully constructed preknowledge and immediate-recall tests of the content of the material presented, and (b) a standardized aptitude or "intelligence" test of supposed "ability to understand." The cloze forms that he used were made by mutilating the passages by three somewhat different methods to produce "any," "easy," and "hard" cloze forms. The purpose of this was to explore the question of whether or not the deletion of only "important" words, such as nouns or verbs, would yield more discriminating results than the practice of counting out words without regard for their differing function. To construct the "any" form, any and all words were considered equally liable to deletion. To devise "hard" and "easy" forms, all of the approximately 650 words in the sample were preclassified. This operation was based on the findings of an exploratory analysis which utilized all previously collected cloze data and a set of "functional" categories of parts of speech. In analyzing past data it was determined that the parts of speech fell into three categories according to their difficulty:

1. Adverbs, verbs, and nouns had been most frequently guessed wrong, hence were "hard"
2. Verb auxiliaries, conjunctions, pronouns, and articles had been most often guessed right, hence were "easy"
3. Adjectives (not including articles) and prepositions fell into a "medium" group

All "hard" and "easy" words in the sample were identified. One mutilation operation took only the former into account, and another operation only the latter. "Medium" parts of speech were excluded from consideration. Performances relative to the chance deletion of words by the "any," "easy," and "hard" methods not only indicate that "any" and "hard" yield more discriminating results than "easy," but also that the "any" method is equal or superior to "hard" for all purposes except one--gauging preknowledge of technically worded content. Comparisons of the results for the three test groups indicated that, in general, the "any" cloze form, which is far the simplest to construct, yielded more stable, reliable, and discriminating results than did the "easy" and "hard" forms.

Taylor concluded, therefore, that to restrict deletions to particular kinds of words is to ignore the fact that those kinds may not occur equally often in different materials. That difference in frequency of occurrence may itself be a readability factor and its effect should be included in--not excluded from--the results.

During the short history of cloze procedure differences have been found regarding the relative difficulty of replacing

words of differing classes. Stubbs and Tucker (1974) found something different from what Taylor found. They found that adjectives were harder to replace than were adverbs. They found the order of difficulty of replacing parts of speech from most difficult to least difficult to be the following: (1) conjunctions, (2) prepositions, (3) pronouns, (4) verbs, (5) adjectives, (6) nouns, and (7) adverbs. However, in discussing the various deletion systems in constructing a cloze exercise Ammon (1975) says that it should be noted that adverbs, adjectives, and prepositions appear to be hardest for children to generate. Again, this conflicts with other statements by other writers and researchers. Ammon does not give credit for this information to any other writer. One wonders on what basis he makes that statement.

Schneyer (1965) explored the effects of the close procedure upon the reading comprehension of sixth grade pupils by using two types of cloze exercises. One was built on every-tenth word deletions regardless of the type of word. The second type was based on noun-verb deletions. In these passages the nouns and verbs were first identified, and then alternate nouns and verbs were deleted. Schneyer based his two deletion systems on the lexical-structural dichotomy introduced by Rankin (1957). Rankin studied the use of the cloze test to measure different aspects of reading comprehension, such as comprehension of specific facts and comprehension of general relationships between ideas. He found that cloze tests constructed by deleting only nouns and verbs

from a reading passage are primarily a measure of factual comprehension. Cloze tests constructed by deleting all types of words indiscriminately resulted in a better measure of the comprehension of relationships. He also obtained evidence that cloze test scores based on noun-verb deletions show lower correlations with intelligence test scores than do cloze scores based on deletions of words without consideration of the type of word that is deleted. The total results for each of the two types of cloze exercises were correlated with the intelligence and reading test results. Both cloze types correlated significantly with the language-I.Q. results. The tenth-word deletion system was much more highly related to intelligence than was the noun-verb deletion system (.63 vs. .42). This seems to substantiate Rankin's earlier contention that the every-nth deletion system is more related to intelligence, whereas the selective deletion of nouns and verbs provides a measure of comprehension less influenced by intelligence.

Jongsma (1971) says that future researchers should know why they are using their particular deletion system with the cloze procedure and explain the reasons in their reports. The every-nth deletion system, which assumes that because of semi-random sampling, a representative number of grammatical elements will be deleted in each passage, has been widely used in measuring readability. In previous instructional studies, many researchers have adopted the lexical-structural dichotomy suggested by Rankin, which assumes that passages comprising

lexical deletions measure the understanding of substantive content, while structural deletions involve an understanding of interrelationships of ideas and are more highly influenced by intelligence. Jongasma said that while there is some evidence in the literature of this dichotomy, it is not as convincing as many would like to believe. He raised some questions. Does the lexical-structural dichotomy apply equally across all age or grade levels, or across all types of reading materials? Are certain deletion systems better than others at developing particular reading skills? Louthan (1965) found that students comprehend better after reading passages with noun determiners deleted than they did after reading intact passages. The greatest loss in comprehension came from the deletion of nouns, verbs, and modifiers, the basic meaning carriers of written language. There is also some evidence that the within-sentence order of elements has an effect on recall (Rothkopf, 1963).

Thus, Bormuth (1968) summarized that the practice of deleting every fifth word is usually followed because it is simple and economical to use and because it provides the greatest number of items possible for a given passage and therefore provides the most reliable measure of passage difficulty. While deletions may be less frequent than every fifth word, MacGinitie (1961) has shown that when a deletion system leaves less than four words of context between items, a student's ability to answer an item begins to depend heavily upon whether he was able to answer correctly the

adjacent items. When this occurs, the scores become difficult to interpret in any meaningful way.

## CHAPTER IV

### METHODS USED TO SCORE AND INTERPRET CLOZE TESTS

As with the deletion methods used in constructing a cloze test, more than one method of scoring has been applied to cloze tests. These methods have arisen because the person who scores the test must decide which answers are correct. A student's response can differ from the deleted word in grammatical inflection and spelling. Furthermore, it can differ in semantics. The test scorer has to decide whether or not to score as correct synonyms of the deleted word.

Taylor (1956) said that findings up to that time indicated that the easiest ways of applying cloze procedure may be best for most uses. There seems to be little advantage in putting oneself to the trouble of judging and scoring synonyms. In his study in 1957 only those filled-in words which matched the original words were counted as right. The singular form of the correct word did not count for the plural, nor a common spelling for a technical one, nor an abbreviation for a written-out form. And no credit was given for synonyms. What graders considered to be obviously careless misspellings of obviously right word forms were not penalized, however, and no attention was paid to capitalization



or the omission of internal punctuation. Similarly, Ruddell (1964) found that cloze comprehension tests scored by the exact deletion and synonym count scoring methods do not differ significantly in validity as paragraph meaning measures of reading comprehension.

In addition to the main thrust of Stubbs and Tuckers' study--finding out whether or not cloze is a valid measure of English proficiency for an Arabic speaking population--Stubbs and Tucker were also interested in the relationship which existed between scoring the tests for exact replacement and for contextually-appropriate response. Of course, they were interested in this relationship because they feared that non-English speaking teachers would not be able to score the tests for contextually appropriate responses. They found a significant, positive correlation between scoring for exact and contextually-appropriate responses. This suggests that the cloze technique may well be appropriate for use by non-native teachers of English. This would eliminate the time-consuming problem of evaluating acceptable responses or of having to find a native speaker to check the results. It would also result in more reliable scores since the element of subjectivity, a problem even for native-speakers which enters into the evaluation of contextually-acceptable responses, would be eliminated entirely. This finding has implications for classroom teachers using cloze as well. In using cloze as a diagnostic device the teacher would have to spend a great deal of time trying to decide

whether or not a response is appropriate if other than exact matches are accepted. If there is a positive significant relationship between the two methods of scoring, the easier method can be chosen.

John Bormuth (1965) conducted a study in which he classified cloze test responses according to their semantic and grammatical relationships to the deleted word. Scores based on each of these categories were studied to find out which are most valid when the tests are used to measure reading ability and passage difficulty. Each of the cloze test responses was classified into one of the seven categories given below. Errors of spelling did not cause a response to be counted wrong unless the response was unclassified because of its ambiguity or unrecognizability: (1) Exact word, grammatically correct, (2) Exact word, grammatically incorrect, (3) Synonym, grammatically correct, (4) Synonym, grammatically incorrect, (5) Unrelated semantically, grammatically correct, (6) Unrelated semantically, grammatically incorrect, and (7) Unclassifiable responses. He found that scores obtained by counting exact word, grammatically correct responses were superior to any of the other types of scores included in the study. The conclusion was reached, therefore, that when cloze tests are used as measures of individual differences in reading ability, scores obtained by counting responses exactly matching the deleted words seem to yield the most valid scores. When cloze tests are used in readability studies as measures of the

comprehension difficulties of passages, scores obtained by counting responses exactly matching the deleted words seem to yield the greatest amount of discrimination among passage difficulties.

Bormuth (1968) said that users of the cloze readability procedure have settled on the practice of scoring correct just those responses which exactly match the deleted word, disregarding minor misspellings. This practice is based on findings by Taylor, Ruddell, and also Rankin (1957) that including synonyms as correct responses slightly increases the correlations between cloze scores and scores on comprehension tests. But their data show that it does so simply by increasing the variability of the scores, an effect that is far more easily obtained by adding a few items to the test. So variations in the cloze procedure itself have been investigated. Different scoring methods have been compared to determine the effect on the reliability and validity of this technique. Likewise, different deletion patterns have been used.

John Bormuth (1964) did a study in which he made five different test forms from a single passage by beginning the deletion process with successive words. For example, in one form words 1, 6, 11, etc. were deleted. In another form words 2, 7, 12, etc. were deleted. He found the difficulty of a test form by converting the scores of subjects to percentages and finding the mean. Five cloze forms of fifty items each were made from each of twenty passages. The test

forms were divided after every fifth item to form ten test lengths. As the tests were scored a cumulative score was recorded after every fifth item in the test. These scores were then converted to percentage scores and used to compute a test form difficulty at each test length. The test form difficulties were, in turn, used to compute a passage difficulty at each test length. The differences among the mean scores on the five different test forms over the same passage were tested for significance. The analysis was performed separately for each test length within each passage. He found that the means on different cloze test forms that are made from the same passage differ significantly for test of fifty items or less. There were significant differences among over half of the twenty sets of test forms used in his study. The differences in difficulty among test forms made from the same passage tend to diminish as more items are included in the test form, therefore, Bormuth concluded that test forms made from the same passage, if made sufficiently long, might come to yield nearly identical mean difficulties. He suggested, however, that the tests would be too long to be of practical value in designing research studies. Consequently, researchers should use more than one cloze test form over the passages that they are studying.

Cloze has been used as a measure of readability. There is some value in knowing that one passage is more difficult for students than another. But a cloze readability score

has little value unless a teacher can say that the score does or does not represent a satisfactory level of performance on the materials from which the test was made.

In order for the cloze tests to be useful, Bormuth (1967) established a frame of reference by which the cloze score can be interpreted when it is used to measure the comprehension difficulties of passages. Up until his study there had been no way to say that any given cloze test score presented a particular level of performance by the student who made that score. Bormuth determined comparable scores on cloze and multiple-choice tests. Multiple-choice comprehension tests, used for many years, have a widely known frame of reference accepted in both readability research and in classroom practice. Dr. Emmett Betts (1954) has outlined minimal performance standards in his competency levels--frustration, instructional, and independent. In this frame of reference a student must answer correctly at least seventy-five percent of the items over passage before it is suitable for his use. When his score falls between seventy-five and ninety percent, the material is suitable for use in ordinary supervised instruction. A score above this range indicates that the material may be used for independent study. Bormuth obtained the results concerning the comparability of cloze scores and multiple-choice test scores as shown in table 1. According to conventional readability standards, a passage on which a student receives a cloze score of thirty-eight percent is sufficiently

understandable to him to be used on his instruction level. In other words, he can correctly answer about seventy-five percent of the multiple-choice items that can be written over that passage. On the other hand, if the multiple-choice score is corrected for guessing, a cloze test score of forty-three percent is required to reach the same level. This latter cloze score is probably quite similar to the criterion cloze score that would have been obtained if completion tests had been used in Bormuth's study. In a replication of Bormuth's study (see table 2) Earl F. Rankin and Joseph W. Culhane (1969) also suggest cloze test percentage scores which are equivalent to conventional reading comprehension scores. The scores were different but somewhat similar to Bormuth's, so the results of their study can be seen as tending to corroborate the validity of his comparable cloze and multiple-choice percentage scores.

TABLE I  
EQUIVALENT CLOZE AND MULTIPLE CHOICE TEST  
Percentage Scores

CLOZE TEST SCORES	MULTIPLE-CHOICE TEST SCORES	
	Raw	Corrected
19	50	33
23	55	40
27	60	47
31	65	53
35	70	60
38	75	67
42	80	73
46	85	80
50	90	87
53	95	93
57	100	100

TABLE 2

## EQUIVALENT CLOZE AND MULTIPLE CHOICE PERCENTAGE SCORES

Multiple-choice Scores	Cloze Scores (Bormuth)	Cloze Scores (Rankin & Culhane)	Difference
50	19	10	+9
55	23	15	+8
60	27	22	+5
65	31	28	+3
70	35	35	0
75	38	41	-3
80	42	48	-6
85	46	54	-8
90	50	61	-11
95	53	67	-14
100	57	74	-17

Rankin and Culhane also compared the results of their study to a study done by Bormuth in 1968. The results compared to this later study were even closer, as table 3 shows for the reference points established by Betts. The authors pointed out that Bormuth maintains those results obtained in 1968 are more valid than those of the 1967 study.

TABLE 3

CLOZE TEST PERCENTAGE SCORES COMPARABLE TO 75% AND 90%  
CRITERION MULTIPLE-CHOICE SCORES

Criteria	Comparable Cloze Percentages		
	Bormuth (1967)	Bormuth (1968)	Rankin & Culhane
75%	38	44	41
90%	50	57	61

Even after the frames of reference of Bormuth and Rankin and Culhane were established, cloze still provided no grade level identification for the readability level of any written material. The cloze procedure determines readability on the basis of comprehension, rather than grade levels. In order to investigate the correlation between cloze and a readability formula Schlief and Wood (1973) used a device for which they coined the term "Cloze Readability Index." Ten cloze readability passages were administered to a randomly selected sample of subjects in a group testing situation. The Gates-MacGinitie reading achievement grade level score of the subject who scored 45 to 55 percent on a given cloze passage was attached to that cloze readability passage since both are measures of comprehension. Where more than one pupil's achievement score was attached to a single cloze readability passage, an average was computed for that group's scores. The resulting grade-level comprehension figure, labeled the Cloze Readability Index, was determined for each of the ten cloze passages. However, the Cloze Readability Index might in some cases be misleading, if the weaknesses of standardized reading tests, one of which is the Gates-MacGinitie Reading Test, are considered. By guessing on such tests children can possibly obtain a much higher reading score than their reading level in actuality could ever suggest. Again, teachers must be cautious in their use of test scores. Schlief and Wood do not stress this point.



Even though there has been much research on cloze since its introduction by Taylor in 1953, it is still not fully understood. When more than one frame of reference has been supplied by research studies, one must be leary of accepting a certain set of scores as infallible. Certainly there is no magic set of numbers. The Reading Diagnosis Kit (1975) contains a description of the technique, along with directions for using cloze, directions for constructing a cloze exercise at the elementary level, and directions for constructing a cloze exercise at the secondary level. After the teacher counts the number of cloze blanks correctly filled in, the directions say he should interpret the results in this way: If he has completed about 45-50 percent of the blanks correctly, the material is on his instructional reading level. These percentages may seem less than perfect in view of frames of reference different researchers have determined. The user of cloze should be aware of this problem and not interpret scores to be faultless.

## CHAPTER 5

### VARIOUS USES OF CLOZE TESTS

Cloze as a testing device has been used for various purposes. It has been used as a measure of both general reading comprehension and specific comprehension. It has been used as a measure of ability to detect author's style. Cloze test scores, it is said, are also an indication of intelligence. Cloze has come out of the group testing situation into personal interviews to diagnose specific weaknesses in reading skills. Cloze can be used as an indication of existing information. It can be used in areas other than reading: foreign language, mathematics, social studies and science.

Extensive research has tried to establish the relationship between cloze scores and standard measures of reading comprehension. Jones and Pikulski (1974) believe that evidence given from any cloze test tells a teacher more about the pupil's reading level placement than does data from a standardized test. Ruth Gallant (1965) did a study to test the reliability and validity of cloze tests for pupils in the first three grades. She compared the ranking of pupils within each grade on the paragraph reading section of a standardized reading achievement test--the Metropolitan Achievement Test--and the ranking of these pupils on the same section of a comparable form, rewritten as a cloze test.

The findings indicated that cloze procedure was a valid and reliable measure of reading comprehension for beginning readers. Rankin (1959) said that the high correlations between cloze test scores and standardized reading tests is quite amazing when one considers the money, effort, and skill necessary for the construction of a standardized reading test and the ease with which cloze tests can be constructed by clerical personnel.

However, not every researcher agrees. Weaver and Kingston (1963) found that the relationship of the cloze tests they used to the standardized tests they used varied from little relationship to moderate relationship. The cloze tests were related only moderately to the verbal comprehension factor. They were surprised in their findings, since the literature of the subject to that time had emphasized the close relationship of lexical deletions to objective reading tests. These researchers implied that cloze tests of varied kinds are more related to each other than to verbal comprehension. Cloze tests are most closely related to "redundancy utilization." Redundancy has been discussed previously in this paper. Except for the Weaver and Kingston study, however, evidence indicates substantial correlations between general reading comprehension as measured by standardized reading tests and as measured by cloze tests.

Even though cloze tests appear to correlate with standardized reading tests and measure general reading

comprehension, some researchers say they are an even better measure of the specific comprehension of an article. In order to determine the validity of cloze as a measure of specific comprehension, cloze scores are correlated with comprehension test scores covering the same material. Rankin (1959) found a significantly stronger relationship between cloze test results and an objective test of the same material than between cloze test results and scores on the Diagnostic Reading Test, Survey Section. It is often desirable to differentiate aspects of comprehension such as the comprehension of facts or the comprehension of more general relationships between ideas. Rankin obtained evidence indicating that cloze tests constructed by deleting nouns and verbs measure factual comprehension primarily. When, however, cloze tests are constructed by deleting all types of words indiscriminately, they produce a better test of the comprehension of relationships. So the cloze procedure appears to be a valid measure of specific reading comprehension. In fact, Bickley (1970) in his "The Cloze Procedure: A Conspectus" said that it appears to measure specific comprehension better than it does general comprehension. He based this statement largely on the research findings of Rankin (1964, 1965).

Cloze has also been advocated as a diagnostic device to measure the ongoing progress of a student. Rankin (1959) said that the best solution to the pretesting and post-testing problem--that of a child's failing to register any

improvement or even showing an apparent regression even though he seemingly made improvement under treatment--is to carry out a program of continual assessment to replace the simple before-after comparison. This could easily be done by using a number of cloze tests based upon samples of the same material. Both content and style of reading material and difficulty of questions would be constant, and several equated tests could be constructed in this matter. Maybe Rankin would hesitate to say this after some later studies showed that tests constructed differently even on the very same passage show significant differences in reliability. For example, Bormuth (1964) showed that by using different deletion patterns which delete the first word, sixth word, etc. or the second word, seventh word, etc., different scores are obtained. However, continued assessment of student progress is by all means necessary, whether it is by cloze or by some other means.

Rankin cites Jenkinson (1957) as obtaining striking evidence concerning the use of the cloze procedure for diagnostic purposes. In his study students with very high and very low cloze test scores were given individual interviews. During the interview each student took an additional cloze test and verbalized his reasons for inserting words in each blank space. Analysis of these verbalizations revealed that the high scoring students were superior in many important reading skills. Rankin said that the idea of having students explain orally in individual interviews

their reasons for making cloze response should yield considerable diagnostic information which no test score could reveal by itself.

Users of cloze tests are often heard to speculate that a persons's score on a cloze test is in some degree dependent upon his ability to respond to the aesthetic and stylistic features which characterize the writing of an author. Exactly matching an author's words requires an acute sensitivity to the author's literary style, his choice of words, his sentence patterning, his attitudes toward his subject matter, and his aesthetic devices. The purpose of a study done by Bormuth and MacDonald (1965) was to find out if scores on cloze tests constructed to measure ability to detect an author's literary style are valid. It is also reasonable to speculate that the sample of language contained in a cloze test does not give a subject a sufficient amount of information to permit his cloze test responses to be influenced by an author's characteristic literary style. Usually cloze tests are administered to subjects who have read neither the original passage from which the cloze test is made, nor anything else by that author. If the material within a cloze test is insufficient to permit responses to be influenced by the author's literary style, scores on cloze tests given to subjects who have had no specific instruction in an author's works should have a relatively low correlation with their scores on a test of ability to detect an author's style which is given to the subjects after they have studied

the author's works. Conversely, there should be a relatively higher correlation between scores on a cloze test given after the subjects have studied the author's work and scores on the test of ability to detect the author's literary style.

Bormuth and MacDonald's study showed that scores on cloze tests correlate with scores on tests of ability to detect an author's style. This fact plus the logical and intuitive evidence form the basis for a strong presumption that a person's sensitivity to literary style is one of the variables which determines how well a person performs on a cloze test. Subjects' responses seem to be as strongly influenced by the author's style when the subjects are given just the material within a cloze test as when the subjects are first allowed to study a book by that author. Cloze tests made by deleting every fifth word seem to be as valid when administered to subjects who have not read the materials from which the tests were made as when the tests are administered to subjects who have studied those materials. Bormuth and MacDonald said that this finding seemingly contradicts some earlier studies and raises important questions about the generalizability of the results of those studies.

The studies of Bormuth and MacDonald failed to support the hypothesis that the scores on the test of ability to detect the author's style would have a higher correlation with the scores on the cloze test given after the subjects had read the book than with scores on the test given to the subjects before they had read the book. Rankin (1957)

reported having found that tests given to subjects before they had read the passages from which the tests were made were less valid than tests given after subjects had read the passages from which the tests were made. The major differences between the two studies were the criterion tests used and the type of deletion procedures. It seems unlikely that the differences in the criterion tests could have accounted for the contradictory findings, since Rankin used a number of different criterion tests and got essentially the same results with each. However, in his deletion procedure for making the cloze tests he deleted only nouns and verbs. He chose this procedure after showing that scores obtained on such tests behaved differently from scores obtained from cloze tests made by other deletion procedures. The results of Bormuth and MacDonald's study suggest that the effects observed by Rankin may have been peculiar to cloze tests made by deleting only nouns and verbs. Evidently, researchers cannot ignore their deletion procedures and generalize their findings to cover the properties of all cloze tests.

Because learning depends on the comprehension and retention of new information, and because comprehension itself depends both on native intelligence and how much one already knows, it seemed that cloze scores might indicate more than just comprehension. They might also measure intelligence, existing knowledge, and success in learning and remembering. This reasoning was tested in an



experiment by Wilson Taylor (1953) which used trainees at Sampson Air Base, New York as subjects. Analysis dealt with five scores for each subject, two comprehension scores, two cloze scores, and his general intelligence score on the Armed Forces Qualification Test. The results fulfilled expectations. The correlation coefficients among five sets of scores for forty-eight subjects were large, and all were significant in the sense that they could not be so large by pure chance even once in a thousand times. Cloze tests can be administered when based upon unfamiliar material or when based upon material which has just been read. These alternate procedures may be designed to measure a number of different factors such as previous knowledge and reading comprehension. However, Rankin (1959) said that research has suggested that cloze tests based upon unfamiliar material may be quite unreliable for certain kinds of subjects. For testing purposes, therefore, he said it is best to have subjects read the unmutilated passage before taking the cloze test.

In a study done by Stubbs and Tucker (1974) information was collected concerning the validity of the cloze technique as an English-proficiency measure for an Arabic speaking population. In May, 1973, they administered a cloze test as an integral part of the English Entrance Examination (EEE) required of all applicants to the American University of Beirut (AUB). Pearson Product-Moment correlations were computed for the total EEE, its parts, and the cloze-exact

and cloze-acceptable scores. All correlations were significant at the .01 level. On the basis of their results they concluded that the cloze technique constitutes a powerful and economical measure of English-language proficiency for non-native speakers.

Cloze has also entered the realm of mathematics. In a study by Sedlak (1974) the performance of nine-year-old educable mentally handicapped (EMH) good and poor arithmetic problem solvers was compared on a test composed of problems written in a modified cloze format, where closure was required on the verb. The purpose of Sedlak's study was to separate students who were successful in solving word problems containing extraneous information (good problem solvers) from those who were not successful (poor problem solvers), and to compare their respective performances on a modified cloze verbal problem solving test. He had hypothesized that those who used a strategy involving the active processing of information should be more successful on the modified cloze problems than those who merely used a rote strategy, merely adding, for example, all numbers in a word problem. Studies which have examined EMH children's inadequate verbal problem solving skills have identified two strategies used quite often by EMH children when solving word problems. One strategy is to look for cue words in the problem in order to determine what operation needs to be performed. A word cue such as "left" would generally convey to the student that a subtraction algorithm is needed. Another strategy used called the "rote

computational habit" is to sum all numbers in the problem. The pattern of performance of both groups on the different modified cloze problems was strikingly similar to results obtained in studies which had used conventional problems. Since this is the case, it appears that performance on the modified cloze problems is correlated with performance on conventional problems. It would seem logical, therefore, for a teacher to occasionally use modified cloze problems in the place of conventional problems in her class. In many ways, the modified cloze problems can offer greater diagnostic insights for a teacher into a particular child's verbal problem solving difficulty than conventional problems. The primary advantage of the modified cloze is the extent to which it can be used to isolate any linguistic interference impeding the problem solving process.

Frequent are the complaints of social studies and science teachers using textbooks for instruction that their students cannot adequately read their instructional materials. Cloze tests are potentially a useful tool in determining what reading materials are suitable for each child. For example, Thelen (1974) has said that the classroom teacher is in need of an instrument that will accurately and quickly assess each student's ability to understand the text and that the cloze procedure is such an instrument. She said that perhaps the greatest feature of the cloze procedure is the facility with which it is scored since credit is given only when the exact word that was deleted is supplied. Cloze is also constructed with similar ease.

Geyer and Carey (1972) said that cloze procedure is useful in determining what social studies materials are appropriate for high school students, though they found in their study that standardized reading test scores are significantly better predictors of ability to comprehend social studies materials than cloze test scores. But considering the ease with which cloze is constructed and scored over standardized tests and considering the fact that comparable cloze scores and multiple-choice comprehension test scores have been determined, cloze has much to offer in content area subjects.

So there are many pros and cons to cloze procedure. There are definite advantages to cloze. In reading tests where the student is asked to answer questions, his score is influenced not only by the passages read but also by the quality of the questions and his comprehension of them. This is not true of a cloze test in which the student responds only to the reading selection itself. Pennock (1973) said that the cloze procedure would appear to combine the advantages of both standardized and informal testing procedures-- the reliability, validity, and much of the scoring ease of the former, with the pertinence and relevance of the latter, in that passages are selected from instructional materials actually being considered for use by students. He went as far as to say that perhaps the time has come for well-constructed cloze tests developed on each book published for instructional purposes to be included with the desk copy or teacher's

manual, with the provision that the tests might be duplicated by the instructor as needed in order to determine which of the materials would be appropriate at any point of time. Meanwhile, he said it would seem unlikely that many classroom teachers would have the time for cloze test production for the purpose of assessing the difficulty of each book with students. He suggested that tests might be constructed by school reading coordinators or similar persons, perhaps in conjunction with curriculum committees, in order to develop suitable school-wide or school-system-wide cloze tests for all texts in common use.

But even though it is faster and easier and advocated by several authorities, this author sees the cloze procedure as being far from perfect. For example, independent level would be set at fifty percent according to Bormuth's study. However, that same level would be set by sixty-one percent by Rankin and Culhane's study. Even though cloze tests do allow the child to interact with the reading materials to be used in instruction, there can be no determination of the child's specific strengths and weaknesses that need to be considered in instruction. A suitable instructional program can be planned only in terms of such analysis of specific skills and the pupils' adequacy of achievement in these skills. Though teaching at the right level is important, it is not enough. Teaching reading must be directed toward overcoming any specific weaknesses that exist. For example, a teacher who is using an informal reading inventory can detect

problems that a child might have in interpreting punctuation marks or in using suffixes. Such problems as these cannot be detected on cloze tests. One can come to the conclusion that cloze tests by themselves are inadequate for establishing a developmental reading program for a child. They are merely one more indication of a child's reading ability. Cloze tests could be used effectively if considered along with other diagnostic devices. For example, cloze tests and an informal inventory in conjunction with one another might reveal a great deal about a student in terms of diagnosis.

Rickley (1970) cites these experts--Klare, 1963, 1966; Coleman, 1968; Weaver, 1967; and Kingston and Weaver, 1967--who still have reservations about certain aspects of the cloze procedure. Obviously, the case of cloze is not closed. It is still open for experimentation. There must be presentation of further evidence that would show cloze to be a valid and reliable testing device. This does not mean that teachers should have to wait for definitive proof that establishes cloze in all its aspects as a precise and exact testing device in the classroom. Teachers may fit cloze in their reading programs if they have read widely on the topic and are cognizant of the fact that cloze in itself does not supply all the answers a teacher wishes to know about a student.

PART II  
CLOZE AS A TEACHING DEVICE

## CHAPTER VI

### INTRODUCTION

To date the cloze procedure has been more fully researched as a device for determining the readability of instructional materials--as a testing device--than as a teaching technique. The effectiveness of cloze in measuring readability and comprehension has received major attention. In addition to the use of cloze as a diagnostic device, however, cloze has also been used as a teaching device. Though the cloze procedure was initially investigated as a measure of readability, the research which followed Taylor's study explored the use of cloze both as a measurement and teaching device. Not too many years after Taylor's introduction of cloze Rankin (1959), writing on the cloze procedure and how it could be used in the reading clinic, stated that many research findings had pointed to the diagnostic values of the cloze procedure in the reading clinic but that no research had been reported concerning the possibilities of cloze exercises for remedial purposes. "However," he said, "it can easily be shown that this technique has a great potential as a tool for both the diagnosis and remediation of reading difficulties." Since the time that Rankin wrote that statement, cloze has indeed been researched and used as a teaching device, not only in remedial situations but in a variety of situations.



As shown in table 4, Jongsma (1971) offered what he called "a capsule summary of the relevant studies" concerning the cloze procedure as a teaching device from 1962 to 1970. Much of the research done on cloze has come under fire by Jongsma, who pointed out particular weaknesses relevant to studies using the cloze procedure as a teaching technique. He said that the absence of direct teaching alone might well account for the lack of significant differences in some of the studies. Some of the investigators of cloze have relied on the cloze procedure itself to do the work, feeling that students could improve their reading ability simply by going through the process of completing cloze exercises. But in those exceptions where instruction did take place (Martin, 1968 and Kingston and Weaver, 1970) Jongsma said that the results were encouraging. Furthermore, the periods of instruction, insofar as they existed, were very brief, sometimes as few as six exposures to cloze exercises. Jongsma said that it is doubtful that any teaching technique, regardless of its quality, could produce anything more than superficial effects in such a brief experiment. Jongsma speculated that one reason for the absence of direct instruction may be that the investigators seemed to lack a clear definition of the problem. Seldom exhibiting a clear notion of intent, they employed the cloze procedure in hopes of improving "reading comprehension," or "general reading ability," rather than considering the use of cloze to increase a particular skill such as the use of context clues or

TABLE 4  
SUMMARY OF CLOZE TEACHING STUDIES

Author	Type of population	Type of deletion system	Results
Roossinck (1962)	One sixth grade class (n=18)	Programmed format with selective deletions	No real test of the effectiveness of cloze
Bloomer (1962)	Three groups of college students (n=127)	Every-10th deletion system with a 96% criterion for movement through passages	Significant differences in reading comprehension in favor of group using the cloze procedure
50 Friedman (1964)	Three groups of foreign students at university level	Every-5th deletion system on 20 passages from <u>McCall-Crabbs</u>	No significant difference in reading comprehension
Schneyer (1965)	Two sixth grade classes (n=66)	(1) Every-10th word deletions (2) Noun-verb deletions	No significant difference in reading comprehension
Blumenfield & Miller (1966)	One class of freshman college English students (n=20)	Every-5th deletion system, rotated to produce five forms	No significant difference in reading ability

TABLE 4--Continued

Author	Type of population	Type of deletion system	Results
Bloomer, <u>et.al.</u> (1966)	Cross-section of 5th, 7th, 9th and 11th graders (n=1000 plus)	Non-overt reinforced, with 10% deletions of (1) random, (2) nouns, (3) verbs, (4) modifiers, (5) function words, (6) noun determiners, and (7) a control passage of no deletions	No significant differences in reading comprehension
Heitzman & Bloomer (1967)	Longitudinal study of 9th graders (n=125)		Evidence of differential effects due to varying syntactic deletions
51 Martin (1968)	Three groups of college freshmen (n=142)	Selective deletion of lexi- cal elements--nouns, verbs, adjectives, and ad- verbs; some use of multiple-choice format	Significant difference in reading ability in favor of group using the cloze control group Evidence that verbalizing the reasons for closures is effective
Guice (1969)	Four groups of college students (n=26)	Every-nth deletion of concept words--nouns, verbs, adjectives, adverbs	No significant differences in reading comprehension
Kingston & Weaver (1970)	Culturally disad- vantaged first graders (n=74)	(1) Any-word cloze-- random, every-nth, (2) Multiple-choice, structural cloze-- function words (3) Multiple-choice lexical cloze--nouns, verbs, adjectives (4) Aural-reading cloze-- random, every-nth deletions	Cloze-like tasks can be used effectively with first graders  Cloze tests can serve as effective predictors of 1st grade reading achievement

vocabulary.

Jongsma also criticized the experimental designs of the investigators, saying that in some studies, variables were confounded. For example, deletion systems, in some cases, were confounded with the method of presentation so that in those situations, the researcher could not be certain as to which factor was responsible for the resulting effects. In addition to weak experimental designs Jongsma said that measurement problems also existed in the studies. There is no doubt that the validity and reliability of the measures used to assess student achievement must be considered carefully. Most of the studies relied on standardized tests to measure reading comprehension or general reading ability. Jongsma said that it is questionable whether most of these tests validly measured the skills students were taught during the instructional programs. In order to select a valid measurement instrument, an investigator must have defined carefully the reading behaviors he is seeking to develop in the instructional program. Since many of the researchers did not clearly define the reading behavior expected to change, Jongsma said that this type of selection was difficult. Furthermore, he found a tendency to use crude gains, measured by the post minus pretest technique, as an assessment of growth. This is probably one of the most unreliable ways to measure student progress.

Finally, Jongsma said that some researchers failed to report the kind of cloze procedure being used, neglecting

to describe adequately such important elements as the type, rate, and number of deletions made in the cloze exercises. The nature of the content and the difficulty of the material used for the cloze passages were frequently not cited. In studies where cloze results were correlated with multiple-choice comprehension questions, researchers often neglected to describe fully what skills the questions were measuring, or to explain how they were developed. Although some researchers briefly mentioned the grade level of the students used in their studies, complete descriptions of subjects were inadequate. Another common and serious omission was the failure to report the reading levels of the subjects. In studies comparing cloze with other teaching methods, the regular method of instruction was seldom defined.

Jongsma concluded that contrary to the recommendations frequently made by authorities in the field, the research evidence up to that time did not suggest that the cloze procedure is an effective teaching technique. For the most part, studies have demonstrated that the cloze procedure, used either as a supplement to or in lieu of regular reading instruction, does not produce significantly improved results in reading proficiency.

## CHAPTER VII

### VARIOUS USES OF CLOZE EXERCISES

Even though research on cloze as a teaching device may be inadequate, this technique is being more and more used in the teaching of reading. Since Taylor suggested the cloze procedure in 1953, there have been many modifications upon his process. Consequently, there are many facets to cloze as a teaching device. Many of the modifications of cloze have been made in an effort to adapt cloze to meet the needs of children in particular teaching situations. The use of cloze as a teaching device can encourage children to respond to what they read. Many children recognize factual information but do not react positively or negatively to what they read. They do not question the author's intent, style, or content.

Adeline Wishengrad Gomberg (1976) used a modification of the cloze procedure at Beaver College Reading Clinic, Glenside, Pennsylvania with third to fifth grade students. She did not delete every nth word, but rather attempted to delete words believed significant for a purpose. Sometimes she wanted to see whether the children had the necessary background of information to fill in the gaps, for example, in the areas of social studies and mathematics. At other times she concentrated on vocabulary development or

grammatical constructs. Words to choose from were placed in a box at the bottom of the page.

The problem that Gomberg's students had was that they were unresponsive to reading. By using a modified cloze procedure she hoped that the students could be free to try something a bit different and to take pleasure in that difference. The children were asked that the answers they give be relevant to the reading selection and that it be logical. It was suggested that there could be many correct answers to the same deletion. What followed was a debating and thinking spree. Gomberg felt that perhaps asking them to take a chance--that if they could prove or support their answers they would be correct--helped free them. The children took turns answering. Accepting or rejecting the insertions became their responsibility. The children became critical of the selection. They delved into pluralization, logic of structure, main ideas, topic sentences, inferential understandings, critical reading, and creative expression. Gomberg found that some children who labor apathetically through an assignment awaken when asked to become part of their own debating session. Children become involved in a cluster of different kinds of thinking skills--reading between the lines, making generalizations, sensing motives and relationships, and making comparisons. They become more critical of what they read by judging, evaluating, and searching for accuracy.

Of course, the deletion pattern Gomberg used--deleting selected words--and then giving the students choices which they can use to supply blanks--might well contradict the very basis of cloze in certain situations. As Wilson Taylor defined a cloze unit, it is an attempt to reproduce a deleted part by deciding from the context that remains what the missing part should be. In a situation similar to Gomberg's it might be possible that a child supply a blank with a word chosen at random. Determining whether the chosen word is the correct one or not would not require nearly as much help from the surrounding contextual parts as would supplying the blank with no help from provided words. What Gomberg and others are using might be more similar to multiple-choice sentence completion exercises than to cloze. Certainly one can question whether this adaptation of cloze is a modification of cloze or a change to a different procedure. In adapting cloze to teaching, rather than testing, situations, it might be true that the process is removed from the original notion of cloze.

Cloze has been used in cases in which children do not even get the factual meaning because so much attention is given to phonic analysis. There has been a long-standing controversy as to how much phonics a child should be taught. Certainly some children are taught so much phonics they rely on phonics to the point that they are merely word-calling rather than concentrating on the meaning of the passage.



Ammon (1975) advocates the use of cloze alongside phonics to solve this problem. He said that in order to read well a familiarity with letter-sound relationships is important, but that the need for the reader to get meaning from the printed page is more important. To help children in getting meaning he thinks that teachers should guide them toward focusing upon semantic and syntactic features of sentences and then toward using that information to make predictions. "Hypothesis generation" should enable children to decode words without having to rely solely upon phonics. The process of making predictions means that the student must pay attention to meaning.

Ammon said that children trained in cloze are better able to predict what an unfamiliar word might be, since they are accustomed to using semantic and syntactic features and then looking for phonics to confirm their prediction. They are not dependent solely upon phonics to the exclusion of other cues. Frequent sounding-out, which not only interrupts the flow of reading but interferes with getting meaning, is therefore eliminated. Furthermore, using only phonics can yield incorrect decoding. Ammon said that "cathedral" could be decoded as "cat-he-dral" by a child who knows what the structure is but overemphasizes phonics. But by focusing upon semantics, the child who is focusing on semantic cues would not read "The children went ice cream" for "The children want ice cream," because it simply would not

make sense.

When a pupil makes syntactical or semantic errors, Ammon advised that the teacher ask the child whether what was read makes sense in order to prompt the reader to notice the proper cues. If the child is unable to correct the error after prompting, the teacher should initiate developmental lessons dealing with that problem. Such lessons may include cloze. Children may read cloze passages independently. To help children focus on the semantic and syntactic features without having to worry about reading the sentences, Ammon suggested that the teacher have them listen to the passages. Because semantic and syntactic cues often follow the blank, it is important that the children, whether reading or listening, take in the entire sentence. Therefore, when preparing a tape for listening, it is helpful to read the entire sentence, replacing the blank with the click of a toy cricket, the tinkle of a bell, or some other sound. Ammon also said that cloze exercises may easily be designed by teachers by using old basals and deleting words with a pen. The teacher needs only to diagnose the student's needs to decide which word to delete. All verbs may be deleted, or all nouns, or the teacher may choose to delete words at random. For example, every fifth word, regardless of what part of speech the word may be, could be deleted.

Ammon's ideas and suggestions for the use of cloze are very helpful. Some children do rely too much on phonics.

It is logical that exercises would be helpful in stressing the syntax and semantics of reading passages. What Ammon does not stress is that the reason children often resort to careful and sometimes laborious sounding-out of words is that too often children are placed in reading materials which are on their frustration level, rather than instructional level. If, however, the children are indeed in their proper instructional materials his comments are very relevant.

Mary Gove (1975) agrees with Ammon that cloze can be used to increase students' sensitivity to semantic and syntactic cues. She used the cloze procedure in a first grade classroom as a way of encouraging beginning readers to apply their understanding of "how language works" to written language. She said that since beginning reading programs introduce students to print, such programs tend to emphasize how to use graphic information when reading. Often all systematic instruction is aimed at teaching isolated words and ways to "attack words." In this way children are not encouraged to use the language's structure and grammatical patterns to comprehend written language. The program she used supplemented a basal program which taught the children graphic features of individual words. She felt the cloze procedure balanced her program because it encouraged the children to deal with the nature and complexity of the syntactic and semantic levels of language. As a result, comprehension of material was emphasized even

at the beginning stages of learning to read. Again, the objective was for the student to use syntactic and semantic information together with the graphic information to determine what the missing words were.

The cloze passages Gove used were less than seventy-five words in length. There were less than fifteen cloze blanks to complete in any one cloze device and usually less than seven blanks to complete. Such cloze passages are appropriate as teaching devices but are not long enough to be statistically reliable as tests of reading comprehension or passage readability. This is an important distinction between cloze used as a teaching device and cloze used as a testing device. A cloze passage suitable for one is not necessarily suitable for the other.

Mary Gove found that the type of deletion system used determined what aspects of the content were discussed. She used three different kinds of deletion patterns. When every nth (usually third or fifth) noun or verb (not auxiliary verbs) was deleted, the discussion focused on factual information in the passage. In addition, vocabulary characteristics of a subject were emphasized. For example, if the subject of the cloze passage was "Going to the Zoo," such words as "yak" and "zebra" were discussed in terms of how their denotations contributed to the meaning of the passage. Gove was aware that the second type of deletion system she used--that of deleting every nth word--has been found to be a better measure of comprehension of relationships

than cloze tests constructed by systematically deleting nouns or verbs. She attributes this finding to Rankin and Culhane as stated in their article "Comparable Cloze and Multiple-choice Comprehension Test Scores" in Journal of Reading (1969). This writer fails to find any discussion of varying methods of deleting words in cloze devices in that article. Rankin and Culhane constructed their cloze devices--which they used as testing devices--by deleting every fifth word. But at any rate, apparently Gove thinks that an every nth deletion system not only pinpoints vocabulary and factual items in the passage but also, because many function words are deleted, that it necessitates, therefore, getting relationships among words in the context of the sentence in order to replace words such as prepositions. That research has shown the every-nth deletion system to be a better measure of comprehension of relationships than cloze exercises constructed by systematically deleting nouns or verbs has already been referred to in Part I of this paper.

The third type of deletion system Gove used was that of deleting portions of words. Every nth noun or verb or every nth word was chosen to have letters deleted. The following systems of deletion of portions of words were used:

1. Only initial consonants, initial consonant blends, digraphs, or initial vowels were given and all other letters deleted
2. The letters mentioned above plus terminal consonants or terminal consonant digraphs were given and all other letters deleted

### 3. Only consonants were given and vowels deleted

An exact replication of the deleted word or synonym of the exact word was considered as to its possibilities for contributing meaning to the passage. However, when the deletion system was that of deleting portions of words, the students were almost always able to respond with an exact replication of the deleted word. Again, one may be in doubt as to whether Cove truly used cloze or a procedure one step removed from cloze, since more than just contextual clues--consonants and/or vowels--could be used in order to determine what the deleted words were.

Schneyer (1965) has also used cloze as a teaching technique. His investigation was undertaken to explore the effects of the cloze procedure upon the reading comprehension of sixth grade pupils. He prepared a series of two-hundred-word cloze exercises based on material from a basal reading series. After each exercise was completed, it was scored by the teacher and returned the same day or on the following day. Each exercise was reviewed and the correct choice for each blank was indicated. The papers were then returned and scores were recorded on a master sheet by the examiner. The pupils who had completed the cloze exercises did not show significantly greater improvement in reading comprehension than those who had not done the cloze exercises. Schneyer said that one explanation could be that practice in cloze exercises does not contribute to improvement in comprehension. However, he said

that it would seem that the skills involved in determining the precise word required for each blank in the cloze exercise should result in such improvement because in order to select the specific words for the cloze passage the reader must possess a knowledge of word meanings, must understand the main idea of the passage, must attend to details, and must make inferences and draw conclusions. All of these are important skills involved in reading comprehension. Since these comprehension skills are just as essential for comprehending a cloze passage as for comprehending any other reading matter, another explanation for the results of his experiment may be that merely filling in the cloze blanks and then checking for correct or incorrect answers does not provide the pupil with increased knowledge of comprehension skills as they function in a particular passage.

Schneyer concluded that the crucial factor which is involved in improving comprehension ability on cloze exercises is the reader's awareness of the reasons for the appropriateness of specific words for each blank in the passage. That is, in addition to checking the correctness of each response the pupils should also discuss the reasons for each choice. The clues from the passage's context, previous experience, or knowledge of language structure which the reader employs in selecting precise words for each blank should be verbalized. So Schneyer made the same criticism of his work that Jongsma made of it and others.

Schneyer's conclusion is probably correct. The situation involving cloze might be compared with a common procedure for improving reading comprehension in which the pupil reads a passage and then responds to questions calling for knowledge of word meaning, main ideas, important details, and conclusions. By merely checking right or wrong answers a pupil may not learn why a certain group of words contains the main idea and not another group of words, or why a certain conclusion may be drawn from the passage and not another conclusion. The reasons for the appropriate responses must be verbalized. Also, Skinner has shown the value of immediate reinforcement. If immediate reinforcement is so helpful in the learning process of other areas, it probably is a potent force in the area of cloze. When the cloze exercises are checked by the teacher, immediate reinforcement is impossible. Apparently, Schneyer did his best to return the papers as soon as possible. Had the responses been verbalized at the time that the papers were returned to the students, there would possibly have been a big change in the results of the experiment.

So cloze has been used in a variety of situations--in reading clinics and in regular classrooms--for various purposes. The cloze procedure has been found to be helpful in encouraging children to respond to what they read and even in giving children further skills in decoding messages in addition to phonics when they do not even get the factual information from their reading. For other readers cloze



has been given another twist by its combination with the language experience approach.

The language experience approach combined with the cloze procedure can be a useful technique in working with disabled readers of any grade level and with readers in the primary grades, particularly first grade. This is true because cloze exercises can be made from writings containing samples of the language of the very children who are doing the cloze exercises. Since the language experience approach provides material from the students' own language patterns, they are not faced with a mismatch between their oral language and the written language of the instructional materials. It is frequently true that such a mismatch is a hindrance in the developmental progress in achieving reading skills disabled readers need.

There is another plus factor to the language-experience approach--its motivational value. Most students like to read their own and other students' materials. Much of the time classroom teachers and reading specialists have difficulty in motivating students with reading problems. The motivational aspect of language-experience is a very positive feature which cannot be overlooked. With the teacher's guidance in a comfortable climate disabled or beginning readers can dictate or write very good stories that can be used in a variety of ways, one of which is in combination with the cloze procedure. Weaver and Bickley (1967) determined that subjects were more skillful in predicting

omissions from texts they had produced themselves than from texts produced by other subjects. Perhaps it is this motivational aspect that is the reason that readers can easily predict omissions from texts they themselves have produced.

Gove (1975) combined the language experience approach with the cloze procedure by making some of her cloze devices from experience stories written throughout the year. In a study conducted by Genevieve S. Lopardo (1975) graduate students in training at the Chicago State University Reading Center used the same kind of combination language-experience approach and cloze procedure but with disabled readers at all levels.

Various deletion systems have been used in language-experience materials. Both an every fifth word deletion pattern and a selected deletion pattern have been effectively used with students' language-experience stories. As in cloze exercises constructed from other sources the every fifth word deletion pattern is used primarily to focus on comprehension skill. The selected deletion pattern is used to focus on specific types of reading skills such as mastery of structural words, development of vocabulary, or development of phonic skills, depending on what words are chosen for deletion. For example, if a child is in need of help in mastery of structural words (those words such as articles, prepositions, and conjunctions) the teacher should prepare a cloze passage from one of the child's language-experience samples in which there is a good supply of structural words. A cloze passage which

focuses on vocabulary development is prepared by deleting certain words for which the child is instructed to insert synonyms or antonyms. Of course, the goal of the particular instruction should always be made clear to the child and directed instruction provided before the child is given the cloze passage. Lopardo stressed that certain language samples are suitable for particular types of cloze activities while others are not. Therefore, not all language samples are used with the cloze procedure. For example, a student's reading needs may be in the area of phonic skill development, and a particular language sample might not contain any or very few of the phonic elements in need of instruction. If a child's needs are primarily in the development of word meanings, a particular language sample might not contain enough words to develop a cloze passage in which the child is guided in inserting synonyms for selected words in the language sample. The teacher should decide if a language sample can be used in combination with the cloze procedure as part of the child's instructional program. Obviously, the language-experience approach combined with the cloze procedure cannot constitute the entire program of instruction but can be used effectively as a part of a total program aimed at meeting the specific needs of the child.

Ammon (1975) would agree with Gove and Lopardo that language-experience materials can be used beneficially for the purpose of making cloze exercises. As mentioned earlier, he is an advocate of cloze. He also likes the language-

experience approach because it is a method which emphasizes the use of the child's unique vocabulary and syntactic structures and therefore does not overrely on phonics. In dictating the stories the child employs the generative processes both in originating the story and in reading the story. Ammon should approve of the language-experience approach combined with the cloze procedure to help beginning readers, low achieving readers, and many Black and ethnic children who experience difficulty in reading.

Some users of the cloze procedure as a teaching technique use it in an attempt to improve general reading comprehension. Others use it to improve specific reading skills such as vocabulary development, use of structural words, etc. Another reading skill which may be developed with the use of cloze is recognizing contextual cues. Lopardo said that the cloze procedure is an excellent way to zero in on the development of contextual cues as aids in word recognition and in comprehension, since cloze passages force the reader to deal with the syntactic and semantic cue system of written language. Both are cue systems that any reader must master if he is to become a competent reader. Rankin and Overholser (1969) have demonstrated that the cloze procedure can be used effectively to diagnose intermediate grade students' sensitivity to context clues.

Rankin (1959) applied some of Skinner's concepts to cloze as it is used to develop comprehension of contextual clues. Skinner strongly advocated the use of immediate

reinforcement as an aid to learning. Even the delay of a few seconds between response and reinforcement reduces learning efficiency, he thought. Conventional reading exercises are subject to long delays between reading responses and knowledge of results. Students must first read the entire article and then read and answer all questions before reinforcement is given. Rankin said that cloze exercises can be constructed with an answer key so that the student can receive immediate reinforcement of each cloze response as he reads through an article. Of course, he said, if the student were only given a few such exercises, the only response that would be reinforced would be the particular words that were correctly guessed. This would be of no value from the standpoint of reading improvement if the purpose of the exercise is to enable the student to develop the skill of comprehending contextual clues. There would be no transfer to other reading situations. But if a sufficient number of exercises were given, sufficient repetition of various types of verbal contexts might be insured so that the student might form a generalization.

Rankin said that it would be better still if a really comprehensive classification of context clues could be worked out, so that the student could be taught these directly by having him not only to fill in a word but also to explain the reason for his guess. In each case, the answer key would provide immediate reinforcement of both word and type of context clue responses. Later, Jongsmá (1971) did report that the develop-

ment of classification schemes by which to categorize context clues had given researchers a framework in which to operate. These schemes were provided by Ames (1966), Moskowitz (1968), Quealy (1969), and Dulin (1968). These researchers have verified differences in difficulty between various context clues and also shown that grammatical classes function differently in combining with each contextual device. Jongsma said that it would appear that the cloze procedure could be employed to teach students the use of context clues. By using one of the classification schemes as a basis for organizing instruction, a series of cloze passages could be developed that would systematically and sequentially lead students to an understanding of specific context clues.

Another Skinnerian idea Rankin applied to the cloze procedure is the "vanishing" technique. This involves gradually reducing clues for responses until the correct responses can be made with a minimum of external stimulation. For example, in learning a poem, first one word would be deleted and the student would read the poem supplying the missing word. Then additional words would be "vanished" with additional repetitions until the whole poem could be recalled. Rankin said that the vanishing technique might be used with the cloze procedure in several ways. One possibility is to construct a number of cloze exercises from the same paragraph by deleting one out of ten words, one out of nine words, etc. Sensitivity to context clues might be developed by starting with a maximum amount of context and progressively reducing the number of available

clues. Again, exercises for different purposes could be constructed by varying the type of words deleted.

The cloze procedure as a teaching technique, then, has been used in various ways. The next chapter of this paper will turn to a discussion of how this author used cloze in her classroom.

## CHAPTER VIII

### THIS AUTHOR'S EXPERIENCE WITH CLOZE

Having read extensively on the cloze procedure, this author decided to explore the procedure in her own classroom. At the onset of the study of cloze it was decided to use the procedure as a teaching device for building the skill of using contextual clues to replace words that have been deleted from a reading passage.

The thirty highest-achieving students of the total sixty-nine students in the fourth grade at McKinley School in Harrisburg, Illinois were used in exploring the cloze procedure as it can be applied to teaching children to use contextual clues. These children came mostly from middle class families. They were white with the exception of one black student. Since only thirty students were used in my study (fifteen in each group), the findings of my exploration into cloze might not be widely generalizable. The sixty-nine students in the entire fourth grade had already been divided by achievement into three groups for reading instruction by three fourth grade teachers at the beginning of the year. The chief basis for the grouping was the recommendations of the third grade teachers. Some of the children were given informal reading inventories. The



intelligence quotients of the children in the highest of the three groups ranged from 105 to 130. The mean intelligence quotient in this highest level group was 120. The lowest score on the Reading Comprehension Subtest of the Iowa Tests of Basic Skills was 2.8, while the highest score was 7.0. The mean score was 5.0. The highest score on the Vocabulary Subtest of the Iowa Tests of Basic Skills was 6.2, and the lowest score was 4.2. The mean score was 4.8. The Iowa Tests of Basic Skills were administered in the third grade, sixth month. Therefore, their mean scores were well above their actual grade placement. These students began their work with cloze exercises and use of contextual clues in the fourth grade, fifth month.

The thirty students in this highest-achieving reading group were divided into two groups by the process of random sampling. Each population element (student) was assigned an identifying number from one to thirty. Then a table of random numbers--"Ten Thousand Randomly Assorted Digits" in Elementary Statistical Methods by Bloomers and Lindquist (1965)--was used in assigning the students to one of two groups. A starting place was chosen in the table, and the first number was selected. The remaining numbers were then selected in an orderly fashion by proceeding down the extreme left of each column until all thirty numbers appeared. The first fifteen numbers appearing in the table were assigned to Group One, the next fifteen to Group Two. One change was necessary. One student from another teacher's homeroom

was shifted from Group Two to Group One because he was in an independent study group which was absent on Wednesdays, when his group was supposed to meet. It was felt that the teacher could much more easily help someone from her own homeroom with make-up work than someone from one of the other two homerooms in the fourth grade. In his place from Group One was placed a student from her own homeroom in the same independent study group. Thus the group working with the cloze exercises--Group One--met on Monday, and the other group--Group Two--met on Wednesday. These groups met for thirty minutes once a week for a total of six weeks. While Group One performed cloze exercises, the other group followed the traditional procedures of learning to use the context as outlined by the basal reader, which consisted of doing Independent Practices, doing workbook pages, and receiving instruction from the teacher as given to her by the teacher's manual accompanying the basal reader. An example of this type of work appears in Appendix B. The basal reader used for instruction was Kaleidoscope of the Houghton Mifflin Series (1971). However, the cloze exercises were constructed from another basal reader, Basic Reading of the Lippincott Series (1965), a fifth-grade book. The cloze exercises employed with Group One appear in Appendix A.

The cloze exercises were made from the first three stories of the book: "The Voyage of Columbus," "Stephen Decatur and the Barbary Pirates," and "A Dog Named Spike." Two readability formulas--the Fry Readability Formula (1968)

and the Dale-Chall Readability Formula (1948)--were applied to the passages of the stories from which the cloze exercises were made. The resulting grade levels are shown in table 5. The computed formula raw score for the story passage "Stephen Decatur and the Barbary Pirates" was very low in the 9-10th grade range. Had the score been rounded down instead of up the readability level for the passage would have been 7-8th grade. These grade levels seem to indicate that the stories that the publishers have placed in this "fifth grade book" are from one to four grade levels advanced in difficulty.

TABLE 5

THE READABILITY LEVEL OF EACH OF THREE STORY PASSAGES  
AS DETERMINED BY TWO READABILITY FORMULAS

Name of Story	Fry Readability Formula	Dale-Chall Readability Formula
"The Voyage of Columbus"	7th grade	7-8th grade
"Stephen Decatur and the Barbary Pirates"	6th grade	9-10th grade
"A Dog Named Spike"	7th grade	7-8th grade

As is customary, for each cloze exercise a few sentences were left intact at the beginning and the end of the passage in order to provide the reader some background as to the subject matter of the story and to give some sense of completion. The first paragraph of each story was kept intact, and the paragraph in which the last deletion appeared was

completed. The cloze exercise never ended in the middle of the paragraph. Each cloze exercise contained fifty deleted words. Each deleted word was represented by a blank space of fifteen spaces. Since the blanks were of equal length, the size of the blank was no clue as to the length of the word. Every fifth word excluding proper nouns was deleted. Proper nouns were excluded from consideration for deletions because the proper nouns--such as names of African countries, volcanoes, and islands--would have been very difficult to match without the students' having had extensive background information before reading the story. Since only thirty minutes each week were spent in instruction, time did not permit that this much background information be given. In the first two cloze exercises a deletion pattern of every fourth, ninth, fourteenth, etc. words was employed. In the third cloze exercise a deletion pattern of every fifth, tenth, fifteenth, etc. word was used.

The pupils were given a cloze exercise and instructed to read the first paragraph. After they had read the paragraph, some discussion was initiated in order to provide motivation for doing the cloze exercise. Since we had only thirty minutes to devote to the cloze exercise, this motivation proved very important in getting the cloze exercise done, as it had to be completed outside of classtime. After the discussion the pupils were given time to work on the cloze exercise, and a small part of each pupil's exercise was checked individually before the end of the period to give

the pupil a good start. If flagrant errors were made, the reason for the answers being wrong were discussed. Together teacher and pupil pointed out parts of the context that pointed to more logical words which would better fit the context. The first cloze exercise, constructed from "The Voyage of Columbus," required much practice. It took some time for the children to get used to "clozing" the blanks, their never having such an exercise before. Of course, they had had similar exercises in which they were to fill in blanks, but never an exercise in which every fifth word is systematically deleted. The children were instructed to guess what word fit into each blank. They were told that they could place only one word in each blank. The students were not allowed to read the short story from which the cloze exercise was taken beforehand because it was felt that they would have relied heavily upon their memory of the sequence of words, having read the passage beforehand. Therefore, the students would not have relied upon the context in order to help them figure out what words belong in the spaces. During the administration of the first cloze exercise much effort was made in order to help the children adjust to this new type of instruction. During the first cloze exercise the teacher did quite a bit of talking, directing, and evaluating. However, at the onstart of the second lesson the children were told that they would evaluate their own answers and that the group would be responsible for rejecting or accepting an answer. Therefore, the teacher became a

resource person only to be used when the children wished to know "the" word which was in the original passage without deletions.

There was no time limit imposed on the cloze exercise. The children could take the cloze exercise back to their homerooms and home if they wished in order to complete it. The cloze exercises were given to them on Monday and were to be returned on Wednesday. The cloze exercises were then read by the teacher and exact matched words were circled. They were returned the following Monday. The children noted the exact matches, and other answers were offered, discussed and then accepted as contextually appropriate substitutions for the exact match or rejected as contextually unacceptable responses. The teacher refrained from imposing her opinions on the children but instead listened to the children's comments and asked them to support their statements with evidence gained from the context of the passage. Acceptance or rejection of a response was decided upon by consensus of the group, including teacher and students. Responses for each blank were discussed, and the students were asked to verbalize their reasons for their responses. The teacher led these discussions by asking such questions as these: "Why did you choose this word rather than this one?"; "What word or groups of words--part of the context--indicate to you that this word should be placed in the blank?"; "What other word could be placed in the blank?"; "How does your word complete the meaning of the passage?"; "When your

word is in the sentence, what does the sentence (or passage) mean?"; "Does the meaning change when another word is used?"; "How does your word contribute to the meaning in a way that is different from the intent of the author?" Thus, the teacher led the students to understanding the process involved in selecting appropriate words for the blanks. There was never any question as to what the goal of the instruction was. The teacher made a conscious effort to keep foremost in the minds of the pupils that they were to use the context as an aid in determining what word went in a blank.

Pretesting and posttesting were accomplished by using pages from the Houghton Mifflin workbooks. Having used an earlier edition of the Houghton Mifflin Series (1966), plenty of workbooks were available. Pages from three workbooks were employed. An equal number of pages from the fourth, fifth, and sixth grade workbooks were used for pretests. Posttests were constructed in the same way. Assuming that the workbook pages grew in difficulty as the workbook progressed, there was an effort to make the pretest and posttest as nearly equal in difficulty as possible. So all the pages in the fourth grade workbook on using the context were torn out. The page which appeared first in order became a part of the pretest, the second page, a part of the posttest, the third page, a part of the pretest, etc. The pretest and posttest contained the same number of possible correct answers. Table 6 shows the results of the

pretest and posttest. An example of a workbook page included in the tests is shown in Appendix C. Jongsma said that using crude gains, measured by the posttest minus pretest technique as an assessment of growth is probably one of the most unreliable ways to measure student progress because crude gains are particularly vulnerable to the effects of regression. Also, the testing device itself--pages from workbooks--present a problem in assessing student growth. These may not be valid and reliable testing devices. Jongsma pointed out that even the validity and reliability of standardized tests which purportedly measure reading comprehension or general reading ability are questionable. The total pretest and posttest scores and their differences are shown in table 7.

TABLE 6

PRETEST AND POSTTEST SCORES  
NUMBER OF INCORRECT ANSWERS

Student Number	Group One		Student Number	Group Two	
	Pretest	Posttest		Pretest	Posttest
1	23	11	16	47	27
2	31	31	17	28	20
3	35	28	18	17	23
4	17	18	19	28	24
5	23	13	20	24	25
6	36	17	21	32	20
7	45	48	22	18	12
8	29	27	23	26	17
9	36	44	24	12	16
10	6	5	25	16	15
11	23	24	26	48	26
12	21	20	27	35	19
13	26	16	28	8	10
14	14	19	29	25	14
15	20	15	30	5	10



TABLE 7  
TOTAL PRETEST AND POSTTEST SCORES  
AND DIFFERENCES BETWEEN THEM

Group	Pretest	Posttest	Difference
One	385	336	49
Two	369	278	91

Soon after we began to work on the cloze exercises, it became obvious that the instruction employed could not be restricted merely to instruction in using the context. Many other skills came to the foreground. Many factors must be considered in order to arrive at a word that is correct not only semantically but also syntactically. A discussion of these factors follows.

Cloze necessarily affords the teacher an opportunity to help the children to build vocabulary. The student who puts "of" in the following sentence may not understand the meaning of "blockade:" "In 1803, Commodore Preble took command of the United States fleet in the Mediterranean, and \_\_\_\_\_ a blockade of Tripoli." Here the students are not only given a chance to learn a new word, but also to note that punctuation is helpful in ferreting out the meaning of a passage. The comma in that sentence is very important. It becomes unnecessary if "of" is placed in the sentence. The child who puts "been" in the following sentence does not understand the meaning of

"frigate:" "The ruler of Tripoli, called the Bashaw, complained that the United States had \_\_\_\_\_ a frigate to Algiers. . ." Therefore, the dictionaries were made use of from time to time by the children when they met a new word.

Shades of meaning, multiple meanings, and nuances also come into play when students try to choose the one best word to place in a blank. For example, in the sentence "The ruler of Tripoli, called the Bashaw, complained that the United States had given a frigate to Algiers, and that Tunis had received valuable presents, \_\_\_\_\_ he had received none," more than one word could be appropriate. The exact match, the one in the original passage, is "though." However, "while" and "when" were suggested for use in the blank. "When" was rejected by some students who obviously had never used the word except in situations indicating time, having never used the word defined as "although; whereas; while on the contrary." The children also became cognizant of the fact that certain words are used in juxtaposition, while others are not. For example, the opening sentence of "A Dog Named Spike" required "clozing" on "particles" after "frost." One student, thinking of "snowflakes, put down flakes to go with "frost." However, the group consensus was that the word "flakes" is not usually used with "frost." Therefore, vocabulary was not only extended but existing vocabulary was further refined with the addition of other meanings for words previously used

in a different way. Being able to fill in the cloze blanks requires such a sensitivity to the subtleties of the meanings of the passage that practice in doing so should increase comprehension, as the students strive to put in words that fit the meaning of its context. For example, in some sentences of "Stephen Decatur and the Barbary Pirates" a blank may be supplied with "ship." In trying to expand the possibilities which might be appropriate in the blanks the students arrived at other general words such as vessel and then other specific words such as "ocean liner" and "frigate." Such a sensitivity to shades of meanings can be developed with use of the cloze procedure.

At times cloze may encourage research. For example, "vessel" in the following sentence is a broad, indefinite word: "Just at that time, the Philadelphia, a \_\_\_\_\_ of forty-four guns, one of the best ships in the navy, while pursuing a huge vessel, struck a reef of rocks in the harbor of Tripoli, and was uplifted four to five feet." Research might be done into the various kinds of vessels in an attempt to find one which might carry forty-four guns. Children might be motivated to use resource persons in doing their research. One student placed "frigate" in the preceding cloze sentence because she consulted her father, formerly in the navy. Some children were dissatisfied to merely fill in the blanks. They wanted to know in what encyclopedia they should look in order to learn more about the Philadelphia and Stephen Decatur.

Filling in cloze blanks also gives the teacher an opportunity to teach parallel construction. For example, the child who puts "but" in this sentence has not developed the skill of recognizing parallel construction: "The ruler of Tripoli, called the Bashaw, complained that the United States had given a frigate to Algiers, and that Tunis had received valuable presents, \_\_\_\_\_ he had received none." The teacher can lead the students to an understanding that a "but" in the blank would require a "that" following it. Writing the parts of the sentence which are parallel on the board, one under another using "but" in the third line instead of the exact match led the children to an awareness that a third "that" is necessary to make all three constructions parallel.

The students also learned about parts of speech and their location in sentences. One student wanted to put the word "brightly" in the sentence: "On an early December morning a wet, heavy fog rose up from the Antarctic Sea while the air sparkled with frost \_\_\_\_\_." Other students thought brightly did not sound right in the context of the sentence, though they did not know or could not explain why the word did not sound right to them in the sentence. The teacher upon request then had a chance to tell the class that modifiers--words that tell how, when, or where--are placed as closely as possible to the verb modified.

Filling in cloze blanks also gives the teacher an opportunity to teach tense of verbs, that a writer should not change tenses in a passage. For example, in the sentence "Later, the ruler of Tripoli informed the American consul there that he \_\_\_\_\_ wait six months for a present in money, and if it did not arrive within that time, he would declare war against the United States," the word "will" does not fit the syntax of the sentence. The children must learn to look at the future from different points in time. After careful thinking they can see that "will" is correct if one is seeing the future from the present but that "would" is correct if the future is seen from the past.

Being able to correctly fill in the blanks requires a sensitivity to the author's style and the tone of the passage. Therefore, the children might have done better had all the cloze exercises been taken from one book rather than passages from various short stories by different authors. An English teacher--literature teacher--who is interested in her students familiarizing themselves with a particular author's style might use cloze to her advantage. But cloze can also be used to stress the literary style of an author to fourth graders. When a student says "But that sure isn't the way I'd say it!" there exists the opportunity to discuss how the styles of writing of various writers differ. Since this writer's investigation into cloze involved three passages written by different authors, the students did not go deeply into style, but it appears that so doing could be

possible in an extensive study of writings by one author.

An author's style of writing results from his repetitious use of a particular set of language patterns. Therefore, this author is convinced that the recognition of redundant elements--or what Kingston and Weaver called the "redundancy utilization factor"--has much to do with a reader's being able to detect literary style and supply blanks with words. Earlier in this paper an excerpt from a poem by Walt Whitman was quoted in order to point out redundancy of words. However, one does not have to resort to poetry to show that English is indeed redundant. In the sentence "The man is coming toward me," two words carry the main thrust of the meaning: man and coming. "Toward me" merely reinforces "coming." Anaphora within paragraphs and longer passages is even more frequent. For example, consider this passage from The Cricket in Times Square:

"What's the matter?" asked Tucker.

"I don't feel like playing," said Chester.

"You don't feel like playing!" the mouse exclaimed.

"That's like the sun saying, 'I don't feel like shining.'" The words "feel like" appear three times. The words "feel like playing" appear twice. Had a blank appeared in place of shining--"That's like the sun saying, 'I don't feel like \_\_\_\_\_.'" contextual clues very strongly suggest "shining." Anaphora are words or phrases which refer back to an earlier word or phrase in a passage. The use of anaphora may indicate the extent to which a passage deals

in depth with a single topic, but also the style of a writer.

As the author was working on this paper, she often photocopied in the library entire articles on cloze in order to be able to read them at home. Once in a while it happened that the book would not be lying flat so that the letters at the ends of the lines did not copy. The writer herself was then faced with something of a cloze exercise to complete. Without the aid of the context she would never have been able to comprehend the passages due to their being incomplete. Redundant elements did their part in helping her do this.

In contrast to closure in reading passages it is only logical to assume that there exists an opposite phenomenon which could be labelled "openure." Every teacher has heard children leave out words when reading orally. These children often have ferreted out the meaning of the passage without reading those words, do not even act as though they realize they left them out, and see no significance in them after their attention has been called to the fact that they indeed have left them out. What the children are doing is unconsciously reducing the verbage--redundant elements--to its bare essentials to express a meaning. So both cloze and its opposite seem to exist.

## CHAPTER IX

### CONCLUSION

Certainly much more research on cloze should be done. It is obvious to this writer that cloze has its place in the teaching of reading and that the value of it cannot be doubted. In Part II of this paper the teaching--rather than testing--side of cloze has been explored. This author attempted to use cloze in a teaching situation so that students could build their skills in using the context to supply blanks with words. This attempt was thwarted because of the many factors which entered into the process of considering words. Isolating one factor which is responsible for obtaining exact or synonomous answers to cloze exercises is impossible if the word is to be both semantically and syntactically appropriate.

If students are guided in using parts of a sentence which surround a deleted word to ascertain what word it is, then it is only logical that this guidance should build students' skills in using contextual clues to determine unknown words and their meanings. However, pretest and posttest scores seemed to show that instruction in cloze does not build this skill as well as the traditional route of teaching using the context as provided by basal readers. One reason, then, for the lower score of the group trained



in cloze is that the cloze group got instruction in such a variety of skills that the time spent on using the context was reduced. Another explanation might be that the students' pretest and posttest were more similar to the instruction Group Two received than the cloze instruction Group One received, as a comparison of Appendix A, Appendix B, and Appendix C show.

Another reason that the score was lower might be that the stories from Basic Reading, even though the book was graded fifth grade, were too difficult for cloze instruction. The Dale-Chall and Fry readability levels for all three stories were higher than fifth grade. There is a great difference, then, in the publisher grading and the readability levels as determined by the formulas of Fry and Dale and Chall. The percent of correct answers on the cloze exercise "A Dog Named Spike" of Group One was only thirty-one percent, which is short of previously quoted minimum percentages necessary to qualify for instructional materials. The time spent on each kind of instruction--thirty minutes per week for six weeks--seemed woefully inadequate, especially since each cloze exercise took two weeks. One can conclude that to see gains in the skill of using the context from cloze instruction, instruction should be given the entire year. In view of the many skills that can be taught cloze is a very versatile teaching method.

So Rankin showed foresight in 1959, cloze still in its infancy, when he said, "The fact is that reading

specialists are only beginning to learn about the cloze procedure. Since it has only recently emerged from the research laboratory it has yet to pass the 'acid test' on the clinical field of action. However, granting the limitations of our present knowledge, the writer feels confident in predicting that, as more clinicians learn about the cloze procedure, it will pass this test with the greatest of ease. With its tremendous potential as a diagnostic and remedial tool in reading, it cannot fail." Still, in 1976 much remains to be learned about cloze.

## APPENDIX A

### CLOZE EXERCISES

#### "The Voyage of Columbus"

At daybreak on Friday, the third of August, 1492, Christopher Columbus embarked in the largest of his three barks, the Santa Maria, over which he raised his flag as admiral of an unknown sea.

The people came down to the shore in crowds to be present at the departure on a voyage from which it was supposed there would be no return. There was more sorrow than hope, more tears than hurrahs.

Of the three (vessels), only one had a (deck), and that one was (already) old and weatherbeaten. The (others) were open boats, which (a) heavy breaker might have (swamped).

Beyond the Canary Islands, the appearance (of) the peak of Teneriffe--a (volcano), whose eruption lit up (the) heavens, and was reflected (on) the sea--terrified the (seamen). They thought they saw (in) it the flaming sword (of) the angel who expelled (the) first man from Eden, driving (them) back from forbidden seas (and) lands.

The Admiral passed from \_\_\_\_\_ (ship) \_\_\_\_\_ to ship, explaining to \_\_\_\_\_ (these) \_\_\_\_\_ simple people the cause \_\_\_\_\_ (of) \_\_\_\_\_ the volcano. But the (disappearance) of the volcano's peak, \_\_\_\_\_ (as) \_\_\_\_\_ it sank below the \_\_\_\_\_ (horizon) \_\_\_\_\_, caused them as much \_\_\_\_\_ (sadness) \_\_\_\_\_ as the eruption had \_\_\_\_\_ (caused) \_\_\_\_\_ them fright. It was \_\_\_\_\_ (their) \_\_\_\_\_ last beacon, the farthest \_\_\_\_\_ (seamark) \_\_\_\_\_ of the Old World. Losing sight \_\_\_\_\_ (of) \_\_\_\_\_ it seemed to be \_\_\_\_\_ (losing) \_\_\_\_\_ the last traces of \_\_\_\_\_ (their) \_\_\_\_\_ road through space.

Again \_\_\_\_\_ (the) \_\_\_\_\_ Admiral called them around him \_\_\_\_\_ (in) \_\_\_\_\_ his own ship, and \_\_\_\_\_ (described) \_\_\_\_\_, as if he had \_\_\_\_\_ (already) \_\_\_\_\_ seen them, the lands, \_\_\_\_\_ (the) \_\_\_\_\_ islands, the seas, the \_\_\_\_\_ (riches) \_\_\_\_\_, the plants, the sunshine, \_\_\_\_\_ (mines) \_\_\_\_\_ of gold, sand covered \_\_\_\_\_ (with) \_\_\_\_\_ pearls, the mountains shining \_\_\_\_\_ (with) \_\_\_\_\_ precious stones, the plains \_\_\_\_\_ (loaded) \_\_\_\_\_ with spice, to which \_\_\_\_\_ (every) \_\_\_\_\_ wave was carrying them \_\_\_\_\_ (nearer) \_\_\_\_\_ . These pictures gave hope \_\_\_\_\_ (to) \_\_\_\_\_ the discouraged sailors.

The \_\_\_\_\_ (sight) \_\_\_\_\_ of a heron and \_\_\_\_\_ (of) \_\_\_\_\_ a tropical bird which \_\_\_\_\_ (came) \_\_\_\_\_ the next day and \_\_\_\_\_ (flew) \_\_\_\_\_ around the masts comforted \_\_\_\_\_ (the) \_\_\_\_\_ men. These two land \_\_\_\_\_ (birds) \_\_\_\_\_ could not live on \_\_\_\_\_ (an) \_\_\_\_\_ ocean where there were \_\_\_\_\_ (no) \_\_\_\_\_ trees, no grass, and no fresh water near. The mild climate of that part of the ocean, the transparent water, the

dolphins playing across their bows, and the brilliant stars, all comforted the sailors.

"Stephen Decatur and the Barbary Pirates"

Long before the discovery of America, the Barbary States, on the northern coast of Africa--Morocco, Tunis, Tripoli, and Algiers--were in the habit of sending out pirate ships to seize the goods of any vessels captured in the Mediterranean. For protection, all the great sea powers of Europe had long been bribing these pirates by sending them tribute money--presents, the pirates called it. The American Government, too, at one time paid money to these states.

But this did \_\_\_\_\_ (not) \_\_\_\_\_ serve to protect the American \_\_\_\_\_ (vessels) \_\_\_\_\_. The ruler of Tripoli, called \_\_\_\_\_ (the) \_\_\_\_\_ Bashaw, complained that the United States had \_\_\_\_\_ (given) \_\_\_\_\_ a frigate to Algiers, and \_\_\_\_\_ (that) \_\_\_\_\_ Tunis had received valuable presents, \_\_\_\_\_ (while) \_\_\_\_\_ he had received none. \_\_\_\_\_ (Later) \_\_\_\_\_, the ruler of Tripoli informed \_\_\_\_\_ (the) \_\_\_\_\_ American consul there that he \_\_\_\_\_ (would) \_\_\_\_\_ wait six months for \_\_\_\_\_ (a) \_\_\_\_\_ present in money, and \_\_\_\_\_ (if) \_\_\_\_\_ it did not arrive \_\_\_\_\_ (within) \_\_\_\_\_ that time, he would \_\_\_\_\_ (declare) \_\_\_\_\_ war against the United States. No \_\_\_\_\_ (tidings) \_\_\_\_\_ of the money reached Tripoli, \_\_\_\_\_ (and) \_\_\_\_\_ the flagstaff of the American \_\_\_\_\_ (consul) \_\_\_\_\_ was cut down in May, 1801. \_\_\_\_\_ (That) \_\_\_\_\_ was a declaration of \_\_\_\_\_ (war) \_\_\_\_\_.

In 1803, Commodore Preble took command of \_\_\_\_\_ (the) \_\_\_\_\_ United States fleet in the Mediterranean, and \_\_\_\_\_ (declared) \_\_\_\_\_ a blockade of Tripoli. Just \_\_\_\_\_ (at) \_\_\_\_\_ that time, the

Philadelphia, a (frigate) of forty-four guns, one (of) the best ships in (the) navy, while pursuing a (pirate) vessel, struck a reef (of) rocks in the harbor (of) Tripoli, and was uplifted four (or) five feet. All attempts (to) force the vessel off (the) rocks were useless. The (enemy's) gunboats were growing bolder (every) minute, and night was (at) hand. Finally, Captain Bainbridge, the commander (of) the Philadelphia, saw that it (was) his duty to haul (down) the flag, to save (the) lives of his man. (The) ship had no sooner (struck), than the pirates rushed (into) the vessel and began (to) plunder their captives. These (were) hurried into boats, and (sent) to Tripoli to be put (into) prison.

The misfortune that (befell) the Philadelphia strongly encouraged the (ruler) of Tripoli to continue the (war) in the hope of (receiving) high ransom for (the) prisoners. The pirates got (the) Philadelphia off the rocks, partially repaired her, remounted her guns, and moored her off the town about half a mile from the Bashaw's castle. There was little doubt of her being sent out as a cruiser as soon as the mild season came. As such, she would be a great menace to American shipping.

### "A Dog Named Spike"

This is the story of an Eskimo sledge dog named Spike. He is the bravest, finest dog I have ever known and in saying that I am not unmindful of many other fine Huskies I have seen and handled. Spike won his fame in the Antarctic, serving men who explore "round the pole." To this very day he is spoken of whenever adventurers meet and set pipes glowing cozily while they talk over the glorious days that are past. But first let me give you a picture of the land where Spike and his fellows struggled gallantly for their masters. It's the strangest, most dreary spot on the whole globe.

On an early December morning \_\_\_\_\_ (a) \_\_\_\_\_ wet, heavy fog rose \_\_\_\_\_ (up) \_\_\_\_\_ from the Antarctic sea while \_\_\_\_\_ (the) \_\_\_\_\_ air sparkled with frost \_\_\_\_\_ (particles) \_\_\_\_\_. Two small ships moved \_\_\_\_\_ (cautiously) \_\_\_\_\_ through the slush ice \_\_\_\_\_ (as) \_\_\_\_\_ though feeling their way \_\_\_\_\_ (among) \_\_\_\_\_ hidden dangers. And danger \_\_\_\_\_ (there) \_\_\_\_\_ was, too, for here \_\_\_\_\_ (was) \_\_\_\_\_ the home of the \_\_\_\_\_ (giant) \_\_\_\_\_ icebergs. These boats carried \_\_\_\_\_ (the) \_\_\_\_\_ men and supplies of \_\_\_\_\_ (the) \_\_\_\_\_ Byrd South Polar Expedition and every one of \_\_\_\_\_ (us) \_\_\_\_\_ on board stood tense \_\_\_\_\_ (and) \_\_\_\_\_ eager, straining for the \_\_\_\_\_ (first) \_\_\_\_\_ glimpse of the land \_\_\_\_\_ (toward) \_\_\_\_\_ which we had been \_\_\_\_\_ (steaming) \_\_\_\_\_ for many weary months.

\_\_\_\_\_ (Suddenly) \_\_\_\_\_ a slight breeze sprang \_\_\_\_\_ (up) \_\_\_\_\_. Its coming seemed to \_\_\_\_\_ (increase) \_\_\_\_\_ the feeling of



tenseness (aboard) ship. Then came the (signals) which sent all hands (into) action.

"Clang--clang-clang." Almost simultaneously (the) bells in each engine (room) rang out, signals to (stop), then go slow astern.

(The) captains were taking no (chances). The breeze, mild and (gentle) though it was, might (easily) send a great berg (swirling) out of the fog (and) hurl us crashing to (the) bottom. Now the mists (began) to weave and spin (before) the wind, twisting like (tattered) streamers of silk. In (only) a few minutes the (fog) lifted entirely and there (before) us, not more than (a) mile distant, stretched the Antarctic (continent).

There wasn't a man (on) board, from Admiral Byrd down to (the) youngest deckhand, who had (not) spent hours reading all (about) the Antarctic. Every story, every (picture), every exploration account ever (recorded) had been studied until (we) knew them all by (heart). We imagined that when (at) last we saw the (great) icy wastes which surrounded the South Pole, we could then say proudly, "I remember that section. Amundsen described it just so," or, maybe, "Captain Scott and Sir Ernest Shackleton wrote that the Antarctic looked just as we are seeing it now."

But somehow it didn't exactly work out like that. Somehow it was different, different in that it was far more wonderful than any pen could describe.

## APPENDIX B

### INDEPENDENT PRACTICE 36

#### Using Context to Get Meaning

As you read the following story, use the context to help decide on the meaning of each underlined word, each time it is used. Listed below the story are those underlined words and three different meanings with which each word is used. On the line before each meaning, write the number of the paragraph in which the word was used with that meaning. The first one has been done for you.

1. Jimmy Clark had something to tell the class as they planned their field trip. His hand wagged around until he was called on.

2. "Last year," Jimmy began, "Mrs. Reilly, our teacher, would post a notice about anything special we were going to do. She'd always draw a funny cartoon, too, so the kids would get interested and want a hand in what was going on.

3. "One time we planned this real neat picnic. All the boys picked out the games, like races, a 50-yard dash, and softball. Every time we had a ball-game, Jane Matthews would be one of the captains. Even though she was only a girl she could really belt that ball. We'd always bank on her for at least one homer.

4. "The girls wrote the names of foods on slips of paper. Each girl would draw a slip and bring whatever it said. The dash of salt in Kay's potato salad turned out

rain would dash all our fine plans. But by the time the driver found a place to park the bus, the sun was out.

6. "Mrs. Reilly found a spot to have our lunch right on the bank of a creek, and there was a fence post nearby that made a great finish-line for our races.

7. "The girls went to put the food on a picnic table, and then we had that softball game. Jane got two homers for her team, and the game ended in a draw when Bill and Joe knocked in runs for the other side. They almost won but Bill's belt broke. He had to slow down and was put out.

8. "Just as we finished the last bite of food, it began to rain. The bus got stuck in the mud and a park ranger had to give us a hand. He showed us his quarters in a real neat log cabin, and then we saw his post on a watchtower. The tower was in a belt where trees had been cleared as a fire break.

9. "On the bus ride home,

to be a boxful. Nobody could eat it. Four boys got into one cake, cut it into quarters, and gobbled it up before we left.

5. "On the way to the park, the sky got so dark we thought

Tony showed us two quarters he'd found and said he'd treat us to some candy. But Mrs. Reilly told him he'd better put the money in the bank.

- |             |                              |  |                                      |
|-------------|------------------------------|--|--------------------------------------|
| 1. bank     | _____ a place to keep money  | _____ land next to water                   | _____ depend on                      |
| 2. belt     | _____ a strip of leather     | _____ a strip of land                      | _____ strike or hit                  |
| 3. dash     | _____ a short race           | _____ to spoil or ruin                     | _____ a small amount                 |
| 4. draw     | _____ to make a picture      | _____ a tie score                          | _____ take by chance                 |
| 5. hand     | _____ the end of the arm     | _____ a part or share                      | _____ help or aid                    |
| 6. post     | _____ a short, upright pole  | _____ to place something so it may be seen | _____ the place where one is on duty |
| 7. quarters | _____ coins worth \$.25 each | _____ a place to live                      | _____ four equal parts               |

## APPENDIX C

### HELP SAVE THESE BIRDS!

As you read the article below, use the context to figure out the meaning of any word that may be new to you.

Whooping cranes are now so rare that most people have never seen one. Yet, a hundred years ago in some parts of America, they sometimes flew overhead in such legions that they darkened the sky. Since then, so many millions have been killed that this species of bird is in danger of becoming extinct. There is now believed to be just one flock of whooping cranes left in the world.

These huge birds spend both summer and winter in wild, marshy areas. In the summer they nest in northern Canada. When September comes, they start migrating to their winter feeding grounds in a national wildlife refuge near Rockport, Texas. Because they fly in small groups, it is usually January before they all arrive. In April they head back north again.

In both their summer and winter homes, whooping cranes are so inaccessible for most of their enemies that they are rarely molested. Only while

they are migrating are they in serious danger. Their very large white bodies make them so conspicuous that they are easily spotted. Furthermore, the fact that they do not rest in trees but on the ground makes them very likely to be slaughtered by prowling wild animals.

Shooting whooping cranes is prohibited by law. No real sportsman would knowingly shoot so rare a bird anyway. However, careless hunters sometimes mistake whooping cranes for other large game birds and kill them erroneously.

A campaign to protect these birds while they are migrating has been started. It is important to keep track of each bird as it travels. Newspapers and radio announcers have issued pleas for help in doing this. If you should see a whooping crane, you can help by writing to the manager of the Chamber of Commerce in Rockport, Texas.

The following words may have been new to you. At the right of each are four numbered meanings. Decide which is right for each word as used in the report. In front of each word, write the number of the meaning you chose.

legions	1. pairs	2. small groups	3. great numbers	4. soldiers
species	1. kind	2. size	3. color	4. flock
extinct	1. too numerous	2. wiped out	3. disease-ridden	4. unusual
migrating	1. nesting	2. feeding	3. walking	4. traveling
inaccessible	1. invisible	2. out of reach	3. unheard of	4. tough
molested	1. fed	2. helped	3. harmed	4. chosen
conspicuous	1. invisible	2. plain to see	3. noisy	4. restless
slaughtered	1. killed	2. avoided	3. defended	4. pursued
prohibited	1. allowed	2. encouraged	3. uncovered	4. forbidden
erroneously	1. purposely	2. quickly	3. mistakenly	4. easily
campaign	1. plan	2. pond	3. refuge	4. magazine
pleas	1. excuses	2. requests	3. regrets	4. thanks

## SELECTED BIBLIOGRAPHY

- Ames, W. S. "The Development of a Classification Scheme of Contextual Aids." Reading Research Quarterly 2 (Fall 1966): 57-82, cited by Jongsma, Eugene. The Cloze Procedure as a Teaching Technique. Newark, Delaware: The International Reading Association, 1971.
- Ammon, Richard. "Generating Expectancies to Enhance Comprehension." The Reading Teacher 29 (December 1975): 245-249.
- Betts, Emmett. Foundations of Reading Instruction. New York: American Book Company, 1954.
- Bickley, A. C.; Ellington, Billie J.; and Bickley, Rachel T. "The Cloze Procedure: A Conspectus." Journal of Reading Behavior, 2 (1970): 232-234.
- Bloomers, Paul, and Lindquist, E. F. Elementary Statistical Methods. Boston: Houghton Mifflin Company, 1960.
- Bormuth, John R. "Experimental Applications of Cloze Tests." Proceedings of the International Reading Association 9 (1964): 303-306.
- Bormuth, John R. "Optimum Sample Size and Cloze Test Length in Readability Measurement." Journal of Educational Measurement 2 (June 1965): 111-116.
- Bormuth, John R. "Validities of Grammatical and Semantic Classifications of Cloze Test Scores." Proceedings of the International Reading Association 10 (1965): 283-286.
- Bormuth, John R., and MacDonald, O. L. "Cloze Tests as a Measure of Ability to Detect Literary Style." Proceedings of the International Reading Association 10 (1965): 287-290.
- Bormuth, John R. "Comparable Cloze and Multiple-Choice Comprehension Test Scores." Journal of Reading 10 (February 1967): 291-299.

- Bormuth, John R. "New Developments in Readability Research." Elementary English 44 (December 1967): 840-845.
- Bormuth, John R. "The Cloze Readability Procedure." Elementary English 45 (April 1968) 429-436.
- Bormuth, John R. "Cloze Test Readability: Criterion Reference Scores." Journal of Educational Measurement 5 (Fall 1968): 189-196.
- Burmeister, Lou E. "A Chart for the New Spache Formula." The Reading Teacher 29 (January 1976): 384-385.
- Coleman, E. B. "Experimental Studies of Readability, II." Elementary English 45 (1968): 317-325, cited by Bickley, A. C., Ellington, Billie J., and Bickley, R. T. "The Cloze Procedure: A Conspectus." Journal of Reading Behavior, 2 (1970): 232-234.
- Coleman, E. B. and Aquino, M. R. Communications Project. Project in Progress at the South West Regional Laboratory in Los Angeles, 1967, cited by Bormuth, John R. "New Developments in Readability Research." Elementary English 44 (December 1967): 840-845.
- Dale, Edgar and Chall, Jeanne S. "A Formula for Predicting Readability: Instructions." Educational Research Bulletin 27 (February 1948): 37-54.
- Dulin, Kenneth L. "The Role of Contextual Clues in the Acquisition of Specific Reading Vocabulary by Mature Readers." Ph. D. dissertation, University of Washington, 1968, cited by Jongsma, Eugene. The Cloze Procedure as a Teaching Technique. Newark, Delaware: The International Reading Association, 1971.
- Farr, James, and Jenkins, James. "Tables for Use with Flesch Readability Formulas." Journal of Applied Psychology 33 (June 1949): 275-278.
- Farr, James N., Jenkins, James J., and Paterson, Donald G. "Simplification of Flesch Reading Ease Formula." Journal of Applied Psychology 35 (October 1951): 333-337, cited by Schlieff, Mabel, and Wood, Robert W. "A Comparison of Procedures to Determine Readability Level of Non-Text Materials." Reading Improvement (1973): 57-64.
- Flesch, R. F. "A New Readability Yardstick." Journal of Applied Psychology 32 (June 1948): 221-233.



- Fry, Edward. "A Readability Formula That Saves Time." Journal of Reading 11 (1968): 513-516, 575-577.
- Gallant, Ruth. "Use of Cloze Tests as a Measure of Readability in the Primary Grades." Proceedings of the International Reading Association 10 (1965): 286-287.
- Geyer, James R., and Carey, Albert R. "Predicting and Improving Comprehensibility of Social Studies Materials: The Roles of Cloze Procedure and Readability Adjustment." Reading World (December 1972): 85-93.
- Gomberg, Adeline Wishengrad. "Freeing Children to Take a Chance." The Reading Teacher 29 (February 1976): 455-457.
- Gove, Mary K. "Using the Cloze Procedure in a First Grade Classroom." The Reading Teacher 29 (October 1975): 36-38.
- Gunning, R. The Technique of Clear Writing. New York: McGraw-Hill, 1952, cited by Schlieff, Mabel, and Wood, Robert W. "A Comparison of Procedures to Determine Readability Level of Non-Text Materials." Reading Improvement (1973): 57-64.
- Jenkinson, M. E. "Selected Processes and Difficulties in Reading Comprehension." Ph. D. dissertation, University of Chicago, 1957, cited by Rankin, Earl F. "Uses of the Cloze Procedure in the Reading Clinic." Proceedings of the International Reading Association 4 (1959): 228-232.
- Jones, Margaret B. and Pikulski, Edna C. "Cloze for the Classroom." Journal of Reading 17(March 1974): 432-438, cited by Gomberg, Adeline Wishengrad. "Freeing Children to Take a Chance." The Reading Teacher 29 (February 1976): 455-457.
- Jongsma, Eugene. The Cloze Procedure as a Teaching Technique. Newark, Delaware: The International Reading Association, 1971.
- Kingston, A. J. and Weaver, W. W. "Feasibility of Cloze Techniques for Teaching and Evaluating Culturally Disadvantaged Beginning Readers." Research and Development Center in Early Educational Stimulation, University of Georgia, 1970, cited by Jongsma, Eugene. The Cloze Procedure as a Teaching Technique. Newark, Delaware: The International Reading Association, 1971.

- Klare, George R. "Comments on Bormuth's Readability: A New Approach." Reading Research Quarterly (Summer 1966): 119-125.
- Lopardo, Genevieve S. "LEA--Cloze Reading Material for the Disabled Reader." The Reading Teacher 29 (October 1975): 42-44.
- Lorge, I. "Readability Formulae--An Evaluation." Elementary English 26 (1949): 86-95, cited by Taylor, Wilson L. "'Cloze' Readability Scores as Indices of Individual Differences in Comprehension and Aptitude." Journal of Applied Psychology 41 (1957): 19-26.
- Louthan, Vincent. "Some Systematic Grammatical Deletions and their Effects on Reading Comprehension." English Journal 54 (April 1965) 295-299, cited by Jongsma, Eugene. The Cloze Procedure as a Teaching Technique. Newark, Delaware: The International Reading Association, 1971.
- Marks, M. R. and Taylor, Wilson. "The Effect of Goal and Contextual Constraints Upon Meaningfulness of Language." paper presented by Marks at annual meeting of American Psychological Association, Chicago, 1951; summary in American Psychologist 6 (1951): 325, cited by Taylor, Wilson L. "'Cloze Procedure': A New Tool for Measuring Readability." Journalism Quarterly 30 (Fall 1953): 415-433.
- Martin, Ruby W. "Transformational Grammar, Cloze and Performance in College Freshmen." Ph. D. dissertation, Syracuse University, 1968, cited by Jongsma, Eugene. The Cloze Procedure as a Teaching Technique. Newark, Delaware: The International Reading Association, 1971.
- McCracken, Glenn, and Walcutt, Charles C. Basic Reading 5 Philadelphia: J. B. Lippincott Company, 1965.
- MacGinitie, W. H. "Contextual Constraint in English Prose Paragraphs." Journal of Psychology 51 (1961): 121-130, cited by Bormuth, John R. "The Cloze Readability Procedure." Elementary English 45 (April 1968): 429-436.
- McLaughlin, G. Harry. "Smog Grading--A New Readability Formula." Journal of Reading (May 1969).

- Miller, Wilma H. Reading Diagnosis Kit. The Center for Applied Research in Education, Inc., 1975.
- Moskowitz, S. "The Relation of Certain Types of Context Clues to the Ability of Children to Discover the Meaning of Unfamiliar Words." Ph. D. dissertation, New York University, 1968, cited by Jongsma, Eugene. The Cloze Procedure as a Teaching Technique. Newark, Delaware: The International Reading Association, 1971.
- Osgood, Charles E. "The Nature and Measurement of Meaning" Psychological Bulletin 49 (May 1952): 197-237, cited by Taylor, Wilson L. "'Cloze Procedure': A New Tool For Measuring Readability." Journalism Quarterly 30 (Fall 1953): 415-433.
- Osgood, Charles E. Method and Theory in Experimental Psychology. New York: Oxford, 1953, cited by Taylor, Wilson L. "'Cloze Procedure': A New Tool For Measuring Readability." Journalism Quarterly 30 (Fall 1953): 415-433.
- Pennock, Clifford D. "Using Cloze to Select Appropriate Level Instructional Materials," Elementary English 50 (September 1973): 940-941.
- Powers, R. D., Sumner, W. A., and Kearl, B. F. "A Recalculation of Four Readability Formulas." Journal of Educational Psychology 49 (April 1958): 99-105, cited by Schlieff, Mabel, and Wood, Robert W, "A Comparison of Procedures to Determine Readability Level of Non-Text Materials." Reading Improvement (1973): 57-64.
- Quealy, R. J. "Senior High School Students' Use of Contextual Aids in Reading." Ph. D. dissertation, Indiana University, 1969, cited by Jongsma, Eugene. The Cloze Procedure as a Teaching Technique. Newark, Delaware: The International Reading Association, 1971.
- Rankin, Earl J., Jr. "An Evaluation of the Cloze Procedure as a Technique for Measuring Reading Comprehension." Unpublished Ph. D. dissertation, University of Michigan, 1957, "The Cloze Procedure--Its Validity and Utility," Starting and Improving College Reading Programs. Eighth Yearbook of the National Reading Conference. Fort Worth: Texas Christian University Press, 1958.

- Rankin, Earl F., and Culhane, Joseph W. "Comparable Cloze and Multiple-Choice Comprehension Test Scores." Journal of Reading 13 (December 1969): 193-198.
- Rankin, Earl, and Overholser, Betsy M. "Reaction of Intermediate Grade Children to Contextual Clues." Journal of Reading Behavior 1 (Summer 1969): 50-73.
- Rosenberg, S., "Recall of Sentences as a Function of Syntactic and Associative Habit." Journal of Verbal Learning and Verbal Behavior 5 (1966): 392-396, cited by Bormuth, John R. "New Development in Readability Research." (December 1967): 840-845.
- Rothkopf, Ernst. "Learning from Written Sentences: Within-Sentence Order in the Acquisition of Name-Clause Equivalences." Journal of Verbal Learning and Verbal Behavior 2 (1963): 470-475.
- Ruddell, Robert B. "A Study of the Cloze Comprehension Technique in Relation to Structurally Controlled Reading Material." Proceedings of the International Reading Association 9 (1964): 298-303.
- Schneyer, J. Wesley. "Use of the Cloze Procedure for Improving Reading Comprehension." The Reading Teacher (December 1965): 174-179.
- Sedlak, Robert A. "Performance of Good and Poor Problem Solvers on Arithmetic Word Problems Presented in a Modified Cloze Format." The Journal of Educational Research 67 (July-August 1974): 467-471.
- Spache, George D. "The Spache Readability Formula." Good Reading for Poor Readers. Champaign, Illinois: Garrard Publishing Co., 1974.
- Spache, George D. "Estimating Readability." Good Reading for Poor Readers. Garrard Publishing Co., 1970.
- Stubbs, Joseph Bartow, and Tucker, G. Richard. "The Cloze Test as a Measure of English Proficiency." (1974).
- Taylor, Wilson L. "'Cloze Procedure': A New Tool For Measuring Readability." Journalism Quarterly 30 (Fall 1953): 415-433.

- Taylor, Wilson L. "Recent Developments in the Use of 'Cloze Procedure.'" Journalism Quarterly 33 (1956): 42-48, 99.
- Taylor, Wilson L. "'Cloze' Readability Scores as Indices of Individual Differences in Comprehension and Aptitude." Journal of Applied Psychology 41 (1957): 19-26.
- Thelen, Judith N. "Using the Coze Test with Science Textbooks." Science and Children 12 (November/December 1974): 26-27.
- Weaver, W. W. "The Word as the Unit of Language." Journal of Reading 10 (1967): 262-268, cited by Bickley, A. C., Ellington, Billie J.; and Bickley, Rachel T. "The Cloze Procedure: A Conspectus," 1970.
- Weaver, W. W. and Bickley, A. C. "Some Differences in Encoding and Decoding Messages." Journal of the Reading Specialist (1967): 18-26, cited by Bickley, A. C.; Ellington, Billie J.; and Bickley, Rachel T. "The Cloze Procedure: A Conspectus," 1970.
- Weaver, Wendell W., and Kingston, Albert J. "A Factor Analysis of the Cloze Procedure and Other Measures of Reading and Language Ability." The Journal of Communication 13 (1963): 252-261.
- Whitman, Walt. Leaves of Grass. New York: Doubleday, Doran and Co., Inc., 1940.