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An Investigation of the Maze Procedure in Assessing Reading Levels of Incarcerated Adults: Texas Department of Corrections.

Alice Shields Fisher
Texas Southern University

AN INVESTIGATION OF THE MAZE PROCEDURE IN ASSESSING READING LEVELS OF INCARCERATED ADULTS: TEXAS DEPARTMENT OF CORRECTIONS

DISSERTATION

Presented in Partial Fulfillment of the Requirements for

the Degree Doctor of Education in the Graduate School

of Texas Southern University

By

Alice Shields Fisher, B.A.T., M.Ed.

Texas Southern University

1984

Approved by

Sumpter L. Brooks, II
Advisor
School of Education

Dean, The Graduate School

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Dr. Sumpter L. Brooks, II, Advisor

ABSTRACT

The purpose of this investigation was to determine whether significant correlations exist between comprehension and vocabulary scores on the maze procedure test and the Gates-MacGinitie Reading Tests when these instruments are administered to incarcerated adults. The investigator conducted this investigation during the spring of 1983. The sample (N=299) from the population (N=1,300) was randomly selected from alphabetical class rosters of the ten Texas Department of Corrections units randomly selected for this investigation. Subjects attended regular academic classes in the Windham School System (Texas Department of Corrections). For this investigation, the Test of Adult Basic Education, Level M, Form I, reading scores were used to classify readers as proficient (Group A) or nonproficient (Group B). Subjects with a reading score of 6.0 to 9.0 were identified as proficient readers (N=174). Subjects with a reading score of 4.0 to 5.9 were

identified as nonproficient readers (N=125). The predicted variables in this investigation were comprehension and vocabulary scores obtained from the Gates-MacGinitie Reading Test, while comprehension and vocabulary scores obtained from the maze procedure test served as predictor variables. To determine whether significant correlations existed between predicted and predictor variables, the investigator used the Pearson Product-Moment Correlation (r) method. The .05 level of probability was used as a criterion to support or not to support the null hypotheses.

When comparing comprehension and vocabulary scores from the maze procedure test with comprehension and vocabulary scores from the Gates-MacGinitie Reading Tests using proficient and nonproficient incarcerated adult readers, it was concluded that significant and positive correlations existed between the two measures. This investigation should be replicated in other instructional settings representing adult readers with diverse goals, reading abilities, attitudes, motivations, and backgrounds to confirm or challenge the results of this investigation.

Approved By

Sumpter L. Brooks, II
Advisor

Elynor P. Brown
Committee Member

Committee Member

Nettie C. Fredericks
Committee Member

Bobby Gentry
Committee Member

April 5, 1984
Date

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VITA

June 16, 1949. .	Born - Oakwood, Texas
1971	B.A.T., Sam Houston State University Huntsville, Texas
1971	Reading Teacher, Conroe Independent School District Conroe, Texas
1975	M.Ed., Sam Houston State University Huntsville, Texas
1977	Reading Teacher, Huntsville Independent School District Huntsville, Texas
1978	Reading Teacher Windham School System, Texas Department of Corrections Huntsville, Texas
1978	Reading Supervisor - Title I Windham School System, Texas Department of Corrections Huntsville, Texas
1982 - 84. . . .	Communications Supervisor Windham School System, Texas Department of Corrections Huntsville, Texas
Major Field. . .	Curriculum and Instruction

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DEDICATED

to

my Father, Mother, and Husband

Chapter 1

INTRODUCTION

Teaching incarcerated adults to read is the single most important task of academic teachers in the Windham School System, Huntsville, Texas. Although significant progress has been made toward achieving academic and vocational skills for inmates, Texas Department of Corrections research has revealed that a large percentage of the incarcerated men and women has critical reading problems (Texas Department of Corrections, 1981). Thus, the primary focus of the Windham academic program is the teaching of reading to incarcerated adults. Since many of these students come from educationally deprived backgrounds, an ongoing effort by academic teachers is that of finding an effective instructional approach to use with disabled readers.

The cloze procedure has been found to be a useful technique in working with disabled readers (Lopardo, 1975). The technique was first introduced in the literature by Taylor (Robinson, 1973). Since the 1950s, many investigations have been made of the cloze procedure, and many studies have used the procedure as a criterion measure. Although initially it was validated as a measure of readability against readability formulas, it was quickly assumed to be superior to those formulas (Alderson, 1978).

Although the initial use of the cloze procedure was in readability studies, by 1975, it was used to measure the reading comprehension abilities of subjects

(Lopardo, 1975). Many studies showed that cloze procedure correlated to varying degrees but always positively with respected and widely used measures of reading ability (Horton, 1975). The general conclusion from most of the cloze procedure studies has been that this procedure is a reliable and valid measure of reading comprehension. Although students in the Windham School System are given an achievement test which is administered every three months, many teachers are unaware of the level at which their students can read and comprehend. Additionally, these teachers lack a means by which they can assess and monitor their students' reading progress on a regular basis.

As a result, two problems arise. The first problem is the need to identify students whose comprehension is deficient and to determine their level of comprehension. A second problem is that teachers need a simple, accurate means to assess and monitor the reading progress of students on a regular basis. A potential solution to these problems lies in the use of a technique to measure comprehension levels within the classroom. The cloze procedure has been suggested by many as a potent tool in the measurement of readability and reading comprehension (Cohen, 1975).

As noted by Bortnick and Lopardo (1973), "Cloze does not constitute the entire program of instruction but is used effectively as a part of a total program aimed at meeting the specific needs of the student" (p. 296). Not only does the cloze procedure provide a reasonably valid determiner of instructional reading level and reading comprehension, but the ease with which it is constructed and administered makes it a practical tool for teachers who have had very little or no training in test administration (Ekwall, 1976). Therefore, the cloze procedure could be used effectively by reading teachers in the Windham School System,

provided one could determine whether the procedure has a correlation with other valid and reliable instruments designed to measure reading comprehension when administered to incarcerated adult readers.

For this investigation, the maze procedure, which is a modification of the cloze procedure (Guthrie, 1973), was selected to assess reading levels of incarcerated adults. The investigator chose the maze procedure because it was closer in format to the standardized instrument selected for this investigation, both of which were used to assess comprehension and vocabulary levels of incarcerated adults. The maze procedure has substantial appeal to the classroom teacher with limited or no training in test administration because of its ease of construction, administration, and scoring.

Statement of the Problem

An ongoing concern of academic teachers in the Windham School System is that of finding an appropriate and effective measure by which they can assess and monitor students' reading progress on a regular basis. A potential solution to this problem may be achieved, provided one could determine whether the scores on the maze procedure has significant correlations with another valid and reliable instrument (test scores) designed to measure reading achievement. The purpose of this investigation is to determine whether significant correlations exist between comprehension and vocabulary scores on the maze procedure test and the Gates-MacGinitie Reading Tests when these instruments are administered to incarcerated adults.

Significance of the Problem

Academic teachers of the Windham School System are faced with the dilemma of ascertaining students' current reading status in an effort to provide effective instruction for incarcerated adults. The foundation of the Windham academic program is the teaching of reading. Yet, many of the reading teachers quickly recognize that they know very little about their students' reading ability; as a result, students are often given reading material that is either too simple or too difficult. Additionally, some teachers have had very little or no training in administering and interpreting test results. Therefore, they do not know which instruments are appropriate for use with their students, and, further, they lack experience in interpreting the results of these instruments after they have been administered.

McClellan (1971) wrote that instructors should have the same concern about readability as there is about the reading ability of students. She further stated that the variability of reading skills among adult students demands that teachers are knowledgeable about the appropriateness of the material used for developing content and concepts in their classes (p. 353). McClellan (1971) supported the views of Bentley and Galloway (1961), who cited the following:

> The usefulness of the tool of reading is lost if the material to be read does not reasonably match the capability of the reader. If the material is too difficult, the student will not comprehend; if it is too simple, the student may be insulted and/or bored. In either case, learning suffers. (p. 373)

Writing in the same vein, Smith (1978) added that effective teachers should be "intelligently eclectic" by familiarizing themselves with a variety of procedures

and materials, as well as with the process for implementing them.

Academic teachers in correctional institutions are constantly seeking more effective ways and means of teaching reading to their students. Research as well as reading specialists support the general attitude among these teachers that no one method is the best way to teach reading. However, the maze procedure is one of the methods that has received considerable attention because it can assist teachers of reading in several ways.

The maze procedure is a simple way to determine whether or not reading material is too difficult for students to read with success (Wiseman & McKenna, 1978). Of equal importance, it is believed that this success in reading often helps break the orientation toward failure and frustration (Helgenson & Hisama, 1982). Research on the maze procedure by Guthrie (1973) indicated possible implications for the use of this procedure in the teaching of reading skills to older students. Additionally, Bradley and Meredith (1978) researched the use of the maze procedure with adult students and found it to be suitable for assessing reading levels.

The cloze procedure in its many forms has been found to be an important technique to research and instructional implications. The review of the literature revealed many discussions and recommendations regarding the use of the cloze procedure in its various formats for instructional purposes. Although a great deal of attention and research has been given to the assessment of the cloze procedure, evaluations revealed that the maze had not been tested with certain specific populations, e.g., incarcerated adult populations, minority groups, and other adults with limited reading ability (Robinson, 1973).

The target population for this investigation included younger, older, and minority incarcerated adults with limited reading ability in the Texas Department

of Corrections, Huntsville, Texas. The results of this investigation will be used to document the effectiveness of the maze procedure in teaching reading to incarcerated adults. Furthermore, the results of this investigation will be used to substantiate the effectiveness of the maze procedure in identifying reading levels (vocabulary and comprehension) of incarcerated adults. In addition, appropriate recommendations can be made to Windham reading teachers concerning its use as an instructional technique and as a diagnostic instrument.

Research Questions

In consideration of the problem statement, the following research questions were formulated:

1. When the maze procedure test and the Gates-MacGinitie Reading Tests are administered to incarcerated adult readers, is there a significant correlation between the comprehension scores?

2. When the maze procedure test and the Gates-MacGinitie Reading Tests are administered to incarcerated adult readers, is there a significant correlation between the vocabulary scores?

3. When the maze procedure test and the Gates-MacGinitie Reading Tests are administered to proficient incarcerated adult readers, is there a significant correlation between the comprehension scores?

4. When the maze procedure test and the Gates-MacGinitie Reading Tests are administered to proficient incarcerated adult readers, is there a significant correlation between the vocabulary scores?

5. When the maze procedure test and the Gates-MacGinitie Reading Tests are administered to nonproficient incarcerated adult readers, is there a significant correlation between the comprehension scores?

6. When the maze procedure test and the Gates-MacGinitie Reading Tests are administered to nonproficient incarcerated adult readers, is there a significant correlation between the vocabulary scores?

Statement of Hypotheses

In order to find solutions to the questions raised in this investigation, the investigator generated the following null hypotheses to be tested:

Ho_1: There is no significant correlation between the maze procedure comprehension test scores and the Gates-MacGinitie Comprehension Test scores when administered to incarcerated adult readers.

Ho_2: There is no significant correlation between the maze procedure vocabulary test scores and the Gates-MacGinitie Vocabulary Test scores when administered to incarcerated adult readers.

Ho_3: There is no significant correlation between the maze procedure comprehension test scores and the Gates-MacGinitie Comprehension Test scores when administered to proficient incarcerated adult readers.

Ho_4: There is no significant correlation between the maze procedure vocabulary test scores and the Gates-MacGinitie Vocabulary Test scores when administered to proficient incarcerated adult readers.

Ho_5: There is no significant correlation between the maze procedure comprehension test scores and the Gates-MacGinitie Comprehension Test scores when administered to nonproficient incarcerated adult readers.

Ho_6: There is no significant correlation between the maze procedure vocabulary test scores and the Gates-MacGinitie Vocabulary Test scores when administered to nonproficient incarcerated adult readers.

Assumptions

Basic to this investigation were several variables which the investigator was unable to control. These variables were:

1. Methods of reading instruction used.
2. Time (hour and day) of test administration.
3. Attitude and motivation of the subjects.
4. Attitude and enthusiasm of teachers.

Since the investigator was unable to control the above variables, the following assumptions were made:

1. The methods of teaching reading would have no adverse effects on students' reading performance when either the maze procedure test or the Gates-MacGinitie Reading Tests was administered. Therefore, differences in teaching methods would not alter the results of this investigation.

2. Variations in time (hour and day) of test administration would have no adverse effects on the students' reading performance. Therefore, time variations in test administration would not alter the results of this investigation.

3. The attitude and motivation of subjects would have no adverse effects on the students' reading performance. Therefore, any differences in students' attitudes and motivations would not alter the results of this investigation.

4. Attitude and enthusiasm of reading teachers would have no adverse effects on the students' reading performance. Therefore, any differences in

teachers' attitudes and enthusiasm would not alter the results of this investigation.

Limitations of the Study

1. The research for this investigation was limited to incarcerated male and female adults at the Texas Department of Corrections attending regular academic classes six hours per week. Therefore, its findings may be generalized to incarcerated adults in other penal institutions, but they cannot be generalized to other institutional settings involving adult readers with diverse goals, reading abilities, and backgrounds.

2. Another limitation of this investigation was that no effort was made to control classroom situations, course objectives, instructors' attitudes and expectations, or students' attitudes and motivational levels.

3. A further limitation was that, since students attended classes on different days and at different times, no effort was made to control the dates and the times of the administration of tests used in this investigation.

Definition of Terms

The terms listed below are unique to this investigation. They are presented here to facilitate the reader's understanding of the investigation.

Academic teacher. The academic teachers instruct students in the area of language arts, social studies, science, mathematics, and reading.

Cloze procedure. A method of systematically deleting words from a passage and then evaluating the success a reader has in accurately supplying the words deleted. The reader replaces the missing words, and the number of words

He was reading a book / car / quickly

One of the three choices is the correct answer. The other is syntactically acceptable but semantically inappropriate. The third choice is both syntactically and semantically inappropriate. The criteria for assessing reading levels (when using the maze procedure) are: independent level, 90% and above; instructional level, 60-90%; and frustration level, below 60%.

Nonproficient reader. In this investigation, the nonproficient reader achieved a reading score in the range of 4.0 to 5.9 as measured by a standardized reading test (Test of Adult Basic Education - Tiegs & Clark, 1967).

Proficient reader. In this investigation, the proficient reader achieved a reading score in the range of 6.0 to 9.0 as measured by a standardized reading test (Test of Adult Basic Education).

Readability. Readability involves measuring components of text, such as syllables and sentences, in order to compute a relative index of reading difficulty.

Special education teacher. Special education teachers work with the emotionally disburbed and the mentally retarded.

Standardized tests. These tests are written and published with standard procedures for administering and interpreting the results.

Vocational teacher. The vocational staff offers technical and occupational training in 33 skill areas.

Organization of the Investigation

Chapter 1 presents the framework of this investigation. This includes the Introduction, Statement of the Problem, Significance of the Problem, Research Questions, Statement of Hypotheses, Assumptions, Limitations of the Study, Definition of Terms, and Organization of the Investigation.

Chapter 2 consists of a Review of Related Literature. Chapter 3 presents the Design of the Investigation. Included in Chapter 3 are the Research Design, Subjects and Sampling Procedures, Data Collection Procedures, Scoring Procedure, Instrumentation, and Data Analysis.

Chapter 4 presents the Analysis of Data, Results, and Summary. Chapter 5 presents the Summary, Conclusions, Recommendations Based on the Findings, and Recommendations for Further Study.

Chapter 2

REVIEW OF RELATED LITERATURE

Literature Pertinent to Reading Disabilities Among the Incarcerated

The need for correctional education is overwhelming in view of the fact that research has revealed that a large percentage of the incarcerated population has critical reading problems. Kvareaus (1971) has investigated the educational level of incarcerated persons. He acknowledged that between 20-50% of the half million adults incarcerated in American federal and state prisions cannot read or write. He noted that many inmates are viewed as educationally bankrupt, having followed the tragic trial of reading retardation, truancy, and delinquency.

Holloway (1973) reported that many of the 2 million men and women incarcerated or on parole have tremendous reading problems. Chief Justice Warren E. Burger (1981), commenting about the same problem, wrote:

> The percentage of inmates in all institutions who cannot read is staggering. . . . The figures on illiteracy alone are enough to make one wish that every sentence imposed could include a provision that would grant release only when a prisoner had learned to read and write. (p. 6)

Helfrich (1973) surveyed all prisons, juvenile facilities, and large jails, reporting that there were probably a quarter million individuals, both adults and youth, incarcerated in this country who could not cope with reading tasks as well as

the average sixth-grade student. These findings revealed that approximately half of the population of all of the correctional institutions read somewhat less proficiently than the average 12-year-old.

In fact, many individuals in prison may be functionally illiterate, thus unable to meet the minimal reading demands of modern society (Rovner-Pieczenik, 1973). Rovner-Pieczenik further stated that reading deprivation not only cuts across the entire educational spectrum, it also poses an enormous and difficult task that rehabilitation must first attend to before proceeding to other tasks. Writing about the same issue, Helfrich (1973) wrote that it is most difficult to imagine a more crippling barrier to rehabilitation, reintegration, or productive job placement for released offenders than the inability to read or write in a literate complex society.

Helgenson and Hisama (1982), two other correctional educators, reported that correctional institutions across the United States have created much needed programs to address the reading deficiencies of their students. They supported the findings that many of the incarcerated students enrolled in various correctional programs have difficulty in their educational endeavors because of reading problems and that reading instruction is a major concern of correctional education. These findings confirm that there are severe reading disabilities in the correctional population. Referring to the large void in reliable reading achievement data for incarcerated adults, Kavale and Lindsey (1977) described the issue as a critical one that warrants attention.

A review of the literature has revealed a lack of research in the area of reading instruction for illiterate adults. Even less attention has been directed to those adults who lack the basic skills of reading at the eighth-grade level and who

most often have not completed high school. Kavale and Lindsey (1977) suggested that one of the factors contributing to this lack of information is the absence of data on the nature of the reading process of adult illiterates. They voiced a need for the development of a significant body of knowledge about the characteristics of adult readers and the nature of their reading process.

Fader, as cited by Bowren and Zintz (1978), concluded that the poorest man in all the world is the man who cannot read or who cannot see through the prism of time. Thus, he cannot comprehend the world outside the paradigm of his own experiences. Further, it seems that the tool of reading, while no guarantee of character, is a powerful aid in forming or transforming it. It appears that teaching prisoners to read offers one of the very real hopes for their rehabilitation (MacCormick, 1931).

Literature Pertinent to the Cloze and the Maze Procedures as Related to Reading Comprehension

Since its introduction by Taylor in 1953, the cloze procedure has been subjected to several investigations concerning its many uses. Taylor coined the word "cloze" to describe the procedure because the reader is presumed to go through a gestalt process when replacing the deleted words according to the surrounding context (Elley, 1976). The gestalt theorists believed that learning follows a sequence through which one first understands the whole or broader issues and then grasps the individual details (Stransfield, 1974). Likewise, the cloze procedure requires the student to perceive the whole by filling in missing words as if they were not missing at all (Elley, 1976). As noted by Potter (1968):

> Cloze measurement appears applicable to many types of communication. It seems to discriminate among the readability levels of passages and among the reading comprehension levels of readers. The cloze technique provides a measure of the degree of correspondence between the language habits of the transmitter and those of the receiver. (p. 35)

Elley (1976) contended that if the reader can reproduce the exact word he is more "in tune" with the writer and his message than if he chooses an inappropriate word. Carroll (1972) stated, "If the encoder producing a message and the decoder receiving it happen to have highly similar semantic and grammatical habit systems, the decoder ought to be able to predict or anticipate what the encoder will produce at each moment with considerable accuracy" (p. 10). By this rationale, the cloze procedure provides an estimate of the degrees of similarity in language habits between the writer and the reader (Rankin, 1978).

From a theoretic point of view, the cloze procedure is compatible with theories of communication, perception, learning, and information processing. The ability to fill in cloze blanks is an indication of language correspondence between a message source and receiver (Rankin, Haase, Howard, & Stewart, 1980). The concept underlying the cloze as a test instrument is that the greater the match between the language function, background experience, the interests of the author and the reader, the more accurately the reader will be able to predict the deleted words and, hence, arrive at closure (Babcock, 1975).

Jongsma (1971) reported that researchers have been studying the cloze procedure and its potential for reading instruction based on the assumption that "by

going through the task of completing cloze units, a reader will gain insights into the process of using context, recognizing the interrelationships of language, and consequently improving comprehension skills" (p. 42). Recognizing that this assumption could have implications for teaching comprehension, Bormuth (1975) stated that the cloze procedure as a measure of reading comprehension "is possibly the most thoroughly validated and sophisticated method of testing presently used in education" (p. 60).

Reading comprehension pertains to the identification of the meaning of words, phrases, sentences, and passages as a whole. According to Smith (1971), those areas which are crucial in teaching reading comprehension are vocabulary development, promoting language learning through syntax, and making use of context clues and redundancy. Stratton and Nacke (1974) cited that a review of the research on reading comprehension strongly indicates that, while knowledge of word meaning is important, complete vocabulary knowledge, in itself, is neither a necessary nor a sufficient condition for comprehension. They further stated that reading is a complex information-processing task and that identifying word meanings is but one element in the total process. Writing in the same vein, Martin and Herndon (1972) stated that written and spoken language contain many words and word sequences which are unnecessary for the comprehension of a message; that is, in the usual message there are words, phrases, and sometimes even sentences which add no further information.

According to Samuels (1976), fluent reading and good comprehension require more than just accurate decoding skills. It is possible to have a student to test who appears to be a very accurate decoder and yet his decoding skills demand too much of his attention, resulting in poor comprehension. Samuels (1976) further

stated that so-called "word callers" who can read about as well but show little comprehension illustrate this type of reading problem.

There has been an accelerated use of the cloze procedure as a measure of reading comprehension. Cloze performance has been widely accepted as a measure of reading comprehension (Bormuth, 1969a; Rankin & Culhane, 1969). It has also been postulated that cloze is a measure of language redundancy (Burton and Licklinder, 1955; MacGinitie, 1961; Tuinman, Blanton, & Gray, 1975; Weaver & Kingston, 1963); language skills (Carroll, 1959; Taylor, 1953); verbal aptitude (Carroll, 1941; Taylor, 1957); and/or classical closure factors, flexibility and speed of closure (Ohnmucht, Weaver, & Kohler, 1970).

Jenkinson (1957), Ruddell (1963), and Bormuth (1965, 1969b) found correlations of .70 to .85 between scores on standardized reading achievement tests and scores on cloze tests. Bormuth (1969b) concluded that cloze measures "skills" closely related or identical to those measured by conventional multiple-choice reading comprehension tests" (p. 365).

According to Rankin (1978), at first glance the cloze as a measuring instrument for assessing comprehension was not very convincing. He further noted the assertion that the correlation between cloze measurements and other comprehension measurements was due to the fact that both were measuring a general verbal competency. He added that there was no doubt that there was some substance to this contention. High correlations are usually found between cloze test scores and measures of verbal aptitude (Ramanauskas, 1971); therefore, cloze tests measure something more than verbal aptitude (Kibby, 1980).

A more serious criticism has been made by Carroll (1972) who contended that cloze scores are largely influenced by linguistic clues in the immediate

context around the missing word; therefore, cloze scores do not assess the ability to comprehend major ideas in a message. On the other hand, studies by Darnell (1963), Ramanauskas (1971), and others showed that, from a theoretic point of view, a good case can be made for the contention that cloze measurements do, in fact, measure comprehension more "directly" than do conventional comprehension tests. Five points were made to support this contention:

1. Cloze tests are intrinsic measures of the effectiveness of communication by sampling the degree of language correspondence between a message source and a receiver. This could hardly be the case if comprehension of the communication were not being tapped directly.

2. Cloze tests measure comprehension in process, not comprehension as a product after the fact. Answering large numbers of questions after the communication has been received (as in the conventional comprehension test) is not as direct a measure of the communication in process as can be obtained by the cloze test.

3. All cloze responses are based upon the basic psycho-linguistic process of inference which is intrinsic to all communication. Cloze avoids overlooking short-term memory by tuning in and out selectively and filling the gaps in both oral and written communications. It is precisely this process that is tapped by all cloze items in varying degrees. This cannot be said of conventional comprehension measurements.

4. Cloze tests sample more or less randomly the choice points for predictability within a message. What other comprehension test can attain such unbiased item samples from a universe?

5. Unlike any other communications test format capable of measuring higher level thought processes, cloze item writing lends itself to precise replication by independent writers (Rankin, 1978). Finn (1977) added that although all comprehension tests impose some degree of artificiality upon the message receiver in the measurement process, the intimate relationship between language and learning theory and cloze measurement provides a more direct and natural testing situation in many ways than is provided by conventional comprehension tests.

Research findings on the reliability and validity of the cloze procedure as an index of reading comprehension are numerous and quite impressive (Elley, 1976). Brown (1968) cited that cloze tests do, in fact, correlate highly with standardized reading comprehension tests so that descriptively the instrument may be viewed as an adequate reading comprehension measure. Rankin and Culhane (1969) corroborated on the validity of the comparable cloze and multiple choice percentage scores found by Bormuth (1969a). Similarly, they studied the validity of the cloze procedure and compared its use to that of multiple choice tests:

> These substantial correlations indicate that the cloze procedure is a highly valid measure of reading comprehension. The average validity coefficient was .68. Since the multiple choice test took several weeks to construct, the cloze tests are preferable for measuring comprehension or readability, and they are measuring substantially the same thing. (p. 195)

Jones and Pikulski (1974) reported from their study that:

> The cloze test gave a considerably more accurate reading level placement than did the standardized test. . . . Not only does the cloze procedure appear to provide a reasonably valid

> determiner of instructional reading level, but its very ease of construction and administration makes it a practical tool for teachers who have had no special training in test administration. (p. 434)

Schoenfeld (1980) theorized, "Besides being a valuable evaluative technique, cloze can also be an effective instructional method, particularly to improve comprehension via semantic (word meaning) and syntactic (word order) clues" (p. 147).

Writing in the same vein, Baldauf and Propst (1978) reported that cloze tests have been proposed as an alternative means of producing simply constructed yet valid measures of reading comprehension. Entin and Klare (1978) stated that the cloze procedure provides a convenient method of testing reading comprehension. The cloze procedure has been used to explore a variety of reading and language variables. In particular, cloze has been used to measure reading comprehension and to estimate the readability of text material (Readence, Baldwin, Bean, & Dishner, 1980).

Cloze measurements have been constructed and interpreted in the tradition of what has been called "classical test theory" (Rankin, 1978). As such, they have been designed to yield maximum validity and reliability. In addition, a norm-referenced interpretation has been developed (Miller, 1975).

Grant (1979) reported that, with advanced readers, work with various types of cloze apparently can improve reading comprehension. Bloomer (1962) used the cloze procedure as a remedial teaching technique for college students. In his study, one group received cloze exercises, a second proceeded with traditional remedial reading exercises, and a third received no treatment at all. The college

students who used cloze increased significantly in comprehension and total reading ability.

To explore the effects of cloze exercises on sixth-grade pupils, Schneyer (1965) used the cloze version built on the deletion of every tenth word and the version built on the deletion of only nouns and verbs. On a final reading comprehension test, there were no significant differences between the mean scores of pupils who used the cloze exercises and those who used the basal program.

Peterson, Paradis, and Peters (1972) used a similar experimental format to determine whether the cloze percentages identified by previous researchers as equivalent to the 75% level of multiple choice are applicable to high school and college age students. In these studies, students were assigned cloze passages on the basis of a match between grade equivalence scores on the Nelson-Denny reading comprehension test and predictions of readability of a group of health education passages. The results were similar to previously reported data. The cloze percentage level found to be equivalent to 75% accuracy in answering multiple choice comprehension questions was 42% for high school students, 43% for adult vocational technical students, and 44% for university students.

Another set of baseline data on cloze scores comes from Asher, Hymel, and Wigfield (1977), who gave fifth-grade students cloze tests based on 25 passages from the Encyclopaedia Britannica Junior. Cloze scores on these passages averaged 28% correct. The correlation of the cloze scores with standardized achievement test scores was .49.

Various other researchers in doctoral dissertations have examined the cloze procedure in terms of its effectiveness as a teaching device. Smith (1969), using junior college readers who worked with materials in which every tenth

concept word was deleted, found the cloze was valuable for demonstrating the process of comprehension and for pointing out to students their own deficiencies in the comprehension process.

Ellington (1973) used 11th-grade students who were divided into three groups: (1) cloze reading group, (2) conventional reading group, and (3) no reading group. She found that no significant difference existed among the three groups on a standardized reading comprehension test. Rynders (1971), using the same materials presented either in a cloze format or as an intact passage followed by questions, found that there was no significant difference in reading comprehension of 189 sixth-graders.

Bormuth (1967) and Rankin (1965) have conducted studies on the utility of closure in evaluating comprehension and confirmed that the cloze procedure does measure a factor identified as reading comprehension. These studies evaluated together show the importance of carefully determining the procedures to follow when doing cloze exercises. Conditions which produced positive results were (1) working actively with students, (2) synonym scoring, and (3) deletion pattern other than mechanical (Kennedy & Weever, 1973).

The potential of clozure as an instructional aid is both enormous and terribly exciting (Hunter, 1971). Several researchers have offered interesting ideas regarding cloze in the classroom. Cranney (1968) suggested organizing material so that the student's initial exposure to cloze will be highly structured. He called this process "fading" and observed that fading cloze helps students organize their thoughts. Along the same lines, Rankin and Overholser (1969) suggested preparing materials first with every tenth word deleted, then every seventh word, and finally

every fifth word. In this way, the students would begin with maximum context and potential for success.

Kennedy (1974) suggested that students first be given only one sentence with which to work. With this sentence, the student would practice interpreting the overall meaning of a sentence with deletions. Next, the student would practice verbalizing the missing words. Eventually, the student would be led to see that information given in the preceding or following sentences might be needed to find the best word for the blank.

The possibilities for adaptation of the cloze concept are almost endless, both in terms of structure and content. Teachers and students may experiment with a variety of cloze designs for deleting parts of any material. Schoenfeld (1980) cited that the adaptation of printed material requires careful structuring in the cloze procedure format. Jongsma (1971, p. 17) offered the following formats for constructing and introducing cloze passages:

1. Any word cloze, based on every nth deletions with a total of 50 deletions.

2. Aural-reading cloze-based on random, every nth deletion, but read orally by the teacher, while students read silently, with the teacher pausing 30 seconds at each deletion while the student wrote in his responses.

3. Multiple-choice, structural cloze - deletion of function words with the deleted words paired with distracters of the same grammatical class and randomly ordered after five deletions.

4. Multiple-choice, lexical cloze with every fifth deletion of nouns, main verbs, or adjectives using the same multiple-choice format mentioned.

A less difficult multiple choice form of the cloze procedure was introduced by Guthrie (1973). He called it the maze procedure. Guthrie, Seifert, Burnham, and Caplan (1974) cited that the appropriate description of the maze procedure is that it is a meaningful sentence selection task. In performing the task, the subject looks at the words surrounding the alternatives. He then selects a word he recognizes as suitable for the meaningful and grammatical completion of the sentence. To perform a given item correctly, the subject must process an entire sentence that has not been seen previously in terms of its substance. Thus, the task qualifies as a reading comprehension measure rather than a measure of memory, learning, or oral language (p. 166).

Assuming that reading primarily involves the construction of meaning from printed language, the valid assessment of comprehension is crucial for appropriate reading instruction (Jongsma, 1977). Guthrie (1973) offered the maze procedure as one informal means of assessing reading comprehension. As stated, the maze procedure is a modification of the cloze procedure (Guthrie, 1973). The maze procedure utilizes multiple-choice items, while the cloze procedure utilizes completion items. Guthrie (1973) recommended the following directions for developing a maze procedure reading inventory, consisting of three options per maze item: (1) the correct word, (2) a syntactically incorrect word, and (3) a syntactically correct but semantically incorrect word. For example . . .

book

He was reading a car

quickly

The subject reads the material silently and circles the alternative which he believes is correct. The number or percentage that the subject circles correctly

indicates the level of his comprehension of that passage. For example, if a subject was given a 100-word passage with 20 maze items and he answered 15 items correctly, it could be said that he understood the passage with 75% proficiency (Guthrie, 1973).

The criteria for assessing reading levels (when using the maze procedure) are as follows (Guthrie et al., 1974): independent level, 90% and above; instructional level, 60-90%; and frustration level, below 60%. Evidence concerning the reliability and validity of the maze procedure was presented by Guthrie (1973). He examined sentence comprehension and the use of syntactic cues during silent reading for a group including disabled readers, old normal readers, and young normal readers. The validity of the measure was assessed by correlating the total number correct with a standardized test grade level score. The correlation between the maze procedure and the Gates-MacGinitie Vocabulary Test was .85; the correlation between the maze procedure and the Gates-MacGinitie Comprehension Test was .82. These high positive correlations illustrate the high agreement between the maze and the Gates-MacGinitie Reading Tests. Reliabilities were computed with the Kuder-Richardson Formula 21 for all passages. The reliabilities were .93, .93, .90, .90, .92, .90, and .91, respectively. If the goal of comprehension measurement is to obtain reliable and valid measures, the maze procedure appears to hold promise as an informal reading assessment for use in the initiating of instructions, as well as monitoring student progress.

A review of the literature refers to the cloze procedure, regardless of format, for both its versatility and simplicity and for its use as a diagnostic and teaching tool. The additional benefits of ease of construction and administration make the cloze a potentially valuable instrument for the classroom teacher.

Smith (1971) had provided strong evidence for the value of the cloze procedure in reading research. He offered three key concepts that make the cloze procedure valuable in testing. He first stated that cloze is not a test but rather a means or technique by which one can devise a test. This concept is important in that, while many tests exist, there are very few elegant means of testing which can readily be understood and utilized by people with little or no training in research technology. His second concept was that of systematic common techniques by which one can test (multiple choice, free recall, sentence completion, essay, etc.), all of which involve an experimental variable. The test-maker selects and frames the items to be tested and determines the correct answers. When using the cloze procedure, the test-maker selects only the text. The procedure dictates the test items, and thus the experimenter variable is more fully controlled. His third concept concerned the passage used. While the passage chosen affects the results and while an ill-advised selection can produce confounded conclusions, the cloze procedure provides a measure of control. However, it should be used only with a passage which is sufficient and complete.

Anderson (1976) described the cloze procedure as a "simple technique" which measures how well a reader understands what he has read:

> Cloze procedure consists of a set of rules for constructing cloze tests over samples of written materials, administering these tests to subjects and scoring them, determining from the cloze scores the degree of comprehension of the written materials. . . . Words of a passage are systematically deleted in some mechanical way and replaced by blanks, usually of a standard length. The technique may be used at primary,

> secondary, and tertiary levels; it may be used with a wide variety of material from narrative and descriptive to technical and scientific; it may be used with oral as well as written material. (p. 6)

The cloze test has become very attractive to the classroom teacher for its ease of construction, lack of bias, ease of scoring, adaptability, and ready availability of forms (Streiff, 1979). The cloze test is extremely flexible in that it can test not only language proficiency but reading comprehension and subject area information as well.

What distinguishes a cloze test from an ordinary deletion test is the fact that it is completely replicable because it uses definite rules for deletion. This replicability makes it, despite its simplicity, a valid measure for classroom use (Bormuth, 1973).

Literature Related to Word Identification in Assessing Reading Ability

The relationship between vocabulary and comprehension is one of the few clearly established factors in assessing reading ability. In part, this is due to a lack of consensus on definition. "Word recognition" is defined by Johnson and Kress (1974) merely as "reading words aloud," whereas Arnold and Miller (1976) include meaning clues, visual analysis, structural analysis, phonics, and dictionary skills, all under the rubric of word recognition.

Bormuth (1974) has stated, "Probably the source of this dismal situation is the fact that comprehension is presently defined almost solely in terms of mental processes." However, comprehension cannot be said to exist apart from the

tasks by which it is measured (Tuinman, 1972). Tuinman (1972) further stated, "The degree to which one comprehends must always be expressed in terms of the behavior accepted as a demonstration of that comprehension."

In reviewing literature on word identification, it was noted that several studies reported positive correlations between word identification in isolation and word identification in context. For instance, Spache (1963) cited several studies with correlations as high as .89 between word-list scores and instructional levels as determined by reading in context. While suggesting that the data do not necessarily indicate the same skills are being assessed, Spache (1972) noted that "recognition vocabulary plays a large part in oral reading performance" (p. 32). Similarly, Shankweiler and Liberman (1972) presented correlations between word-list and paragraph reading to buttress their argument that students encounter the major difficulty in learning to read at the word level. They further argued that a "student's reading of connected text tends to be only as good or as poor as his reading of individual words" (p. 298).

These studies and others in a similar vein seem either to explicitly state or at least imply that tests of word identification in isolation can be used to predict accuracy of word recognition when reading in context or to prescribe instructional strategies to develop word recognition in context (Durrell, 1955; Bryant, 1965; Bond & Tinker, 1973; Harris & Sipay, 1975).

In defining reading, some people concentrate on the meaningful interpretation of printed material, others on the process of decoding. Weiner and Cromer (1967) pointed out that definitions of the reading process differ in their emphasis on "identification" (producing the oral label for the printed word) and "comprehension" (understanding the word).

An unprecedented interest in reading as comprehending (as opposed to pronouncing words) is evident by a cursory look through current reading journals and convention programs. There are three groups of theorists in the field of reading, and all three groups suggest different models of instruction for how people learn to read. One group of researchers and reading experts suggests that beginning readers start learning to read by recognizing letters and the sounds they represent. In other words, reading is seen as a decoding process. Emphasis in instruction is placed on the pronunciation of words. Phonics instruction is the primary emphasis in the initial stages. In reviewing literature on reading processes, it was noted that this view of reading is referred to as the "bottom-up" model of reading (Pearson and Kamil, 1978). Many contemporary reading experts (Fries, 1963; Gough, 1976; LaBearge & Samuels, 1974) have supported this view and have defined reading primarily as a process of decoding written symbols to the sounds that they typically represent. Thus, word parts and words are processed individually and sequentially and meaning derives directly from them. An example of such a view would be Flesch's (1955) definition, "Reading means getting meaning from certain combinations of letters. Teach the child what each letter stands for and he can read" (p. 10).

In opposition, another group of researchers suggests that other considerations are equally as important as decoding words. This group supports the "top-down" processing model of reading instruction. They believe that there are several other factors that dictate what happens when a person is processing print. Supporters of this model (Goodman, 1973; Smith, 1971; Levin & Kaplan, 1970; Hockberg, 1970) share the common view that readers rely heavily on their language skills and their knowledge about the world to make confirmations and predictions

about what they read. Decoding the words is important in the process, but decoding takes place often when a reader is able to make predictions about the test (Longnion, 1981). Stanovich (1980) summarized the major difference between the two models of instruction: "Top-down analyses start with hypotheses and then attempt to verify them by processing the stimulas, whereas bottom-up analyses start by processing the stimuli" (p. 32). [sic]

The third group of theorists support the "interactive" view of reading processing. This theory views reading as a process by which readers use both the text and information about their world to process meaning of print (Rumelhart, 1977). Thus, this interactive process occurs at all levels of processing, including basic word recognition (Stanovich, 1980). These theorists contended that the reader uses text and his own background experiences and knowledge to reconstruct his own interpretation of a given selection. In summary, they adopt part of the "bottom-up" view and affirm that both are important. They also say that the knowledge one has is equally important. The reader uses both and relies on text more when his background in the topic is limited (Stanovich, 1980). Proponents of this theory are Anderson, Spiro, and Anderson, 1977; Rumelhart, 1977; and Stanovich, 1980.

In summary, the top-down model suggests that instruction should begin with the teaching of phonics or other decoding skills. Emphasis is placed on the pronunciation of words rather than on the understanding of what is read. The bottom-up model suggests strongly that emphasis be given to the understanding of what is read. Stress is placed on comprehension rather than decoding. The "interactive" model suggests that a balance of skills and practice in reading should occur. Both top-down and bottom-up models are seen to be important in the

teaching of reading.

It is evident that reading involves both of these processes. Mackworth (1972) has defined successful reading as the achievement of a three-way synthesis among meaning, the spoken word, and the written word. Specifically, training in recognizing the object referred to, knowing its name, and recognizing its name in print appears to interact; as a result, the reader experiences word recognition in the full sense of both decoding the printed symbols and understanding what they refer to. These syntheses can be both tested for and taught. For a diagnostic instrument of reading ability to be of maximal value, it must afford opportunities to examine as many aspects of a reader's behavior as possible.

Literature Related to Cloze and Readability

According to Ekwall (1976), Taylor's designation of the cloze procedure as a measure of readability represented a significant breakthrough. Although Taylor (1957) first reported the use of the cloze procedure, it was Bormuth's (1969b) research that brought attention to the cloze procedure. He specifically researched the use of the cloze procedure to derive "the percentage of correct answers equivalent to the independent, instructional, frustration reading levels, and to derive information on readability" (p. 360).

Readability, according to Klare (1963), refers to "the ease of understanding written materials due to the style of writing used" (p. 19). Chall (1949) defined readability as the sum total (including interaction) of all elements within the written material that affect the success a reader will have with it. Both Kla (1975) and Chall (1949) agreed that readability is associated with the compre sion on learning that takes place as a result of the reading. They also agre

the speed with which an individual reads material and an individual's preference for the material can be affected by readability.

Smith and Fay (1973) stated that the purpose of the readability formula, graph, or scale is to have the best predictor possible for matching suitability of the material with the functioning reading level of the individual learner. They added that the learner cannot be successful unless instructional materials are readable. The following suggestions were made by Carstens and McKeag (1975) in an effort to help the adult educator do the necessary matching based upon what information and materials are available.

1. When the reading skill of the reader is known and reading materials are available at an appropriate level of readability, all that would be required of the adult educator is to make the existing reading materials available to the reader.

2. When the reading skill of the reader is known but no reading materials are available at the appropriate level of readability, it would be necessary for the adult educator to rewrite the materials to the correct level of readability.

3. When the reader's skill is unknown, three possibilities, or a combination of the three, could be used: (a) supply reading materials at two or more levels of readability and allow the participants to choose the level of readability they believe most suitable, (b) measure the participant's reading skill with a standardized reading test and choose reading materials based on the findings, or (c) develop a cloze passage out of material(s) being considered and choose materials that are appropriate based on the cloze.

Carstens and McKeag (1975) suggested that two factors will result in increasing acceptance of reading as a primary or auxiliary method of instruction. These were a greater awareness of the readability of written materials used in adult education and a concentrated effort to match the readability of the materials with the reader's skill. Moreover, they suggested that these factors should also result in greater learning, greater acceptance of written materials, and reduced time per selection of material read.

Hittleman (1973) cited that one confusion which appears frequently in the literature on the use of reading materials arises from the means for determining whether or not a set of materials is readable. The confusion seems to result from whether one is attempting to predict or to measure the degree of readability of any test. Hittleman (1973) proposed that readability is a "moment" at which time the reader's emotional, cognitive, and linguistic backgrounds interact with each other, with the topic, with the proposed purpose for doing the reading, and with the author's choice of semantic and syntactic structures all within a particular setting. At such a "moment," the material is a constant on which two main sets of forces are being exerted, the characteristic of the reader and the elements of the situation actual and perceived.

Harris (1976) wrote that educators who attempt to predict the difficulty of a message seek to use those characteristics of the material that will place it within a continuum of selections whose readability scores have already been established. On the other hand, Harris noted that those who attempt to measure readability seek to estimate the reader's understanding of that material as a function of the reader's language competence, the subject matter of the message, and the syntactic and morphologic complexity of the message. Both approaches

have been examined in an attempt to identify a means for judging the suitability of instructional materials for effective and efficient learning by a particular pupil population.

The most common means for predicting the readability of materials is through the use of standard readability formulas (Dale & Chall, 1948; Fry, 1968; Harris & Sipay, 1975; Spache, 1968), which use factors such as vocabulary and sentence difficulty to sample "those characteristics of reading material which made for ease or difficulty in reading comprehension" (Harris & Sipay, 1975, p. 658). Harris and Sipay (1975) reported that standard formulas have four major shortcomings:

1. A criterion of comprehensibility cannot be reliably determined.

2. Word frequency and sentence length do not stand in a simple relationship to reading difficulty.

3. The formulas may be of dubious value when used with pupils or materials dissimilar to those used in computing the formulas originally.

4. They do not consider difficulty caused by factors such as concept load, format of the materials, organization of the ideas, or the writing patterns.

Recently, much attention has been given to the role that syntactic complexity (factors other than sentence length) plays in determining the readability of written materials. There exists both a formula of syntactic complexity (Botel, Dawkins, & Granowsky, 1973) and a means for establishing a syntactic density score (Kidder & Golub, 1974). Some of the criticisms of standard formulas can be raised about syntactic complexity or sentence density measures.

First, they do not measure readability under natural conditions; that is, the interaction between the reader and the written message is not sampled.

Second, these measures do not take into consideration the context in which the sentences occur. Third, the sentence measures do not account for the factor of concept load. Fourth, the formulas at present are only heuristic. Furthermore, little empiric evidence has been provided that indicates the assigned weights truly represent a real order of difficulty (Hittleman, 1973).

Other researchers have attempted to predict readability through (1) the study of the effects of lexical density, the role of different types of grammatical units, and the difficulty of different transformations (Carroll, 1971); (2) the relative difficulty of different word classes (Lesgold, 1973; Stodt, 1972); and (3) the effect of paragraph structure and organization (Carver, 1974; Crothers, 1971; Peters, 1975). While these studies provided insight into factors that might affect the readability of passages, the insights have been put to use only in an attempt to predict readability (Hittleman, 1973).

Recent research by Siegel (1974) looked upon the cloze not as a predictor of readability but as an accurate measure of readability. The rationale was that the cloze procedure takes into account the interaction between and among the reader, the material, and the reading situation (Bormuth, 1971; Carroll, 1971). A great deal of research has attempted to validate the cloze procedure (the systematic deletion of every nth word) as a means for estimating the readability of material (Bormuth, 1969b). The estimates of readability obtained through its use seem to be much more reliable than those obtained through the use of standard formulas (Hittleman, 1973).

Since cloze procedure scores are percentages, some way had to be created for translating them into meaningful scores of readability. Bormuth (1971) has identified scores that represent a desirable level of performance on

instructional materials that account for certain variables. Examples of these variables are (1) the reader's learning, retention, and transfer of information, (2) the reader's rate of reading and response, (3) the reader's preference for the subject matter, style, and difficulty of the passage and willingness to study it, and (4) the effects on the reader's self-concept and attitudes from having studied the material. In essence, readability scores identified by Bormuth (1971) were shown to vary depending upon the grade level of the readers and the purpose for which the material was to be used.

The cloze procedure measures readability, whereas various formulas predict it. Concerning readability, Hittleman (1973) ordered the following recommendations:

1. Avoid the use of predictive formulas which usually have arbitrarily assigned grade equivalents or are capable of establishing only a rank order of difficulty according to some criteria. Although formulas will provide some indication of the relative difficulty of different materials in relation to each other, they will not provide useful information about whether or not those materials are readable by a group of pupils.

2. Use some form of the cloze procedure. The cloze procedure is the only available procedure which can take into account, in a natural setting, the constraints of the language system of the reading matter, the reading ability and other characteristics of the reader, and the background information needed by the reader.

3. Do not use the same criteria of success for all age groups, for all materials, and for all purposes. There are some established criteria available for

use at different grade levels when reading for different purposes (Bormuth, 1971, 1975). These can provide teachers with quick interpretations of cloze scores.

In terms of instructional purposes, readability should be viewed as ever changing (Lowry & Marr, 1974). They further emphasize that standards determining what is readable and judgments determing what is understandable should always be relative to a particular instructional situation. Carver (1974) added that, with current knowledge of the factors that are interacting during an act of reading, it is inexcusable to rely solely upon some artificial and arbitrary means for classifying reading materials.

There is now much evidence that the cloze procedure has been validated as a measure of readability. It was quickly assumed to be superior to standard readability formulas (Alderson, 1978). One of the advantages of the cloze method of assessing readability is that it provides an objective criterion for deciding whether a given reader can profit from reading the material in question (Elley, 1976). Hittleman (1973) concluded that the cloze has two important advantages. It allows pupils to bring knowledge and understanding of the content area and topic being read, and it encourages anticipation and expectation of the purposes and the objectives of the reading lesson.

In short, the cloze procedure is the only available procedure in which a measure is taken of the interaction between characteristics of the reader and the written message. This interaction occurs under the influence of a particular instructional situation in a natural setting (Hittleman, 1973). The cloze makes fewer assumptions about the abilities of the readers. Rather than systematically counting the elements presumed to be difficult, it manages to measure all their effects at once (Elley, 1976). Finally, if used with proper precautions, the cloze

procedure will yield valid, reliable information about reading ability, language, maturity, and the readability of written materials.

The cloze test has been classified as an integrative or pragmatic measure of reading skills (Oller, 1979). Taylor (1953) called the cloze unit a "common denominator" of communication success because it stresses not so much meaning as it does language-use correspondence. The cloze test capitalizes on the tendency to close gaps and fill in the blanks by requesting the reader to provide missing information based upon predictions about what should occur within the context.

The literature review points favorably to the cloze procedure for both its versatility and simplicity and for its use as a diagnostic and teaching tool. The additional benefits of ease of construction, administration, and scoring make the cloze a potentially valuable instrument for the classroom teacher.

Chapter 3

DESIGN OF THE INVESTIGATION

The purpose of this investigation was to determine whether significant correlations exist between comprehension and vocabulary scores on the maze procedure test and the Gates-MacGinitie Reading Tests when these instruments are administered to incarcerated adults. When using the maze procedure test and the Gates-MacGinitie Reading Tests as measures, this investigation was designed to answer the following questions:

1. When the maze procedure test and the Gates-MacGinitie Reading Tests are administered to incarcerated adult readers, is there a significant correlation between the comprehension scores?

2. When the maze procedure test and the Gates-MacGinitie Reading Tests are administered to incarcerated adult readers, is there a significant correlation between the vocabulary scores?

3. When the maze procedure test and the Gates-MacGinitie Reading Tests are administered to proficient incarcerated adult readers, is there a significant correlation between the comprehension scores?

4. When the maze procedure test and the Gates-MacGinitie Reading Tests are administered to proficient incarcerated adult readers, is there a significant correlation between the vocabulary scores?

5. When the maze procedure test and the Gates-MacGinitie Reading Tests are administered to nonproficient incarcerated adult readers, is there a significant correlation between the comprehension scores?

6. When the maze procedure test and the Gates-MacGinitie Reading Tests are administered to nonproficient incarcerated adult readers, is there a significant correlation between the vocabulary scores?

In consideration of the questions raised in this investigation, specific null hypotheses were generated to test for significant correlations or significant relations relative to each question. This chapter describes the procedures used in testing the null hypotheses as follows:

1. Research Design.
2. Subjects and Sampling Procedures.
3. Data Collection Procedures.
4. Scoring Procedures.
5. Instrumentation.
6. Data Analysis.

Research Design

This investigation was conducted using descriptive research procedures. Huck, Cormier, and Bounds (1974) defined the purpose of descriptive research as describing things the way they are rather than investigating cause-and-effect relationships. Isaac and Michael (1974) noted that descriptive research does not necessarily seek or explain relationships, make predictions, or get at meanings and implications. Rather, its primary concern is to describe systematically the facts, characteristics, and factual and accurate comparisons and evaluations of a given

population or area of interest. Therefore, the research design which was used in this study is shown below.

Group A: R O_1 - - - - O_2 - - - - O_3

Group B: R O_1 - - - - O_2 - - - - O_3

Where:

Group A = Proficient readers

Group B = Nonproficient readers

R = Random assignments of subjects to groups

O_1 = Observations (Test of Adult Basic Education, Level M, Form 10)

O_2 = Observations (maze procedure tests)

O_3 = Observations (Gates-MacGinitie Reading Tests)

- - - = Absence of formal treatment between observations

Subjects and Sampling Procedures

This investigation utilized subjects attending academic classes in the Windham School System (WSS), Texas Department of Corrections (TDC), in Huntsville, Texas. The Windham School System provides academic and vocational classes for inmates who are not already graduates of an accredited high school. The program is delivered through the combined efforts of more than 500 staff members and an individualized, nongraded curriculum. Inmates who achieve less than a fifth-grade equivalent on a standardized test are required to attend school at least six hours per week. Over 20,000 inmates attend Windham classes during a school year. The average class size is 15-18 students.

Currently, there are 25 Texas Department of Corrections units covering over a 300-mile area. The name of each unit was placed in a box, and ten units

(Appendix F) were randomly selected from the box to facilitate data collection. Class rosters of the ten units were examined to determine the total number of students enrolled in academic classes. Those falling into one or more of the following categories were not used in the investigation:

1. Those students who had been in a regular academic class less than three months.

2. Those students who had not been assessed by the Test of Adult Basic Education.

3. Those students who had a reading score less than 4.0 and greater than 12.0 as measured by the Test of Adult Basic Education.

After all inmates in the preceding categories were eliminated, a population of 1,300 subjects was available for this investigation. To determine the appropriate sample size (S=297) of a given population (N=1,300), the investigator referred to Cornett and Beckner's (1975) published table (Appendix G). The sample for this investigation (N=299) was randomly selected by taking every third name from the alphabetical class rosters of the ten units randomly selected for this investigation. This procedure of selecting every nth name from an alphabetized list was suggested by Isaac and Michael (1974) as an approved method of randomization. Subjects ranged in age from 17-60 years. Blacks, Mexican-Americans, and Anglo-Americans were the dominant ethnic groups represented in the investigation. The homogeneous nature of these classes as well as the frequency with which they meet made them a population with greater accessibility for testing for purposes of this investigation. Table 1 provides a summary of demographic information of subjects participating in the investigation.

Table 1
Summary of Demographic Data

Trait	Number of subjects (N=299)
Group	
Proficient readers (Group A)	174
Nonproficient readers (Group B)	125
Age	
16-20	71
21-30	139
31-40	59
41-50	25
51+	5
Sex	
Male	258
Female	41
Ethnic Class	
Anglo	112
Mexican-American	77
Black	107
Other	3
Language	
English	219
Spanish	78
Other	2

The Test of Adult Basic Education, Level M, Form 1, reading scores were used to classify types of readers for the investigation. Subjects with a reading score of 6.0 to 9.0 were identified as proficient readers, Group A (N=174). Subjects with a reading score of 4.0 to 5.9 were identified as nonproficient readers, Group B (N=125).

Data Collection Procedures

Data for this investigation were collected by the investigator at the Texas Department of Corrections Windham School System during the spring of 1983. To determine whether significant correlations exist between the vocabulary and comprehension scores on the maze procedure test scores and the Gates-MacGinitie Reading Test scores, the investigator first administered the maze procedure comprehension test to subjects participating in the investigation. The directions were standard for all subjects. Subjects were instructed to read a maze passage silently and mark an "x" in the circle by the one word that best fit in the sentence. Next, subjects were administered the vocabulary test using words from the maze passage. Subjects were required to read orally 50 deleted words from the maze passage. The words were presented one at a time in a random order. The subject's ability to pronounce each word was assessed by putting a check mark after each error. After a 15-minute rest period, subjects were administered the Gates-MacGinitie Comprehension Test (which was a 25-minute timed test). They were instructed to read prose passages containing blank spaces, to find the word that made the best sense in the blank, and to put an "x" on the word. Next, subjects performed the vocabulary portion of the Gates-MacGinitie Reading Tests (which was a 15-minute timed test). The vocabulary test sampled the students' reading vocabulary. This test contained 50 items, each consisting of a test word followed by five other words, one of which was similar in meaning to the test word. The student's task was to choose the word that meant most nearly the same as the test word. The first items were composed of easy and commonly used words. Gradually the words became less common and more difficult. Raw scores were computed by counting the total number of items which the student chose correctly.

Scoring Procedure

A Scan-Tron (OMR) Test Scorer was used to score the comprehension portion for both the maze and the Gates-MacGinitie tests. The tests were scored using an exact word scoring method, which means that only the actual word deleted from the passage was accepted as a correct response. The vocabulary portions for the maze procedure test were hand-scored, counting as an error the following: (1) each mispronounced or omitted word, (2) words which took more than five seconds to pronounce, (3) more than one pronunciation for words, and (4) incorrect word endings. Raw scores were obtained from both tests by counting the total number of correct responses subjects had obtained on each task. Once subjects' raw scores on each test had been obtained, appropriate statistical procedures were applied to analyze the data.

Instrumentation

The instruments used in this investigation were the maze procedure test and the Gates-MacGinitie Reading Tests, Survey E, Form 1. The maze procedure test was constructed by the investigator, and the Gates-MacGinitie Reading Tests were commercially published. Each was administered by the investigator and is discussed in the sections which follow.

Maze Procedure. The cloze passage was constructed using the maze technique. Guthrie et al. (1974) called it the maze technique because the usual cloze blank is replaced by three words. For example:

	car
He was reading a	book
	quickly

One of the three choices is the correct answer; another is syntactically acceptable but semantically inappropriate. The third choice is both syntactically and semantically inappropriate (Guthrie et al., 1974). Criteria for the three levels of reading comprehension when using the maze technique are as follows (Guthrie et al., 1974):

Independent level	90% and above
Instructional level	60-69%
Frustration level	Below 60%

The relationship between the cloze and the Gates-MacGinitie Reading Tests was determined by using the Pearson Product-Moment Correlation method. The correlation between the maze procedure test scores and the Gates-MacGinitie Vocabulary Test scores was .85; the correlation between the maze procedure comprhension test scores and the Gates-MacGinitie Comprehension Test scores was .82. These high positive correlations illustrate the high relationships between the maze and the Gates-MacGinitie Reading Tests. Reliabilities were computed with the Kuder-Richardson Formula 21 for all passages. The reliabilities were .93, .93, .90, .90, .92, .90, and .91, respectively. Guthrie (1973) concluded that this showed that performance on short passages was likely to be internally consistent and would probably be similar across short periods of time.

The maze passage for this investigation consisted of 304 words with 50 deletions. The Fry (1968) readability formula was used to determine an approximate reading level of difficulty (7.0) for the passage. To confirm this readability

level, the folloiwng readability formulas were calculated via computer: Fog (7.0), Holmquist (6.4), ARI (6.0), Flesch-Kincaid (8.0), Powers (6.0), Coleman (7.0), and Dale-Chall (6.0) (Micro Power & Light Co., 1982). The passage contained a series of sentences extracted from a story about entertainer, Louis Armstrong. The passage was modified by substituting three alternative words for every deleted word which included the correct word, an incorrect word that was the same form (verb, noun, function word, modifier) as the correct word, and an incorrect word that was a different form of the correct word.

In the spring of 1982, the investigator conducted a pilot study to establish reliability coefficients for the maze procedure. Because all 25 Texas Department of Corrections units were accessible and due to the large enrollments of the classes at the time, the pilot sample consisted of 481 (male and female) incarcerated readers. The subjects' reading ability ranged from level 0 to level 12+. Available students attending Windham School System regular academic classes were administered maze procedure passages, developed from academic instructional materials as follows (Appendix C): Scale I and Scale II consisted of equivalent passages ranging from level 2.0 to level 12+. Three subtest scores and a total score were obtained from each scale. The Pearson r and the Spearman Rank-Order statistical procedures were applied to compute the eight variables. Table 2 presents the findings. The Pearson r resulted in a correlation of .84, and the Spearman Rank-Order was .85. The correlations for the Pearson r and the Spearman Rank-Order were determined by computing Variable #4 (total of subscores from Scale I) with Variable #8 (total of subscores from Scale II).

Table 2
Correlation Matrix - Maze Scale I with Maze Scale II
Pilot Study (N=481)

Pearson r

Var.	1	2	3	4	5	6	7	8
1	1.0000							
2	0.6569	1.0000						
3	0.3854	0.6556	1.0000					
4	0.7377	0.9060	0.8371	1.0000				
5	0.8355	0.6832	0.4124	0.7098	1.0000			
6	0.6262	0.8112	0.5930	0.7907	0.6994	1.0000		
7	0.3606	0.5715	0.6909	0.6557	0.4162	0.6304	1.0000	
8	0.6848	0.8070	0.6834	0.8442	0.7919	0.9170	0.8313	1.0000

Spearman Rank-Order

Var.	1	2	3	4	5	6	7	8
1	1.0000							
2	0.7052	1.0000						
3	0.4412	0.7382	1.0000					
4	0.7634	0.9177	0.8343	1.0000				
5	0.7851	0.6958	0.4607	0.7291	1.0000			
6	0.6894	0.8097	0.6364	0.7992	0.7559	1.0000		
7	0.4126	0.6135	0.6762	0.6419	0.4920	0.7136	1.0000	
8	0.7350	0.8221	0.6746	0.8504	0.8433	0.9341	0.7964	1.0000

Identification of Variables:

Scale I	Scale II
1 = Passage I	5 = Passage I
2 = Passage II	6 = Passage II
3 = Passage III	7 = Passage III
4 = Total of subscores	8 = Total of subscores

Gates-MacGinitie Reading Tests. The Gates-MacGinitie Reading Test is well established with norms based on nationwide standardizations (Buros, 1978). The test was administered to a sample of approximately 40,000 pupils in 38 communities (Gates & MacGinitie, 1965). The communities participating in the standardization were carefully selected on the basis of geographic location, size, and socioeconomic level to assure a representative sample of pupils at all grade levels (Gates & MacGinitie, 1965). Reliability coefficients for Survey E on the alternate form ranged from .80 for ninth graders to .81 for seventh graders (comprehension). Vocabulary coefficients ranged from .83 for ninth graders to .78 for seventh graders. Split-half reliability coefficients ranged from .89 for ninth graders to .94 for seventh graders (comprehension). Vocabulary reliability for ninth graders to seventh graders is .88 (Gates & MacGinitie, 1965). Thus, the Gates-MacGinitie Reading Test results appear to provide an accurate measure of assessing students' instructional reading level.

Data Analysis

Data for this investigation were gathered for 299 randomly selected subjects attending academic classes in the Windham School System, Texas Department of Corrections. Each subject took four reading tests: the maze procedure comprehension test, the maze procedure vocabulary test, the Gates-MacGinitie Comprehension Test, and the Gates-MacGinitie Vocabulary Test. The predicted variables (criterion/dependent) in this investigation were vocabulary and comprehension scores on the Gates-MacGinitie Reading Test, while vocabulary and comprehension scores on the maze procedure test served as predictor or independent variables. To determine relationships between the predicted and predictor

variable (maze procedure), this investigation used the Pearson Product-Moment Correlation method (r). Correlation coefficients were computed to determine the following: (1) the magnitude of the relationship (the degree to which the variables, comprehension and vocabulary scores, on the maze and Gates-MacGinitie vary together) and (2) the direction of the relationship (whether the maze procedure and the Gates-MacGinitie Reading Test scores vary together positively or whether they vary inversely or negatively). The Statistical Package (STP) from Western Michigan University was used to analyze the data. The .05 probability level was preestablished as a criterion for supporting or not supporting the null hypotheses.

Chapter 4

ANALYSIS OF DATA

This investigation was designed to determine whether significant correlations exist between the comprehension and vocabulary scores on the maze procedure test and the Gates-MacGinitie Reading Tests when these instruments were administered to incarcerated adults. The sample population consisted of 299 randomly selected adult readers incarcerated in the Texas Department of Corrections, Huntsville, Texas; 258 were males (86%) and 41 were females (14%). There were 174 proficient readers (58%) and 125 nonproficient readers (42%). Specifically, this investigation was designed to answer the following questions:

1. When the maze procedure test and the Gates-MacGinitie Reading Tests are administered to incarcerated adult readers, is there a significant correlation between the comprehension scores?

2. When the maze procedure test and the Gates-MacGinitie Reading Tests are administered to incarcerated adult readers, is there a significant correlation between the vocabulary scores?

3. When the maze procedure test and the Gates-MacGinitie Reading Tests are administered to proficient incarcerated adult readers, is there a significant correlation between the comprehension scores?

4. When the maze procedure test and the Gates-MacGinitie Reading Tests are administered to proficient incarcerated adult readers, is there a

significant correlation between the vocabulary scores?

5. When the maze procedure test and the Gates-MacGinitie Reading Tests are administered to nonproficient incarcerated adult readers, is there a significant correlation between the comprehension scores?

6. When the maze procedure test and the Gates-MacGinitie Reading Tests are administered to nonproficient incarcerated adult readers, is there a significant correlation between the vocabulary scores?

Data from this investigation were analyzed to determine relationships between the various test scores as stipulated by the research questions. Pearson Product-Moment Correlation Coefficients (r) were computed to determine if relationships did in fact exist. The .05 probability level was used as a criterion to support or not to support each of the null hypotheses. That is, if the computed r value was equal to or greater than the table value for N-2 degrees of freedom at the .05 probability level (Appendix H), the null hypotheses were not supported. This chapter presents the results and summary tables of the correlations (r) the degrees of freedom, and the levels of significance.

Results

Ho_1: There is no significant correlation between the maze procedure comprehension test scores and the Gates-MacGinitie Comprehension Test scores when administered to incarcerated adult readers.

Table 3 presents a summary of these findings. The maze procedure comprehension test scores correlated positively (r=.60) and significantly ($p<.01$) with the Gates-MacGinitie Comprehension Test scores. Therefore, this hypothesis was not supported, and it was concluded that there was a significant correlation between the maze procedure comprehension test scores and the Gates-MacGinitie Comprehension Test scores when administered to incarcerated adult readers.

Table 3
Pearson Product-Moment Correlation Coefficients of Maze Procedure Comprehension Test Scores with Gates-MacGinitie Comprehension Test Scores
(n=299)

	Correlation (r)	df	Level of significance
Maze Gates-MacGinitie	.60	297	.01

Ho_2: There is no significant correlation between the maze procedure vocabulary test scores and the Gates-MacGinitie Vocabulary Test scores when administered to incarcerated adult readers.

Table 4 presents a summary of these findings. The maze procedure vocabulary test scores correlated positively (r=.33) and significantly ($p<.01$) with

the Gates-MacGinitie Vocabulary Test scores. Therefore, this hypothesis was not supported, and it was concluded that there was a significant correlation between the maze procedure vocabulary test scores and the Gates-MacGinitie Vocabulary Test scores when administered to incarcerated adult readers.

Table 4
Pearson Product-Moment Correlation Coefficients of Maze Procedure Vocabulary Test Scores with Gates-MacGinitie Vocabulary Test Scores
(n=299)

	Correlation ($\underline{r}$)	df	Level of significance
Maze Gates-MacGinitie	.33	297	.01

Ho_3: There is no significant correlation between the maze procedure comprehension test scores and the Gates-MacGinitie Comprehension Test scores when administered to proficient incarcerated adult readers.

Analysis of the data presented in Table 5 indicates the following. The maze procedure comprehension test scores correlated positively ($\underline{r}$=.48) and significantly ($p<.01$) with the Gates-MacGinitie Comprehension Test scores. Therefore, this hypothesis was not supported, and it was concluded that there was a significant

correlation between the maze procedure comprehension test scores and the Gates-MacGinitie Comprehension Test scores when administered to proficient incarcerated adult readers.

Table 5
Pearson Product-Moment Correlation Coefficients of Maze Procedure Comprehension Test Scores with Gates-MacGinitie Comprehension Test Scores for Proficient Readers
(n=174)

	Correlation (r)	df	Level of significance
Maze Gates-MacGinitie	.48	172	.01

Ho_4: There is no significant correlation between the maze procedure vocabulary test scores and the Gates-MacGinitie Vocabulary Test scores when administered to proficient incarcerated adult readers.

Table 6 presents a summary of these findings. The maze procedure vocabulary test scores correlated positively ($r=.50$) and significantly ($p<.01$) with the Gates-MacGinitie Vocabulary Test scores. Therefore, this hypothesis was not supported. It was concluded that there was a significant correlation between the maze procedure vocabulary test scores and the Gates-MacGinitie Vocabulary Test scores when administered to proficient incarcerated adult readers.

Table 6
Pearson Product-Moment Correlation Coefficients of Maze Procedure Vocabulary Test Scores with Gates-MacGinitie Vocabulary Test Scores for Proficient Readers
(n=174)

	Correlation (r)	df	Level of significance
Maze Gates-MacGinitie	.50	172	.01

Ho_5: There is no significant correlation between the maze procedure comprehension test scores and the Gates-MacGinitie Comprehension Test scores when administered to nonproficient incarcerated adult readers.

Table 7 presents the findings of this analysis. The maze procedure comprehension test scores correlated positively ($r=.47$) and significantly ($p<.01$) with the Gates-MacGinitie Comprehension Test scores. Therefore, this hypothesis was not supported. It was concluded that there was a significant correlation between the maze procedure comprehension test scores and the Gates-MacGinitie Comprehension Test scores when administered to nonproficient incarcerated adult readers.

Table 7
Pearson Product-Moment Correlation Coefficients of Maze Procedure Comprehension Test Scores with Gates-MacGinitie Comprehension Test Scores for Nonproficient Readers
(n=125)

	Correlation (r)	df	Level of significance
Maze Gates-MacGinitie	.47	123	.01

Ho_6: There is no significant correlation between the maze procedure vocabulary test scores and the Gates-MacGinitie Vocabulary Test scores when administered to nonproficient incarcerated adult readers.

Table 8 presents a summary of these findings. The maze procedure vocabulary test scores correlated positively ($r=.30$) and significantly ($p<.01$) with the Gates-MacGinitie Vocabulary Test scores. Therefore, this hypothesis was not supported. It was concluded that there was a significant correlation between the maze procedure vocabulary test scores and the Gates-MacGinitie Vocabulary Test scores when administered to nonproficient incarcerated adult readers.

Table 8
Pearson Product-Moment Correlation Coefficients of Maze Procedure Vocabulary Test Scores with Gates-MacGinitie Vocabulary Test Scores for Nonproficient Readers
(n=125)

	Correlation (r)	df	Level of significance
Maze Gates-MacGinitie	.30	123	.01

Summary

1. When the maze procedure test and the Gates-MacGinitie Reading Tests were administered to incarcerated adult readers, there was a significant ($p<.01$) correlation between the comprehension scores ($r=.60$).

2. When the maze procedure test and the Gates-MacGinitie Reading Tests were administered to incarcerated adult readers, there was a significant ($p<.01$) correlation between the vocabulary scores ($r=.33$).

3. When the maze procedure comprehension test and the Gates-MacGinitie Comprehension Test were administered to proficient incarcerated adult readers, there was a significant ($p<.01$) correlation between comprehension scores ($r=.48$).

4. When the maze procedure vocabulary test and the Gates-MacGinitie Vocabulary Test were administered to proficient incarcerated adult readers, there was a significant (p .01) correlation between the vocabulary test scores (p=.50).

5. When the maze procedure comprehension test and the Gates-MacGinitie Comprehension Test were administered to nonproficient incarcerated adult readers, there was a significant ($p<.01$) correlation between the comprehension scores (r=.47).

6. When the maze procedure vocabulary test and the Gates-MacGinitie Vocabulary Test were administered to nonproficient incarcerated adult readers, there was a significant ($p<.01$) correlation between the vocabulary test scores (r=.30).

Chapter 5

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

The major purpose of this investigation was to determine whether significant correlations exist between the comprehension and vocabulary scores on the maze procedure test and the Gates-MacGinitie Reading Test when these instruments are administered to incarcerated adults. An ongoing concern of academic teachers in the Windham School System is that of finding a valid and reliable measure by which they can assess and monitor students' reading progress on a regular basis. A potential solution to this problem may be achieved, provided one could determine whether scores on the maze procedure test has positive correlations with scores on another valid and reliable instrument (Gates-MacGinitie Reading Tests) designed to measure reading achievement.

The investigator did not attempt to control certain variables which were related to the purpose of this investigation. Methods of reading instruction and time of test administration were assumed not to have an adverse effect on the results of this investigation. The investigator also assumed that attitudes and motivation of the subjects and attitudes and enthusiasm of teachers would not alter the results of this investigation.

The investigator conducted this investigation during the spring of 1983. The sample (N=299) from the population (N=1,300) was randomly selected from alphabetical class rosters of the ten Texas Department of Corrections units

randomly selected for this investigation. Subjects attended regular academic classes in the Windham School System (Texas Department of Corrections). For this investigation, the Test of Adult Basic Education, Level M, Form I, reading scores were used to classify readers as proficient (Group A) and nonproficient (Group B). Subjects with a reading score of 6.0 to 9.0 were identified as proficient readers, Group A (N=174). Subjects with a reading score of 4.0 to 5.9 were identified as nonproficient readers, Group B (N=125).

Hypotheses

The null hypotheses tested in this investigation were as follows:

Ho_1: There is no significant correlation between the maze procedure comprehension test scores and the Gates-MacGinitie Comprehension Test scores when administered to incarcerated adult readers.

Ho_2: There is no significant correlation between the maze procedure vocabulary test scores and the Gates-MacGinitie Vocabulary Test scores when administered to incarcerated adult readers.

Ho_3: There is no significant correlation between the maze procedure comprehension test scores and the Gates-MacGinitie Comprehension Test scores when administered to proficient incarcerated adult readers.

Ho_4: There is no significant correlation between the maze procedure vocabulary test scores and the Gates-MacGinitie Vocabulary Test scores when administered to proficient incarcerated adult readers.

Ho_5: There is no significant correlation between the maze procedure comprehension test scores and the Gates-MacGinitie Comprehension Test scores when administered to nonproficient incarcerated adult readers.

Ho_6: There is no significant correlation between the maze procedure vocabulary test scores and the Gates-MacGinitie Vocabulary Test scores when administered to nonproficient incarcerated adult readers.

Summary

According to the results of the statistical analyses, the summary is presented as follows:

1. There was a significant ($p<.01$) and positive ($r=.60$) correlation between the maze procedure comprehension test scores and the Gates-MacGinitie Comprehension Test scores. The correlation of .60 is moderate, yet a substantial correlation does exist between the maze procedure test scores and the Gates-MacGinitie Reading Test scores when administered to incarcerated adult readers.

2. There was a significant ($p<.01$) and positive ($r=.33$) correlation between the maze procedure vocabulary test scores and the Gates-MacGinitie Vocabulary Test scores. The correlation of .33 is relatively low for this task, yet a definite but small correlation does exist between the two measures when administered to incarcerated adult readers.

3. There was a significant ($p<.01$) and positive ($r=.48$) correlation between the maze procedure comprehension test scores and Gates-MacGinitie Comprehension Test scores when administered to proficient incarcerated adult readers. The correlation of .48 is moderate, yet a substantial correlation does exist between the two measures.

4. There was a significant ($p<.01$) and positive ($r=.50$) correlation between the maze procedure vocabulary test scores and the Gates-MacGinitie Vocabulary Test scores when administered to proficient incarcerated adult readers.

The correlation of .50 is moderate, yet a substantial correlation does exist between the two measures.

5. There was a significant ($p<.05$) and positive ($r=.47$) correlation between the maze procedure comprehension test scores and the Gates-MacGinitie Comprehension Test scores when administered to nonproficient incarcerated adult readers. The correlation of .47 is moderate, yet a substantial correlation does exist between the two measures.

6. There was a significant ($p<.01$) and positive ($r=.30$) correlation between the maze procedure vocabulary test scores and the Gates-MacGinitie Vocabulary Test scores when administered to nonproficient incarcerated adult readers. The correlation of .30 is relatively low for this task, yet a definite but small correlation does exist between the two measures.

Conclusions

When comparing the maze procedure test scores (comprehension and vocabulary) with the Gates-MacGinitie Reading Test scores (comprehension and vocabulary) using proficient and nonproficient readers, it was concluded that:

1. A significant and positive correlation exists between the maze procedure comprehension test scores and the Gates-MacGinitie Comprehension Test scores when administered to incarcerated adult readers.

2. A significant and positive correlation exists between the maze procedure vocabulary test scores and the Gates-MacGinitie Vocabulary Test scores when administered to incarcerated adult readers.

3. A significant and positive correlation exists between the maze procedure comprehension test scores and the Gates-MacGinitie Comprehension Test scores when administered to proficient incarcerated adult readers.

4. A significant and positive correlation exists between the maze procedure vocabulary test scores and the Gates-MacGinitie Vocabulary Test scores when administered to incarcerated adult readers.

5. A significant and positive correlation exists between the maze procedure comprehension test scores and the Gates-MacGinitie Comprehension Test scores when administered to nonproficient incarcerated adult readers.

6. A significant and positive correlation exists between the maze procedure vocabulary test scores and the Gates-MacGinitie Vocabulary Test scores when administered to nonproficient incarcerated adult readers.

Recommendations Based on the Findings

The findings from this investigation add support to other cloze procedure studies in that the maze procedure is a potentially valuable instrument for the classroom teacher. Based upon the findings of this investigation and the survey of literature, the investigator provides the following recommendations to reading teachers concerning its use as an instructional technique and as a diagnostic instrument:

1. The maze procedure can be a useful technique for identifying incarcerated adult readers who have reading problems relative to comprehension and vocabulary.

2. The maze procedure can be a useful technique for monitoring progress in comprehension and vocabulary abilities of incarcerated adult readers on a regular basis.

3. The maze procedure can be a useful technique in identifying groups or subgroups at different levels to assess comprehension and vocabulary abilities of incarcerated adult readers.

4. The maze procedure can be a useful technique for measuring specific reading comprehension and vocabulary abilities for a particular passage or general reading comprehension and vocabulary levels as measured by standardized reading tests.

5. The maze procedure can be a useful technique for both pretesting and posttesting measures of comprehension and vocabulary reading levels of incarcerated adult readers.

6. The maze procedure can be a useful technique for testing sequence. Oller (1972) discussed the element of expectancy or the capacity to anticipate elements in sequence. This is very important in developing good reading skills and is an essential skill to develop in second-language readers. The maze procedure measure would be useful for developing this skill.

Recommendations for Further Study

When comparing the maze procedure test scores (comprehension and vocabulary) with the Gates-MacGinitie Reading Test scores (comprehension and vocabulary) using proficient and nonproficient incarcerated adult readers, the findings were moderate to low correlations between the two measures. These

results might be due to any one of several variables. Therefore, the following recommendations were made for further research:

1. Research studies should be conducted to determine whether methods of reading instruction would have an adverse effect on incarcerated readers' performances when administered multiple maze procedure tests.

2. Research studies should be conducted to determine whether variations in time of test administration would have an adverse effect on incarcerated adult students' reading performance when administered multiple maze procedure tests.

3. Research studies should be conducted to determine whether incarcerated students' attitudes and motivational levels are factors which influence their performance on maze procedure tests.

4. Research studies should be conducted to determine whether attitude and enthusiasm of reading teachers would have an adverse effect on incarcerated adult students' reading performance as measured by the maze procedure tests.

5. Follow-up studies should be conducted using multiple passages to examine the effectiveness of the maze procedure in assessing reading levels (comprehension and vocabulary) of incarcerated readers.

6. Research studies should be conducted which investigate the effectiveness of the maze procedure as a predictor of language proficiency for placement purposes of incarcerated ESL (English as a Second Language) students.

7. This investigation should be replicated in other instructional settings representing adult readers with diverse goals, reading abilities, and backgrounds to confirm or challenge the results of this investigation.

APPENDICES

APPENDIX A

Maze Procedure Tests
Comprehension and Vocabulary

(Passage used in this investigation)

CLOZE READING

Name_____ Unit_____

Age_____ E.A. Reading_____

TDC #_____ E.A._____

Race_____ Cloze Score_____

Date_____

DIRECTIONS: Select the one word that best fits the sentence by darkening the space beside the matching letter on the Scan-Tron sheet. Make no marks on this sheet. The sample below will help you understand how to read and mark your answers.

SAMPLE:

A ate
The mean dog B yelled at the man.
C barked

A house
The B stove ran away.
C man

If you want to change your answer, be sure to erase your old answer completely and record your new answer.
If the reading passage is too difficult for you to understand, do not guess. Hand in your test immediately.

The Greatest of Them All

He was born over seventy years ago in a slum district and roamed the streets as a ragged child, sometimes hungry. He may have lacked parental guidance in those days, as his father had deserted the family and his mother was compelled to scrub for several households to support her needy family.

He acquired more than one nickname because his mouth was so large. He didn't care; he was good-natured about it. He never learned to hate -- it was a waste of time; he had too many things to learn about the world he was growing up in.

Before he was thirteen, he was sent to jail for a foolish prank, and from there to an orphanage. While he was there he learned that dreams could come true. He had a dream, a goal he must follow, and he followed that dream to the end.

Out on the streets again, he sometimes made less than a dollar a day, but people had begun to notice him. He was going to the top, and he knew that people all over the world would hear his name someday. Through hard times, exhausting days and nights, he never ceased his unwavering struggle to become the greatest in his profession.

He began to receive recognition all over the world. Anyone with a radio or televison set could see him or hear his familiar voice. Books were written about him. He was known everywhere as a "soft touch" because he could never turn down anyone with a hard luck story. People everywhere loved him because he loved them.

He's dead now, but the world will always remember him as the greatest of them all. Who was he? Louis Armstrong, but we call him Satchmo because of that big mouth of his. He made himself heard all over the world.

He was born over seventy years ago in a slum district and roamed

the streets as a ragged child, sometimes hungry. He may have (A likely / B lacked / C missiles)

parental guidance in those (A days, / B show, / C dormant,) as his father had (A discourse / B distilled / C deserted)

the family and his (A mother / B maze / C mine) was compelled to scrub (A from / B fast / C for) several

households to support (A she / B her / C hers) needy family.

He acquired (A more / B many / C modern) than one nickname because his (A money / B minute / C mouth) was

so large. (A He / B Men / C She) didn't care; he was (A grateful / B goodnatured / C musical) about it. He never

(A instigated / B master / C learned) to hate--it was a (A awful / B waste / C impair) of time; he (A had / B waited / C begun) too many

things to (A learn / B apply / C live) about the world he (A went / B wilted / C was) growing up in.

Before he was (A thirteen / B secretary / C supposed) he was (A abode / B sent / C vortex) to jail for a (A foolish / B united / C blame)

prank, and from there (A to / B at / C once) an orphanage. While he was (A three / B there / C train) he

learned that (A dealer / B dreams / C ancestors) could come true. He had a dream, a (A goal / B field / C cold)

he must follow, and he (A followed / B master / C adverse) that dream to the (A years. / B end. / C tip.)

Out on the streets (A there, / B when, / C again,) he sometimes made less (A than / B and / C for) a dollar

a day, (A with / B but / C such) people had begun to (A notice / B chatter / C abode) him. He was going to the

A epic A chartered A the
B top and he B knew that people all over B his world would hear
C bounds C starch C him

A interest A earlier
his B name someday. Through hard times, B exhausting days and nights,
C mind C starvation

A never A assumed
he B brave ceased his unwavering struggle to B become the greatest
C new C apologize

A his
in B high profession.
C him

A expense A air.
He began to B receive recognition all over the B world. Anyone
C set C tank.

A him
with a radio or television set could see B his or hear his familiar
C he

A valor. A spoken
B voice. Books were B written about him. He was known everywhere as
C vortex. C sung

A should A family
a "soft touch" because he B could never turn down B anyone with a
C masterful C settler

A novel. A blame
hard luck B curfew. People everywhere B loved him because he loved them.
C story. C design

A imaginative A was
He's B dead now, but the world B will always remember him
C standard C claim

A greatest
as the B immensity of them all.
C sunniest

A since
Who was he? Louis Armstrong, but we call him Satchmo B before
C because

A of
of that big mouth B for his. He made himself heard all over the world.
C from

Cloze
Oral Reading Word List

Name_____TDC#_____Unit_____

Phase_____Rd. E.A._____E.A._____Age_____Race_____

Date_____

1. to
2. foolish
3. sent
4. thirteen
5. was
6. learn
7. had
8. waste
9. learned
10. goodnatured
11. he
12. mouth
13. more
14. her
15. for
16. mother
17. deserted
18. days
19. lacked
20. there
21. dreams
22. goal
23. followed
24. end
25. again
26. than
27. but
28. notice
29. of
30. because
31. greatest
32. will
33. dead
34. loved
35. story
36. anyone
37. could
38. voice
39. top
40. knew
41. the
42. name
43. exhausting
44. never
45. become
46. his
47. receive
48. would
49. him
50. written

SCORE

Raw Score_____

Reading Level_____

APPENDIX B

Gates-MacGinitie Reading Tests
Comprehension and Vocabulary

THE GATES-MacGINITIE READING TESTS

Comprehension

DIRECTIONS: Read the sample paragraph below. It has numbered blanks in it. The first blank is number C 1. Look below the paragraph at the line of words with C 1 in front of it. Find the word in line C 1 that makes the best sense in blank C 1. The word direction from line C 1 makes the best sense in blank C 1. The word direction is the answer to number C 1. Draw a line under the word direction.

Now look at the words in line C2. Find the word in line C2 that makes the best sense in blank C2, and draw a line under it.

SAMPLE

Homing pigeons may be used to carry messages. Their sense of ___C1___ enables them to find their way ___C2___ over unfamiliar territory.

C1. humor direction distinction values confusion

C2. blocked marked driving lost home

The word home makes the best sense in blank C2. You should have drawn a line under the word home.

Now draw a line under the best word for each of the blanks that follow on this page and on the next two pages. If you can't choose the best word for a blank, don't spend too much time on it. Go on to the next one.

Sea lion pups play in much the same way as dog pups do, except that, when they are older, they like to play under ___1___, which ___2___ pups do not like to do.

1. sky trees tents water fire

2. fish drowns sea lion play dog

The archaeologist tries to add to our knowledge of ancient peoples. He must often dig down through layers of earth and debris to ___3___ relics of an ancient civilization. By digging carefully, he hopes not to miss or ___4___ valuable evidence.

3. discard waste impossible uncover dirt

4. make destroy discover understand search

We were much elated by the first gleam of light shining through the swirling fog. The curtain of fog had seemed to make of our short ___5___ over well-known water an unending voyage upon ___6___ seas.

5. boat man song log journey

6. joyful paved unknown dry expensive

Many skin divers have read ___7___ of ships sunk in coastal storms and have become fascinated with the idea of ___8___ some of the cargo of sunken ships.

7. buoys gear denials nothing accounts

8. recovering burning making losing escaping

Attempts have been made to abolish quack remedies. In spite of the fact that some such "medicines" contain only harmless ingredients, they are sometimes sold under false pretenses. The ___9___ should be protected against wasting his money as well as against endangering his ___10___

9. medicine consumer quack enemy paymaster

10. money help protection health friends

Trees close to the ocean shore often lean inland. Winds from the ocean have blown almost unceasingly on them and have pushed them almost ___11___ in the same inland ___12___.

11. kindly upright never costly constantly

12. swamps mountains prison direction breezes

The currency of the United States is based on the decimal system. Because ten is also the ___13___ of our number system, we find it easy to ___14___ in terms of ten.

13. writing chapter series base equivalent

14. calculate certify authorize prescribe monitor

Comprehension

Some telegraph sending machines use perforated tape. A message is typed in advance on a special machine. It appears as a series of ___15___ on a plastic or paper tape. The tape can then be fed into the transmitting machine. Since the tapes are all ___16___ before transmission, time can be saved in the actual transmission of messages.

15. lines messages holes colors words

16. short unimportant long transmitted prepared

People usually are not capable of hearing sound frequencies ___17___ than about 20,000 cycles per second. The ___18___ at which the normal ear can hear best is about 2,000 cycles per second.

17. less other above shorter greater

18. length frequency pressure place strength

In order to keep up with all that one needs to read, some students have tried to increase their ___19___ speed. Those who have good self-discipline can ___20___ by practicing faster reading. Since faster reading requires greater concentration, many students have improved their ___21___ as well as their speed.

19. walking eating reading writing speaking

20. improve relax dream entertain keep

21. time speed manners increase comprehension

The inventor spends many long and weary hours working on his particular problem. He tries one plan after another. Many of these are ___22___, but he keeps on working until he has found a successful ___23___. It is ___24___ true that inventions result solely from sudden inspiration.

22. successful designed failures faultless final

23. business problem solution trip manager

24. even real false seldom more

Tape recorded conversations or confessions are always suspect as evidence because it is easy to ___25___ a tape recording by snipping out sections and splicing the cut ends together. The resulting tape can then be played and recorded by another machine, producing a final ___26___ tape.

25. repeat record alter unwind lengthen

26. unrecorded unspliced punched original reliable

Sable Island is a small, almost deserted island with dangerous ___27___ sand bars. It lies between North America and Europe in the North Atlantic shipping ___28___. Sailors call it "The Graveyard" because of the many shipwrecks which have occurred there.

27. lighthouse floating fishing surrounded submerged

28. center lane office island harbor

A bank makes a variety of loans. If an individual has unquestionable credit, he can secure a loan on his personal note signed only by ___29___. Other loans, however, may require a cosigner so that a second individual also makes himself ___30___ for the repayment of the ___31___.

29. law himself ink another memory

30. liable possible secure content scarce

31. interest premium borrower loan letter

A terrarium is a small indoor glass-enclosed ___32___. It can be constructed in any number of interesting ways. Very often small figures are included. Of course the main attractions are the ___33___. They must be rooted firmly in the soil and given plenty of space to grow. The ___34___ is usually a mixture of loam, sand, and peat-moss. It should be placed on a layer of pebbles.

32. bookcase porch garden turtle puzzle

33. plants fish figures pebbles roots

34. side sand space charcoal soil

TURN THE PAGE AND GO ON

Comprehension

Soundproofing is a type of insulation. One kind, used in music rooms, consists of sound-absorbing and ___35___-deadening materials placed on walls, ceilings, and floors. These ___36___ are chosen because they improve the quality of the music by ___37___ objectionable echoes.

35.	sound	sense	odor	fire	thought
36.	materials	quantities	speakers	tubes	needles
37.	consisting	reducing	producing	very	amplifying

An important part of our legal system is the jury. A jury is made up of twelve people selected from a list of those qualified to be ___38___. Before a trial begins, jurors swear to ___39___ the facts fairly and to render a just ___40___.

38.	justices	doctors	jurors	exempt	injured
39.	conceal	weigh	alter	wave	ignore
40.	law	defense	verdict	right	legality

Demographic data are obtained through statistical studies of selected characteristics of a population. The U.S. census, taken every ten years, is an ___41___ of a demographic study. Certain ___42___ of the population of the United States are analyzed___43___.

41.	interesting	event	oversight	example	accident
42.	aspects	students	disasters	income	typical
43.	statistically	wrongly	chemically	harshly	writing

Although the eye is not fragile, it should be properly protected. Actually, many other parts of the body would also be ___44___ by events that cause serious injury to the eye. The problem is plain enough, however; while the body can ___45___ damaged tissues in many ___46___ areas, it cannot grow a new eye.

44.	spared	injured	fragile	produced	unprotected
45.	hurt	care	replace	injure	grow
46.	other	of	certain	any	undamaged

The ambiguous use of technical terms in various languages offers difficulty for a ___47___ of scientific material. Our government has helped by publishing a glossary which gives English ___48___ for words not found in most dictionaries or other ___49___ books.

47.	number	translator	shipment	scarcity	name
48.	equivalents	people	ships	books	authors
49.	reference	expensive	popular	old	comic

When Austria ruled Switzerland, it is said that Gessler, a tyrannical Austrian, set a hat on top of a pole in a Swiss village. He then ordered the Swiss to bow to this hat, a ___50___ of Austria. William Tell, a skilled archer, ___51___ to bow. Gessler ___52___ him, under penalty of death, to shoot an apple from the head of his son. William did this but never bowed to the hat.

50.	flag	ruler	time	symbol	village
51.	wanted	rejected	tried	refused	decided
52.	begged	determined	shot	cheered	forced

STOP

CHECK YOUR WORK

THE GATES-MacGINITIE READING TESTS

Vocabulary

DIRECTIONS: Look at the sample test word V 1 below. The word is **home**. Now read the five words below home. Find the one word in this group that means most nearly the same as **home**. The word **house** means most nearly the same as **home**. Draw a line under the word house.

Now look at test word number V2. Find the one word in the group below it that means most nearly the same, and draw a line under it.

Pull means most nearly the same as drag. You should have drawn a line under the word pull.

For each numbered word on this page and the next page, draw a line under the word below it that means most nearly the same. If you can't decide which word means most nearly the same as a numbered test word, go on to the next test word.

SAMPLES

V1. **home**
rock
moment
talk
house
some

V2. **drag**
pull
style
send
wagon
sick

1. **rescue**
remember
reduce
mistake
save
charge

2. **illegal**
forbidden
distressing
enormous
loyal
cheap

3. **federation**
respect
organization
report
guarantee
inflation

4. **inquiry**
insult
robbery
question
plant
court

5. **attractive**
electric
jumpy
pretty
silent
happy

6. **dramatic**
medical
energetic
edible
painful
expressive

7. **fascinate**
waiver
patch
charm
suspend
dictate

8. **melody**
tune
dessert
bush
color
farce

9. **heedless**
poor
careless
barefoot
full
tidy

10. **moccasin**
fish
location
event
shoe
holiday

11. **gaiety**
jollity
garment
buckle
mystic
entrance

12. **shudder**
shake
accuse
close
window
confuse

13. **revise**
destroy
squeeze
raise
change
enlarge

14. **colossal**
fancy
tired
huge
building
pillar

15. **glimmer**
murmur
cutter
sound
fame
light

16. **bronchitis**
pony
ailment
moss
tickle
storm

17. **monarchy**
danger
bank
archery
vault
kingdom

18. **saturation**
fullness
celestial
contention
duration
greeting

GO ON TO THE NEXT PAGE

Vocabulary

19. ferocity
- iron
- distance
- wildness
- cleanliness
- rate

20. lunacy
- insanity
- moonlight
- monthly
- legal
- alertness

21. empress
- railroad
- queen
- stamp
- printer
- tree

22. gluttonous
- sheepish
- soapy
- greedy
- dull
- trashy

23. reminiscence
- proportion
- divinity
- recollection
- criticism
- glow

24. fallible
- fertile
- willing
- tottering
- tender
- imperfect

25. obstruction
- foundation
- ignorance
- oration
- hindrance
- doctor

26. mollusk
- fortress
- snake
- container
- invertebrate
- fabric

27. priority
- younger
- precedence
- ballot
- boldness
- shelter

28. annex
- cellar
- beseech
- record
- add
- cancel

29. plebeian
- soldier
- reptile
- decent
- common
- noble

30. reconstitute
- resemble
- restore
- reject
- impeach
- laboratory

31. void
- bitter
- count
- empty
- truce
- cheat

32. intricacy
- digestion
- interior
- politics
- secret
- complexity

33. pabulum
- book
- oar
- mixer
- food
- weight

34. belligerent
- musical
- wanderer
- mellow
- immigrant
- warlike

35. petulant
- gasoline
- irritable
- swinging
- clumsy
- tonic

36. germinate
- sprout
- disinfect
- litter
- conclude
- emigrate

37. disconcert
- discourse
- symphony
- disturb
- eliminate
- follow

38. primeval
- stupid
- pompous
- daily
- original
- fussy

39. oracle
- launch
- hole
- wonder
- revelation
- grip

40. disrepute
- argument
- disgrace
- distribute
- unearth
- answer

41. zealot
- deserter
- miser
- fool
- collector
- enthusiast

42. endow
- furnish
- admire
- punish
- erect
- hire

43. vilify
- congregate
- tempt
- slander
- progress
- classify

44. rigid
- cross
- fixed
- cold
- high
- large

45. neurasthenia
- network
- ointment
- shrub
- treatment
- disorder

46. abominable
- horrible
- bodily
- explosive
- gigantic
- extinct

47. fauna
- headdress
- stream
- spray
- animals
- garden

48. monetary
- prominent
- slow
- temporary
- marriage
- financial

49. vestigial
- remnantal
- feminine
- shining
- sordid
- novel

50. ostentatious
- showy
- bony
- fat
- wise
- experimental

STOP
CHECK YOUR WORK

APPENDIX C

Maze Procedure Tests
(Scale I and Scale II)

Developed for Pilot Study

Name_____ Number_____ Date_____ School Day _____ Age_____ Teacher_____

Phase_____ Unit_____ E.A._____ E.A. Rdg._____ Part 1 _____ Part 2 _____ Part 3 _____ Parts 1+2 _____ Total_____

DIRECTIONS

Complete the information asked for by the instructor. This test consists of three reading passages. As you read the passages, darken the circle by the one word that fits best in the sentence. The sample will help you understand how to read and mark your words.

If you want to change your answer, make an X through the darkened space and darken your new choice. DO NOT ERASE.

If the reading passage is too difficult for you to understand, do not guess. Hand in your test immediately.

This is a 10 minute test.

SAMPLE PASSAGE

Fish can talk! They get quite noisy. Some sound 0 little / 0 light / ● like

whistles. Some grunt and 0 mouth. / ● moan. / 0 meow. Others make different noises.

X Them / ● They / 0 The make these sounds with ● teeth, / 0 teen, / 0 tough, bones, and fins.

Are ● fish / 0 fishy / 0 finks deaf? No, they have 0 other / ● inner / 0 no ears and can hear

X out / 0 above / ● under the water. They can 0 hurt / 0 heat / ● hear as well as people 0 job. / 0 build. / ● can.

1

Red was a fox. His hair was red. I first saw him last

year. He was near the creek. I saw him run fast. I began

0 or
to look 0 for him.
0 over

0 like 0 would
Each day I 0 would to walk. Sometimes I 0 work
0 run 0 like

0 rope. 0 trunks
walk along a little 0 aisle. Once I saw Red's 0 tracks
0 road. 0 car

0 It 0 look
in the dusty road. 0 I'll thought I would never 0 sew
0 I 0 see

him again.

0 I 0 thump
One day 0 A took a short cut 0 thrust the woods.
0 As 0 through

0 would 0 at
The wind 0 cold blowing away from me 0 of I stepped
0 was 0 as

0 at 0 was
from behind 0 from old oak tree. I 0 saw Red playing
0 an 0 again

0 dry 0 looked
in the 0 drip leaves, but when he 0 saw me, he
0 dust 0 was

0 always.
quickly leaped 0 gone.
0 away.

0 around 0 tell
I saw Red often 0 after that and we began 0 at
0 off 0 to

0 butcher
know each other. The 0 beautiful fox would never come
0 bountiful

0 calm 0 hero
0 close me, but I felt 0 he was a friend.
0 near 0 him

0 form 0 once
It 0 looked a sad day the 0 last time I saw Red.
0 was 0 less

0 I 0 house.
0 For walked into a farmer's 0 yard. The farmer
0 I'll 0 chicken.

proudly displayed Red hanging from a fence.

2

There were tough men in the early West. These big,

0 argue 0 chartered
wild men 0 were at home in a 0 domestic land. They
0 went 0 dangerous

0 perils 0 arena
learned how 0 to stay alive in an 0 area that was
0 could 0 abode

0 blank
only a 0 blame on our map.
0 blunder

0 brutal 0 to
These 0 brave men were great Americans 0 always
0 gentle 0 and

0 off
became legends in their 0 own lifetime. Perhaps
0 omen

0 fragrantly 0 slight
America will 0 gently see a breed of 0 such bold
0 never 0 sullen

0 united 0 trail
men again in 0 its history. They faced a 0 train
0 wretched 0 trench

0 they 0 acre.
of danger each day 0 misery marched in a wild 0 land.
0 thrilling 0 field.

0 wide
They opened the frontier 0 of the settlers of the
0 to

0 mountains.
0 West. Starvation, hostile Indians, numbing
0 North.

0 barbecue 0 jests
0 wagons and scorching heat, dangerous 0 snakes and
0 cold 0 jeans

0 standard
beasts, were only 0 stanches fare for these robust
0 starch

0 agents.
0 Americans.
0 gangsters.

0 family
You'll find some of 0 their names in history
0 barbarian

0 For 0 obligation
books. 0 Few of them ever claimed 0 currency wanted
0 First 0 or

0 friends.
any fame for 0 ancestors. Their daring spirit and
0 themselves.

0 vortex
0 valor will live on as long as there is an America.
0 vanity

3

He was born in a little Italian town. He had a curious

0 comparable 0 it
0 foreboding mind. He was interested 0 on many things
0 imaginative 0 in

0 arrogant 0 aged
and had 0 amazing ideas for a youth 0 long lived five
0 adverse 0 who

0 curfew.
hundred years 0 ago.
0 epic.

0 minutes
When he was fifteen 0 months old he began to
0 years

0 study 0 musical.
0 apply painting with a Florence 0 secretary. He was
0 impair 0 master.

0 of 0 with
so gifted, 0 edit work soon surpassed that 0 of his
0 his 0 off

0 revealed 0 she
teacher, and he 0 wilted famous by the time 0 the
0 was 0 he

was twenty-six.

0 freak 0 informer,
This young 0 man was a musician, an 0 inventor,
0 dealer 0 instigator,

0 It
a sculptor, an architect. 0 He built a flying machine,
0 I

0 men 0 panel
0 she designed a parachute, a 0 plastic bridge, a printing
0 he 0 modern

0 Oh 0 flanked
press. 0 His masterful knowledge and insight 0 picked
0 With 0 set

0 hosts,
him apart from ordinary 0 gods, for the immensity of
0 men,

0 him 0 expanse.
0 his genius knew no mortal 0 bounds.
0 heathen 0 empire.

0 always
Leonardo da Vinci was 0 some man truly touched by
0 a

0 two 0 originally
0 all hand of God. He 0 is considered by
0 the 0 earlier

historians to have possessed one of the most original minds

of the Renaissance period.

WINDHAM READING SCALE II

1

The dog stopped. Joe stopped too. The (0 red, 0 house, 0 car)

(0 and, 0 but, 0 go) went by. Then Joe his dog crossed the street.

Joe is blind. his (0 mind, 0 dog, 0 cat,) Ruff, takes care of

(0 he, 0 him, 0 what) when he walks. The (0 dog, 0 car, 0 book) wears a harness. Joe

(0 can, 0 sees, 0 holds) the handle on the harness. Joe can tell when

(0 on, 0 it, 0 to) stop, go, or turn (0 by, 0 how, 0 holds) what his dog does.

(0 Bill, 0 Who, 0 Joe) did not get Ruff (0 only, 0 until, 0 since) he was trained. A

(0 pet, 0 hunting dog, 0 guide) must go to (0 many. 0 school. 0 dinner.) After months of

(0 who, 0 he, 0 how) can lead a blind (0 street. 0 dog. 0 person.)

Ruff had to learn (0 handle, 0 those, 0 about) traffic safety. The dog

(0 went, 0 learned, 0 must) to stop for stop (0 signs, 0 walks, 0 overs) and stoplights. He

(0 leans, 0 looks, 0 barks) always both ways before crossing (0 a, 0 on, 0 in) street.

The dog also (0 learned, 0 doesn't, 0 listens) to watch for things (0 go, 0 him, 0 Joe)

might trip over or (0 walk, 0 fly, 0 come) into. Ruff carefully leads

(0 it, 0 Joe, 0 dog) around things that could (0 from, 0 close him. 0 hurt) The dog

(0 learns, 0 becomes, 0 has) actually Joe's eyes. For Joe, a dog is

certainly one of man's best friends.

2

We tend to think of currency as coins and bills.

Metal coins and paper (0 cars, 0 comics, 0 bills) are relatively recent

forms (0 of, 0 buy, 0 only) money. In the past, (0 nobody, 0 people, 0 however) have used

everything from (0 blue, 0 salt, 0 in) to whales' teeth.

On (0 the, 0 how, 0 my) Pacific island of Yap, (0 active, 0 birds, 0 men) used

coins which were (0 engraved, 0 carved, 0 stolen) from rocks. A coin's

(0 value, 0 shine, 0 going) was determined by its (0 green, 0 date, 0 size) and weight. A

rich (0 coin, 0 person, 0 wealth) might have coins weighing (0 minute, 0 something, 0 several)

tons apiece. If something (0 cheap, 0 expensive, 0 standard) was purchased,

the islander (0 can, 0 would, 0 only) have to gather all (0 can, 0 many, 0 his) friends

to help move (0 and, 0 those, 0 the) coin.

Alaskan Indians used (0 chair, 0 and, 0 bone) fish hooks, blankets,

and (0 runs, 0 old, 0 not) copper for money. The (0 cup, 0 turkey, 0 fish) hooks were

like our (0 small, 0 clothes, 0 better) change while the blankets (0 were, 0 aren't, 0 aimed)

like our $10 and $20 (0 carts. 0 bills. 0 coins.) Old pieces of copper

(0 sure, 0 might, 0 were) considered really big money.

(0 As, 0 If, 0 In) you can see, our (0 modern, 0 ancient, 0 exact) currency has some

definite (0 important. 0 priorities. 0 advantages.) It is easy to carry and easy to

trade.

3

It seems incredible, but one of the world's greatest

inventors had only three months of formal education.

Young Alva was withdrawn (0 from, 0 for, 0 fast) first grade because

his (0 library, 0 hamster, 0 teacher) considered him stupid.

His (0 pedal, 0 program, 0 parents) knew Alva was extremely (0 intelligent, 0 exactly, 0 inebriated)

and assumed responsibility for (0 he, 0 his, 0 him) education. His

mother made (0 extend, 0 bread, 0 learning) a game of exploring (0 the, 0 those, 0 some)

exciting world of knowledge. (0 But, 0 In, 0 Only) just a few short

(0 years, 0 pants, 0 stick) he had progressed so (0 far, 0 many, 0 mad) his mother could

no (0 attempt, 0 matter, 0 longer) teach him.

At the (0 maze, 0 age, 0 years) of 12 Alva was (0 employed, 0 timid, 0 captured) by the

railroad to (0 sell, 0 buy, 0 many) apples, candy, sandwiches, and

(0 professors, 0 engines, 0 newspapers) to passengers. During the (0 animal, 0 century, 0 years) that

followed, he printed (0 your, 0 his, 0 the) own newspaper, worked as

(0 in, 0 a, 0 an) telegrapher, and began inventing. (0 Up, 0 Be, 0 At) the age of

23 (0 Alva, 0 John, 0 Mark) sold an invention for $40,000 (0 exact, 0 which, 0 about)

enabled him to set (0 up, 0 in, 0 on) his first shop.

In (0 the, 0 side, 0 a) years that followed, Thomas (0 and, 0 Alva, 0 the)

Edison had patents on (0 felt, 0 mine, 0 over) 1,100 inventions. Of these,

the light bulb, phonograph, and telephone can be found in

nearly every home.

APPENDIX D

Letter Requesting Approval to Conduct Investigation

SO-2 Rev. 10-75

TEXAS DEPARTMENT OF CORRECTIONS

Inter-Office Communications

From Alice Fisher Date June 28, 1983

To Richard Hartley Subject Permission to use test results

I have obtained permission from Dr. Murray to work with students in the Windham School System academic program to obtain data for my doctoral research. Essentially, I have been gathering reading data pertaining to students comprehension levels. The purpose of the study is to validate the usefulness of the cloze procedure (a reading technique) in assessing reading comprehension levels. The results of the study will be used to document the effectiveness of the cloze procedure in the teaching of reading. Furthermore, on the basis of the findings of the study, appropriate recommendations can be made to Windham reading teachers concerning its use as an instructional technique and as a diagnostic instrument.

I am asking permission to report the findings of this study in my dissertation; of course, names and identification numbers of inmates will not be reported.

Thank you for consideration in approving this request.

Respectfully,

Alice Fisher

Alice Fisher, Communications Supervisor
Windham School System

AF/cmm

APPENDIX E

Letter Granting Approval to Conduct Investigation

SO-4 Rev. 10-75

TEXAS DEPARTMENT OF CORRECTIONS

Inter-Office Communications

From Larry Farnsworth, Coordinator of Extra Departmental Research
To Ms. Alice Fisher

Date 5 July 1983
Subject ExtraDepartmental Research

Your IOC of June 21, 1983 to Mr. Hartley has been forwarded to this office. Your request has been approved, however, in order to comply with requirements, it will be necessary for you to complete the enclosed forms. Also, please send me a copy of your dissertation prospectus. Thank you.

Sincerely,

Larry Farnsworth

Larry Farnsworth, Ph.D
Coordinator of Extra
Departmental Research
Management Services

LF:kah
Encl.

APPENDIX F

Texas Department of Corrections Randomly Selected Units

TEXAS DEPARTMENT OF CORRECTIONS

HUNTSVILLE, TEXAS 77340

TEXAS DEPARTMENT OF CORRECTIONS RANDOMLY SELECTED UNITS

BETO I UNIT
Tennessee Colony, Texas

CENTRAL UNIT
Sugarland, Texas

CLEMENS UNIT
Brazoria, Texas

DARRINGTON UNIT
Rosharon, Texas

FERGUSON UNIT
Midway, Texas

GATESVILLE UNIT
Gatesville, Texas

HILLTOP UNIT
Gatesville, Texas

HUNTSVILLE (WALLS) UNIT
Huntsville, Texas

MOUNTAIN VIEW UNIT
Gatesville, Texas

RAMSEY II UNIT
Rosharon, Texas

APPENDIX G

Table for Determining Sample Size from a Given Population

TABLE 3–1. Table for Determining Sample Size from a Given Population.

N	*S*	*N*	*S*	*N*	*S*
10	10	220	140	1200	291
15	14	230	144	1300	297
20	19	240	148	1400	302
25	24	250	152	1500	306
30	28	260	155	1600	310
35	32	270	159	1700	313
40	36	280	162	1800	317
45	40	290	165	1900	320
50	44	300	169	2000	322
55	48	320	175	2200	327
60	52	340	181	2400	331
65	56	360	186	2600	335
70	59	380	191	2800	338
75	63	400	196	3000	341
80	66	420	201	3500	346
85	70	440	205	4000	351
90	73	460	210	4500	354
95	76	480	214	5000	357
100	80	500	217	6000	361
110	86	550	226	7000	364
120	92	600	234	8000	367
130	97	650	242	9000	368
140	103	700	248	10000	370
150	108	750	254	15000	375
160	113	800	260	20000	377
170	118	850	265	30000	379
180	123	900	269	40000	380
190	127	950	274	50000	381
200	132	1000	278	75000	382
210	136	1100	285	1000000	384

Note: *N* is population size. *S* is sample size.

Cornett, J.D., & Beckner, M. (1975). Introductory statistics for the behavioral sciences, p. 46. Columbus, OH: Charles E. Merrill.

APPENDIX H

Table for Critical Values of Pearson-Product Moment Correlation (r)

Table G. Critical Values of *r* (Pearson Product-Moment Correlation Coefficient)

df	.1	.05	.02	.01	.001
1	.98769	.99692	.999507	.999877	.9999988
2	.9000	.9500	.9800	.9900	.99900
3	.8054	.8783	.9343	.9587	.99116
4	.7293	.8114	.8822	.9172	.97406
5	.6694	.7545	.8329	.8745	.9507
6	.6215	.7067	.7887	.8343	.9249
7	.5822	.6664	.7498	.7977	.8982
8	.5494	.6319	.7155	.7646	.8721
9	.5214	.6021	.6851	.7348	.8471
10	.4973	.5760	.6581	.7079	.8233
11	.4762	.5529	.6339	.6835	.8010
12	.4575	.5324	.6120	.6614	.7800
13	.4409	.5139	.5923	.6411	.7603
14	.4259	.4973	.5742	.6226	.7420
15	.4124	.4821	.5577	.6055	.7246
16	.4000	.4683	.5425	.5897	.7084
17	.3887	.4555	.5285	.5751	.6932
18	.3783	.4438	.5155	.5614	.6787
19	.3687	.4329	.5034	.5487	6652
20	.3598	.4227	.4921	.5368	6524
25	.3233	.3809	.4451	.4869	.5974
30	.2960	.3494	.4093	.4487	.5541
35	.2746	.3246	.3810	.4182	.5189
40	.2573	.3044	.3578	.3932	.4896
45	.2428	.2875	.3384	.3721	4648
50	.2306	.2732	3218	.3541	.4433
60	.2108	.2500	.2948	.3248	.4078
70	.1954	.2319	.2737	.3017	3799
80	.1829	.2172	.2565	.2830	3568
90	.1726	.2050	.2422	.2673	3375
100	.1638	.1946	.2301	.2540	.3211

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