CLOZE CRITERION SCORES FOR COMPREHENSION LEVELS AMONG SELECTED NIGERIAN SECOND LANGUAGE READERS

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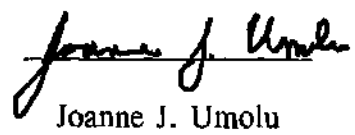
DECLARATION

I hereby declare that this dissertation is an original work based on my own research. It has not been presented in any previous application for a higher degree. All quotations are indicated and the sources of information are specifically acknowledged by means of references.



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8 January, 1996

CERTIFICATION

This dissertation entitled *Cloze Criterion Scores for Comprehension Levels Among Selected Nigerian Second Language Readers* by Joanne J. Umolu meets the regulations governing the award of the degree of Doctor of Philosophy of Ahmadu Bello University, and is approved for its contribution to knowledge and literary presentation.

Chairman, Supervisory Committee — 19th January, 1996
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Date

DEDICATION

This work is dedicated to

all children in schools in Nigeria for whom reading is difficult

and

to all the teachers who seek to help them.

ABSTRACT

The study was designed to establish criterion scores which would enable teachers to use the teacher-constructed cloze test, an informal reading assessment instrument, to predict how well Nigerian L2 students can comprehend the reading material used for their class. This is necessary in view of the evidence that a large amount of the reading material used in Nigerian schools today is too difficult for the students to comprehend.

In this correlational study, four cloze passages drawn from Integrated Science texts were administered in six schools in Jos yielding a total of 797 JSS2 and 602 SSS2 passages completed by L2 readers. Miscue analysis was carried out on each of the 100 cloze tests randomly selected for each of the four passages. Each miscue was classified according to its semantic and syntactic acceptability and the relationships between cloze scores and patterns of miscue types were examined. Regression analysis was used to predict the proportion of semantically acceptable miscues associated with each cloze score.

Based on this, predicted comprehension levels were established for cloze scores for use with students at JSS2 and SSS2 levels. For example, cloze scores of 44% predict comprehension levels of 73% among JSS2 and 72% among SSS2 readers while cloze scores of 58% predict comprehension levels of 88% at both class levels. Recommendations are made for the training of secondary teachers in the development, administration and interpretation of cloze testing using the comprehension levels established in the study.

Miscue patterns were also examined to find out unique processing strategies among Nigerian L2 readers. The findings showed that these readers rely heavily on semantic information to make meaning from syntactically difficult text. An observed trade-off between use of syntactic and semantic cues supports the interactive-compensatory views of the reading process. The implications of this for L2 reading instruction include the need for teachers to build on the ability of the readers to process semantically while improving their use of English syntactic cues while reading.

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SYMBOLS AND ABBREVIATIONS

AMSLAN	American Sign Language
ESL	English as a Second Language
GCE	General Certificate of Education
IRI	Informal reading inventory.
IEA	International Association for the Evaluation of Education Achievement
JAMB	Joint Admissions and Matriculation Board
JSS	Junior Secondary School
L2	Second Language
NCE	Nigeria Certificate of Education
NTI	National Teachers' Institute
SSS	Senior Secondary School
TC II	Teachers' Certificate Grade Two
WAEC	West African Examinations Council
SEM +	Semantically acceptable miscue.
SYN +	Syntactically acceptable miscue.
SEM -	Semantically unacceptable miscue.
SYN -	Syntactically unacceptable miscue.

OPERATIONAL DEFINITIONS OF TERMS

Accuracy level. This term was used in this study to refer primarily to a reader's cloze score as expressed in percentage of correctly replaced deletions. It was used in this study in the context of the effect of accuracy level on miscue scores. It is also used in the literature to refer to a reader's word recognition score during oral reading with reference to its effect on miscue scores.

Cloze Test. This is a passage from which selected words have been deleted and replaced by a blank. (See page 2 for more detail.)

Comprehension level. In the present study this term refers to the degree of comprehension of a given text by a given reader as expressed by his predicted percentage of meaningful responses on a cloze test.

Content Words. These are words whose main function is to convey meaning, for example, nouns, verbs, adjectives and adverbs.

Criterion Scores. In the present study this term is used to refer to the scores on a reading test which may be interpreted to represent a specified level of comprehension.

Function Words. These are words which determine structure and carry grammatical information, for example, articles, prepositions conjunctions and auxiliary verbs.

Informal Reading Inventory (IRI). An IRI is a series of graded reading passages on which a readers' oral reading performance and ability to answer comprehension questions on each passage are evaluated. The reader's performance at each passage level is used to determine his independent, instructional and frustration reading levels. The criterion scores for the three levels presented below are those established by Betts (1946) and most widely used.

(a). Independent level. This is the level of difficulty at which a reader is able to comprehend fully without assistance. Generally a text is considered to be on a reader's independent level if his word recognition accuracy while reading the text orally is above 98 percent and if he is able to answer 90 percent of the comprehension questions based on the text.

(b). Instructional level. This is the level of difficulty at which the reader is able to comprehend a given text provided he receives some guidance and support from the teacher. A text is considered to be on a reader's instructional level if his word recognition accuracy while reading the text orally is between 95

percent and 98 percent and if he is able to answer between 75 percent and 90 percent of the comprehension questions based on the text.

(c). Frustration level. This is the level of difficulty at which the reader is unable to comprehend a given text. Scores which fall below the lower boundary used to indicate instructional level are generally considered to mean that the text is on the reader's frustration level.

Language cueing systems. These are the sources of information potentially available to readers for use during the reading process. There are three language cueing systems, graphophonic, semantic and syntactic. In the present study a reader's access to and use of semantic and syntactic cues are inferred by the acceptability of his cloze miscues in the sentences in which they occur.

a. Semantic cues. The information available to the reader from the meanings of words and the background knowledge of the reader.

b. Syntactic cues. The information available to the reader from the word order and grammatical structure of the written language.

Literacy. The term literacy is generally understood to mean the ability to read and write. Nigeria's *Blueprint and Action Plan for the Eradication of Mass Illiteracy by the Year 2000* (Nigeria, Federal Ministry of Education, 1990) includes the following with reference to the concept and definition of literacy:

> The word literacy has been given a variety of definitions which range from the possession of mechanical skills for writing, reading, computing and communicating in written symbols to the acquisition of competencies, knowledge and critical consciousness required for effective performance of social and economic roles and the appreciation of basic issues and features of one's environment. In all, however, there is a general consensus that for literacy to be valuable, it must be functional in terms of improved performances of the recipients in the attainment of economic, political, social, cultural and health care delivery goals. In other words, functional literacy leads to improved productivity, popular participation in the democratic process, improved social interaction and social justice, appreciation of the valuable aspects of a culture and acquisition of desirable health habits (p.6).

According to Bormuth (1971), four criteria are widely used in defining literacy. On the basis of these, a person may be considered functionally literate if (a)

he has attended school for five years; (b) his reading achievement test scores are not below the national norm; (c) he can read as well as an average student in his class; (d) he can read as well as the average student in his class with the same degree of aptitude or intelligence.

Essential to the focus of the present study is the fact that any literacy definition requires the establishment of a rationally determined criterion of reading performance. Bormuth's own seminal contribution toward measuring reading performance is an attempt to identify criteria which represent what he terms "the most desirable level of comprehension performance on a passage" (p.15). His research in this area is in recognition of the extent to which literacy and reading assessment are linked.

Miscues. This term was originally applied to oral reading responses which are not the same as the actual words in a text. In the present study, the term was also used to refer to responses on a cloze test which are not the same as the original text.

Miscue Quality. Miscues may be considered to be of various degrees of quality depending on their acceptability in the context in which they occur and, by implication, the degree of comprehension which they reflect. A miscue is **semantically acceptable** if it results in a sentence which is meaningful, and **syntactically acceptable** if it results in a sentence which is grammatical. A miscue is regarded to be of high quality if it is semantically and syntactically acceptable both within the sentence in which it occurs and within the passage as a whole. A miscue which is either semantically or syntactically acceptable, but not both, is considered of lower quality as it reflects a lower degree of access to contextual information by the reader. A miscue which is neither semantically nor syntactically acceptable is

viewed as evidence of a breakdown of comprehension and is regarded to be of the lowest level of quality.

Miscue scores. Miscue scores are the proportion of miscues used by a reader on an oral reading or cloze passage which are of a given miscue type. For example in the present study a TYPE ONE (Sem+ Syn+) miscue score .87 means that 87 percent of all the miscues of that reader were classified as being both semantically and syntactically acceptable.

Miscue type. In the present study miscues have been classified into four types depending on their quality. In descending order of quality, these are:

TYPE ONE: Sem+ Syn+ The miscue is judged to be semantically and syntactically acceptable at the sentence level.

TYPE TWO: Sem+ Syn-. The miscue results in a sentence which is meaningful but ungrammatical.

TYPE THREE: Sem- Syn+. The miscue results in a sentence which is not meaningful but which is grammatical.

TYPE FOUR: Sem- Syn-. The miscue results in a sentence which is neither meaningful nor grammatical.

Readability level. This refers to the estimated ease of reading of a text based on such text factors as vocabulary load and sentence complexity. It is used to compare the potential ease of reading of one text with another text. It is usually expressed in either the grade or age level for which it is estimated that the text would be appropriate in terms of its ease of reading. **Readability estimates** may be obtained by using any of a number of readability formulas. In the present study the **Fog Readability Formula** was used.

CHAPTER ONE

INTRODUCTION

1.0 Background to the Problem

1.0.1 Introduction

In order to facilitate an understanding of the problem out of which the present study has grown, some explanation of the key terms used in the title is presented at this point. **Cloze testing** is a procedure for assessing a reader's comprehension of a text by measuring his ability to identify words which have been deleted from the text and replaced with a blank. The form of cloze test which was investigated in this study is the fixed-ratio deletion format according to which every 5th word is deleted from a 250-word centre portion of a complete passage consisting of about 275 - 300 words. **Cloze criterion scores**, expressed as a percentage of correct responses, are interpreted in terms of the predicted **comprehension levels** they represent. These levels of comprehension refer specifically to the percentage of meaningful cloze responses associated with given cloze scores. More generally, they refer to the degree of comprehension of a given text. In this study **L2 readers** refers to Nigerian readers for whom English is not the mother tongue but for whom English may be their first literacy language.

1.0.2 Importance of reading and literacy development

Reading is a key factor both in the success of an individual and in the development of a nation. Viewing literacy at the individual level, Johnson (1988:1) observes that, "literacy represents more than a reading score, a statistic or a percentile. It is an individual's hope for the future, a ladder to an individual's success." Full participation in today's society is largely dependent on the ability to read. Many

situations in modern society call for efficient reading skills. Good reading ability is particularly critical as a key to job efficiency and professional growth. According to Miller (1978:iii), modern society places a high priority on man's efficiency in reading. With the skyrocketing growth in human knowledge and the increasing complexity of the vocational environment, an individual who is limited in his reading skills faces serious problems of many kinds.

At the national level, development in all aspects of a nation's life is facilitated by attention to literacy development. A nation's level of technological and scientific development is largely a reflection of its level of literacy development. Johnson (1988) points out that a nation cannot be strong and competitive in a global economy, and a democracy cannot fulfil its promise of opportunity for all, if a large percentage of its citizens are illiterate.

But perhaps it is at the school setting that the importance of reading is best appreciated. Because books constitute the bulk of the learning resources, it is obvious that a student's success depends on the extent to which he can obtain information from print quickly and efficiently. It is for this reason that Thorndike (1973:175) observed that " ...at the elementary and early secondary levels such prediction as can be made of achievement in content subjects comes almost entirely from knowledge of achievement in reading." In this connection, Unoh (1976a) points out that,

> reading is an indispensable tool of learning in the various hierarchies of modern educational systems. Even though it is possible at various rungs of the educational ladder to get by without possessing advanced reading skills such as critical, creative, inferential and rapid reading skills, effective learning at schools and advanced educational institutions demands the possession and application of at least the minimum skill required for specific reading tasks.(Reprinted in Unoh 1985, pp. 1-2)

It was the recognition of the relationship between literacy and national development that prompted the United Nations General Assembly in 1987 to pass a resolution declaring the year 1990 as International Literacy Year. By this declaration the international community was being called upon to pursue literacy development activities with vigour in the 1990s in order that, by the year 2,000, the illiterate populations of the world will have acquired necessary literacy skills. According to a Unesco report (1988), one out of four adults throughout the world is illiterate and more than 100 million school-aged children have no opportunity to learn to read. In recognition of the fact that the great majority of illiterate people are in developing countries, literacy development activities which require only minimal expenditure and manpower are recommended by Unesco.

1.0.3 Reading conditions in Nigerian schools

Literacy is a term that is popularly associated with the ability of adults to read. The foundation of a literate populace is built, however, in the primary and post primary schools. How effectively this foundation is laid is largely dependent on the conditions which affect the quality of reading instruction in the schools. In this section, the conditions under which Nigerian students are expected to learn to read will be examined.

The Nigerian National Policy on Education (1981) recognizes the role of the school in literacy development. This is implicitly included in the statement that one of the primary aims of education is "...the acquisition of appropriate skills, abilities and competencies, both mental and physical, as equipment for the individual to live in and contribute to the development of his society" (Section 1,5). It is more

explicitly expressed in the statement that a major objective of primary education is "the inculcation of permanent literacy" (Section 3,14a) and in Section 15(10e) that specialist teachers will be provided for "language arts with special emphasis on reading."

However, there are many factors which inhibit the implementation of the literacy objectives of the National Policy. Looking first at the primary school level, there is the problem of inadequate preparation of teachers to carry out reading instruction. There is considerable evidence that teacher training institutions are neither providing prospective primary school teachers with an understanding of the nature of the reading process nor are they equipping them with the skills needed to teach young children how to read (see Olayemi, 1989). For example, Olaiya (1987) found that English methods teachers in Grade Two teachers colleges in Plateau State failed to cover reading instruction in their methods courses, either because they had no syllabus in their school which included reading methods or because their own background in the subject was so weak that they preferred to skip that part of the syllabus. The lack of teacher training in reading methods is especially serious in the light of the poor understanding by teachers of the nature and purpose of reading instruction. Especially at the lower primary level, many teachers do not seem to be aware of the distinction between teaching children to read in English and teaching other English language skills. In the primary school, once a child is able to speak English fluently, it is assumed he can automatically read English. Therefore, there is no conscious effort to develop skill in reading. (This confusion is illustrated by the fact that the term 'illiterate' is commonly used to refer to someone who can't speak English regardless of whether he/she can read and write in his native language.)

It is a widespread practice to begin teaching children to read in English before they can speak and understand the language. Although the National Policy states that the mother tongue should be the language of instruction in lower primary (Section 3,15.4), in practice English reading is introduced from primary one in a large part of the country. This is not only the case in multi-ethnic communities where there is no common language except English but also in schools where a Nigerian language is used as the medium of instruction. For example, Omojuwa (1989) found that in six schools in Zaria where Hausa was the medium of instruction, both Hausa and English reading were introduced in Primary One. Even in English medium schools children's exposure to standard English is limited to the hours they attend school, about 25 hours per week. In both situations there is very little opportunity for incidental learning of English or occasion to practise using it. At home most children hear only their mother tongue spoken and outside the home they may hear many different languages spoken as well as some English, much of it non-standard. Thus, many children are introduced to reading instruction in a language over which they have very limited control and which many of them associate only with the school environment. As a result, reading instruction tends to be an exercise in 'reciting' passages from the books with little or no comprehension involved.

In most schools in Nigeria reading is included in the English period and thus shares time, under the topic 'comprehension', with oral English, spelling, writing, and grammar. There is the temptation for teachers to treat reading casually when it is not given a separate time on the timetable and when there are no basal reading schemes which would help a teacher focus on reading skills. The books in use now, for example, *New Oxford English, Straight for English,* are primarily designed to

teach the English language, not to teach the reading of English. A widespread practice is to use a single language textbook in a class with no consideration of the range of reading achievement levels of the pupils in the class. For example, Book Four is used for all the pupils in Primary Four regardless of whether or not the book is too difficult or too easy for some of the pupils. In fact, numerous studies have shown that the books used in most primary schools are on frustration level for a large proportion of children, especially in the government schools (see Umolu and Oyetunde, 1991).

Reading skills can only be developed through practice reading a variety of material. However, for a very large proportion of children in Primary schools the only books the children are exposed to are textbooks, and many children do not even have access to these. Extensive reading is only possible if children have access to sufficient high quality books which are easy enough for them to read independently. However, school libraries are virtually non-existent at the primary level, except in a few private schools. Thus, children neither have the opportunity to learn to enjoy reading nor to practise reading enough to develop automatic word recognition skills.

As learning to read is a continuous process, the conditions of instruction at the post-primary level significantly affect the extent to which the learner will eventually attain a level of literacy required by an adult. It is at the post-primary level that students are expected to learn to comprehend a variety of expository text types, to develop study and information gathering skills and to develop higher level comprehension skills. However, if students who enter JSS One are deficient in basic reading skills, and there is ample evidence that a high proportion are (see Oyetunde and Umolu, 1989c), such students are at a stage when they need further developmental reading instruction. Unfortunately, at this level there is no reading

instruction at all except for 'comprehension lessons' in their English classes which, as Oyetunde (1987) observes, serve as a test of reading comprehension rather than as instruction. As is the case at the primary level, teachers of secondary school English generally lack training in reading and reading instruction (Unoh, 1982).

The reading requirements at the secondary level involve a heavy load of expository text in books written by subject specialists without regard to their readability. At the time students enter JSS they have had very limited experience with such text types because most reading at the primary level is of narrative material. Because content area reading instruction is not fully implemented in most secondary schools, most students are not given enough special help in learning to adjust to expository text and many are virtually left on their own to develop this critical new skill. In addition, readability studies have shown that most of the books are written in such a way that they are suitable for only a negligible percentage of students with exceptionally good reading skills (see for example, Jegede, 1985; Fuanbial, 1990). Thus, even good readers must struggle with textbooks that are above their reading ability. In addition, since most of the reading done at this level is for homework, the students must cope with difficult reading material independently, resulting in the widespread practice of copying the textbooks or memorizing entire portions word for word without comprehension.

Exposure to frustration level text materials also inhibits the development of a reading habit, thus discouraging students from reading beyond the prescribed texts. In addition, as at the primary level, extensive reading is further inhibited by the lack of books that are interesting and at an appropriate level of difficulty.

Within the context of this background, especially concerning the reading conditions outlined above, the present study is an attempt to develop a testing technique which will help teachers ensure that the reading material given to their students is not too difficult for them and, thus, avoid the negative affects of frustration level reading material.

1.1 Statement of the Problem

1.1.1 Reading assessment instruments

Reading assessment is essential for effective reading instruction and it is carried out for purposes of making instructional decisions. A most important instructional decision is that of selection of text material at the appropriate difficulty level for the reader. Reading is a skill which students develop at varying rates. For reading material to be beneficial to every student, it must be matched to the level of skill development of each student at any given point in time. As with any skill, reading develops through practice. However, if a student is required to read material which is too difficult for him to comprehend, he only faces frustration and discouragement without developing the skill any further. On the other hand, students must be exposed to some reading material which is challenging enough to stimulate further skill development. This means that teachers must be able to match books to the reading levels of the students in his class. This can only be accomplished if teachers have access to a simple and effective procedure for determining whether books are on the frustration level of their students. As noted earlier, studies have shown that the books currently used in Nigerian schools are on the frustration reading levels of an

alarmingly high proportion of readers, both at the primary (see Umolu and Oyetunde, 1991) and secondary (see for example Etim and Omoh, 1983; and Jegede, 1985) levels. Given this situation, any effort to upgrade the quality of reading instruction, both at the primary and secondary levels, must include the introduction of assessment tools which can be easily administered and interpreted by teachers.

Traditionally, some form of a reading inventory is used to place students in appropriate level instructional materials as well as to group them for instruction (Baumann, 1988). A reading inventory consists of a series of graded reading passages. The difficulty level of each passage corresponds with the difficulty level of reading books normally used at each class level. A teacher can determine whether each passage level is on a readers' independent, instructional or frustration reading level based on whatever criteria is used for that particular inventory. For example, a student may read passages based on class levels one through three on independent level. This student's comprehension level of the class four passage may be instructional, while all passages above class four difficulty level may be on his frustration level. The teacher would use this information to select appropriate books for him to read independently and to use for reading instruction.

Although a variety of commercial instruments are available overseas which yield reading levels (for example, *Diagnostic Reading Scales [DRS], Spache*, 1981), there are a number of widely recognized disadvantages to using them, even in the developed countries which can afford them. One important objection is that commercial reading inventories are rarely useful to the classroom teacher for making instructional decisions because the difficulty levels of the reading passages in them may not correspond with the levels of books used in a particular school (Baumann,

1988). In addition, most commercial instruments are standardized group tests which require the students to read each passage silently and then to answer the written questions which follow each passage. This procedure has the disadvantage of relying completely on the child's responses to the questions to determine his comprehension at each passage level. There are a number of factors which may negatively affect the validity of such measures. One of these is the problem of bias in question selection. Also, pupils may comprehend the passages but have difficulty comprehending the questions. Where the questions require written answers, the test may unintentionally measure writing ability, instead of reading ability.

Teacher constructed Informal Reading inventories (IRIs) are generally considered more appropriate for classroom use (Johnson, Kress and Pikulski, 1987). These are usually based on passages drawn from books used in the school or from books known to be very similar in style, content and readability. An IRI is an individual oral reading test. The child's ability to comprehend passages on each difficulty level is usually measured by the percentage of words correctly recognised and the percentage of comprehension questions correctly answered. The most popular criteria used with IRIs are based on those of Betts (1946) according to which word recognition scores of 99 percent and above and comprehension scores of 90 percent and above indicate independent level performance. Instructional level scores are 95-98 percent word recognition and 75-89 percent comprehension. The teacher asks the questions and the child answers orally, thus avoiding some of the problems associated with written questions. However, there are a number of disadvantages to using IRIs. As an individual test, it is time consuming to administer. Secondly, children respond differently to the stress involved in reading orally to an adult in a test situation. The

validity of the test would be reduced if the reader deviates from his usual strategies. For example, under the test conditions a reader may concentrate more on correct pronunciation than on meaning or avoid taking the risk of attempting unfamiliar words. The reliability of the comprehension measures are also weakened by the subjectivity involved in informal construction of comprehension questions (Cooper and Petrosky, 1976).

A third type of instrument which yields reading levels is the cloze test based on a procedure developed by Wilson Taylor (1953). This can serve as an inventory similar to the IRI by administering cloze versions of graded reading passages. As it is a written test, it can be administered either individually or to a group. In order to prepare a cloze version of a passage, every nth word is deleted, usually every 5th, from a 250 word section of a passage containing about 275 words. The task of the reader is to use the context provided by the undeleted parts of the passage to supply the deleted words. The ability to complete a cloze test is dependent on the reader's ability to recognize the intact words and to use the semantic and syntactic cues provided by the context both at the intersentential and intrasentential level. This provides a measure of the reader's familiarity with the language structure used in the passage as well as his prior knowledge about the topic. Thus, the extent to which a reader is able to fill in the blanks with words used in the original text is a measure of his comprehension of that passage. As with the IRI, a cloze inventory yields a child's comprehension level for each passage and is interpreted the same way for purposes of grouping for instruction and for placement in instructional materials.

There are marked advantages of cloze testing over the silent or oral reading inventories described above. Cloze has the advantage of being objectively constructed

and scored, thus ensuring reliability. It is easily and inexpensively constructed, administered and interpreted by teachers with only minimal special training. It can be derived from samples of actual text material used in the classroom, thus strengthening its content validity. In fact, Cooper and Petrosky (1976:205) claim that within the psycholinguistic context of reading comprehension cloze tests are "...the only valid tests we know of for reading performance..."

1.1.2 The need for cloze tests in Nigerian schools

This study arose from the need for assessment tools which special education students working as learning disabilities resource teachers could use during their teaching practice. For clarification, the responsibilities of the student as a special education resource teacher are briefly outlined below.

At the beginning of the teaching practice the students are required to select children with reading problems who would benefit from special education. This is the 'identification' stage in the 'prescriptive teaching process' used in special education. Identification should normally be carried out by a combination of screening test and teacher referrals. The second stage of the prescriptive teaching process is 'initial assessment.' It is at this stage that the special education teacher assesses each child individually in order to find out the information needed to plan and prepare an instructional programme based on the unique needs of each child. One of the first tasks of the special education teacher is to find out the reading levels of each child. This information is used to guide the resource teacher in selection of appropriate reading material for the child's instructional programme. It is also used to advise the

class teacher on the appropriate level of language textbook to use with the child in class.

This need prompted the researcher to develop an Informal Reading Inventory (IRI). The development of an IRI for use with *Straight for English* (Stitt, 1975) published by Longman Nigeria was decided on because this was the series used in most schools in Plateau State at that time. The IRI was designed to enable teachers to determine which book level of *Straight for English* was at the appropriate difficulty level for a child. The first IRI was developed in 1982/1983 and reported at the Reading Association of Nigeria Conference in 1983 (subsequently published: Umolu, 1985). It was used in a study of the reading performance of 300 children from ten schools in Plateau State (Umolu and Mallam, 1985). The inventory was revised the following year and special education students continued to be trained in its use as part of a course in reading disability.

However, it soon became apparent that there were important limitations to the use of the IRI. First was the problem of adequately training students to use it. Due to Faculty and Departmental programme changes over the years, the number of hours allocated to the reading disability course was reduced and the level of competency students were attaining in administering the IRI was no longer satisfactory. Also, the researcher recognised that there was the very important need to develop a simple instrument which all teachers, including grade two teachers, could administer to an entire class of students at one time. This would make it possible to screen a whole class during the identification process to supplement teacher referrals for special education. Also it would enable a classroom teacher to find out whether the books used in the class are too difficult for the students. The researcher was convinced that

it was necessary for teachers to learn to do this in order to avoid the common situation where students were expected to read frustration level reading material. However, because of the special training needed for using IRIs, it was not possible for teachers in the schools to learn to use it. Its use was, therefore, restricted to the relatively few special education graduates working as learning disabilities specialists in schools who had the training and the time to employ it.

In view of the above, the next step was to develop a cloze version of the revised Informal Reading Inventory. This cloze inventory had three significant advantages. Unlike the IRI, it could be administered as a group test to an entire class at one time. It could be administered, scored and interpreted by teachers with very little special training. Finally, single passages could be selected from the inventory to be used as a screening test for the identification of children for special education.

The cloze inventory soon became widely used by learning disabilities students and graduates working in the field of special education. Gradually, classroom teachers in some schools began to use it. The inventory was incorporated into research projects, including a study of the reading skills of deaf and hearing students (Umolu and Boison, 1987), and miscue analysis began to be applied to cloze responses in order to investigate reading strategies (Umolu, 1987).

As the advantages of using cloze in the schools became increasingly apparent, there was further motivation to intensify research with the cloze procedure and with miscue analysis of cloze responses. However, one persistent problem affecting this research was the selection of criteria to use in interpreting cloze scores. A comprehensive literature review revealed that the criterion scores used to define functional reading levels varied widely. Yet, the value of the cloze procedure is

highly dependent upon the validity of the criteria which are used to relate specific cloze scores to levels of comprehension. Arbitrarily selecting any of the commonly used criteria to distinguish each of the three comprehension levels (frustration, instructional and independent levels) from each other seemed inadvisable.

1.1.3 Problems with existing cloze criteria.

There are three major reasons for the need to question the present criterion scores. The first is the fact that there are serious inconsistencies in the criteria established through earlier research. For example, Bormuth's (1968) criteria for instructional level performance are 44-56 percent, those of Jones and Pikulski (1974) 30-45 percent while Ransome's (1968) was 'arbitrarily set' at 30-50 percent. Thus, while 44 percent is used to indicate the cut-off point between frustration and instructional levels according to Bormuth's 1968 criteria, 45 percent is used to indicate the cut-off point between instructional and independent levels based on the criteria suggested by Jones and Pikulski (1974). As if to compound the already confused situation, Bormuth's study of 1971 failed to confirm his 44-56 percent criteria established in 1968. Instead, he established a set of criteria which varied depending on the class level of the reader as well as on his purpose for reading. In light of the above, the unquestioned acceptance of any set of criteria based on the above research would appear unwarranted.

A second reason for questioning the existing cloze criteria has to do with the methods used in arriving at these criteria. Most research into cloze criteria has involved comparison of cloze performance scores with scores on multiple-choice comprehension tests. Yet Bormuth, himself, pointed out that the conventional

multiple-choice comprehension criterion scores are based on insufficient evidence and that multiple choice tests "produce unreliable measures of the amount a student has learned from the material" (1971:67). Thus, it is doubtful whether cloze criteria based on such multiple-choice criterion scores can be regarded as valid and reliable.

Another important problem with the existing cloze criteria, especially as it relates to their application in Nigeria, is that they were developed through studies with students whose first language is English. Their application to a second language situation cannot, therefore, be readily assumed. While it is not being suggested that different criteria must necessarily be used for first and second language readers, there was the need for validation of these criteria using a second language population.

Because of the potential value of the cloze procedure as a diagnostic and evaluation tool in Nigerian schools, it would be of immense benefit to both researchers and classroom teachers to be able to place a greater degree of confidence in the extent to which specific cloze scores indicate functional reading levels. Given the conflicting criterion scores currently in use, it has been difficult to pinpoint with some measure of confidence those cloze criterion scores which actually indicate an unacceptably low level of comprehension. Specifically, there was the need for the establishment of cloze criterion scores which are valid indicators of comprehension. This makes it possible to equate a given percentage score on a cloze test with the individual's comprehension level on a given text, thus enabling teachers to avoid situations where students are inadvertently required to read frustration level material. The necessity of ensuring that readers are given material suitable for their reading level is especially important in Nigeria where students do most of their reading in English which is a second language. Given the many problems associated with

reading in a second language (see Kaminsky, 1976; Bruder and Henderson, 1986) care has to be taken that these problems are not compounded by placing students in material which is above their reading level.

1.2 Assumptions

This study was based on the assumption that miscue quality is an indicator of reading comprehension. There is considerable evidence that analysis of readers' miscues provides a valid measure of readers' comprehension during the reading process. That is, the reader's ability to make us of syntagmatic and paradigmatic relations of words in a text is tapped through miscue analysis.(See for example, K. Goodman, 1973; Kendal and Hood, 1979.)

1.3 Purpose of the Study

1.3.1 Objectives

The purpose of this study was two-fold. The major objective of the study was to establish criterion scores for Nigerian readers on English language cloze tests which can be used by teachers to predict students' comprehension levels. The second purpose was to investigate how Nigerian readers process English text as revealed by miscue analysis of cloze tests.

In order to find out the level of comprehension represented by scores on a cloze test, miscue analysis of non-text cloze responses was carried out and changes in miscue quality at various cloze score levels were examined. Miscue analysis is a technique developed by Goodman (1973), and Goodman, Watson and Burke (1987)

to observe the relative use a reader makes of the three language cueing systems (semantic, syntactic and graphophonic) during the reading process. Miscue analysis was originally applied to oral reading and involved judging oral reading substitution 'errors', or miscues, according to their syntactic and semantic acceptability as well as their graphophonic similarity to the word actually used in the text. Miscue analysis has also begun to be applied to cloze responses (Kelly and Ewoldt, 1984; DeSanti, 1986; Umolu, 1987; Oyetunde, 1988). Numerous studies using miscue analysis have shown that the quality of a readers' miscues are affected by how difficult the passage is for an individual reader. This is usually referred to as the "accuracy level effect." Christie and Alonso (1980), Hood (1982), Kibby (1979) and Leslie and Osol (1978) have found significant qualitative changes in reader's oral reading miscues at varying accuracy levels. Miscue analysis of cloze responses of Nigerian university students (Oyetunde and Umolu, 1989a) and secondary students (Umolu and Oyetunde, 1989) have similarly shown an accuracy level effect. Specifically, these studies have shown that readers' access to semantic and syntactic cues decreases with passage difficulty. On the basis of this, one can then infer that a high degree of use of semantic and syntactic cues is associated with a high level of comprehension and that a lack of access to semantic and syntactic cues is associated with a low level of comprehension. It is in view of the consistent findings of an accuracy level effect on reader strategies that miscue scores can be used to distinguish between levels of reading comprehension.

An important aspect of this study is the investigation of the extent to which cloze scores can be relied upon as a meaningful source of information about a reader's comprehension. Studies of oral reading miscues have indicated that additional

factors, besides accuracy level, affect readers' access to the language cueing systems (see Wixson, 1979). The factors most relevant to this study are text characteristics and years of schooling. It was, therefore, necessary to use two class levels, JSS2 and SSS2 and to use two different expository passages at each level in order to find out what influence these factors may have on the relationship between cloze scores and miscue quality.

The study was also designed to reveal any unique processing strategies which may be characteristic of Nigerian readers of English. Miscue analysis of cloze responses provides valuable insight into the reading process as it reveals the conditions under which readers have access to and/or make use of semantic and syntactic cues during the reading process. (See **1.6.2 Scope and Delimitations** for why graphophonic cues are not included in the study.) In particular, miscue analysis reveals reading problems which may be common among Nigerian readers at the JSS and/or SSS levels.

1.3.2 Specific objectives

The specific objectives of the study were as follows:

1. To find out the level of comprehension associated with cloze scores on two passages read by JSS2 students and two passages read by SSS2 students.
2. To find out the patterns of changes in Nigerian readers' access to semantic and syntactic cues at different levels of comprehension. This was observed by examining the patterns of miscue types which are produced at various accuracy levels on the two cloze passages read by JSS2 students and two passages read by SSS2 students.

3. To find out to what extent readers' access to semantic and syntactic cues are predicted by their cloze scores.
4. To find out any unique processing strategies which may characterise Nigerian L2 readers of English at the secondary school level.

1.3.3 Research questions

It is in the light of the above that the following research questions have been formulated:

1. What level of comprehension, as estimated by predicted percentage of semantically acceptable cloze responses, is associated with cloze scores by JSS2 readers on two expository science passages?
2. What level of comprehension, as estimated by predicted percentage of semantically acceptable cloze responses, is associated with cloze scores by SSS2 readers on two expository science passages?
3. What are the patterns of associations between each of four miscue types, TYPE ONE, TYPE TWO, TYPE THREE, TYPE FOUR and cloze scores on each of four texts? (See Definitions of Terms for a description of the four miscue types.)
4. What are the strengths of associations between each of four miscue types, TYPE ONE, TYPE TWO, TYPE THREE, TYPE FOUR, and cloze scores on each of four texts?
5. What do cloze responses reveal about the access of Nigerian L2 readers to semantic and syntactic cues when reading English?

1.4 Significance of the Study

1.4.1 Theoretical contributions

The theoretical contribution of this study is best understood in the light of current understanding of the nature of the reading process. The focus here is on the understanding of the role of the three language cueing systems, graphophonic, semantic and syntactic, in the reading process. In order to understand the current thinking, there is the need to briefly review the historical development of reading theory as it relates to these three language cueing systems.

Up through the mid-1970's reading was viewed as primarily a visual, text driven process. 'Bottom-up' views of the reading process were postulated by Gough (1972) and LaBerge and Samuels (1974), among others, based on the logical assumption that reading progresses from recognition of the smallest unit, the letter, through consecutively larger units such as words and sentences to, finally, meaning. The most popularly held view of the link between print and meaning in bottom-up theory is that reading is a process of recoding from print to sound. That is, the reader attaches meaning to the print only when he pronounces the words, either aloud or to himself, based on the graphophonic information provided by the text.

However, bottom up views of reading were seriously challenged by the popularization of psycholinguistic theories of Frank Smith and Kenneth Goodman. (See, for example, Goodman, 1967 and Smith, 1971) The psycholinguists conceptualize reading as a 'top down' process which is meaning-driven, rather than text-driven. That is, the reader formulates hypotheses about the content of what he is reading and then samples textual information to test these hypotheses. A

distinguishing feature of this theory is that the reader relies heavily on semantic and syntactic cues in the text as he actively searches for meaning. In using these cues, he applies both his "world knowledge" based on the culture in which he lives as well as specific background knowledge about the topic of the text. In addition the reader draws upon his knowledge of the vocabulary and syntax of the language in which he is reading.

More recently a new class of models has emerged in which reading is seen to be both interactive and compensatory (see Rummelhart, 1977; Stanovich, 1980). In these models the importance of the three language cueing systems embodied in the models described earlier are also recognized. However, unlike the bottom-up and the top-down models in which the processing is considered to be linear, the three cueing systems are seen to be both simultaneously and independently available to the reader. Moreover, the interactive-compensatory models are based on the assumption that "..a process at *any* level can compensate for deficiencies at any other level" (Stanovich, 1980:36). Research has confirmed, for example, that readers with poor automatic decoding skills compensate for lack of access to graphophonic cues for word recognition by relying more heavily on the higher level semantic and syntactic cues than do fluent readers (Nicholson, Lillas and Rzoska, 1988).

The present study is based on the premise that all three language cueing systems are potentially available to all readers, both those reading in their mother-tongue and those reading in a second language; and that deficiencies in the ability to use any one of these systems can be compensated for by a heavier reliance on another. In fact, studies of oral reading miscues of first and second language readers suggest that the reading process is the same for all readers (see Verhoeven, 1990).

However, within the interactive-compensatory models there is provision for considerable variance in the relative use the L1 and L2 readers make of the three language cueing systems. Thus, although the research cited earlier appears to confirm that, among L1 readers at least, there is a trade-off between use of graphophonic cues on the one hand and semantic and syntactic cues on the other hand; theoretically there could also be a trade-off between semantic and syntactic cues. Specifically, it was postulated in this study that limited access to syntactic information may be compensated for by reliance on semantic information.

The postulated trade-off between the two higher level language cues would appear to be most relevant to the L2 reader, especially in the Nigerian situation where a preponderance of school-going students have limited control over the language in which they are reading. This is because the L2 reader's limited control over the language in which he is reading results in a more frequent encounter with text that is unfamiliar, either in its syntactic structure or in its semantic content or both, thereby limiting the reader's access to use of context. There is reason to believe that in the Nigerian situation, school-age readers of English as a second language are relatively stronger in their use of semantic cues than in their use of syntactic cues. One important reason is the fact that Nigerian students have a limited exposure to standard English syntax. Many children first begin to learn English when they enter school and use it rarely outside the school classroom. Often the English which they hear spoken in the environment, such as in the market or on public transport, is a variety of English that is not standard English. Another contributing factor may be that the majority of the children do not have access to easy reading material for recreational reading which would give them practice with English syntax, especially

that which characterizes written language. On the other hand, these same children have reason to be relatively stronger in their access to English semantic cues. While their knowledge of their mother tongue may not facilitate the learning of English syntax, their rich mother tongue vocabulary may be expected to enhance their acquisition of English vocabulary given adequate exposure to the language. Support for this is provided by research findings which suggest that acquisition of a second language vocabulary is facilitated by the richness of the learner's mother tongue vocabulary. (See for example, Massad, 1975.)

Within the interactive-compensatory reading models one could, therefore, suggest that when there is a mismatch between the language structures over which the reader has control and the language structures of the text which he is reading, the reader may rely on semantic cues to compensate for deficiency in access to syntactic cues. There is some evidence to suggest that this is, indeed, the case with the Nigerian reader of English as a second language. For example, a study of the cloze responses on two different passages completed by 30 JSS Two students revealed that the percentage of semantically acceptable miscues was consistently higher than the percentage of syntactically acceptable miscues (Oyetunde and Umolu, 1989b). This was found to be the case regardless of whether the students were reading on instructional or frustration level or were reading expository or narrative texts. A similar phenomenon has been found by Yurkowski and Ewoldt (1986) to occur in deaf readers for whom American Sign Language is a first language and printed English is a foreign language. Being deaf, they are unable to hear standard English spoken, and the syntax of the language in which they communicate, American Sign Language, is substantially different from that of standard English. Ewoldt suggests that deaf readers

may compensate for the fact that they have little or no intuitive knowledge of standard English syntax by using their background knowledge and knowledge of word meanings to comprehend print. In the words of Yurkowski and Ewoldt (1986:243), "the deaf readers appear to have used a plausibility strategy ("What makes sense in my world?") rather than a parsing strategy ("What are the grammatical relationships of these words?")." A similar phenomenon may also occur among Nigerian readers of English as a second language.

This is in contrast to the situation with first language readers who tend to rely heavily on syntactic cues during reading (Y. Goodman, 1976; K. Goodman, 1976b). In considering the reasons for this phenomenon among first language readers, Y. Goodman observes:

> ...for all readers the syntactic system of language is more easily controlled at any point than the semantic system. Such differences may also occur because syntax as a finite system is well learned during early childhood, while the semantic system, which is tied to the development of concepts and ideas, is more complex and continues developing into adulthood (1976:120).

Goodman's assumption that the reader acquires a high level of mastery of the syntactic system of the language in which he is reading is clearly not the case for Nigerian readers of English as a second language. As was noted earlier, most Nigerian children begin to learn to speak English when they enter school and are not in a position to acquire any degree of mastery of English syntax before reading instruction has begun. On the other hand, many Nigerian children live in an environment in which varieties of English, ranging along a continuum from pidgin to standard English, are used for communication between members of different ethnic groups (see Todd, 1974). In these informal situations, communication is of primary importance. Such children, therefore, become accustomed to obtaining meaning from

spoken English regardless of the grammatical structures used. In other words, there is reason to believe that many Nigerian children bring to the reading task a strategy of semantic processing. As Parry (1985,p.158) observed,

> ...since the [Nigerian] students spend so much time speaking their second and third languages, and since their interlocutors are often second- and third-language speakers themselves, they have developed a high tolerance of lexical and grammatical inaccuracy. Their concern, whether talking with another student, a teacher, or a trader in the market, is always with what the other person means, rather than with a dictionary and grammar-book interpretation of what he says.

In view of the above, it is important to reconsider the assertion by K. Goodman, (1976b: 66) that "things can be syntactically acceptable and not make sense, but they can't be semantically acceptable unless they're syntactically acceptable." According to Goodman, Watson and Burke (1987), it is impossible for an oral reading miscue to be judged as semantically acceptable if it renders the sentence in which it occurs ungrammatical. It was the premise of this study, on the other hand, that the use of semantic cues provides evidence of comprehension even when syntactic cues are not used.

With specific reference to cloze testing, the miscues of readers which are semantically acceptable are viewed in this study as an indication of reader comprehension even when those responses are not acceptable syntactically. This is illustrated by an example of a sentence from a cloze test administered to Nigerian readers in which the cloze responses are meaningful even though they resulted in sentences which are ungrammatical (Oyetunde and Umolu, 1989b). The words *always*, *tree* and *catch* were deleted in this sentence taken from the story "Zomo and the Lizard" (*Straight for English Pupils Book Four*).

Original text: **"But Lizard always ran quickly up his tree and no one could catch him."**

Examples of responses by pupils in Primary 5:

"But Lizard have already ran quickly up his tree and no one could catch him."

"But Lizard can ran quickly up his tree and no one could kills him."

"But Lizard was ran quickly up his trees and no one could see him."

"But Lizard could ran quickly up his tree and no one could get him."

In the above examples children had particular difficulty predicting a word which could precede *ran*. Based on their limited knowledge of standard English syntax they predicted an auxiliary verb just as if the verb were present tense (*run*) instead of past tense (*ran*). Yet in each of the examples there is clear evidence that they understood that the lizard escaped because he could run quickly up a tree.

The present study was, therefore, based on the premise that the Nigerian reader of English as a second language may compensate for a deficiency in access to syntactic cues by relying heavily on semantic information. The implication of this for using miscue analysis to analyze reader responses in the present study is that, contrary to the procedure used for first language readers (Goodman, Watson and Burke, 1987), cloze miscues which result in a meaningful, yet ungrammatical sentence are viewed as evidence of comprehension.

1.4.2 Methodological contributions

The methodological contributions of this study fall into three main areas. The first is the method employed in the study in seeking to establish cloze criterion scores to

predict comprehension levels. As was pointed out earlier, there are acknowledged weaknesses in the use of multiple-choice comprehension tests which have been employed to establish the existing criteria. The basis of the present study was the use of an entirely different technique, miscue analysis of cloze responses, to determine the extent to which different cloze scores represent some level of comprehension by the reader. Miscue analysis has the advantage of being a process measure of comprehension rather than a product measure. By analyzing the miscues of readers on cloze tests, it was possible to examine the degree of a reader's access to semantic and syntactic information during the process of completing the cloze passage. In addition, there was also the opportunity to infer reader strategies such as use of background knowledge, and integration of intersentential information. Thus, this technique of miscue analysis provides a unique source of information concerning the relationship between cloze scores and level of comprehension.

The second methodological contribution of this study was that the use of miscue analysis takes into account the value of synonyms as evidence of comprehension. Thus, the use of miscue analysis in this study may contribute toward resolving the issue of whether it is misleading to use non-synonymic scoring in evaluating a readers' cloze performance. Advocates of synonymic scoring point out that when only text responses are accepted in scoring a test, the cloze score of the reader who selects synonyms will be lower than that of a reader who selects the original word in the text. The lower cloze score of the reader who chose synonyms would give the false impression that he understood less than the reader who made exact word replacements. Yet on any cloze test, there may be some deleted words which a good reader could replace by several equally acceptable words. Sims

(1979:105) cautions that "... miscue quantity can be a poor indication of comprehension. That is, a reader may make many miscues and still supply evidence of comprehending." The present study established cloze criterion scores by analyzing the quality of miscues, in terms of semantic and syntactic acceptability, which characterize various cloze scores. Thus the evidence of comprehending which is shown when a reader uses synonyms was taken into account in establishing the criterion scores.

The third methodological contribution was the acceptance of semantically acceptable miscues as evidence of comprehension regardless of whether or not such miscues render a sentence ungrammatical. This is especially important in the Nigerian context because the cloze criterion scores used for determining reading levels of first language readers may not be applicable to Nigerian readers of English as a second language. As was observed above, there is reason to believe that the Nigerian reader relies heavily on semantic information. Thus a miscue by a Nigerian reader on a cloze test may be a synonym or it may be a word which renders the sentence meaningful but which is not syntactically acceptable in the sentence. In either case, such a miscue is used in this study as evidence of comprehending, thereby establishing cloze criterion scores which take into account the extent to which Nigerian readers may rely heavily on semantic processing of English print.

1.4.3 Applications of cloze testing

Cloze testing has immense potential value as a tool for reading assessment in the Nigerian schools because of its wide applicability as well as its ease of construction, administration and interpretation. Already the procedure is put to limited use in JAMB examinations. This potential can be maximised if some criteria can be established which can be used with confidence.

Cloze has many uses in primary and post-primary classrooms. It is also a potentially indispensable tool for the special education teacher. Cloze testing can be employed to guide publishers and educators involved in the preparation and selection of textbooks. Finally, cloze is useful for programme evaluation. Specific ways in which cloze can be applied are described in detail below.

Applications in primary classroom instruction. At the primary level it is essential that books used for reading instruction are not on the frustration level of the pupils. This is of particular concern in a school environment such as that of Nigeria in which many children learn to read in English while it is still a relatively unfamiliar language. As it is the current practice in most Primary schools in Nigeria to use a single book for the entire class, there is a serious need to assist classroom teachers in learning how to recognize when a book is on the pupils' frustration level and to change to a more appropriate book. This is only possible if teachers have access to simple, inexpensive tools for assessing reading achievement. Cloze tests can be easily administered and interpreted by a classroom teacher for this purpose.

As the ability of a child to read is an important consideration in making decisions about admission, placement and promotion, cloze tests can be used to obtain the required information. In addition, as primary schools are now being encouraged to place reading on their timetable, cloze testing can meet the important need for continuous assessment and terminal examinations to enable schools to include reading performance on their school reports.

Applications in secondary classroom instruction. The cloze procedure has the potential of being an invaluable tool which can be used by any classroom teacher for

a number of purposes. First of all it can be used by teachers to predict how difficult specific textbooks are for the class. For example, a biology teacher can use the cloze procedure to test his SSS1 students at the beginning of the school year to find out how well the students will be able to comprehend the required textbook. He may find out that the book is on the frustration level of the entire class. In this case he will know at the beginning of the session that assigning independent reading of the textbook would be unproductive and he will seek alternative methods of imparting the information in the text. On the other hand, he may find out that the text is on the instructional, but not independent, reading level for most of the students in the class. This information would guide the teacher in planning lessons which would involve reading the book in the classroom under the direction and guidance of the teacher. As the test would also reveal any students for whom the text is on frustration level, this would enable the teacher to plan ways to assist those students so identified. The cloze procedure would also assist the teacher in finding which text material might be on the independent level of the students and, therefore, suitable for use for homework assignments.

Applications in Special Education. The cloze procedure is an invaluable tool for the learning disability specialist working as a resource teacher in a regular school. A special education resource teacher works with children with learning problems individually or in small groups for specified periods during a school day. Much of this special instruction is devoted to development of reading skills as reading problems are the most common and most serious of all learning problems in schools (Boyd and Bartel, 1978). The cloze procedure can be used as a screening test by the

special education teacher in order to identify children with reading problems in a school. After such students have been identified and selected to receive special education, the cloze procedure can be used as a diagnostic instrument with individual children. Used this way, it can provide valuable information to guide the special education teacher in planning an individualized instructional programme for each child.

Application to textbook selection and development. Cloze testing is a potentially valuable tool to aid in the selection of set textbooks for schools. For example, textbook selection committees in state ministries are often formed for the purpose of periodically reviewing the suitability of textbooks for schools. There are often a number of textbooks which cover the same content but which vary considerably in readability. Such committees can prepare cloze versions of sample passages from each book and test them in schools on children at the class level for which the books are intended. This would enable the committee to identify those books which are most easily comprehended by the majority of the students.

The procedure can similarly be used by publishers to pilot test early drafts of books. The feedback from the cloze testing would provide authors with feedback on the readability of the text which would enable them to rewrite where necessary. A more detailed analysis of cloze responses can also reveal potential sources of ambiguity in the language of the text and thus aid the author in his writing (Umolu, 1987).

Application to programme evaluation. Because of the importance of reading, a valid measure of reading achievement is valuable in evaluating the quality of instruction in schools. Cloze tests are simple to develop and they can, therefore, provide an inexpensive means of programme evaluation. They can be used equally effectively on a large scale such as on the Federal Ministry level as well for small scale evaluation within a single school. They can also be developed for inclusion in public examinations at all levels of the school system, primary, secondary and tertiary.

This study has an additional aspect which is significant because of its potential effect on the curriculum, especially at the classroom level. In a test-oriented school system such as that of Nigeria, there is considerable pressure on teachers to "teach to the test" (Hawes,1978). As Allen (forthcoming) has observed with reference to her work in developing reading tests in Zimbabwe, "If there is to be any change in classroom teaching, then the most effective way of introducing it is by the examination." If cloze testing could be incorporated into examinations in schools on a regular basis, there would be a greater incentive for teachers to devote time and effort to reading instruction. In fact, one private primary school in Jos has recently begun to use cloze tests as part of the terminal examinations for this very purpose.

1.4.4 Providing information about how Nigerian students process English text.

The miscue analysis of cloze reveals important information on the strengths and weakness exhibited by Nigerian students while reading various text types and at various levels of difficulty. Specific types of problems unique to Nigerian L2 readers of English are identified. Such information is important for classroom instruction and special education as well as for curriculum and material development.

1.5 Scope and Delimitations

1.5.1 Scope

Expository passages of the cause and effect organization structure were selected because of the frequency of use of this text type in school materials (McGee and Richgels, 1985).

Bormuth's (1971) findings that years of schooling affect criterion scores on cloze tests suggest a possible developmental effect. This study examined cloze test performance of students in JSS Two and in SSS Two. The two levels of schooling were selected in order to find out if there is a developmental influence on the patterns of miscues among secondary school readers which would result in different criterion scores for the two levels.

1.5.2 Delimitations

Although there are three language cueing systems, graphophonic, semantic and syntactic, the reader's access to graphophonic cues is not directly measurable through miscue analysis of cloze responses when an uncued cloze format is used. Therefore, the analysis of Nigerian L2 reading strategies was limited in this study to the relative use of semantic and syntactic cues. Although there was no direct measure of discourse level processing, this was tapped through the criteria that a miscue must yield a sentence which does not contradict information elsewhere in the passage in order to be judged as semantically acceptable.

CHAPTER TWO

LITERATURE REVIEW

2.0 Reading Assessment

2.0.1 Purposes of reading assessment.

There is a great variety of techniques and instruments for the assessment of reading, all of which are intended to be used in one way or another in educational decision making. Baumann (1988, p.3) defines reading assessment as "...the formal and informal acquisition of information about the reading ability of an individual or group of individuals and the evaluation of that information in order to make educational decisions." Similarly, in Johnston's (1983) view "Reading comprehension assessment is merely a more or less systematic sample of reading behaviour which has been taken for the purpose of informing a decision or statement" (p.40). Farr and Carey (1986, p.1) observe that it involves "...collecting a wide variety of information for decision making...(of which) tests are merely one means of collecting information and therefore are not synonymous with evaluation."

The purposes of reading assessment may range from considerations concerning the needs of the community as a whole to the needs of a single individual. For example, Bormuth (1971) relates the evaluation of reading performance to the goals of the society and to the anticipated benefits of various levels of performance to society. Bormuth's focus is on the use of reading assessment to determine whether reading instruction is at the appropriate level of difficulty for the student. He uses the terms "instruction termination criteria" and "unit termination criteria" to refer to the evaluation of levels of instruction which relate to the "goals of society and the way resources must be used" (p.10).

More often the purpose of reading instruction is viewed from the perspective of the classroom teacher and the school administrator. Thus, reading assessment may be used for three categories of educational decisions: administrative, parental and instructional (Baumann, 1988). At the administrative level reading assessment may be used for programme and materials evaluation, identification of students for special education (either gifted or remedial) and for decisions concerning promotion. Reading assessment may be used to inform parental decisions such as whether a child is ready to enter primary or secondary school. Instructional decisions include selection of appropriate level text books as well as for grouping of students for instruction. Finally, the focus of reading assessment may be on individual diagnosis such as that carried out by a reading specialist. Assessment at this level contrasts sharply with the emphasis on performance at the higher levels. Rather, it is characterised by a concentration on "locating the conditions under which readers can or cannot perform certain tasks, rather than simply whether they can or cannot perform them" (Vygotsky, 1978 in Johnston, 1983, p.77).

The kinds of decisions that the above authors assume that a teacher routinely makes such as textbook selection, grouping of students for instruction and, even, decisions concerning promotion, are not necessarily decisions the Nigerian teacher is empowered to make. Although there are numerous factors which may limit the ability of the teacher to participate fully in instructional decision making, lack of access to simple, valid and inexpensive reading assessment techniques must be recognised as a significant restricting factor. The importance of establishing criterion scores for the cloze procedure among Nigerian readers can be seen in this context.

2.0.2 Problems in reading assessment

The value of the cloze test in the Nigerian school depends on the extent to which it can be relied upon to provide information which is useful for decision making. This implies that the validity of this, and any other, test largely determines its value. Baumann (1988, p.27) views validity as, "...the accuracy of inferences about a test taker's behaviour." These inferences are of two types:

> (a) inferences about performances or behaviours other than those measured--the notion of validity as prediction; or (b) inferences about the domain of behaviour represented by the test itself--the notion of validity as truthfulness of measurement. (Baumann, 1988, p.27)

Farr and Carey (1986) point out that the purpose for reading assessment and the type of test used for that purpose are intimately related because the validity of the test is dependent upon the purpose. "This means that the validity of any test must be determined in relation to the use that will be made of the results. Tests do not possess validity as some inherent quality. A test may be valid for a particular educational decision when it is used with other information, but no test is valid for all purposes" (p. 2).

Farr and Carey identify four issues concerning the validity of reading assessment. The first is whether a test actually assesses a particular behaviour. This in turn depends on one's understanding of the reading process and on how similar a test procedure is to the actual reading process. The second issue is to what extent a single test can provide all the information needed for a given purpose. Thirdly, one must consider to what extent a particular set of test results help us with the educational decision which prompted the use of the test. Finally, it is necessary to be aware of the extent to which test results may be misused or misunderstood.

As an understanding of the interactive nature of the reading process has grown, the validity of much of the traditional reading assessment procedure has been questioned. Velluntino and Shub (1982) assert that many currently used tests have little theoretical basis, fail to reflect current linguistic research and ignore aspects related to the cognitive and experiential requirements for comprehension. Similarly, with particular reference to the fact that many tests focus on the measurement of discrete skills, Farr and Carey (1986) assert that "results of research on the reading process are in obvious conflict with the contents of many standardized reading tests" (p.17).

Additional problems of test validity are related to specific types of test procedures. For example, many reading tests, both formal and informal, require students to read a passage and then answer questions based on that passage. The validity of this procedure may be seriously reduced if the questions require responses which do not draw on the reading process. For example, Hasenstab (1985) argues that "The ability to answer questions is a complex process that involves a level of sophistication regarding the pragmatic, semantic, syntactic and morphological aspects of question forms themselves. Frequently the stimulus question itself is more difficult for a language impaired child to comprehend than the content of the passage he or she has read" (p.352). Another difficulty is ensuring that all questions are passage independent. That is, it must be impossible for the reader to select multiple choice options or to answer open-ended questions without having understood the passage (See Baumann, 1988; Bernhardt, 1991).

More recently the issue of "authentic assessment" has led to the recognition that the validity of reading assessment is largely dependent upon how "natural" the

test procedure is. From the perspective of authentic assessment, validity issues include challenging the use of test procedures which deviate from the normal reading procedure or the selection of passages which are on topics which are irrelevant to the interests and background of the reader. (See for example, DeFina, Anstendig and DeLawter, 1991)

Ensuring the validity of tests for Nigerian readers of English as a second language can be even more problematic as there are numerous additional factors which come in to play in L2 conditions. For example, Bernhardt (1991) has objected to L2 testing procedures which require the reader to write on the grounds that one can normally comprehend more in a non-native language than one can express. For this reason, Bernhardt recommends testing procedure which involve responses in the native language--a procedure which is, however, clearly inappropriate within the Nigerian school context.

Another perspective on reading assessment has been advanced by Hill and Parry (1988). These authors draw heavily on the theory of Street (1984) that Western cultures view text as *autonomous* and that comprehension, therefore, is assumed to be independent of the background of the reader. Autonomous text contrasts with oral language, the comprehension of which may be largely dependent upon the context of the situation in which it is produced. Hill and Parry are of the view that much reading testing in non-western countries, including Nigeria, lacks validity because it is based on the autonomous model of literacy. Describing this form of assessment, the authors write:

> In the first place, the tasks that are constructed are presumed to have well-defined target responses that readers will inevitably arrive at if they carefully attend to what is in the passage. The text, in other words, is presumed to be autonomous. Moreover, the use of

> particular texts to determine whether individuals are sufficiently literate (at least in their capacity to understand what they read) presupposes that if they can respond appropriately to these texts, they can also read other texts of comparable difficulty in other situations. The skill, in other words, is presumed to be autonomous--that is, independent of the social situation in which it is practised. (1988, p. 11)

The concerns expressed by Hill and Parry are particularly relevant to national examinations such as those of the West African Examinations Council (WAEC). Writing with reference to the reading tests included in the national examinations in Zimbabwe, Allen (forthcoming) complained that the emphasis was on "testing student's understanding of surface details rather than on their ability to predict and negotiate meaning" (p.21). Two studies carried out on different aspects of NTI and WAEC examinations illustrate the problems inherent in the type of reading assessment included in national examinations in Nigeria. The first study is by S.O. Ayodele (1989) who argues that one reason the performance on such tests is so low is that the tests themselves are unreasonably difficult. He came to this conclusion as a result of a study in which 95 graduate teachers of English who were serving as NTI examiners for the 1987 Grade Two Teachers' examination took the comprehension and summary writing section of the same exam before marking the scripts. In this section there is one long passage to be read after which there are six comprehension questions and one summary question asked. Ayodele found that of a sample of 700 student candidates' scripts, the mean total score expressed in percentage was 12 percent while that of the 95 graduate examiners was only 37 percent. In analyzing the tasks, the researcher noted that the items on which performance was the poorest required making inferences, translation of difficult words which were used in unique ways, and summarizing the passage in five sentences. However, these were the very items which carried the most marks. S.O. Ayodele (1989) concludes:

> In all therefore, the most suitable items carry just 18 marks, while those ranging from difficult to very difficult carry a total of 42 marks! This is the crux of the matter and it is in the light of this analysis that we stress that this particular measuring instrument is not particularly suitable--it is a valid measuring instrument only to a limited degree. (p.169)

Parry (1985) carried out a more comprehensive analysis of WAEC exam questions and came to similar conclusions. As part of an ethnographic study of 18 Form Five students in St. Peter's Seminary at Yola, she examined both the texts used for comprehension and summary sections of the WAEC examinations and the cultural/linguistic characteristics of the students as readers. Parry's analysis of such passages and of the comprehension and summary tasks led her to conclude that they would be difficult even for skilled readers of English. She found the passages to be weak in cohesion and coherence, and characterised by complex and unusual syntactic structures. Passages included a high proportion of words with relatively uncommon usages. For example, she discovered that the students in her sample were familiar with most of the words in passages drawn from WAEC examinations. However, very often these words were used in an unusual way in the passage and thus contributed to misunderstanding. She notes that "there are some words which raise specific associations for the students--associations which are strong but not appropriate to the context" (p. 261). This is a particularly serious problem in L2 testing. For example, Parry relates how the students in her sample all knew the word *shadow*, but tended to equate it with the Hausa word *inuwa*, which refers both to shadow and to shade. Thus some of the students interpreted the word *shadow* literally to mean a shelter (as in a mat shelter from the sun) in a passage in which it was used figuratively, "a shadowy existence.." (p. 256). She also found the comprehension tasks to be "full of traps" (p.345) and, in her view, the nature of the summary tasks make it "difficult,

even for skilled readers, to see what the examiner expects, and so it is a matter of luck whether one hits on the target response" (p. 346).

While conceding that there is a role for autonomously oriented text in reading assessment, Hill and Parry (1988) suggest the inclusion of, what they term, pragmatically oriented texts. Such texts are drawn from the environment, such as from letters, local newspapers and advertisements. The types of questions asked in pragmatically oriented assessment tap the readers' ability to use his background knowledge to make inferences and to evaluate what they read. For example, in reading a newspaper editorial, the readers may be asked to identify the textual features that distinguish the editorial from another type of text (Hill and Parry, 1988). With specific reference to Nigeria, Hill and Parry (1990, p.5) suggest the following basic principles: (1) select textual material that is relevant to Nigerian society; and (2) develop tasks that reflect the responses that readers ordinarily make to such material.

The pragmatic model was the basis for the development of a new reading component of the ZJC, a national exam used in Zimbabwe (Allen, forthcoming). Passages were drawn from newspapers, advertisements, forms and instruction manuals. The questions were designed to tap the ability of the students to interpret and reorganize information presented in different formats and included skills such as scanning and the ability to analyze text organisation.

In subsequent sections it will be shown that cloze testing is recognised as a valid assessment procedure which, within the constraints of the Nigerian school conditions, can serve as an alternative to the practices which have been cautioned against above.

2.1 Reading Theory

2.1.1 Models of the reading process

An understanding of the nature of the reading process is essential to the design and interpretation of reading assessment instruments. This is because the validity of any assessment procedure depends on the degree to which it actually tests the behaviour which it is intended to assess. As Farr and Cary (1986) point out, this is dependent upon one's understanding of the reading process and on how similar a test procedure is to the actual reading process. Thus, the testing of reading in Nigeria requires recognition of the unique interplay of factors which characterize the Nigerian reader's processing of English print. The focus in this section is on the Nigerian reader whose first literacy language is English. This requires an understanding of the process by which an individual reads, whether in his native language or in a second language.

It is now recognised that the reader draws upon a number of sources of information, both from the text itself and from the individual reader. The text information includes the print itself, often referred to in the literature as graphophonic cues (Goodman, 1965) or perceptual information (Danks and Hill, 1981). The information the reader contributes to the reading task includes his intuitive knowledge of the structure of the language in which he is reading (syntactic information), his knowledge of the vocabulary used in the text as well as his background of information or "prior knowledge" related to the topic of the text. Both of these latter are part of the semantic information drawn upon during the reading process.

Three categories of reading models take into account the role of each of these sources of information in the reading process. These are often referred to as the

bottom up model, top down model and interactive model. Although each of these models accounts for the information sources, the interrelationships between the use of these information sources vary according to the different models. The main features of each of these models will be presented below. The L2 reading process will then be examined in the light of these models.

Bottom up models. The major characteristics of bottom up models are that they are serial stage models, in which each level of information source acts as a data base for the next, and in which the direction of processing is from print at the bottom level to meaning at the top level. The most popular bottom up model is that of Gough (1972). According to Gough's original model the reader is viewed as a "plodder" who processes print from left to right letter by letter and word by word. Gough's model includes a second stage, which involves some form of phonological mediation. Among beginning readers this involves recognition of the meaning of a word by pronouncing or sub-vocalizing it. Among fluent readers, Gough hypothesizes a mapping process of print onto abstract "phonemic representors" which are viewed as being activated as part of the normal speech process but prior to any motor command. This activates a lexical search which results in the reader understanding the words in a sentence serially, from left to right.

An essential element of Gough's theory is the assumption that a fluent reader must master the alphabetic code. He calls this the ability to cipher, a skill which is most easily measured by the readers' ability to read nonsense words. Gough stresses that the child does not learn this code through memorization of phonics rules -- in fact he cannot be taught the code but must discover it himself. While Gough

acknowledges that some words are learned as sight vocabulary, he suggests that sight words make up only a proportion of the words recognised by a skilled reader. He also points out that decoding does not automatically ensure comprehension and that "word calling" results if the pauses between words disrupt the ability of the child to integrate the words into a comprehensible message. Gough views oral reading errors as the result of a reader attempting to read fast enough for it to appear to make sense, even when he is unable to decode some of the words automatically. Gough (1972, p. 683) asserts "the good reader does not need to guess, the bad should not."

Later research findings which demonstrate that context does affect word recognition has led Gough to the conclusion that reading is not strictly a bottom-up serial process as he had postulated in his model (Gough, 1985). However, another serial model theory, that of LaBerge and Samuels (1974), has been modified in such a way that it incorporates the more recent evidence that higher level semantic processes may influence the lower level word recognition process. Although the original LaBerge and Samuels model was linear, in it certain stages could be by-passed although no higher level stage could influence a lower level. Samuels modified the model by adding feed-back loops to the linear model through which semantic knowledge could interact with lower level processes (See Samuels, 1985).

The main contribution of the LaBerge and Samuels model is the concept of automaticity. The research of LaBerge and Samuels has led them to the conclusion that a reader who has not developed automatic word recognition does not have sufficient attentional capacity free for the comprehension process, resulting in laborious word-by-word reading with minimal comprehension. However, the fluent

reader processes the print automatically; thus his conscious attention is free to attend to meaning.

Top down models. The second class of models to be considered are the top-down models of K. Goodman (1967) and Smith (1971) which developed out of the field of psycholinguistics, particularly in the light of a renewed interest in cognitive aspects of language. Viewing reading primarily as a language process rather than primarily a visual perceptual process, the reader is seen to contribute nonvisual information to the print in order to "reconstruct" a message encoded by a writer in graphic language. This non-visual information, according to Smith (1973, p.6) is "what we already know about reading, about language, and about the world in general."

An essential characteristic of the psycholinguistic reading models is that the reading process is viewed as "driven" by non-visual information used by the reader to formulate hypotheses about a given text. The print is then "sampled" just enough to test the hypotheses. It is assumed that a good reader has no need to process every letter, or even every word, in a text. According to K. Goodman (1972, p.23), both listening and reading processes "are cycles of sampling, predicting, testing and confirming." Thus Goodman views reading as a "psycholinguistic guessing game" which involves an on-going process of sampling from graphic cues, searching memory for "related syntactic, semantic and phonological cues", making a "guess or tentative choice" which he tests for semantic and grammatical acceptability and, if it is acceptable, "meaning is assimilated with prior meaning....,(and) expectations are formed about input and meaning that lie ahead" (1976a, pp. 507-508).

A major contribution of K. Goodman's theory to the understanding of the reading process has been his study of the role of, what he terms, "the language cueing systems." These cueing systems are the graphophonic, syntactic and semantic information available to a reader, both from the text and from his own relevant world knowledge and knowledge of the language in which he is reading. Goodman introduced miscue analysis, analysis of oral reading errors, as a tool for the investigation of readers' relative use of the three cueing systems in the reading process (See K. Goodman 1969, 1973; Goodman and Burke, 1972; Goodman, Watson and Burke, 1987). Findings from studies using miscue analysis have led him to the conclusion that the three cueing systems are both simultaneously available and interdependent. However, the extent to which a reader is seen to rely on one or more of the cueing systems is believed to be largely due to his ability to contribute non-visual information to the reading process. The concept of "reader strategies" developed from this view, based on the assumption that a good reader selects the cues which are most productive for any given reading task. In no case is heavy reliance on graphophonic cues considered productive because of the assumption that "the reader who concentrates on identifying every word correctly will, unless he is already very familiar with the material he his reading, be unable to read for meaning" (Smith, 1973, p.7).

A study by Goodman (1965) of the role of context in word recognition lent strong support for his view of reading as a psycholinguistic guessing game. In this study comparing children's ability to read words on a word list with their subsequent ability to read the same words in sentences, he found a 60-80 percent improvement in their word recognition when reading in context. These findings were interpreted

as suggesting that readers make use of context cues as part of their on going word recognition process.

Interactive models. The third and most current class of models of the reading process are interactive models. The concept of reading as interactive was first introduced by Rumelhart (1977). His interactive model was first developed in the light of clear evidence that "apprehension of information at one level of analysis is partially determined by higher levels of analysis" (p. 726). Specifically, research in the 1970's showed that perceptions of letters often depend on the surrounding letters, that perceptions of words are influenced both by the syntactic and semantic environments in which the words are encountered, and that our perception of syntax often depends on semantic context.

Rumelhart and McClelland (1981) describe the general concept of the interactive model as follows (p. 37): "In brief an interactive model is one in which data-driven, bottom-up processing combines with top-down, conceptually driven processing to cooperatively determine the most likely interpretation of the input". The interactive model is distinguished from the other models primarily by the direction of processing. Unlike the bottom-up and top-down models, output from each source of information, graphophonic or contextual, may serve as a data base for all other sources (Levy, 1981).

Stanovich (1980) introduced a compensatory element to the interactive model which accounts for research findings that there is a trade-off between use of graphophonic and contextual cues depending on a readers' strength in automatic word recognition. Specifically, "... a reader with poor word recognition skills may ... be

prone to a greater reliance on contextual factors because these provide additional sources of information (Stanovich, 1980, p. 36). This is a major point of contrast with the views of Goodman and Smith who assumed that reliance on contextual cues is a characteristic of the skilled reader rather than of the unskilled reader. While Goodman views reading as a "psycholinguistic guessing game" in which context is being consciously applied for the prediction that is assumed to be a part of the *on going* word recognition process, Stanovich's interactive-compensatory model (1980) does not recognise the use of context for conscious prediction except in cases where words cannot be recognized automatically. Stanovich does, however, acknowledge the importance of contextual effects, which he terms "automatic spreading activation," for facilitation of on-going word recognition and for comprehension. The distinction between the conscious prediction of the psycholinguistic theories and contextual facilitation is critical. As Stanovich (1980, p.56) points out, "... the observation of a contextual facilitation effect does not necessarily implicate conscious prediction on the part of the subject. Facilitation effects can occur via automatic processes that do not involve conscious attention".

A number of studies have seriously challenged the assertion by Goodman and Smith that only poor readers rely on graphophonic cues while good readers use more of context for word recognition. For example, the findings of Goodman's 1965 study comparing children's recognition of words in context and in isolation have been reinterpreted as a result of a replication study by Nicholson, Lillas and Rzoska (1988) in which the performance of good and poor readers was compared. However, unlike in Goodman's original study, the performance of good and poor readers were analyzed separately. The researchers concluded, "The results suggest that the poor

readers use context to help with reading, whereas good readers who are skilled at decoding do not need to do so" (p. 9). Such findings suggest that, although good readers have access to contextual information and may use it when necessary, they do not rely on it because of their ability to decode automatically and rapidly. Tunmer and Cole (1985) suggest that although good readers do not rely on their superior predictive abilities to facilitate on-going word recognition, they use it to monitor their comprehension. This suggestion is supported by the findings of Weber's (1970) study of oral reading errors of primary school children. Weber observed that good readers were much more likely than poor readers to correct errors that disrupted the syntax and meaning of a sentence. As correction occurs after a word has originally been read, it is evidence of a monitoring rather than a word recognition strategy.

On the other hand, a reader whose word recognition skills are weak compensates by using context. However, if a readers' word recognition skills are too poor, there will not be enough context available to him and comprehension will break down. As Kibby (1979) points out, "...a child must automatically process some proportion of the words in a passage before experience and language skills can be applied.." (p. 390).

The role of automatic spreading activation has been further investigated by Vitek and Schwantes (1989). These researchers studied intersentence context effects and concluded that automatic spreading activation (they call it "automatic expectancies") facilitates speed of recognition of words across sentences. Their findings also suggest that such automatic context effects may facilitate comprehension and recall by contributing to " the establishment of coherent links that connect segments of text..." (p.192). Vitek and Schwantes (1989) conducted a series of

experiments in order to investigate the interaction between bottom-up and top-down processes during oral reading in order to throw more light onto the process of reading beyond the sentence level. By using oral reading tasks which involved reading sentences which contained various combinations of non-words, semantically inappropriate and syntactically inappropriate words, the researchers were able to observe the influence of these obtrusions on the oral reading process. Although they acknowledge that there are important differences between oral and silent reading, for example oral reading must be sequential and attention paid to oral production, some of their findings may be considered to offer significant information on the silent reading process. In particular, Vitek and Schwantes observed convincing evidence "that syntactic and semantic information came from functionally independent knowledge sources both of which were active in lexical access" (p.150). Of particular relevance to the present study is the finding that oral reading was disrupted less by syntactic violations than by semantic violations, thus providing evidence of an ability to compensate for the loss of syntactic cues by a relying on semantic information.

2.1.2 The reading process and the L2 reader

Having reviewed models of the reading process, their implications for reading in a second language will be considered below. Kozminsky and Graetz (1986) have suggested that the reader's reliance on the cueing systems may vary according to his skill in the language in which he is reading, as well as his degree of background knowledge about the topic. Thus, a reader's strategies may be considered fully interactive or they may be closer to those of either the bottom up or the top down models. Table 2.1 below shows the authors' conceptualization of the reading process

under their various conditions. In the table the L1 (skilled) category refers to an individual who has high language facility in his mother tongue which serves as a source of syntactic and semantic information to be drawn upon in the reading process. The L2 (unskilled) category refers to a reader with limited proficiency in the language in which he is reading. It may be assumed that in Nigerian schools the majority of the students would fall into the L2 (unskilled) category. That is, they read in English which is a second or third language. Thus they can be expected to bring fewer language resources to the reading task compared with those for whom English is their mother tongue. Specifically, their access to syntactic and semantic information which should be provided by their knowledge of the language is limited. The table shows the distinctive characteristics of the reading process of the L1 and the L2 reader according to his degree of knowledge about the topic being read.

Table 2.1. **Some principal characteristics of reading as a function of knowledge and linguistic abilities.***

	L1 (SKILLED)	**L2 (UNSKILLED)**
HIGH KNOWLEDGE	Interactive	Top-down
LOW KNOWLEDGE	*Bottom-up*	*Fragmented*

* after Kozminsky and Graetz (1986.p.18)

The first reading condition that will be considered is that of the individual when he is reading in his native language about a topic about which he has a high degree of background knowledge. Such an individual's reading process may be characterised as interactive in that while he is reading he can draw fully on his knowledge of the topic, as well as on his proficiency in the language of the text.

The second condition to be considered is that of the individual reading a text in his mother tongue on a topic about which his background knowledge is low. In this situation the reader is assumed to have access to graphophonic and contextual, semantic and syntactic, information. However, as prior knowledge contributes to knowledge of the vocabulary related to the topic being read, as well as to predictive ability, the reader who lacks background knowledge is forced to rely primarily on textual information. In this situation his reading process could be considered non-interactive and closer to that of the data driven bottom up model. The studies by Vitek and Schwantes (1989) of readers' use of semantic, syntactic and graphophonic information in oral reading tasks lend support to this. The authors found that on material that was conceptually difficult (that is, on which the readers' prior knowledge is low), readers lost access to semantic cues and relied most heavily on graphophonic and syntactic information. Under such conditions, the reader is highly dependent on his automatic word recognition skill. If this too is weak, comprehension would break down entirely.

The third condition is that of the reader who is reading a text in a second language in which he is less proficient than in his native language. His knowledge of the syntax and vocabulary of the language which would provide him with context cues is limited. However, his high degree of prior knowledge provides him with the background information required for prediction. Thus, in line with the top down model of Goodman (1967), higher-level processes are seen to direct the flow of information usage.

The final condition is that of the second language reader when he is reading a text about which he has very little prior knowledge. Under this condition his access

to the information in the text may be limited to words and phrases which he is unable to synthesize into a coherent whole. This reading condition is regarded as fragmented.

2.1.3 Studies of L2 readers' strategies

There are two categories of studies of the reading strategies of L2 readers. The majority are studies of readers who first learned to read in their mother tongue and who are learning to read in a foreign language at the secondary or University level. The studies which are most relevant to the present research, however, are in the second, and very rarely investigated, category -- those of readers whose first literacy language is not their mother tongue. An individual in the latter group would not have benefitted from the experience of having first learned to read in his mother tongue -- a language over which he has a high degree of control and which he uses for intimate and informal communication. Rather, his first reading experiences are based on a language which may be barely meaningful to him and which is used almost exclusively in the classroom setting. One case study by Haddad (1981) illustrates the effect of these two types of language background on children's reading strategies. Haddad studied three Arabic speaking Lebanese children in primary four in the USA. For two twelve year old children English was their first literacy language while the third child first learned to read in Arabic. The children who first learned to read in English spoke English fluently while the child for whom English was her second literacy language had been in an English speaking school for only one year and was not fluent in English. The study addressed the following questions (p. 32): "What are the second language reading strategies of the first language illiterate students and how are they different from those of other second language and first language readers?"

As the two children who first learned to read in English had better control of English syntax and a wider spoken English vocabulary than the third child, the author expected that these children would be able to make more use of syntactic and semantic cues. However, miscue analysis of the oral reading errors revealed that the percentage of syntactically acceptable miscues of the child who first learned to read in Arabic was about twice as high as those made by the children who first learned to read in English. The percentage of semantically acceptable miscues was nearly the same for all three children. The author interprets the findings as suggesting that the L1 illiterate students may lack an understanding of the purpose for reading and were, therefore, unable to draw upon their oral language resources during reading. The child who first learned to read in Arabic may have recognized the relationship between spoken and written language when he first learned to read and intuitively applied his syntactic and semantic knowledge to the reading process. This L1 strategy may then have transferred to reading in English despite his low level of oral proficiency in the language.

The above interpretation is supported by an observation made by Lewis and Massad (1975) in their report of the IEA study of the teaching of English as a Foreign Language in Ten Countries that "word knowledge" of the mother tongue could serve as a predictor of achievement in a foreign language. They examined the relationship between student background variables and the performance on the reading and listening portions of the test of English used in the study. They found that "The closest relationship appears to exist between word knowledge of the mother tongue and each of the criterion variables, reading and listening" (p. 96).

A second study of students reading in English as a first literacy language was carried out by Oyetunde (1988). He studied the strategies of Nigerian secondary school students, most of whom had first learned to speak English in school. He found that access to the three cueing systems was influenced by text difficulty and by text type. In comparing cloze responses on a narrative and an expository passage, a higher proportion of miscues was semantically acceptable on the narrative passage while a higher proportion was syntactically acceptable on the expository passage among readers for whom the text was above frustration level. At all levels and on both text types readers' miscues showed a heavy reliance on graphophonic cues. Only at the independent level on the narrative passage was there evidence of a top-down processing strategy among some readers who relied most heavily on semantic cues.

The third study in this category is of prelingually deaf readers of English. The first language of these students was American Sign Language (AMESLAN). This language has a different syntax from standard English and, of course, the vocabulary is different as it is in the form of gestures rather than spoken words. Thus, when prelingually deaf children learn to read English they are learning a foreign language which they have never heard spoken. Kelly and Ewoldt (1984) studied the cloze miscues of deaf readers of English. Their findings showed that twenty-one percent of the miscues were acceptable syntactically as standard English. However, an additional fourteen percent were syntactically acceptable in AMESLAN -- thus showing evidence of use of the cues supplied by the language form in which they usually communicated.

Studies of readers for whom English is their second literacy language may not be as relevant to the Nigerian conditions. This is because most Nigerian children are first taught how to read in English within the school system. However, miscue

analysis studies show some characteristics that may apply to Nigerian readers. For example Romatowski (1972) studied the miscues of Polish-American students in 5th grade reading in English and in Polish. She found that the syntactically unacceptable miscues rarely resulted in a serious meaning change as they generally were due to inflectional changes.

2.1.4 The cueing systems and the accuracy level effect

In the studies reviewed above, readers have been classified as "good" and "poor," and comparisons made in their use of context and graphophonic cues. However, many of the studies which attempt to compare good and poor readers fail to take into account the fact that the same text was often used for both groups of readers. Under such conditions the text may be on the frustration level of the poor readers and on the independent or instructional level of the good readers. Thus, characteristics which are often interpreted as being an attribute of the skill of readers may actually be a consequence of the level of difficulty of the text.

There is very strong evidence that the access that readers have to contextual cues is affected by the relative level of difficulty of the text. As was noted in the earlier review of the interactive models, readers with good word recognition skills have been shown to have more access to contextual cues but are less dependent upon them in the fluent reading process because of their skill in automatic word recognition. On the other hand, although poor readers have been found to rely more heavily on the use of context for on-going word recognition, because the use of context is dependent upon the reader's access to it, readers with poor decoding ability may not be able to make use of prior context if the difficulty level of the text is too

great. Stanovich (1986, p. 371) makes the important observation that "...the source of individual differences in contextual facilitation ...are directly determined by the decoding ability of the subject and the difficulty level of the contextual material...". He notes that as material becomes more difficult, the difference in contextual facilitation that is observed between poor readers and good readers for word recognition purposes disappears and "...eventually a level of difficulty will be reached where the better readers display larger facilitation effects because the prior text (which forms the context for the word currently being recognized) is simply too difficult for the poorer readers to decode" (p. 371). This observation has been demonstrated in numerous studies using miscue analysis, both of oral reading and cloze miscues, which consistently show a reduction in the percentage of contextually acceptable miscues on texts which are difficult as compared to easy texts. This phenomenon is referred to in the literature as the "accuracy level effect", meaning the effect of difficulty level as reflected in oral reading error rate on miscue quality (see Hood, 1982). While an accuracy level effect may be inferred from some of the studies using a "good" versus "poor" reader design, it can be observed most effectively when a within-subject design is used comparing the miscue patterns of the same students on both difficult and easy passages. Some studies using both designs are reviewed below. Those using a between-subject design are reviewed first.

A study carried out by Goodman and Burke in 1973 in which a comparison was made of the miscues of high and low ability readers was reviewed by Leu (1982) and the findings reinterpreted to take the accuracy level effect into consideration. In this study it was found that when the high and low ability readers read the same text, the miscues of the low ability readers were less contextually appropriate than those

of the high ability readers. Rather than interpreting these findings to confirm the superiority of reading strategies of good readers, Leu comments:

> The same stories, being relatively easy for the more proficient readers, probably enabled these students to utilize a processing strategy that focused greater attention on the available contextual information and less on graphic information. (p.429)

Leslie (1980) compared the oral reading miscues of average and below-average primary school children who read passages within the same accuracy level ranges. The author observed that the proportion of syntactically acceptable miscues of both categories of readers was less among the readers who could read the passages at a high accuracy level. The author observed a clear accuracy level effect on the use of context cues. In addition the author observed differences related to reading ability, and to differences in text characteristics across the passages, suggesting that accuracy level effects may be moderated by additional influences on miscue quality.

An accuracy level effect was also observed in a study by Oyetunde and Umolu (1989a) in which the authors compared the cloze miscues of Nigerian university students on a newspaper editorial and on a simplified version of the same editorial. They found that the miscue quality was very similar among the readers for whom the passage was on instructional level -- regardless of the version of the passage. However a comparison of the miscues of the readers for whom the passage was on instructional level with those for whom the same passage was at frustration level revealed a marked difference in miscue quality. The authors reported:

> ...at frustration level there was clear evidence of a breakdown in comprehension as the majority (76 percent) of the miscues were neither syntactically nor semantically acceptable compared with 39 percent for the instructional level group. Similarly, 48 percent of the miscues made by the instructional level group were contextually appropriate in contrast to only 13 percent of those made by the frustration level group. (p.191)

In another between-subject study by Oyetunde and Umolu (1989d), an accuracy level effect was observed among JSS2 students on cloze versions of a narrative and expository text. This study involved the use of Total Random Cued Plus cloze format (Helfeldt, Henk and Fotos, 1986) in which graphophonic cues are provided by supplying the first letter of the deleted word followed by dashes representing the number of remaining letters. Using this format it is possible to examine the relative use of all three language cueing systems. It was found that on both passages the readers who read at frustration level had access only to graphophonic cues as just over half of their miscues were real English words beginning with the cued letter and with the same word length but not meaningful or grammatical within the sentence. The remaining miscues were mostly non-words. However at the instructional level more of the readers miscues were real words resulting in higher graphophonic miscue scores. At this level between 22 and 38 percent of their miscues were contextually appropriate in contrast to between 2 and 8 percent at the frustration level.

One of the earliest studies in which a within-subject design was used was that of Williamson and Young (1974). In this study primary school children were asked to read texts which were shown by an IRI to be on their instructional level and other texts shown to be on their frustration level. Significant changes in patterns of miscues were found among the same readers depending on whether the text they were reading was on their frustration or their instructional level. Specifically, instructional level reading was characterised by miscues which were semantically and grammatically appropriate to the entire text, while at the frustration level miscues were more likely

to be graphophonically similar and semantic and syntactic appropriateness was more likely to be limited to the sentence level.

Also using a within-subject design, Kibby (1979) found a similar change in the strategies of disabled readers in the upper primary classes when they read passages on two different levels of difficulty. The readers' miscues which were judged to be both syntactically and semantically acceptable were classified as showing strength; miscues which were syntactically acceptable but which resulted in a meaning change in the passage were classified as weakness. It was found that 76 percent of all readers were classified as "weak in use of grammatical relationships" on the difficult passage. On the other hand, the miscues of the same readers on the less difficult passage were such that 74 percent of the same readers were classified as showing strength in grammatical relationships. In other words, their use of context was apparently related to the difficulty level of the text. These results are consistent with those of Beimiller (1979) who found that when high ability first graders, tested at the end of the school year, read passages at four difficulty levels, the mean percentage of contextually acceptable errors dropped from 92 percent on the easiest passage to 68 percent on the hardest.

Kendall and Hood (1979) compared the contextual appropriateness of the oral reading miscues of two groups of readers -- those who had been earlier identified as being high in comprehension but low in word recognition skills and those who were low in comprehension but high in word recognition. They found out that the readers from both groups made more contextually appropriate responses on the passages on which they read with greater accuracy as compared with those which they found more difficult. A follow up study by Hood (1982) confirmed this finding that the contextual

appropriateness of errors is significantly associated with the relative level of text difficulty. Using a within-subject design, she found that at lower oral reading accuracy scores children made proportionally more errors which were neither semantically nor syntactically appropriate while at higher accuracy levels they made proportionally more errors which were both syntactically and semantically appropriate. She concludes, "Whether the same subjects are reading different stories or different subjects are reading the same stories, readers clearly make better use of grammatical relationships when accuracy is relatively high" (p. 156).

Stanovich (1986) reports studies of eye movements which are consistent with the evidence of miscue analysis relating to an accuracy level effect. These studies show that "when skilled readers are forced to read material too difficult for them, their eye movement patterns deteriorate and approximate those usually shown by the less skilled reader" (p. 365). Thus the observation that "the level of reading determines the nature of the eye movement patterns" (p. 365) corroborates the evidence of miscue analysis of an accuracy level effect.

2.2 International Reading Achievement Studies

Before considering the current condition of reading instruction and reading achievement in Nigeria, a brief overview of studies of reading achievement internationally will be made. The International Association for the Evaluation of Education Achievement (IEA) carried out a number of comparative studies in the 1970s which, although they did not include Nigeria, have some relevance to the Nigerian conditions. The study which is of greatest interest included testing of reading

comprehension of children in 15 countries including two which could be considered developing countries, India and Iran (Thorndike, 1973).

The IEA studies not only attempted to measure achievement in some way in which there could be a meaningful comparison made between countries, but also investigated factors which may be related to reading achievement. Of particular relevance to Nigeria is the fact that, between countries, the factor that was most clearly related to reading achievement was whether or not the country was developed or developing. This is expressed most strikingly in the following statement from the Thorndike study (1973, p.148): "...only 5 percent or 10 percent of students in a developing country score as well on a test of reading comprehension as the average student in one of the developed countries." Summarizing the findings of all the IEA studies including the entire range of subject areas evaluated and the countries tested, Levine and Purves (1975, p. 68) refer to this discrepancy between the academic achievement in developed and developing countries as "perhaps the most dramatic findings of all the IEA studies of the last decade and a half...." The authors attempted to describe these findings as follows:

> If school marks were assigned in the various nations [included in the IEA studies] on the basis of the highest nation's standards ..., then almost 50 percent of the students in the lowest scoring of the developed nations would fail, but about 85 percent of the students in the average developing nation would fail. (p. 68)

The picture one has from the situation in the developing countries used in the study, that of India especially, appears to be very similar to that of Nigeria. That is, there were a few schools in which the performance of the children were generally on a par with those of the more developed countries while there were other, and more, schools in which the reading tests used in the study were simply too difficult for the children.

The authors attempted to explain this high between-school variance in India as follows: "Apparently either the input or the educational program is so radically different from school to school in India that the performers within a given school tend to be relatively consistent in their level of achievement, while the differences between schools are very dramatic and striking (Thorndike, 1973, p. 142). In Nigeria, the difference in reading achievement between students in the government schools and private schools is equally "dramatic and striking" (See for example Umolu and Mallam, 1985; Umolu and Oyetunde, 1988; Oyetunde and Umolu, 1991). To what extent the difference in Nigeria is due to "input" or "educational programme" as suggested by Thorndike, is not completely resolved as there is ample evidence that both factors are at play. That is, parents who provide a favourable educational home environment (thus producing high quality "input") are also those parents who are most likely to send their children to private schools where the standards of the educational programmes are generally much higher than in the government schools.

Another finding from the Thorndike (1973) study affirms the importance of home background in accounting for the difference in reading achievement between schools. Thorndike reports that "good home and environmental backgrounds provide strong differentiation between countries and, within countries, between students" (p.179). Levine and Purvis (1975) also report the finding that curriculum, (that is, the opportunity to learn what was tested), teacher competence and the amount of time devoted to teaching were among the most important variables accounting for national differences in school achievement. In all these variables, the developing countries may be the most seriously affected. For example, the authors comment that "perhaps the most important curriculum implication is that beautiful curriculum plans have little

relevance for education unless they are translated into what happens in the classrooms of the nation or community." This appears highly relevant' to the conditions in Nigeria where there is often a big gap between the syllabus and what actually happens in the classrooms (See Hawes, 1978). In the area of reading this has been found to be the case in the teaching of reading methods in the Grade Two Teachers College curriculum. For example, Olaiya (1987) found that although there is a section of the English Methods syllabus for teachers colleges on reading instructional methods, this part of the syllabus was not covered in most schools she studied. The two main reasons for this were that the school either did not have a copy of the syllabus or that the teachers omitted the reading instruction section because they felt their own background did not prepare them adequately to teach it. In the primary schools, themselves, the opportunity to learn to read is also restricted by the neglect of reading in the primary school syllabus. This is reflected by the fact that reading is not regarded as a separate subject to be timetabled, and by the lack of appropriate basic and supplementary reading materials.

Subsequent to the international study of reading comprehension education, an evaluation was also made by the IEA of the teaching of English as a Foreign Language in ten countries (Lewis and Massad, 1975). However, the conditions of the countries included in these studies are quite different from those in Nigeria. In the first place, English is neither the official language nor the language of schooling in the countries studied. Secondly, all the children were literate in their mother tongue before they began to learn to read in English. However, three conditions which were found to contribute to achievement in reading are applicable to Nigerian schools,

namely that the students sometimes speak English to the teacher, that they write exercises in English, and also that they read English for pleasure.

Another international study was reported by Tarnopol and Tarnopol (1976) in which the authors sent a survey questionnaire to officials in selected countries asking approximately what percentage of non-retarded school children have reading disabilities? The findings of this study are weakened by the fact that different countries have different definitions of reading disability and that standards for acceptable reading performance vary greatly. However, it is of interest to note that among the sixteen countries that responded to the questionnaire, on the average three boys to one girl required remedial reading. Most countries identified intrinsic factors as responsible for reading disability but Venezuela (with a disability rate of 33 percent) noted instructional factors. Instructional factors seem to be least acknowledged in small homogeneous countries such as Norway. Minority status and L2 reading conditions were found to have a negative effect on some groups although this was not found to be the case among the Chinese, Japanese and the Jewish in the U.S.A. Instructional and language factors are also recognised to contribute to a considerable proportion of the reading problems in Nigeria. (See, for example, Unoh, 1993.)

2.3 Reading Problems in Nigeria

As has been stated earlier, the present study is a response to evidence that an alarmingly high proportion of students in Nigeria are required to use textbooks which are on their frustration level. In this section, therefore, studies which examine the

nature of the reading problems at the various levels of schooling in Nigeria and the conditions which contribute to them will be reviewed.

2.3.1 Primary level

It is generally recognised that the foundation for reading success must be laid at the primary school level. However, there is overwhelming evidence that this foundation is not being adequately laid. Following is a review of studies that bear this out.

Lasisi (1984) investigated the ability of 225 primary six pupils drawn from nine schools in Ile-Ife, Oyo State to read a culturally relevant passage. She found that, as a rule, the pupils were only word calling without comprehension. She concluded that the pupils "seemed to be seriously lacking in fundamental reading skill, so that no mater what they were given to read, the failure rate would be unusually high" (p.22). Lasisi wondered how long the authorities could tolerate a whole town of children unable to read! A similar situation was found to occur in Zaria where Dubey (1983) tested the English reading ability of 60 primary five pupils drawn from three schools. She reported that one half of the children were unable to read even primary one level material. Similarly, in a study by Umolu and Mallam (1985) in Plateau State schools, it was found that the children in the government schools only began to read English at all when they were in Primary Three and that they finished Primary Six unable to read, independently, any books above a class one level.

There is strong evidence that primary schools are not only failing to teach children to read in English but that the problem is equally serious in the teaching of reading in Nigerian languages. For example, Onyelonu (1986) tested 100 primary

four pupils' ability to read in Igbo and in English in four schools in Enugu. She found out that in the two local government schools in the sample the primary four pupils could neither read in English nor in Igbo. Bodam (1988) tested the Hausa and English sight word recognition of 60 primary three pupils in Kaduna State. He found that, out of the first 100 words introduced in Primary One Hausa and English language textbooks, the mean word recognition score for the primary three pupils was only 25 words in English and 22 words in Hausa.

Although there is evidence that the reading ability of private school pupils is far superior to that of public school pupils, studies show that the level of reading performance is still below the demands of the curriculum. For example, the study by Umolu and Mallam (1985) revealed that in the private schools the English textbooks for classes five or six were on the frustration level of most of the class six pupils by the end of the school session. The situation has been found to be even more serious when students are required to read expository texts. Oyetunde and Umolu (1989b) tested 360 primary five children in nine private schools in Jos and found that only 21 percent of the pupils could read a science passage drawn from a primary four textbook above frustration level.

Educationists in Nigeria have identified a number of conditions that account for the serious reading problems among the primary school children. Of great importance is the home background of the pupils. Ekpunobi's (1991) survey of teachers in primary schools in Onitsha provided evidence that,

> ...the reading problems of children in the primary school can be traced back to the home. The poverty and illiteracy of most of the pupils' homes affect their education adversely, especially their reading. Most of these children do not have the opportunity to practise reading at home and some do not even have the required texts to do this (p.402).

The difficulties Nigerian children face in learning to read in a language other than their mother tongue is widely recognised to contribute to reading problems at the primary school level (Awoniyi, 1983; Macauley, 1983; Aliyu, 1983). In presenting the rationale for the Six-Year Primary Project in which Yoruba was used as the language of instruction, Afolayan (1976, p.114) stated,

> ... much of the already inadequate primary education is given through the medium of the English language at a time when pupils have rarely acquired a working knowledge of the language. Consequently, the children are specialists in rote-learning largely artificial facts which they do not consider relevant to their everyday lives.

The difficulties Nigerian children face in learning to read are compounded by the difficulty levels of the textbooks. Etim (1987) used four different readability formulas to compare the readability of English, Social Studies and Science textbooks used in Primary Four, Five and Six with the class levels for which they were intended. The readability levels of the Social Studies Books were consistently higher than their designated class levels while the readability levels of the English and Science Books were either on or slightly higher than the classes for which they were intended. Considering the evidence that both private and public primary school pupils generally read below their class levels, the use of difficult textbooks increases the proportion of children who are unable to comprehend classroom reading materials.

Nigerian educationists have identified additional factors which contribute to poor reading ability at the primary level; prominent among these are poor methods of teaching reading, large class sizes and lack of supplementary reading materials (Aliyu, 1985; Ekpunobi, 1991; Etim and Willems, 1988)

2.3.2 Secondary level

Obah (1987), in an impassioned plea for recognition of the gravity of the problem of poor reading performance among Nigerian secondary school students, identified three major conditions which contribute to this problem. She noted that the language and cultural background of the average Nigerian student, including the multilingual environment and the absence of a reading tradition, do not prepare him for the academic demands of learning to read and reading to learn in English. In addition, the teaching of reading is not taken seriously by the schools, either in time allocated to it, in content in the school English language curriculum, or in the training of teachers. As Unoh (1985a) observed, "... the four language skills are not taught in any serious sense, even though they are taught incidentally in English lessons.." (p.127).

A survey by Unoh (1982) among English/Language Arts teachers in Oyo and Cross River States supports Obah's alarm over the lack of formal training in reading instruction among secondary level teachers. Unoh found that only 41 out of 250 teachers in Oyo State and 15 out of 101 in Cross River State had any training in reading at all, and for some of these it was only for one month. More recently, Olayemi (1991) reported on the extent to which teachers of JSS students felt they were equipped to teach reading at the time they were furthering their education at the Advanced Teachers College, Zaria. She found out that "...about 50 percent of entrants into the teaching profession at NCE level come into contact with education and methods of teaching reading for the first time at that level. ... Such vital areas as diagnostic reading methods, improvising reading materials and evaluating reading materials seem difficult or unlearned by the respondents" (p. 367).

Recent reviews of the conditions at the Junior Secondary School level have highlighted some conditions associated with the implementation of the National Policy on Education Nigeria, (Federal Ministry of Education, 1981) which affect reading performance in the schools. Olaofe (1989) noted that the reading demands at this level drastically increased under the 6-3-3-4 system as students at this level have to read for eighteen subjects in contrast to the eight or nine subjects under the former system. These include technical subjects for which it is necessary for students to read texts with specialised vocabulary and complex sentence structures for which their primary level education did not prepare them. Similarly, Oyetunde and Umolu (1989c) reported that there is no provision for remedial instruction for the large numbers of students whose reading skills are deficient upon entry to the secondary school, nor is there provision for systematic teaching of the skills needed to read expository texts effectively. A study carried out in 15 Plateau State secondary schools by Akinmade and Gyuse (1987) provides evidence that JSS students' low achievement in Integrated Science is related to their reading comprehension skills, especially ability to make inferences. These authors concluded, "The results of this study suggest that the junior secondary school students examined, underachieved in science... Part of this problem has been traced to students' poor mastery of vital reading comprehension receptive skills."

Statements by WAEC chief examiners on their reports on the comprehension and summary sections of the GCE Ordinary level English examinations (1976-1986) provide further evidence of poor reading comprehension at the secondary school level. The most common observations were that the GCE candidates (a) lifted entire sections from the passages in answer to comprehension questions, (a) misinterpreted the questions, and (c) failed to comply with the rubrics. The following

statements are typical: "There was a clear indication of an inability on the part of the candidates to re-state correctly the ideas of the passage in their own words (WAEC, 1980); "Candidates should learn that one of the cardinal principles of summary writing is the exclusion of illustration and details." "The answers indicated that many understood the passage fairly well but were handicapped by an inability to summarize. Most candidates could not express the ideas of the passage in their own words but relied mainly on a verbatim reproduction of the parts of the passage that contained some of the right ideas" (GCE, 1984). The performance of the students, as noted in the examiners reports, suggests that the candidates are unable to comprehend well enough to rewrite in their own words, to differentiate between details and main points and to understand the directions (rubric) in the questions.

From the perspective of the readers, Parry (1985) examined a number of factors that influenced the responses of the students in her study of secondary school students in Yola on WAEC material. For most of the students English was a third and, almost exclusively, a school language. Their vocabulary and familiarity with a variety of syntactical structures were limited. She found that students made full use of the semantic information available to them but without the precise understanding of many lexical items, they frequently misinterpreted the text. In support of the hypothesis of the present study that Nigerian students make heavy use of semantic processing while reading English, Parry made the observation that "[problems with syntax] never occur independently of lexical difficulties; it seems that if the students knew the lexis, they could understand the syntax. But when they did not know the lexis, they were generally unable to use low-level syntactic cues to solve the problem" (p. 280).

Another interesting finding, which supports Obah's concern over the culture gap in prior knowledge was that the students frequently misunderstood texts which contained information which was "contrary to the assumptions with which the students had been brought up. In such cases the problem was not so much that the students could not understand the lexis and structure of the text as that they could not believe that it was saying what it said" (p.348).

2.3.3 University level

The earliest and most comprehensive work on the reading problems of University level students was carried out at the University of Ibadan starting with the studies by Brimer (1958), McKillop and Yoloye (1962) and Chapman-Taylor (1965) and continued in depth by Professor Solomon Unoh, from 1967 until 1983. The early studies provided evidence that the reading skills of Nigerian University students are below that which would enable them to cope effectively with their academic work. Unoh (1975 reprinted in Unoh 1985, p.319-320) quotes McKillop and Yoloye (1962) as concluding that, "The typical student is carrying a heavy burden when he takes on the reading load of a university course. It does not matter very much what subject he is majoring in, how he prepared for university, or whether he has worked before he came to the university. He needs help with both speed and comprehension." Unoh carried out a comprehensive series of studies of the incidence and patterns of reading difficulty among bilingual Nigerian students (Unoh, 1972, 1975,1976b). Using a sample of 405 University of Ibadan undergraduates from three Faculties, Unoh identified eight reading difficulties as revealed by reading tests and self-reports. These difficulties are: inability to skim, slow reading rate, understanding and interpretation,

comprehension of main ideas, critical evaluation, comprehension of details, word power or vocabulary and retention or short-term memory. Unoh concludes, "The high incidence and the patterns of reading difficulty which emerged were regarded as symptomatic of psycholinguistic problems of learning through the medium of English as a second language, and as indicative of the need for a developmental reading/language arts programme in Nigerian educational institutions" (Unoh, 1975 reprinted in 1985, p. 318).

From a psycholinguistic perspective, a readers' prior knowledge about the topic being read is of prime importance. Considerable research has been done on the effect of cultural constraints on the reading comprehension by Obah (1981, 1985) among students at University of Nigeria, Nsukka, and later, at the Federal University of Technology, Owerri. Obah believes that Nigerians, as well as other colonized readers, read at "second remove":

> For the uncolonized, reading reinforces culture. For the colonized reading denies culture, denies the reader, moreover, a part of himself and his identity. And there is no gainsaying the fact that this denial is an impediment which inevitably affects reading performance adversely. (In Obah, 1982, p.318.)

Obah has carried out a number of studies to find out to what extent "...the cultural component of texts and prior knowledge are, for second language users, particularly important in determining comprehension performance" (Obah 1985, p.282). Her findings suggest that the cultural remoteness of much University level reading material , "introduces unfamiliarity with its attendant problems of less automatic processing, increased requirement of resource-consuming operations and risk of incoherence in the network representation of the meaning of text" (pp. 285-286).

Studies also show that the problems earlier reported by Unoh and his colleagues at Ibadan continue to exist in Nigerian Universities. Nzinga (1983) tested 297 200-level students at the University of Ilorin using the reading comprehension and vocabulary sections of the Test of English as a Foreign Language (TOEFL). The students' performance on the comprehension test was alarmingly poor, with 48 percent of them failing the test. On the other hand, only 28 percent of the students failed the vocabulary section. He identified three factors which contributed to poor reading comprehension: "mismatch between expected discourse structure and encountered text engineering; ignorance of structural-rhetorical organizational signals (binders, joiners, adjuncts); loss of logico-material link between foregrounded and backgrounded information..." (pp. 391-392). Nzinga notes the impossibility of writing texts specifically to match the language levels of Nigeria students. He suggests instead that admission requirements be made more stringent, and that new entrants should be screened and those students identified to be poor readers should be required to take a remedial reading course. Finally he recommends that discrete comprehension skills be taught in the Use of English Course. (The students tested in the study had already completed Use of English.)

Reporting from the then University of Ife, (now Obafemi Awolowo University), Onukaogu (1989) assessed the reading comprehension of 2,349 students who had completed one session of Use of English. He used a text drawn from a West African Examination Council Paper in the Teachers' Grade II Certificate examination and tested them on their ability to understand the central ideas of the text, to identify some grammatical structures considered important to comprehension, and their ability to recognise the author's intention and attitude. He found that more

than one third of the students did not show that they knew what the text was about and the majority of the students were unable to identify and interpret the meaning of the grammatical structures used in the text, to understand the author's intention and attitude or differentiate between the factual and opinion sentences.

2.4 The Cloze Procedure

2.4.1 Historical background

The cloze procedure is first attributed to Herman Ebbinghaus who called it the "combinationmethode" and used it in 1897, not to test reading but to investigate the properties of memory. It's potential as a measure of academic performance was suggested, however, by the observation of Ebbinghaus that his test results had a high correlation with both the age of his informants and their school performance (Wardell, 1985). Subsequently the procedure was put to limited use in academic testing. For example, the early Stanford-Binet Intelligence tests included single sentences with missing words.

The cloze procedure did not become formalized, however, until Wilson Taylor introduced it as a measure of readability of text in 1953. Taylor coined the word *cloze* based on the term "closure" in gestalt psychological theory but it was "...initially derived from a practical engineering strategy for measuring the flow of information" with emphasis on reduction of uncertainty through reception of information and through redundancy (Rankin, 1978, p. 149).

The extensive research on cloze conducted by Bormuth in the 1960's and 1970's led to the popularisation of the cloze procedure, initially as an alternative to readability formulas to evaluate text difficulty, and subsequently as a test of reading

comprehension. Whether the focus was on the text or on the reader, the basic motivation for employing the cloze procedure was to ensure that reading material used in schools is at the appropriate level of difficulty. Bormuth (1967) described this need as follows:

> No one knows how much is wasted each year on instructional materials that are too difficult for many students to understand. When measured in money, the waste may run into millions of dollars. But when measured in human terms, the waste becomes appalling. The costs of stunted education of children, the frustrations and negative attitudes arising from their failures to learn, and the contributions to the dropout rate with its consequences of unemployment and poverty result in a staggering drain on the nation's resources. .... With the cloze test it is now possible to perform readability research with an ease and precision not possible when a researcher was forced to use traditional multiple-choice or completion tests. Of at least equal importance is the fact that the development of these tests has provided teachers with a valid and convenient way to find out how well instructional materials can be understood by their students. (p.29)

As any text can be made into a cloze test, the procedure gradually became widely used as an informal, teacher-made, classroom test in many countries. Part of the popularity of the cloze test among classroom teachers may be attributed to the incorporation of instruction in the use of cloze tests in teacher preparation in these countries. In addition, there is an apparent assumption that the prospective teacher will participate in decision making to a greater extent, perhaps, than that for which the Nigerian teacher is prepared. For example, in a textbook designed for use in Colleges of Education in the United Kingdom, Rye (1982) gives four questions that teachers need to ask in textbook selection. The author shows how these questions can best be answered if the teachers construct their own cloze tests out of passages of texts to be used in the class:

1. Can I use it with the class provided that I do the reading?
2. Can I expect pupils to be able to read it with understanding by themselves, for homework, for example?

3. If it is too difficult to use with the class as a whole, who could benefit from it as a supplement to other material?
4. If I decide to use it in class, who is going to have difficulty with it? (Rye, 1982, p.2)

Eventually the cloze procedure was also incorporated into more formal reading tests. For example, the New York State Board of Regents adopted a modified cloze technique for its test of basic competency in reading known as the Degrees of Reading Power, (See New York City Board of Education, 1982). In presenting its rationale for the decision to use cloze, the following comparison was made of the cloze test procedure with Informal Reading Inventories (IRIs) and standardized achievement tests for assessment. The advantages of cloze include:

> ...it can be administered to groups as well as individuals; can be read silently thus not penalizing the student with expressive or speech problems, every word need not be decoded to achieve full comprehension, recall is not a critical factor since comprehension is processed as the passage is being read; teacher does not need to construct comprehension questions since understanding of the material (literal and interpretive) is conveyed by the reader supplying missing words; teacher can construct cloze tests from a variety of materials in the 'real reading world' which may be more interesting and appealing to the older remedial student; teacher is not dependent on publishers' estimate of the reading difficulty of books; teacher needs no formal training in order to construct and interpret cloze reading tests. (p.1)

2.4.2 Construct validity of cloze

It was noted above that the term *cloze* was originally chosen on the assumption that the cloze procedure draws upon the psychological phenomenon of gestalt, that is the tendency of the mind to fill in gaps in what it perceives. However, it is now recognised that just as reading is primarily a language rather than a visual perceptual task so also is the cloze procedure a cognitive/language task rather than a visual perceptual task. Therefore, in completing a cloze test, rather than making use of the

closure as a gestalt phenomenon, the reader makes use of his language processing skills. Rye (1982) argues that in using cloze,

> The reader has to reason and construct suggestions to fill the gap on the basis of the evidence derived from the context. It is true that there are grammatical "patterns" in language. The reader's innate ability to produce grammatically appropriate sentences will help determine the grammatical class of the word to be produced. However, the completion of meaning, based on understanding and reasoning, is a cognitive task. (p.3)

The recognition of the role of prediction in the reading process, which was first highlighted in psycholinguistic theory, supports the assertion that the cloze procedure involves processes which are similar to those involved during natural reading. Just as the fluent reader anticipates what he will encounter in subsequent text based on the available language cues (these may be ideas, events, information, or may be more specific such as words and phrases), so the reader of a cloze passage uses semantic and syntactic cues to fill in the gaps. This is described by Kirkwood and Wolf (1980) as follows:

> Cloze tests measure literal comprehension because the process of identifying the correct word simulates the process readers go through in reading the passage. Successful substitution for the deleted parts is possible because of the cues in the original language, but the students must use all the syntactic and semantic cues which are visible in the remaining graphic information. In other words, a reader must interact with the particular content and structure of the passage as far as it can be seen in order to consider possible substitutions. The cloze procedure measures the overall concept load and the overall syntactic and semantic processing that must be employed in reading and understanding the passage. (p.4)

Rankin (1978) also drew on psycholinguistic theory in identifying five points which support his contention that cloze testing "measures comprehension more 'directly' than conventional comprehension tests":

> (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, (2) [cloze tests] measure comprehension in process, not comprehension as a product after the fact, (3) cloze responses are based on the basic psycholinguistic process of inference which is intrinsic to all communication, (4) cloze tests sample more or less randomly the choice points for predictability within a message, (5) cloze item writing lends itself to precise replication by independent writers. (p.151)

Rankin concludes, "Although all comprehension tests impose some degree of artificiality upon the message received in the measurement process, the intimate relationship between language and learning theory and cloze measurement provide a more direct and natural testing situation, in many ways, than provided by conventional comprehension tests" (p.151).

The extent to which cloze is a valid measure of comprehension is considered to be closely related to the extent to which it is sensitive to the use of context beyond sentence boundaries. This is based on the premise that the use of information across sentence boundaries is an important aspect of comprehension. The most serious challenge to this premise came from Shanahan, Kamil and Tobin (1982) who carried out a series of studies which they interpreted as suggesting that cloze does not measure intersentential comprehension. These studies involved comparing students' scores on a standard cloze passage and on scrambled versions of these passages in untimed and timed conditions. They concluded "...it seems to be unreasonable to use and interpret cloze in classroom practice as a global measure of reading comprehension" (p.250). However, subsequent commentaries on the Shanahan et al. report (Henk,1982; Cziko,1983; Rye, 1985) provided considerable evidence that a number of weaknesses in the studies rendered their conclusion invalid. At least seven other studies (Darnell, 1973; Chihara, Oller, Weaver and Chavez-Oller, 1977;

Ramanauskas, 1972; Cziko,1978; Bachman, 1982; Bridge and Winograd, 1982 and Rye, 1984) provide substantial evidence of the sensitivity of cloze to intersentential comprehension.

Looking at the issue from the L2 perspective, Brown (1983) examined a cloze test prepared for use with Chinese students of English to find out to what degree, if any, the items in a cloze test are involved in textual cohesion through cohesive devices. The passage used was a 399-word text drawn from a book for ESL readers. The cohesive devices were counted for the entire passage. Then three different deletion patterns were used and the cohesive devices included in these deletions were counted: every seventh word was deleted for 50 deletions; every seventh word but beginning one word after the original starting point; and random deletion of 50 words. The cohesive devices analyzed were reference, substitution, ellipsis, conjunction and lexical cohesion. "By definition, these cohesive devices span across clause boundaries and tend to be intersentential. [The research showed that] ... such cohesive devices account for or are involved in between 56 and 70 percent of the items in all four deletion patterns, while accounting for 52 percent of the words in the whole passage" (p. 241). Brown concluded that "...cohesive devices play a rather substantial role in what this cloze passage is testing ...[and] appear to support [the] position that there are long-range constraints involved in what cloze is testing..." (p. 242). He also found that the role of the cohesive devices did not change significantly when the starting point of the deletion pattern was altered.

Finally, a study which was designed to explore the utility of cloze as a post-reading test unexpectedly provides evidence of the construct validity of cloze. Cunningham and Tierney (1979) sought to find out to what extent pre/post cloze

scores could be used to measure how much a student learned from reading an intact passage. They administered cloze versions of passages to seventh- and eighth-grade students (JSS1 & JSS2) before and after the students read the intact passages. The authors observed:

> It could be argued that certain pretest cloze scores were so close to the complete passage that the process of completing the pre-test actually reflected the individual differences in reading ability among subjects. As a result, little more was gained from reading the intact passage except those few items which were memorable upon reading (for example, the first name of a character which is only used once and is deleted on the cloze test). (p.291)

The authors conclude their article with a statement that "the present data resurrect an unanswered question: What does cloze measure?" (p. 291) However, it would appear that the authors, perhaps inadvertently, answered their own question when they said , "...[at least one of their cloze tests] may represent all the text comprehension which the intact text requires apart from having subjects read the intact passage" (p. 291). In other words, this study, along with the studies reviewed above, provides evidence that a cloze test does, in fact, measure reading comprehension and can justifiably be described as "...buttressed by research that [it] is possibly the most thoroughly validated and sophisticated method of testing presently used in education" (Bormuth, 1975, p. 82). Bormuth's assertion that the cloze procedure has been thoroughly validated is supported by the studies reviewed in the following sections.

2.4.3 Concurrent validity of cloze

Most of the studies which have been carried out to examine the concurrent validity of cloze have correlated cloze scores with scores on multiple choice comprehension examinations. One of the earliest of these was carried out by Jeckinson (reported in

Rankin, 1978) who obtained a correlation of .82 between the scores on a multiple choice comprehension test and a cloze test using the same passage. Bormuth's (1967) study, described in detail below, used nine passages and yielded a correlation of .946 between cloze test scores and multiple-choice test scores while Rankin and Culhane's (1969) study involving five different passages showed an average correlation of.68. The correlations obtained in Rankin and Culhane's study, all of which are significant at $<.01$ level, led the authors to make the following conclusion:

> These substantial correlations indicated that the cloze procedure is a highly valid measure of reading comprehension. The average validity coefficient was .68. Since the multiple-choice tests took several weeks to construct, the cloze tests are preferable for measuring comprehension or readability, and they are measuring substantially the same thing. (p. 196)

Ransom (1968) investigated the concurrent validity of cloze using an informal reading inventory. She constructed an IRI and a cloze inventory based on selections from a basal reading series and administered it to children in grades one through six. She used a cloze criteria of 30-50 percent for instructional level and below 20 percent as frustration level. According to her, "This assigned criteria of 50/30/20 was arbitrarily set by the investigator after visually examining scores students obtained on a cloze test" (p. 480). She found that "the instructional and frustration reading levels were correlated significantly at the .01 level of confidence from grades two through six, when comparing cloze test and the informal reading inventory" (p. 481).

Despite the lack of consensus on the issue of subskills as a part of the reading process (Do they exist? Are they measurable as discrete skills?), standardized tests of reading achievement include them in one form or the other. For this reason, studies which examine the relationship between cloze and tests of subskills have been used to examine the concurrent validity of the cloze procedure. One study which

examined this relationship was carried out by Smith and Zinc (1977). Cloze versions of the passages from the Davis Reading Test (DRT) were constructed to investigate their correlation with five subskills: literal comprehension, main idea, inferential comprehension, literary awareness and structural awareness. The high correlations which were found to exist between all the subskills except for that of literary awareness led the authors to conclude,

> It appears that cloze requires a student to draw upon abilities in literal comprehension..., comprehension of main idea..., inferential comprehension... and structural awareness... to a degree moderately similar to the application of subskills required by the multiple choice format of the DRT. (p.397)

2.4.4 Criterion research

The earliest and most comprehensive studies to establish cloze criteria were done by Bormuth. In 1967 Bormuth noted the need for such research:

> The chief problem that prevents the full utilization of cloze tests is that there is now no frame of reference by which the size of the cloze score can be interpreted. That is, there is no way to say whether any given cloze test score represents an "acceptable" level of performance by the student who made that score. (p.290)

In an effort to meet this need to identify the cloze scores which indicate levels of reading comprehension, Bormuth (1967) used the performance of 100 pupils in American Grades 4 and 5 on a 50-item cloze version of nine different passages and on a 31-item multiple-choice test on the same passages to calculate comparable cloze and multiple-choice scores. His rationale for using multiple choice comprehension tests was that they had been widely used in readability research and because a "widely known frame of reference" (p. 292) had become accepted for evaluating performance on multiple-choice tests. That is, multiple choice scores below 75 percent were

generally interpreted as evidence of lack of comprehension indicating that the text was on the readers' frustration level. Scores ranging between 75 percent and 90 percent were generally viewed as indicating instructional level performance. Bormuth provided no research evidence for the acceptance of these multiple-choice scores. A regression equation was used to calculate the multiple-choice scores which were most closely associated with specific cloze scores. It was found that a person who correctly answered 43 percent of the cloze items usually obtained a score of 67 percent (or 75 percent raw score, before correcting for guessing) on the multiple choice test. A note of caution in using these scores are implied in the following statement by the author:

> *If the conventional readability standards are accepted*, [italics added] a passage on which a student receives a cloze score of 38 percent is sufficiently understandable to him to be used in his instruction. That is, he can correctly answer about 75 percent of the multiple-choice items that can be written over that passage. On the other hand, if one demands as criterion a multiple-choice score corrected for guessing, a cloze test score of 43 percent is required to reach the same criterion level. This latter cloze score is probably quite similar to the criterion cloze score that would have been obtained had completion tests been used in this study. (Bormuth, 1967, p.298)

Bormuth followed up his 1967 study with another in 1968. In this study the score comparable to the 75 percent multiple-choice score was found to be 44 percent instead of 38 percent. Although the second study was very similar to the 1967 study, Bormuth made some methodological changes which led him to express greater confidence in the obtained score.

Bormuth's 1967 and 1968 studies were replicated by Rankin and Culhane (1969) using a sample of primary 5 students only and a completely different set of passages. In this study the score which was found to be comparable to a multiple-choice score of 75 percent was 41 percent. The authors interpreted their findings to

be a confirmation of Bormuth's 1968 scores. The scores from the three studies are summarized in Table 2.2 below drawn from Rankin and Culhane (1969, p.197).

Table 2.2. **Cloze Test Percentage Scores Comparable to 75% and 90% Criterion Multiple-Choice Scores.**

MULTIPLE CHOICE CRITERIA	COMPARABLE CLOZE SCORE PERCENTAGES		
	Bormuth (1967)	Bormuth (1968)	Rankin & Culhane
75%	43%	44%	41%
90%	50%	57%	61%

However, despite the apparent confidence in the 1968 criterion scores, (which up until today remain the most commonly used criterion), Bormuth himself recognised the potential danger in basing cloze criterion scores on the conventional readability standards of 75 and 90 percent on multiple choice questions. In 1975 he gave three reasons for questioning the validity of these multiple choice criterion scores. One important disadvantage to the use of multiple choice scores is that the information purportedly measured by the scores varies depending on the questions prepared by different test writers. Secondly, the scores assume that the higher the score, the more information gained. But Bormuth argues that there is evidence that students who are not motivated to read text which is too easy for them are unlikely to learn as much from such material as they are from more challenging text. Finally, Bormuth questions the criterion scores because,

> Their authors have not offered any evidence for or explained the reasoning that led them to identify these particular scores. We are left to wonder if the criterion scores sprang from an arbitrary decision that became standard practice simply because of the strength of precedence. (p. 64)

Bormuth, therefore, followed up his 1967 and 1968 studies with a comprehensive series of studies sponsored by the United States Office of Education which were published in 1971. In his report on this series he stated,

> The present studies were undertaken when a search of the literature failed to reveal evidence that anyone had ever tried to validate the traditional criterion scores of 75 and 90 percent. Moreover, a broader search showed that there did not even seem to be an instance of anyone having developed a rational model for establishing performance criteria for use in managing a student's instruction. (p.26)

These new studies were based on a broad view of comprehension which included not only the level at which an individual received maximum benefit from studying selected instructional materials but also "how much each outcome from studying the instructional materials contributes to the ultimate outcomes of instruction and the relative values society places on the ultimate outcomes" (viii). Specifically, Bormuth incorporated measures of information gain (based on pre- and post-comprehension tests), subject matter preference ratings, style preference ratings, difficulty preference ratings and willingness-to-study preference ratings into a rational model for evaluating comprehension. In order to maximise the applicability of the criterion scores he sought to establish, Bormuth's sample was made up of students in American grades three (primary three) through twelve (SSS 3). Despite Bormuth's elaborate and comprehensive series of studies, the established performance criterion scores are virtually ignored in practice today. This may be because, rather than establishing a single score, a total of thirty different scores were calculated, a set of three for each grade level from grade three through grade twelve. That is, for each class level the criterion score which may be used to evaluate a student's cloze performance is selected depending on whether the text is designed to be used as a classroom textbook, as reference material or for voluntary reading. All the textbook scores, and

most of the other scores, are higher than the earlier established 44 percent as shown in Table 2.3 below.

Table 2.3. **Bormuth's 1971 Passage Performance Criterion Scores.**

GRADE LEVEL	TEXTBOOK	REFERENCE	VOLUNTARY
GRADE 3	54%	52%	62%
GRADE 4	56%	54%	58%
GRADE 5	57%	54%	55%
GRADE 6	57%	52%	52%
GRADE 7	54%	50%	50%
GRADE 8	51%	47%	47%
GRADE 9	48%	44%	45%
GRADE 10	46%	42%	42%
GRADE 11	45%	41%	39%
GRADE 12	48%	41%	36%

Extracted from Bormuth, 1971, p.139

The extent to which cloze criterion scores may vary according to the class levels of the readers has been an issue which is largely unresolved. In 1966 Bormuth concluded that the linguistic variables which influence comprehension are not different at different ability levels. On this basis he confidently generalized his 1968 criteria beyond the two grade levels which were used to establish them. However, in his 1971 report Bormuth presented findings in which different scores were established for each of ten grade levels. As was shown above, Bormuth found that the lower the class level of the reader, the higher the cloze criterion required to achieve a given amount of information gain. In a later study, Duffelmeyer (1983) sought to find out what effect year of schooling would have on the cloze scores of students in grade 5

(primary 5) and grade 10 (SSS1). He used passages which were shown by a readability formula to be appropriate for the two class levels in order to eliminate what he considered to be a weakness in Bormuth's 1971 study, that is the assigning of criterion scores based on passages which were clearly either too difficult or too easy for the students. Duffelmeyer (1983) reports:

> [The study] was designed to investigate the appropriateness of a single criterion across all grade levels, and also in the event that a single criterion does not seem defensible, to reveal the direction that the nongeneralizability could be expected to take. The results indicate that indeed different criteria may be needed at various grade levels if we want accurate judgements about the appropriateness of a content area textbook for a particular student, and that contrary to what Bormuth found, the higher the grade level, the higher the criteria should be. (p.440)

One would tend to lack confidence in the author's interpretation of his findings, however, since they are based on mean cloze scores only of poor, average and good readers. There are many factors which can affect mean scores, especially passage difficulty relative to the readers taking the test, readability estimates not withstanding. The basis for the author's conclusion that the fact that the average grade five readers scored 38 percent supports the use of cloze scores around 40 percent (based on Bormuth's 44 score) for students at that class level is questionable.

Another attempt to establish cloze criterion scores made use of cloze versions of passages from an IRI to establish the cloze scores that correspond to the independent, instructional and frustration reading levels of upper primary school pupils on the IRI (Alexander, 1968). A cloze criterion range of 47-61 percent was found to be comparable to instructional level performance on an IRI. The author concluded that the cloze tests identified the reading levels of the pupils "...with a

degree of accuracy comparable to that obtainable with a properly constructed and administered informal reading inventory..." (p. 4314-A).

A criterion study of a different kind was carried out by the Ontario Ministry of Education (Kirkwood and Wolfe, 1980). In this study, the cloze criterion score of 35 percent was adopted as the cut-off score between frustration and instructional levels. Interestingly, this 35 percent score is attributed to "recent work by Bormuth" but there is no citation of a referenced work to support this score. The purpose of the study was to provide teachers and administrators information needed to match the textbooks available for use in the Ontario schools with the reading ability of their students as measured by the *California Test of Basic Skills*. This study further exemplifies the felt for classroom teachers to be able to interpret cloze scores for instructional decision making.

2.4.5 L2 cloze

Interest in the cloze procedure as an assessment tool for second and foreign language reading has grown rapidly since Oller enthusiastically endorsed it in the early 1970s. For example, an ERIC computer search listed 92 publications on the use of cloze for L2 assessment from 1977-1986 (ERIC Computer Search #908). Such publications reported studies of the reliability and validity of various forms of cloze tests among different nationalities and language groups throughout the world.

Oller's support for cloze testing is grounded theoretically on his pragmatic grammar of expectancy. Oller (1983) suggests that the element of expectancy is an integral part of the processing of both written and oral language and that this is also

what is used by the reader when responding to a cloze test. Oller describes the process of writing a cloze test as follows:

> On the basis of incomplete information, the subject is required to project a word to fill in a blank and thereby complete a sequence. In doing so, both the so called "productive' (or "active") and "receptive" (or "passive") skills of language must be utilized. The information provided in the cloze test allows the student by analysis to synthesize a greater whole. At the same time, the synthesis or projection may become part of the next analysis required to produce a subsequent whole. (p.114)

Oller suggests that this process parallels what happens when a listener processes speech. Arguing that memory constraints are an important component of language processing, Oller suggests that one characteristic of language competency is the ability of an individual to formulate expectations which enable him to process language in chunks which can be held in short term memory. Oller believes that this competency is tapped by cloze tests as well as by tests of listening comprehension. This is supported by a number of studies which show a high correlation of L2 cloze testing with measures of listening comprehension. For example, Oller (1972a) reports Darnell's (1968) study which correlated a cloze test with the *Test of English as a Foreign Language* (TOEFL). Darnell found that the highest correlation was with the listening comprehension section of TOEFL. In replication of Darnell's study using another test of English as a second language, the University of California Los Angeles *English as a Second Language Placement Examination* (ESLPE), Oller and Conrad (1971) and Oller (1972b) found that the highest correlations were with the dictation test followed by that of the reading section. Oller contends that these findings support the validity of cloze tests as integrative tests of language skills of second language readers.

Numerous investigations have been reported on the validity and reliability of the cloze procedure in second language assessment. Among these studies, many provide apparently conflicting evidence. However, comparisons are made difficult because of variations in sample (for example, age and language facility), deletion rate, length and type of text, and scoring procedure. Thus, for example, the studies of Alderson (1983) using cloze with nonnative speakers of English studying in the United Kingdom, and Klein-Braley (1983) using cloze with German University students preparing to become teachers of English, raise questions about some aspects of the reliability and validity of cloze tests for second language readers. On the other hand, Shohamy (1983) used Hebrew language cloze tests with American university students and Brown (1983) used an English language cloze test in China with Chinese university students. The findings of their studies would appear to contradict those of Alderson and Klein-Braley and demonstrate both the validity and reliability of the procedure. Brown (1983) sheds some light on the apparent contradictions in L2 cloze research with the following observation:

> It is surely no secret at this point in cloze research that there are probably *many* variables that will change mean performance on cloze tests, e.g., type of content, passage difficulty, deletion pattern ...[and] amount of context provided. However, these differences do not occur *within* cloze tests but rather *within* different variations or passages. (p. 250)

In addition to his own work, Brown reports other studies which have demonstrated the reliability of cloze for ESL students at university level. The correlations are all based on studies using the exact word scoring method. (See Table 2.4 below)

momentum. The cloze procedure was recommended for testing English language proficiency among Nigerian primary school pupils by Okonkwo (1988) and Ojerinde (1980). Ojerinde compared the cloze test with nine other tests of English reading which he administered to Yoruba-speaking children. He found that cloze correlated most highly with the other tests. Emenyonu (1984) advocated its use by secondary English teachers to test reading ability and to diagnose specific problems among individual students. Emenyonu also reported on its usefulness in evaluating the appropriateness of comprehension passages for Nigerian Junior Secondary students (1987). The cloze procedure has also been used to assess the readability of physics books used in Nigerian schools (Nwogu, 1987). Ayodele and James (1990) recommended the use of cloze in language testing in Nigeria, but cautioned that users should have a clear understanding of what a genuine cloze test is. The authors suggested the following operational definition:

> Cloze is the systematic mutilation of the language structure of a graded continuous prose passage, by mathematically or purposively [*sic*] deleting words, and replacing them with uniform blanks, which subjects are instructed to complete with the appropriate words. (p.11)

Researchers have examined various aspects of the cloze procedure as it is used in Nigerian schools. Umolu (1987) reported her studies of cloze testing among Nigerian primary school students showing how using cloze testing can be used to find reading levels, and thus "... can serve as a guide in selection of reading material, in grouping and placement of children and in overall programme evaluation" (p.81). She presented examples of miscue analysis of primary school children's cloze responses to show how cloze can be used diagnostically by reading teachers.

Several Nigerian studies have focused on deletion formats in an effort to maximise the effectiveness of cloze in the Nigerian L2 situation. Odusina and Ikegulu

(1987) compared cloze deletion formats at the Junior Secondary School level "... to extend the search for a more valid and reliable cloze test format to a second language situation." Based on their findings, the authors recommend cloze testing in Nigerian schools using an every fifth cued deletion format. Aboderin (1989) tested Nigerian University students to compare the use of two deletion formats, the rational deletion format in which specific categories of words were selected for deletion and the fixed-ratio format with every 11th word deleted. The author concluded that, "Performance on cloze test by fixed-ratio and by rational deletion procedures are comparable since positive correlation has been recorded in the two faces of the cloze test" (p. 182). He suggested that while both formats could be used effectively, the rational deletion format is most useful for diagnostic purposes. A study by O. Ayodele (1989) also used three different cloze formats with students from two Nigerian tertiary institutions, every 5th, every 7th and every 9th word deletions. The researcher concluded that the every fifth word deletion rate was the most linguistically and psychologically demanding of the three and that it "... is a reliable readability yardstick and can be used to measure as well as predict with confidence the degree of difficulty of a cloze reading text" (p.197).

Umolu and Oyetunde (1991) also reported on their use of two deletion formats among Nigerian Junior Secondary school students. The two formats were the standard deletion format (deletion of every 5th word) and the total random cued plus (TRC+) format developed by Helfeldt, Henk and Fotos (1986) which includes graphophonic cues with each randomly deleted word. The researchers concluded that the advantage of this additional cue with the TRC+ format enabled the students tested to approach the cloze test with greater confidence as their chances of supplying the correct answer

qualitative information about a child's reading strategies. For example, Harp (1988) p. 161) advocates miscue analysis as part of ongoing evaluation of primary level readers:

> There is also a growing interest in miscue analysis as a way of observing development. By analyzing a child's miscues, we can draw some valuable inferences about the cueing systems upon which the child relies as a reader.... By doing a series of miscue analyses across time, we can observe a child's progress toward becoming an increasingly meaning-constructing reader. (p.161)

Miscue analysis has also been found to be a useful tool for determining the suitability of reading material for specific groups of readers:

> Such evaluation provides an objective basis for determining whether a given selection should be used in a reading program and for determining its suitability for use by students. The text itself can also be examined to evaluate its cohesion and coherence, the complexity of its grammatical structures, and the density and level of familiarity of the new concepts it presents. (Goodman, Watson and Burke, 1987, p.4)

2.5.2 Factors found to affect miscue quality

As was discussed in the earlier sections, there is abundant evidence that the relative difficulty of a text influences the readers' access to language cues, and consequently, the quality of his miscues. Thus, a major (perhaps, *the* major) influence on miscue type is the accuracy level effect. There is evidence, however, that additional factors are also at play during the reading process which can produce variance in the patterns of miscues. Wixson (1979) reports studies which have shown that "different types of material present readers with different problems, resulting in a variety of miscue patterns" (p.170). Unfortunately, none of the studies cited by Wixson appear to have held accuracy level constant. It is, therefore, impossible to conclude that text factors operated independent of accuracy level. There is also some evidence that degree of

prior knowledge affects miscue quality. Taft and Leslie (1985) reported studies which would suggest that readers with high prior knowledge about the topic being read produce more contextually appropriate miscues than those with low prior knowledge. However, as these studies also failed to control for an accuracy level effect, Taft and Leslie carried out a more carefully designed study in which the miscues of primary three children reading within two accuracy level ranges were examined. They found that at the same accuracy levels there were significant differences in the quality of the miscues of these L1 readers depending on their degree of prior knowledge. The authors state:

> Children with relatively high prior knowledge of the topic, the food chain, had greater semantic knowledge (than the low prior knowledge group) to bring to the oral reading task. They demonstrated their use of semantic knowledge by making miscues semantically congruent with the author's meaning. They seemed to rely less on graphic cues by making fewer miscues (compared to the low knowledge group) which were graphically similar to the word in print. (p.175)

As there are no additional studies available which would confirm the findings of Taft and Leslie, especially at the secondary level and among L2 readers, the evidence that prior knowledge is a factor affecting miscue quality is as yet inconclusive.

Another factor which has been found to influence miscue type among children at the lower primary school level is that of instructional method. There is evidence at this level (Dank, 1976 cited in Wixson, 1979; DeLawter,1975) that children who are taught using an alphabetic or decoding method produced more miscues which were graphophonically similar to the original text but which were either non-words or words which were not contextually appropriate. On the other hand the miscues of pupils who were taught with meaning based methods such as the language experience approach were less likely to look like the original words but were more likely to be

semantically acceptable. This influence appears to reduce as the children develop. For example, Carnine, Carnine and Gersten (1984) found that, "By third grade, students initially taught with a code-emphasis approach dramatically increased in their sensitivity to semantic and syntactic cues." There is no evidence that instructional methods at lower primary continue to influence miscue patterns among readers at the secondary level.

There have also been suggestions that there are developmental trends in patterns of miscue quality. For example, Wixson (1979, p. 167) cites evidence that "... young beginning readers' miscues reveal large percentages of no response and real word substitution errors. As readers mature no response errors tend to decrease and non-word substitution errors tend to increase."

2.5.3 Miscue analysis of cloze responses

The application of miscue analysis to cloze responses has been a logical extension of earlier investigations of oral reading miscues. There are advantages of cloze testing over oral reading tests as has been noted earlier. For example, cloze tests preserve the privacy of the normal reading process thereby enabling the reader to concentrate on comprehension rather than pronunciation; they can be administered to a group and require less skill in administration and interpretation. Rye (1982) also points out that while reading orally a child has little opportunity to attend to any but the most immediate cues. On the other hand, miscue analysis of cloze responses is a better measure of the child's use of the total language in context as the child has the opportunity to "...sit and reflect about meaning and ... search the whole passage for clues" (p. 75). Rye also asserts that as the cloze procedure is a constructive language

clues" (p. 75). Rye also asserts that as the cloze procedure is a constructive language task, analyses of cloze responses reveals weaknesses in a readers' process of construction. Finally, an important advantage is the fact that cloze tests yield more responses for analysis than do oral reading tests, thereby providing greater opportunity for examination of the reader's use of cues. This is especially important for analysis of reader strategies on passages above frustration level. For example, using Betts' 1946 criteria of 95-98 percent correct word recognition as designating instructional level, a researcher would have, at most, twelve miscues available for analysis on a 250 word passage. Using cloze and Bormuth's (1968) instructional level criteria of 44-56 percent, the researcher could have up to 28 miscues to analyze.

One of the earliest studies in which miscue analysis was applied to cloze testing was that of Zink (1978). Zink's rationale for the investigation was "to provide an in depth view of the language abilities utilized in the reading of a cloze passage" through a qualitative analysis of cloze responses (p. 154). The author judged each miscue for its semantic and syntactic acceptability based on Goodman's (1976) taxonomy of reading miscues. He then calculated semantic and syntactic miscue scores and related them to the total cloze test scores. The reader's ability to use syntactic cues was found to be no more predictive of his performance on the cloze test than was his ability to use semantic cues. This finding, which occurred in a first language situation, is of particular relevance to the present study which examines the relationship between miscue quality and comprehension among L2 readers. The Zink study also examined the relationship between readers' "cloze comprehension scores" and their scores on the Stanford Diagnostic Reading Test (SDRT) (1966). The "cloze comprehension scores" were derived from the proportion of miscues which resulted

approximately 31 percent of the variation in SDRT scores, thus supporting the assumption of the present study that cloze miscues provide evidence of comprehension.

Vaughan and Meridith (1978) used miscue analysis of cloze responses to examine the reliability of the cloze procedure as a measure of semantic awareness and syntactic fluency. Their findings support miscue quality as an indicator of reading comprehension. They interpreted their findings to suggest that "..the total syntactically acceptable score ... may be the most accurate index of student's comprehension as measured by cloze scores because it does include both syntactic and semantic awareness" (p. 179).

In the miscue analysis used in the above studies, the judgement of semantic acceptability was considered dependent upon the syntactic acceptability of a given miscue. As was noted earlier, this was in accordance with the procedure for miscue analysis as presented in the manuals developed by Goodman and Burke (1972) and Goodman, Watson and Burke (1987). However, some researchers have made provision in their analysis for a special classification for miscues which are meaningful yet ungrammatical. One of the earliest of these is that of Vaughan, Tierney, and Alpert (1977) who judged each miscue separately for semantic and syntactic acceptability in order to examine the relationship between syntactically acceptable and semantically acceptable responses on cloze tasks. They instructed the students to "guess" rather than leave a blank in order to more fully assess, what they term, "syntactic perceptions". "Thus, even if a reader could not ascertain semantic sense for a blank, the response could be examined for syntactic acceptability" (p.200).

This procedure was adopted in the present study in order to ensure that access to both cueing systems could be more fully investigated.

Rye (1982) proposed a system for categorizing cloze errors into four types based on grammatical class which was also incorporated into the present study. This system includes a category for errors which are semantically acceptable but syntactically unacceptable and another for those that are semantically unacceptable but syntactically acceptable. The main purpose of his classification system is to provide a framework for teachers to use in diagnosing children's reading problems. He reported the results of an analysis of the miscues of seven thirteen-year-old children in the United Kingdom with reading problems. Of interest is the fact that within this sample of readers of English as a first language, the children's miscues showed that they made more use of syntactic than semantic cues.

DeSanti has incorporated miscue analysis of cloze responses into a scoring system for a cloze reading inventory (DeSanti, 1986). His scoring system includes the traditional comprehension values based on Bormuth's (1967) criteria of 44-56 percent exact word responses for instructional level. His "interpretive scoring system" involves coding each cloze response according to its semantic and syntactic acceptability. One of these is what he calls a *total comprehension value* which is a combination of the exact word responses plus the responses which are semantically and syntactically acceptable at both the sentence and passage levels. Another is the *logical language usage value* which is derived by adding the number of cloze responses which yield a semantically acceptable sentence but which do not indicate comprehension of the passage. A final value, *structure of language,* is determined by

replacement), (ii) synonym score, (iii) alternative response (half marks were awarded for response which were semantically and syntactically acceptable), and (iv) grammatical class score (half marks were awarded for responses which were in the same grammatical class as the deleted word but incorrect number or tense). The author reported remarkably high correlations between the four scoring systems (none below 0.99) in ranking the relative difficulty of three passages and concluded, "...whatever was being measured, all four scoring procedures were measuring it" (p.72). This supports the earlier evidence that miscue quality is related to comprehension.

The second correlational L2 study was carried out by Kelly and Ewoldt (1984) of deaf readers for whom American Sign Language (AMESLAN) is the mother tongue. The authors judged cloze miscues according to their semantic and syntactic acceptability and included two categories for use of syntactic cues--one for miscues which were judged to have acceptable English form and one for words which were judged to be syntactically acceptable in American Sign Language, the syntax of which is different from that of standard English. They used the semantically acceptable miscue scores, the syntactically acceptable miscue scores as well as the verbatim scores to find out to what extent each of the three scoring systems agrees with two other measures of comprehension, a standardized reading test and story retellings. It was found that there was a statistically significant relationship between all three of the cloze scoring systems and the standardized test. Thus the authors concluded that "cloze measures seemed to tap almost equally a number of components of reading competence as measured by the SAT-HI [the standardized test]" (p.49). On the other hand, only the semantic scoring system was found to be significantly related to that

of the retelling scores--a measure which appears to tap semantic more than syntactic awareness.

Nigerian studies using miscue analysis of cloze responses have been carried out by Oyetunde (1988) at the Junior Secondary Level, Umolu (1987) at the primary level, Umolu and Boison (1988) with deaf children, and Oyetunde and Umolu (1989) at the University level. In all of these studies miscue analysis was used to examine the strategies of Nigerian readers under varying conditions. The present study builds on the findings in both the L1 and L2 correlational studies which lend support for using the quality of cloze responses as evidence of comprehension as well as on the earlier Nigerian studies of cloze responses as indicators of reader strategies.

2.6 Summary and implications of the reviewed literature.

The literature review covered the following broad areas: reading assessment and reading theory; international achievement studies and reading problems in Nigeria; the cloze procedure and miscue analysis. The implications of the review in each of these broad areas are presented below.

Reading assessment and reading theory. The literature on reading assessment emphasised the importance of using valid assessment instruments which enable teachers to make important instructional decisions with the goal of ensuring quality reading instruction. This supported the need for an assessment technique which teachers in schools in Nigeria could use with confidence and which could improve the reading performance of their students by enabling them to be more actively involved in instructional decision making. The literature on L2 reading assessment revealed that knowledge of the reading process and sensitivity to the factors which may affect

the reading process of L2 readers would be essential to ensure the validity of an assessment technique to be used with readers for whom English is not their mother tongue. This led to the review of reading theories. This review brought out the contribution of psycholinguistics to an understanding of the reading process, showing that a reader actively interacts with the text. Of particular importance to the present study is the evidence that readers use their prior knowledge and language competence in the reading process. The review included interactive models which were seen to build on the psycholinguists' recognition of the role of the reader as an active constructor of meaning, while recognizing the evidence supporting automatic word recognition by fluent readers. A compensatory element was introduced into the interactive models by Stanovich (1980) which is based on evidence of a trade-off between reliance on automatic decoding and application of prior knowledge and contextual information during reading. This model influenced the focus of the present study on the possibility of a similar trade-off between access to and use of syntactic and semantic information among Nigerian L2 readers. This was supported by the evidence in the literature on L2 reading processes that reading strategies vary depending upon the reader's access to background knowledge and linguistic knowledge relevant to a given text (Kozminsky and Graetz, 1986, Haddad, 1981, Oyetunde, 1988). Of particular relevance to the present study was the evidence in the literature of an "accuracy level effect" showing that access to contextual cues is related to the relative difficulty of a text for a given reader.

International achievement studies and reading problems in Nigeria. International studies of reading achievement included the Thorndike studies (1973) which showed striking similarities among developing nations in the conditions which affect reading

performance. In general the review of the Nigerian literature served to emphasize the seriousness of the problem of poor reading ability among Nigerian readers at all three tiers of the educational system. Among the factors identified in both the international studies and the Nigerian studies as having a significant impact on reading performance is level of teacher competence. This reinforces the importance of the contribution of the present study toward upgrading teachers' competence by giving them a reading assessment tool which can guide them in selecting and using textbooks in the classroom.

Cloze procedure and miscue analysis. The literature on the cloze procedure provided extensive evidence of its utility, validity and reliability, both among L1 and L2 readers. This confirmed that the cloze procedure is an appropriate assessment technique for Nigerian classroom teachers to adopt. The criterion research studies, however, revealed that the commonly used criterion scores were established using L1 readers and this brought out the need for the present study among L2 readers. Earlier correlational studies were reviewed (Bormuth, 1967, 1968, 1971; Rankin & Culhane, 1969; Alexander, 1968) and used as a model for the present study. However, the problems identified in the review of such studies, especially in their correlation of cloze scores with multiple-choice comprehension tests, were noted and served as a rationale for the decision in the present study to explore the relationship between cloze scores and miscue quality. This decision was reinforced by the studies on miscue analysis, using both oral and cloze responses, which suggest that examination of semantic and syntactic acceptability of miscues can be used to measure reading comprehension in general as well as to examine reading strategies among L2 readers under varying conditions. The four miscue coding categories suggested by Rye (1982)

were then incorporated into the present study in order to investigate the relationships between each of the miscue types and cloze scores.

CHAPTER THREE

RESEARCH DESIGN

AND

METHODOLOGY

3.0 Research Design

The present research was a correlational study of the relationship between cloze scores and quality of miscues (errors) on cloze tests. As a descriptive study it examined the patterns of miscue types as related to cloze scores and the reading strategies of Nigerian L2 readers as revealed by miscue analysis.

3.1 Sample

3.1.1 Description of sample population

The population from which the sample was drawn is made up of Nigerian Secondary School students in Jos whose mother tongue is a Nigerian language and who have acquired basic reading skills. An urban population was selected in order to ensure that a wide range of reading abilities would be represented among the students. Similarly, the urban population was made up of students from all over Nigeria representing a wide range of Nigerian language groups.

3.1.2 Description of sample and sampling procedure

The sample was made up of two parts. The first was the sample of students who were administered cloze tests. From this first sample a sub-sample was drawn of cloze tests which were used for the miscue analysis.

Sample for administration of cloze tests. The sample of students who were administered cloze tests was drawn from JSS2 and SSS2 in-tact classes in six secondary schools in Jos Metropolis. Purposive sampling was used for the selection of the schools for testing. The schools were selected in such a way that the sample would include students with a wide range of reading abilities. That is, it would be

possible to obtain a sample of students whose performance on the cloze tests would result in a normal distribution of high, medium and low scores. Therefore, the schools involved in the study were drawn from Federal, State and voluntary agency schools. Table 3.1 below gives the details of the schools and the students sampled in each school. The expected reading performance was based on the researchers' familiarity with the educational standards of the schools.

Table 3.1. **Sample of L2 students who completed the cloze tests.**

	SCHOOL	TYPE	EXPECTED *READING* PERFORMANCE	NUMBER OF *JSS STUDENTS* TESTED	NUMBER OF SSS STUDENTS TESTED
1.	Federal Government College, Jos	Federal, selective	high	Eye 62 Wind 62	Machine 58 Growth 58
2.	University of Jos Demonstration Secondary School	University, selective	high	Eye 93 Wind 93	Machine 49 Growth 49
3.	Baptist High School	Voluntary agency, selective	high	Eye 41 Wind 41	Machine 36 Growth 36
4.	ECWA Staff School	Voluntary agency, selective	high to middle	Eye 37 Wind 37	Machine 37 Growth 38
5.	Tempest High School	Private, non-selective	middle to low	Eye 78 Wind 78	Machine 40 Growth 27
6.	Government Secondary School	State, non-selective	middle to low	Eye 87 Wind 88	Machine 87 Growth 87
TOTAL NUMBER OF L2 STUDENTS WITH USABLE SCRIPTS				**Eye 398 Wind 399**	**Machine 307 Growth 295**

After all students in each class were administered the two cloze passages, the scripts of those students who indicated that English or any other non-Nigerian language was their first language were removed. In addition, all scripts were removed which were not fully completed or for which there was suspicion that the student had copied from

another student. The number of usable cloze passages was 797 JSS2 passages and 602 SSS2 passages, resulting in a sample of 1,399 cloze tests.

Sub-sample for miscue analysis of cloze tests. After the 1,399 cloze passages were scored, a sub-sample of 400 cloze tests was constituted for miscue analysis. A table of random numbers was used to select the 100 tests per passage for miscue analysis. This sub-sample of 400 is considered acceptable based on the criteria for determining sample size from a given population presented by Krejcie and Morgan (1970) according to which, out of a population of 1400, the minimum acceptable sample size should be 302. Ultimately this sub-sample yielded a total of 12,252 miscues for analysis.

The bar graphs in figures 3.1 a-d below show the frequency distributions of the cloze scores on each of the passages included in the sub-sample. They show that in general there was a near normal distribution of high, medium and low scores as a result of the measures taken in school selection. This made it possible to have an adequate sample of cloze scores for miscue analysis at the various accuracy levels. The cloze score ranges are based on discrete even-number scores which characterize cloze tests on which there are 50 deletions and two marks is awarded for each correctly filled deletion. Looking at the frequency distributions of the JSS2 passages, the bar graphs show that on both passages the most frequently obtained scores fell in the 30-38 and 40-48 percent ranges. On the SSS2 passages, the scores on *Things that Affect Growth* were higher than on *Maintenance of Machines* with the highest frequency of scores falling in the 40-48 and 50-58 percent ranges on *Growth* and in the 30-38 and 40-48 percent ranges on *Machines*. It can also be seen that there were

relatively fewer low scores on the two SSS2 passages compared with the two JSS2 passages.

Figure 3.1a. **Frequency distribution of scores on JSS2 passage *Care of the Eye*.** (N=100 cloze passages.)

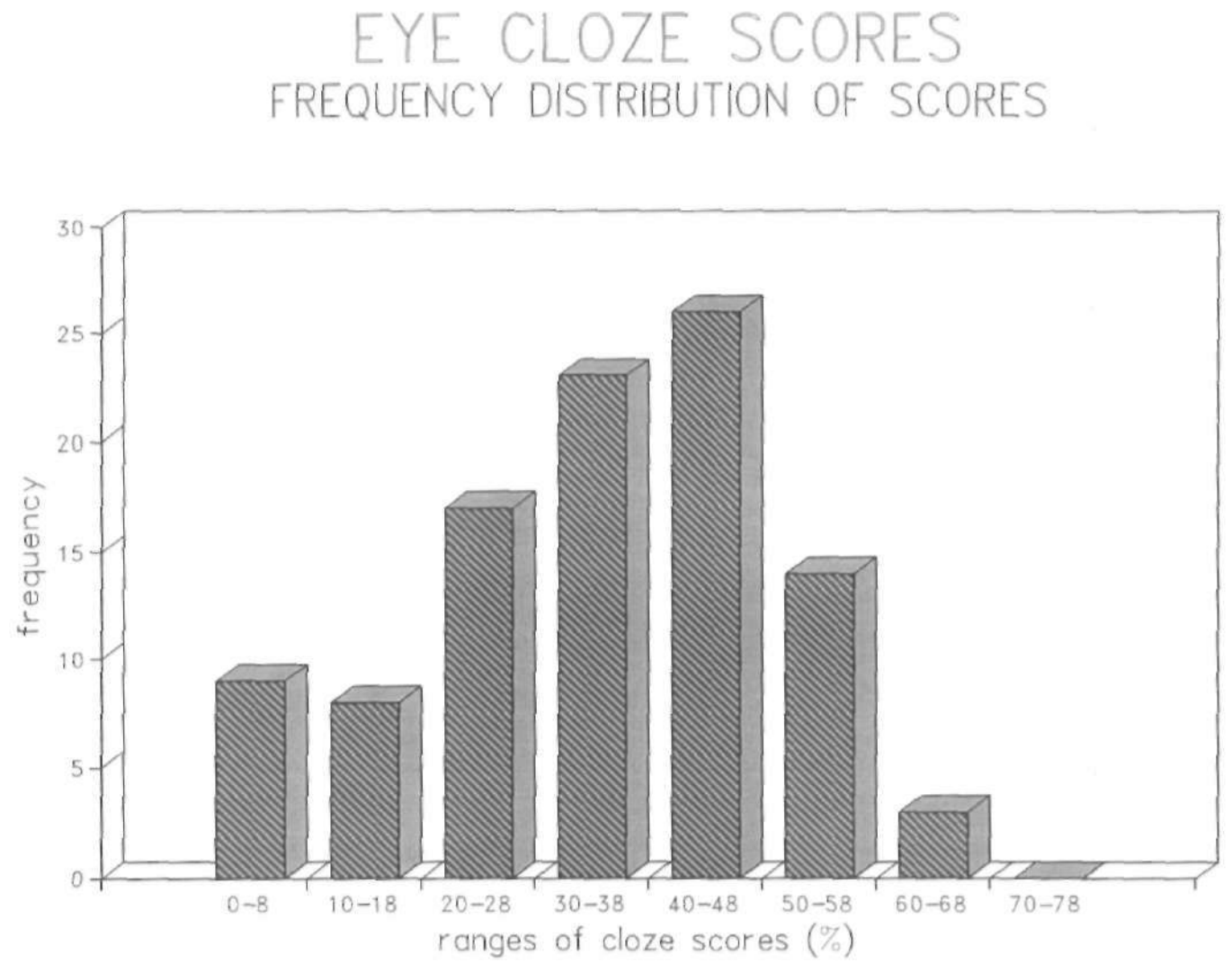


Figure 3.1b. **Frequency distribution of scores on JSS2 passage, *Wind*.**
(N=100 cloze passages.)

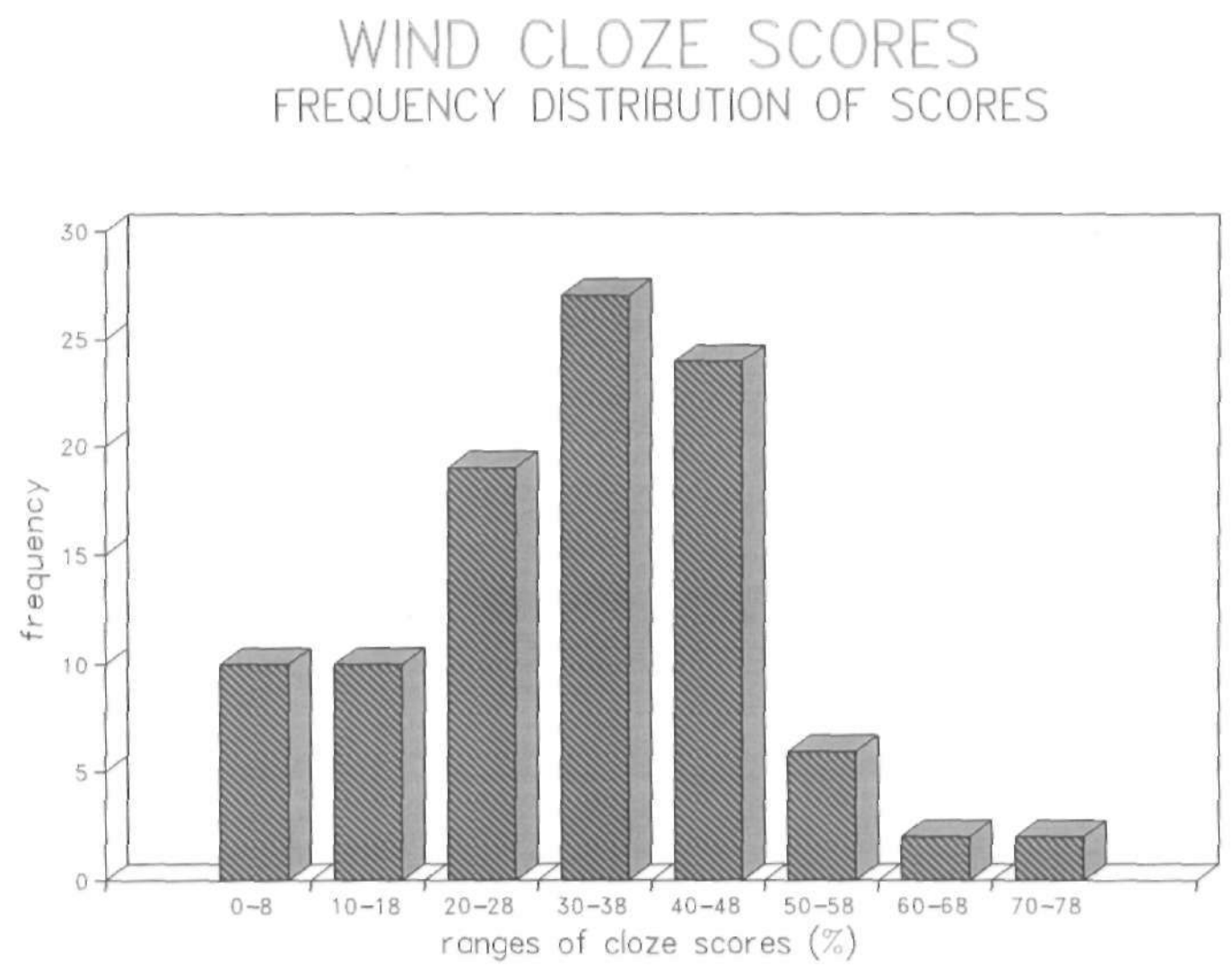


Figure 3.1c. **Frequency distribution of scores on SSS2 passage, *Things that Effect Growth.*** (N=100 cloze passages.)

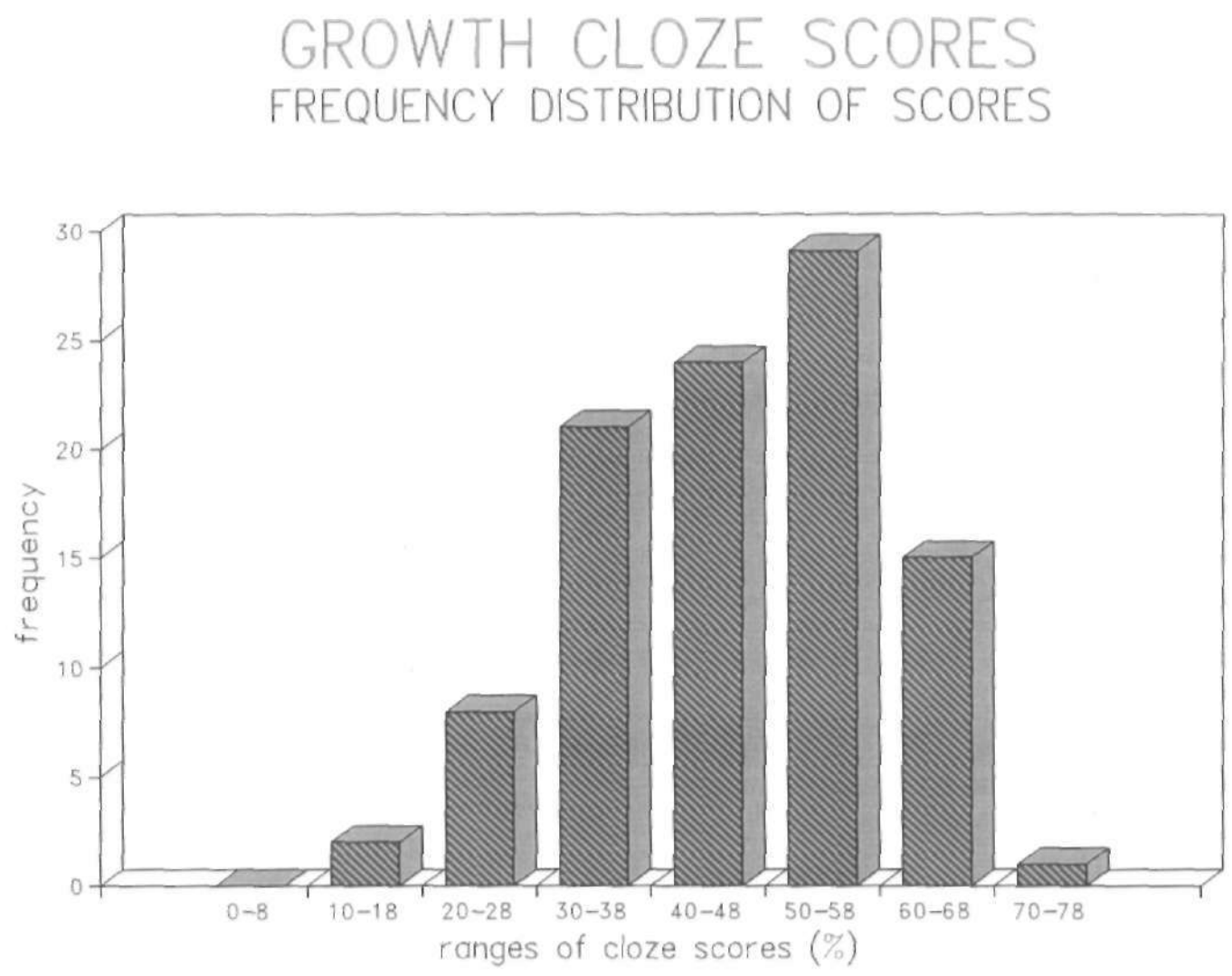
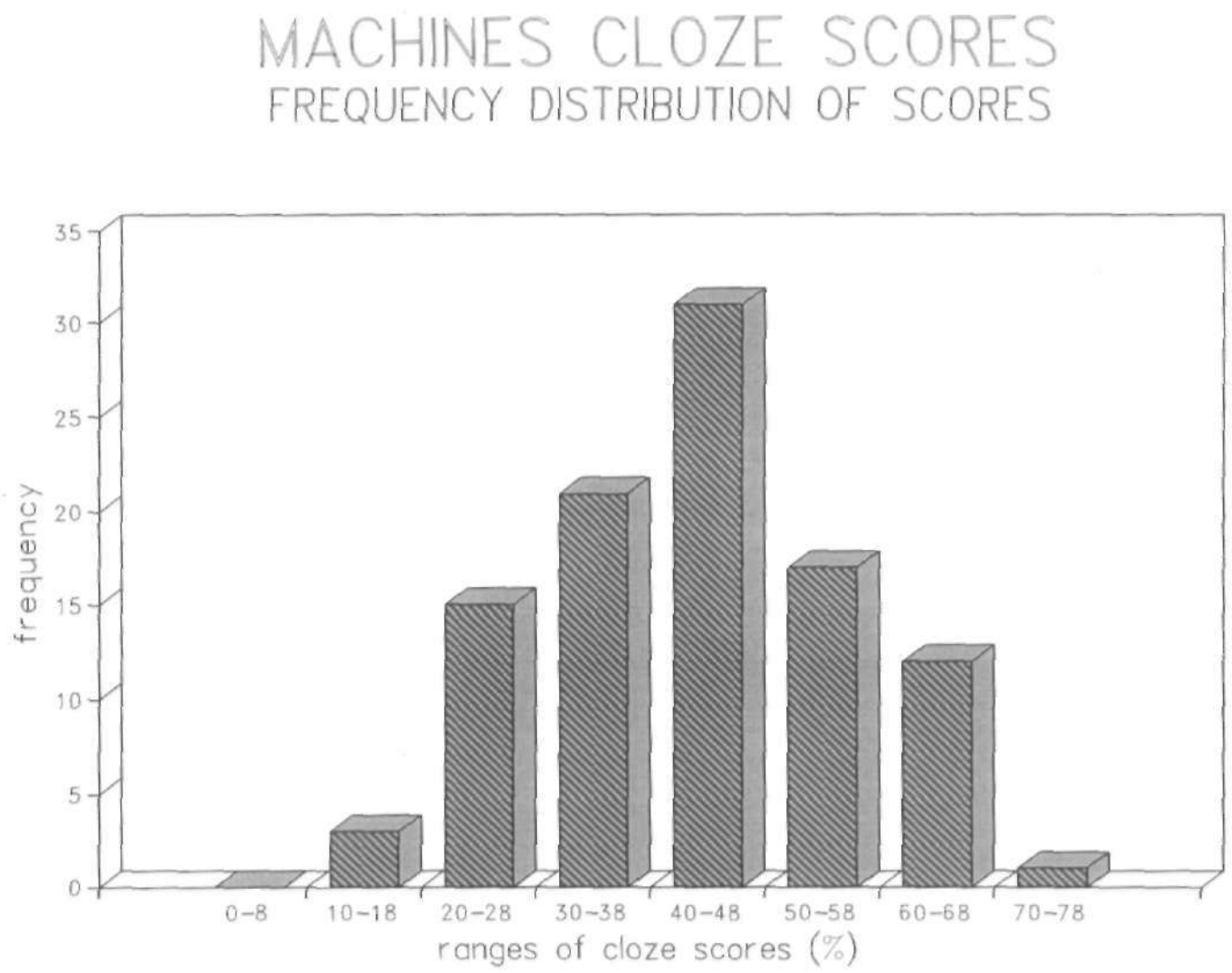


Figure 3.1d **Frequency distribution of scores on SSS2 passage, *Maintenance of Machines.*** (N=100 cloze passages.)



3.2 Instruments and Procedure for Data Collection

3.2.1 Instruments

Four cloze tests derived from expository passages were used for the data collection. The four passages were selected from a pool of seven tests which were administered during a pilot study carried out in May, 1992. The four passages which were finally selected, based on the data obtained during the pilot study, were all from *Integrated Science* published by STAN. Tables 3.2a-b below give a summary of the relevant characteristics of the passages as obtained from the pilot study.

Table 3.2a. Cloze Passages for Junior Secondary Two

PASSAGE CHARACTERISTICS	WIND	CARE OF THE EYE
Source	*Nigerian integrated Science Project, Bk. 3*	*Nigerian Integrated Science Project, Bk.3*
Number of students pilot tested	109	108
Mean cloze score	29% (sd 11.2)	31% (sd 12.4)
FOG readability estimate	7.58 (JSS1)	7.28 (JSS1)
Proportion of content words	56%	66%
Proportion of function words	44%	34%
Average deletions per sentence	2.2	2.6
Range of deletions per sentence	1 to 5	1 to 4
Prior knowledge test mean	18% (s.d. 12)	35% (s.d. 22)
Kuder-Richardson 20	.96	.97
Spearman-Brown prophecy	.85 (r=.73)	.78 (r=.65)

Table 3.2b. Cloze Passages for Senior Secondary Two

PASSAGE CHARACTERISTICS	**THINGS THAT AFFECT THE WAY WE GROW**	**MAINTENANCE OF MACHINES**
Source	*Nigerian integrated Science Project, Bk.2*	*Nigerian Integrated Science Project, Bk.2*
Number of students pilot tested	101	107
Mean cloze score	41% (sd 2.5)	39% (sd 13.2)
FOG readability estimate	9.24 (JSS3)	10.1 (SSS1)
Proportion of content words	68%	60%
Proportion of function words	32%	40%
Average deletions per sentence	2.5	3.3
Range of deletions per sentence	1 to 5	1 to 5
Prior knowledge test mean	66% (s.d. 17)	57% (s.d. 17)
Kuder-Richardson 20	.97	.97
Spearman-Brown prophecy	.83 (r=.71)	.87 (r=.78)

From Tables 3.2a-b above it can be seen that the performance of the JSS2 and the SSS2 students in the pilot study was quite similar on each of the two passages selected for their level as the mean scores were only two percentage points apart in each case. The readability formula used was the FOG readability estimate which measures sentence complexity and vocabulary density. The FOG readability estimate expresses degrees of passage difficulty in terms of class levels. For example the FOG estimate of *Wind* was 7.58 which refers to USA grade seven (JSS1). (See Table 3.2b.) It was deemed necessary to select passages which had a readability estimate below the class level of the students to be sampled in order to ensure that a range of high scores could be obtained. This was in consideration of the fact that the FOG readability estimate was developed for L1 American readers as well as the evidence that many readers in schools in Jos read below class level. The FOG readability estimate of each

of the two JSS2 passages suggests that they are both appropriate for students in grade seven which is comparable to JSS1. The FOG readability estimate placed one of the SSS2 passages at JSS3 level, two class levels below the readers tested, while second passage was estimated to be at SSS1 level. However, the mean performance of the SSS2 students on the two selected passages was very similar although there was more variance in the scores on *Maintenance of Machines* than on *Things That Affect the Way We Grow*.

The cloze versions of the seven passages used in the pilot study were examined to find out the average number of deletions per sentence. This was taken into consideration in choosing the four passages for the main study. Priority was given to passages with relatively low numbers of deletions per sentence because of the practice in miscue analysis of judging each miscue on a sentence level (Goodman, Watson and Burke, 1987). The average deletions per sentence ranged from 2.2 on one of the JSS passages selected to 3.2 on one of the SSS2 passages. In no passages were there more than five deleted words in any given sentence.

An attempt was also made to make sure that the topics of the passages to be selected were not too unfamiliar to the students. In general the JSS readers had little basic knowledge about wind and relatively low knowledge about care of eyes. The SSS students showed more familiarity with the topics of their passages although they knew less about maintenance of machines than they did about things that affect growth.

Finally, the internal consistency of the two passages was measured during the pilot test using both the Kuder-Richardson 20 and the Spearman-Brown prophecy correlation in order to ensure that the reliability of the passages selected were

acceptably high. The Kuder-Richardson 20 correlations ranged from .96 to .97 while the Spearman-Brown prophecy correlations ranged from .78 to .87.

3.2.2 Validation of the cloze passages

A number of steps were taken during the pilot study to ensure the validity and reliability of the passages to be selected for the study. A total of seven passages were used in the pilot test, three for the JSS2 and four for SSS2. All passages were drawn from Integrated Science textbooks currently in use in secondary schools in Plateau State. One school in Jos was selected for the pilot study. Two arms of JSS2 and two arms of SSS2 were tested, totalling about 120 students at each class level. The number of males and females was about equal and the students represented a wide range of Nigerian ethnic groups.

Cloze format. The cloze format used was a fixed-ratio deletion format (deletion of every nth word). The deletion rate chosen was every fifth word. There are two major reasons for the choice of an every fifth word deletion rate. Cloze tests with a fixed deletion rate are easiest for secondary school teachers to construct. Secondly, using an every fifth word deletion rate means that the length of the passage does not have to exceed 300 words to yield 50 deletions. Cloze tests with 50 deletions are most often recommended for classroom use. This is based on Bormuth's (1975) research which showed that 50 deletions yield a reliability coefficient of about .85 while the number of deletions would have to be increased to one hundred to raise the reliability to close to .90.

Each cloze passage had at least 275 words. This made it possible for 50 words to be deleted while leaving at least one complete sentence at the beginning and one at the end of the passage intact. This is in keeping with the standard procedure for cloze testing in order to provide the reader with sufficient context. (See Baumann, 1988; Rye, 1982.)

Validity. In order to ensure content validity of the passages, the passages were selected from textbooks in actual use in Nigerian schools. Passages using a cause and effect structure were selected as these have been observed to be among the most common expository text types in use in textbooks (see McGee and Richgels, 1985).

To ensure that the passages selected for the main study would not be on topics that were either so unfamiliar to the students or so familiar that their performance on the cloze tests would be biased, a test of prior knowledge was administered a week before the cloze testing began. The prior knowledge tests consisted of four questions for each passage. The first three questions were short answer questions asking for basic facts and the last question required the reader to tell what he understood by four key words selected from the passage to be tested. The SSS2 students were found in general to have more knowledge of the topics of the passages meant for them. The JSS2 students had low prior knowledge on all three passages administered in the pilot study.

Because miscue analysis was to be used with the cloze passages, it was deemed necessary to ensure that the passages selected had a balance of deleted content and function words. One of the passages was eliminated because its proportion of deleted function words was much higher than those of the other texts. Similarly, only

the passages with the least deletions in a single sentence and the lowest mean deletion rate per sentence were included in the final selection.

Reliability. The Spearman-Brown Prophecy and Kuder-Richardson 20 formulas were applied to the completed cloze tests in order to determine if their internal consistency was sufficient to ensure the reliability of the passages.

To provide further evidence of the reliability of the cloze procedure with Nigerian students at JSS2 and SSS2 class levels, inter-passage correlations between the performance of the students on each class level on their two selected passages were established. The correlation between the JSS students' performance on the two passages was .73 and that of the SSS was .69. Both of these were significant at the .01 level. (See Table 3.3 below.)

Table 3.3. **Correlations between students' performance on the two passages selected for their class level.**

Class	Passages	Number	d.f.	Critical Value $p < .01$	correlation
JSS2	*Eye & Wind*	107	105	.256	.73
SSS2	*Machines & Growth*	96	94	.270	.69

3.2.3 Administration of the cloze tests

The cloze tests were administered by the researcher with the aid of a lecturer colleague with extensive research experience in cloze testing and two graduate research assistants. Each testing session lasted about one hour and ten minutes. The pupils first answered the cover-page information requesting their name, age, sex, languages spoken, mother-tongue, and languages they can read. Then the students

were introduced to the cloze procedure through a practice passage on the cover-page. The practice passage, titled *Magazines and Newspapers*, is a primary six passage from the Informal Reading Inventory developed by the researcher and described in the Introduction. (See Appendix Ic.) Before the students attempted the practice passage the following rules were discussed and written on the blackboard:

1. Read each passage from beginning to end before you begin to write.
2. Write only <u>one</u> word in each blank.
3. Use your best handwriting.
4. Find the easy words first.
5. Fill all the blanks before you pass your test booklet. Guess if you cannot think of the missing word.
6. Raise up your hand if you need help in spelling any word.

After the students had gone about half way through the practice passage, the researcher asked the students to stop writing. The researcher then went over the first two paragraphs of the practice passage with the students and discussed their responses, pointing out sources of semantic and syntactic cues in a cloze passage to guide the students in appropriate selection of responses. The students were then instructed to complete the practice passage and then go on to the two test passages at their own pace. The two cloze passages for each class were arranged in a booklet in such a way that alternating students started on different passages. The purpose of this was to minimize copying and to eliminate a practice effect on the second passage.

During the test, the researcher and assistants periodically walked up and down the room to ensure that the students were working correctly and to prevent any form

of cheating. If students requested help with spelling, the word was written by the researcher on the margin of the test page. As soon as each student completed his test booklet, the test was scrutinized to ensure that (a) there were no blanks left unfilled, (b) there was only one word in each blank, (c) each word was legible. Only when these three conditions were met, was the test booklet collected.

3.3 Data Analysis

3.3.1 Procedure for scoring the cloze tests

All cloze tests were scored by awarding two marks for each gap which was filled with the same word as the original text. Misspelled words were counted as correct when it was clear that the word the reader was attempting was the same as the original text. However, where word endings were omitted or ambiguities occurred, such as *there* instead of *their*, the response was not marked as correct. Synonymic responses (words which were synonyms of the deleted word) were also not counted as correct.

3.3.2 Miscue analysis of cloze responses

The subsample of 400 cloze tests described in 3.1.2 above were used for miscue analysis, 100 scripts per passage. The researcher analyzed the 12,252 miscues yielded by the 400 cloze tests and coded each one according to its semantic and syntactic acceptability at the sentence level. The procedure for miscue analysis was based on the guidelines developed for miscue analysis of oral responses by Goodman, Watson and Burke (1987), and of cloze responses in the work of DeSanti (1986), Kelly and Ewoldt (1984) and Rye (1982). The judgements made for each miscue are based on the criteria shown in Figure 3.2 below.

Figure 3.2. **Criteria for Judgement of Miscue Type.**

Semantic acceptability	A miscue is judged to be acceptable semantically if it made sense in the context of the entire sentence and if it yields a sentence which does not contradict information elsewhere in the passage. (This indicates that the reader made use of his knowledge of the meaning of the words and word relationships in the sentence to predict the deleted word.)
Syntactic acceptability	A miscue is judged to be syntactically acceptable if it is grammatically appropriate in the context of the sentence. (This indicates that the reader made use of his knowledge of the sentence structure of the English language to predict the deleted word.)

In accordance with the procedure for miscue analysis developed by Goodman, Watson and Burke (1987), each miscue is judged on a sentence level. This means that if there are more than one miscue in a sentence, each miscue is judged according to the grammatical and semantic acceptability of the sentence as rendered by all the miscues. Thus, if one miscue renders a sentence ungrammatical or not meaningful, any additional miscues in that sentence must also be classified as unacceptable or ungrammatical.

Each miscue falls into one of four categories described in Figure 3.3 below. It can be seen that the four miscue types are based on the following coding categories:

TYPE ONE. Semantically and syntactically acceptable miscue.

TYPE TWO. Semantically acceptable but syntactically unacceptable miscue.

TYPE THREE. Semantically unacceptable but syntactically acceptable miscue.

TYPE FOUR. Semantically and syntactically unacceptable miscue.

Immediately following Figure 3.2, which shows the coding categories, is Figure 3.4 which gives examples of actual sentences from passages used in the study and the classification of the sentences according to miscue type. In this figure the miscues are italicised while the original word is in parenthesis.

Miscue scores for each miscue category are obtained by calculating the percentage of a reader's total miscues which fell into each category. For example in Appendix Id there is a miscue analysis recording form for a reader whose cloze score was 42 percent on *Maintenance of Machines* (reader F27). Of this reader's 29 miscues, nine of them were judged by the researcher to fit into the TYPE ONE coding category because they were both semantically and syntactically acceptable. This reader's TYPE ONE miscue score is, therefore, 31 percent. On the other hand, there is another reader (reader E7) whose score was 36 percent on *Things that Affect Growth*. This reader had only one out of a total of 32 miscues which fell into the TYPE ONE coding category rendering a TYPE ONE miscue score of only three percent.

Figure 3.3. **Coding Categories for Miscue Types**

TYPE ONE	Semantic Plus (Sem+) Syntax Plus (Syn+)	Yields a sentence which is: (a) meaningful on a sentence level, (b) contains information which is consistent with the information given in the rest of the passage, (c) grammatical on a sentence level.
TYPE TWO	Semantic Plus (Sem+) Syntax Minus (Syn-)	Yields a sentence which is: (a) meaningful on a sentence level, (b) contains information which is consistent with the information given in the rest of the passage, (c) not grammatical on a sentence level.
TYPE THREE	Semantic Minus (Sem-) Syntax Plus (Syn+)	Yields a sentence which is: (a) not meaningful on a sentence level,and/or (b) contains information which is not consistent with the information given in the rest of the passage, (c) grammatical on a sentence level.
TYPE FOUR	Semantic Minus (Sem-) Syntax Minus (Syn-)	Yields a sentence which is: (a) not meaningful on a sentence level,and/or (b) contains information which is not consistent with the information given in the rest of the passage, (c) not grammatical on a sentence level.

Figure 3.4 **Examples of judgements of miscues.**

TYPE 1 SEM + SYN +	EYE	There is an infection of the eye that is called"apollo" in *English*. (Nigeria)
	WIND	What happens when the valve of a *motorcycle* tyre is *punched*? (car) (opened)
	GROWTH	We have seen how disease can *affect* growth. (retard)
	MACHINES	When machines are in use, their *various* parts do work, and *some* energy is involved. (moving) (so)
TYPE 2 SEM + SYN -	EYE	When people suffer from *such* infection, their eyes itch, *it's* painful and red, and *so* discharge (this). (become) (a) may take place.
	WIND	When the ground is heated, it *rises* the air above it. (heats)
	GROWTH	Exercise also has a good *help* on growth. (effect)
	MACHINES	When *cars* are in use, their moving parts do work and *many* energy is involved. (machines) (so)
TYPE 3 SEM - SYN +	EYE	You should also *be* sure there is *no* light in the room. (make) (proper)
	WIND	This causes currents in the air and a strong *storm* is a wind. (current)
	GROWTH	It makes muscles big *or* strong. (and)
	MACHINES	Regular removal of *grease* from a machine is also very necessary to ensure the good (dirt) performance of the *car*. (machine)
TYPE 4 SEM- SYN-	EYE	When people suffer from *the* infection, their eyes itch, *small* painful and red, and *hospital* (this) (become) (a) discharge may take place.
	WIND	So the hot air *passes* through the heavier colder *and* because it is less *heated*. (rises) (air) (dense)
	GROWTH	When we can not eat, what can *fill* to our body? (happen)
	MACHINES	*The* order to reduce the *energy* produced as the machine *moves*, the friction between its (In) (heat) (works) moving parts must be reduced.

3.3.3 Reliability and validity of the miscue analysis

Inter-rater correlations. The miscue analysis carried out by the researcher was validated through inter-rater correlations. As miscue analysis involves judgement, it is the practice in miscue research to have a sample of the miscues analyzed by an independent judge. (See, for example, Hood,1975-1976). Inter-rater correlations are then calculated to determine the extent to which the researcher and the independent judge are in agreement in their judgements. Both the researcher and an independent judge carried out miscue analysis on 20 cloze tests per passage selected through stratified random sampling at ten cloze score levels. The independent judge was a lecturer who is recognised as an expert in miscue analysis, having used it in his Phd thesis for which he won international recognition. The Pearson-product moment correlations between the semantic and syntactic miscue ratings by the researcher and an independent judge shown in Table 3.4 below confirmed that a high level of confidence may be placed in the researcher's analysis.

Table 3.4. **Inter-rater correlations of miscue scores.**

Miscue Scores	WIND	EYE	GROWTH	MACHINES
Semantic	.995	.947	.954	.893
Syntactic	.986	.981	.983	.807

Intra-rater reliability. The reliability of the researchers' miscue analysis was established through intra-rater correlations. The research analyzed twice 20 cloze tests per passage using stratified random sampling at ten cloze score levels. There was a minimum of 2 months interval between the two analyses. These correlations, shown

in Table 3.5 below, confirmed the high degree of consistency in the judgements made by the researcher.

Table 3.5. **Intra-rater correlations of miscue scores.**

Miscue Scores	WIND	EYE	GROWTH	MACHINES
Semantic	.982	.988	.983	.906
Syntactic	.994	.969	.948	.874

3.3.4 Investigating the relationship between cloze scores and patterns of miscue types

The main statistical procedure used was regression analysis. This is in keeping with the procedure used in earlier cloze criterion studies reviewed in this study (for example, Bormuth, 1967, 1968, 1971; Rankin and Culhane, 1969) in which performance on one or more external measure was used to predict performance on a cloze test. In this study the miscue pattern associated with each of the four miscue types was presented as a scattergramme, passage by passage, showing the relationships between cloze scores and miscue scores. The cloze and miscue scores on the two JSS passages and on the two SSS passages were each combined to form two sets of scores. Using the sets of scores at each of the two class levels, the linear relationships of cloze scores and the combined scores of two semantically acceptable miscue types, TYPE ONE and TYPE TWO, were used to predict the percentage of semantically acceptable miscues which are associated with cloze score. From this predicted percentage, the actual number of predicted semantically acceptable miscues was calculated for each cloze score and added to the number of text responses

represented by each cloze score. This then yields the proportion of semantically acceptable cloze responses that can be expected to be associated with each of the cloze scores at the two class levels.

3.4 Summary

In this correlational study, four cloze passages drawn from Integrated Science texts were administered in six schools in Jos yielding a total of 797 JSS2 and 602 SSS2 passages completed by L2 readers. Miscue analysis was carried out on each of the 100 cloze tests randomly selected for each of the four passages. Each miscue was classified according to its semantic and syntactic acceptability and the relationships between cloze scores and patterns of miscue types were examined. Regression analysis was used to predict the proportion of semantically acceptable miscues associated with each cloze score. Predicted comprehension levels were obtained by combining the predicted number of semantically acceptable responses with the number of correct responses.

CHAPTER 4

DATA PRESENTATION

AND

ANALYSIS

4.0 Introduction

In this chapter the findings are organised objective by objective. The relevant research questions are grouped under each objective and the findings presented. These objectives were earlier stated in section 1.3.2 and the research questions in 1.3.3.

4.1 Objective One

To find out the level of comprehension associated with cloze scores on two passages read by JSS2 students and two passages read by SSS2 students.

This objective was met through research questions one and two.

Research Question 1. What level of comprehension, as estimated by predicted percentage of semantically acceptable cloze responses, is associated with cloze scores by JSS2 readers on two expository science passages?

Research Question 2. What level of comprehension, as estimated by predicted percentage of semantically acceptable cloze responses, is associated with cloze scores by SSS2 readers on two expository science passages?

In order to answer these questions, the following two steps were taken. Each step is presented below with its findings.

Step 1. Linear regressions

The miscues scores of TYPE ONE miscues (Sem+ Syn+) and TYPE TWO (Sem+Syn-) were combined in order to obtain a representation of the proportion of a readers' miscues which are semantically acceptable and thus reflect use of semantic cues. (These are titled **Semantically Acceptable Miscues**.) These semantic miscue scores from 200 readers, 100 from each of the two JSS2 passages, were then plotted against the cloze score obtained by each reader and a linear regression line plotted in order to show the predicted semantic miscue score associated with each cloze score. The same thing was done for the miscues of the 200 SSS2 readers.

The regression data for both JSS2 and SSS2 readers is set out in Table 4.1 below.

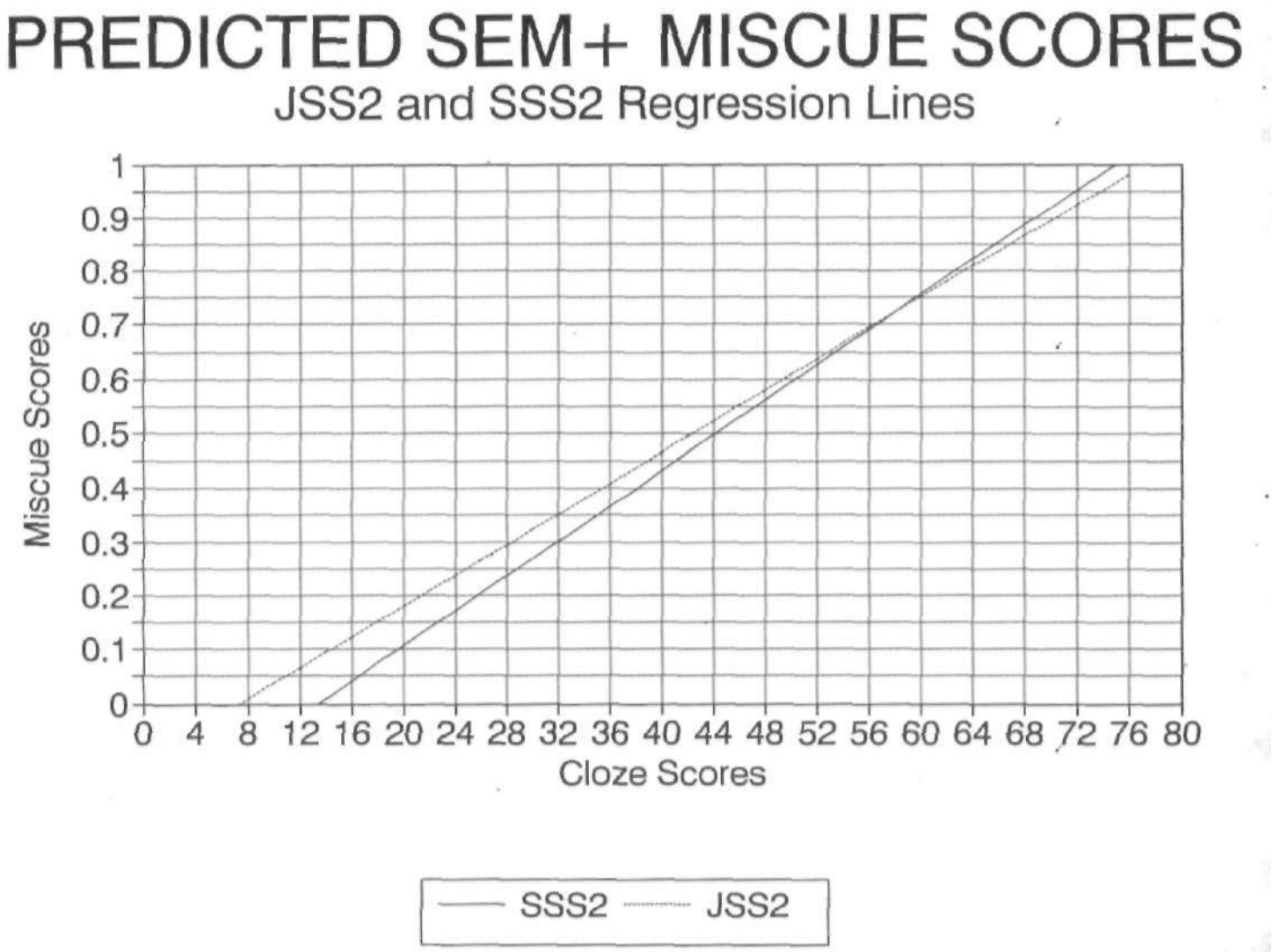
Table 4.1. **Linear Regression Data Showing the Relationship between Cloze Scores and Semantically Acceptable Miscue Scores of JSS2 and SSS2 Readers.**

REGRESSION DATA	JSS2	SSS2
Constant	-0.106	-0.218
Standard error of Y estimate	0.184	0.165
R Squared	0.604	0.624
No. of observations	200	200
Degrees of freedom	198	198
X coefficient	0.014	0.016
Standard error of coefficient	0.001	0.001

From the above table it can be seen that the regression data for JSS2 and for SSS2 are remarkably similar. The strength of the relationship between the cloze scores and semantically acceptable miscue scores (proportion of a reader's miscues which are semantically acceptable) at both the JSS2 and SSS2 levels, as shown by the r^2, is

strong. (By taking the square root of the r^2 for each level r=.78 for JSS2 and r=.79 for SSS2.) The relevant data from Table 4.1 above was used to plot regression lines showing the semantically acceptable miscue scores which are predicted at each cloze score for the JSS2 and SSS2 readers. These are shown in Figure 4.1.

Figure 4.1. **Regression Lines showing relationship between cloze scores and semantically acceptable miscue types obtained by JSS2 and SSS2 readers.**



Step 2. Predicted comprehension levels

The regression data obtained in step 1 was used to predict the **percentage** of a reader's miscues which would be expected to be semantically acceptable for any given cloze score. This was then used to compute the **exact number** of meaningful responses predicted to be associated with each cloze score. This exact number of meaningful responses was then combined with the **number of correct responses** which correspond to the cloze scores to predict the comprehension level associated with selected cloze scores. These comprehension levels are expressed in percentages, representing the predicted **percentage of meaningful responses** which a reader can be expected to make on a cloze test once his cloze score is known. Table 4.2 shows the predicted comprehension levels of both the JSS2 and SSS2 readers at selected cloze scores based on the computations described above. For example, the percent of comprehension which can be predicted by a reader who scores 40 percent on a cloze test is shown on the table to be 68 percent for the JSS2 readers and 66 percent for the SSS2 readers. (See Tables IIa and IIb in Appendix II for a step by step presentation of the computations for both JSS2 and SSS2 readers.)

Table 4.2. **Predicted Comprehension Levels at Selected Cloze Scores for JSS2 and SSS2 readers.**

Cloze Score (%)	30	32	34	36	38	40	42	44	46	48	50	52	54	56	58	60	62	64
Predicted JSS2 comprehension levels (%)	53	56	59	62	65	68	71	73	76	78	80	83	85	87	88	90	92	93
Predicted SSS2 comprehension levels (%)	49	53	56	59	63	66	69	72	75	77	80	82	84	86	88	90	92	94

It can be seen that the predicted comprehension levels are very similar suggesting that any developmental effect, at least with respect to the three years difference between

JSS2 and SSS2, is minimal. This similarity also suggests that text differences did not seriously affect the predicted comprehension levels.

4.1.1 Summary of findings related to the level of comprehension associated with cloze scores

Comprehension levels which could be predicted by cloze scores were established for JSS2 and SSS2 readers. Table 4.2 above shows these comprehension levels at selected cloze scores.

4.2 Objective Two

To find out the patterns of changes in Nigerian readers' access to semantic and syntactic cues at different levels of comprehension.

The patterns of miscue types which are produced at various accuracy levels on the cloze passages were examined based on Research Question 3. These patterns can be seen on scattergrammes which display the miscue scores produced by readers at the various cloze scores. Each data point indicates the percentage of miscues which were of the specified miscue type by a reader with a given cloze scores. Separate scattergrammes were produced for each miscue type, passage by passage.

Research Question 3: What are the patterns of associations between each of four miscue types, TYPE ONE, TYPE TWO, TYPE THREE, TYPE FOUR, and cloze scores on each of four texts?

The findings are presented below according to miscue type and passage by passage.

4.2.1 TYPE ONE miscues: Semantic plus Syntax plus

The scattergrammes for this miscue type are displayed in Figures 4.2a-d. The scattergrammes show the relationship between cloze scores and miscue scores. It can be observed that the patterns are basically similar. The accuracy level effect is seen in the general increase in the proportion of syntactically and semantically acceptable miscues as cloze scores increase. That is, on each of the passages very few of the miscues of students who scored low on the cloze test were both semantically and syntactically acceptable. On the other hand a relatively high proportion of the miscues of students who scored high on the cloze tests fell in this category. This suggests that readers' access to syntactic and semantic cues is associated with degree of comprehension as measured by performance on the cloze test. Variations in the miscue patterns, especially in the pattern for the JSS2 passage, *Wind*, suggest that text factors may also have had some effect on the miscue patterns.

Figure 4.2a. **Scattergramme showing relationship between cloze scores and TYPE ONE miscues on *Care of the eye.*** ($N=100$)

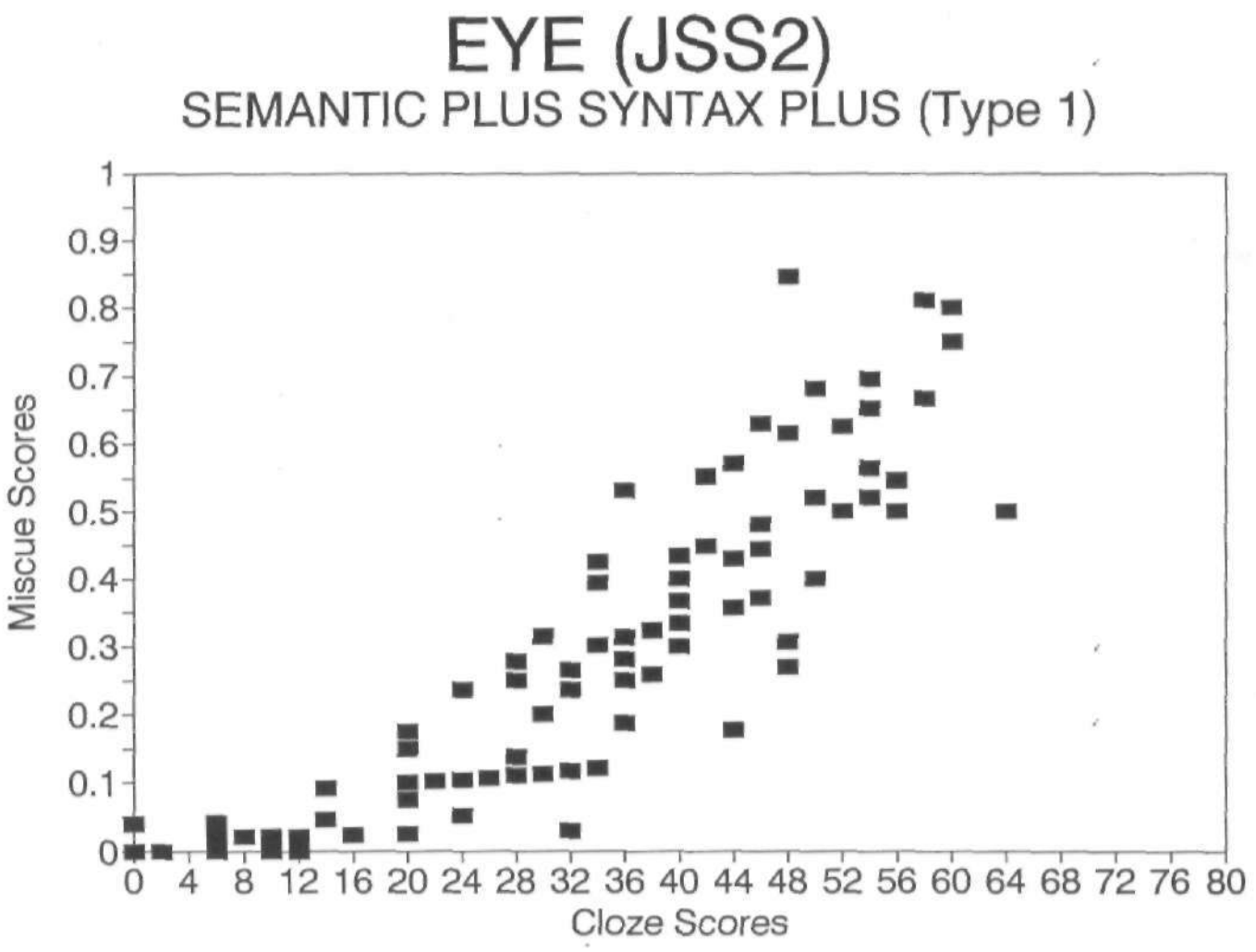


Figure 4.2b. **Scattergramme showing relationship between cloze scores and TYPE ONE miscues on *Wind*.** ($N=100$)

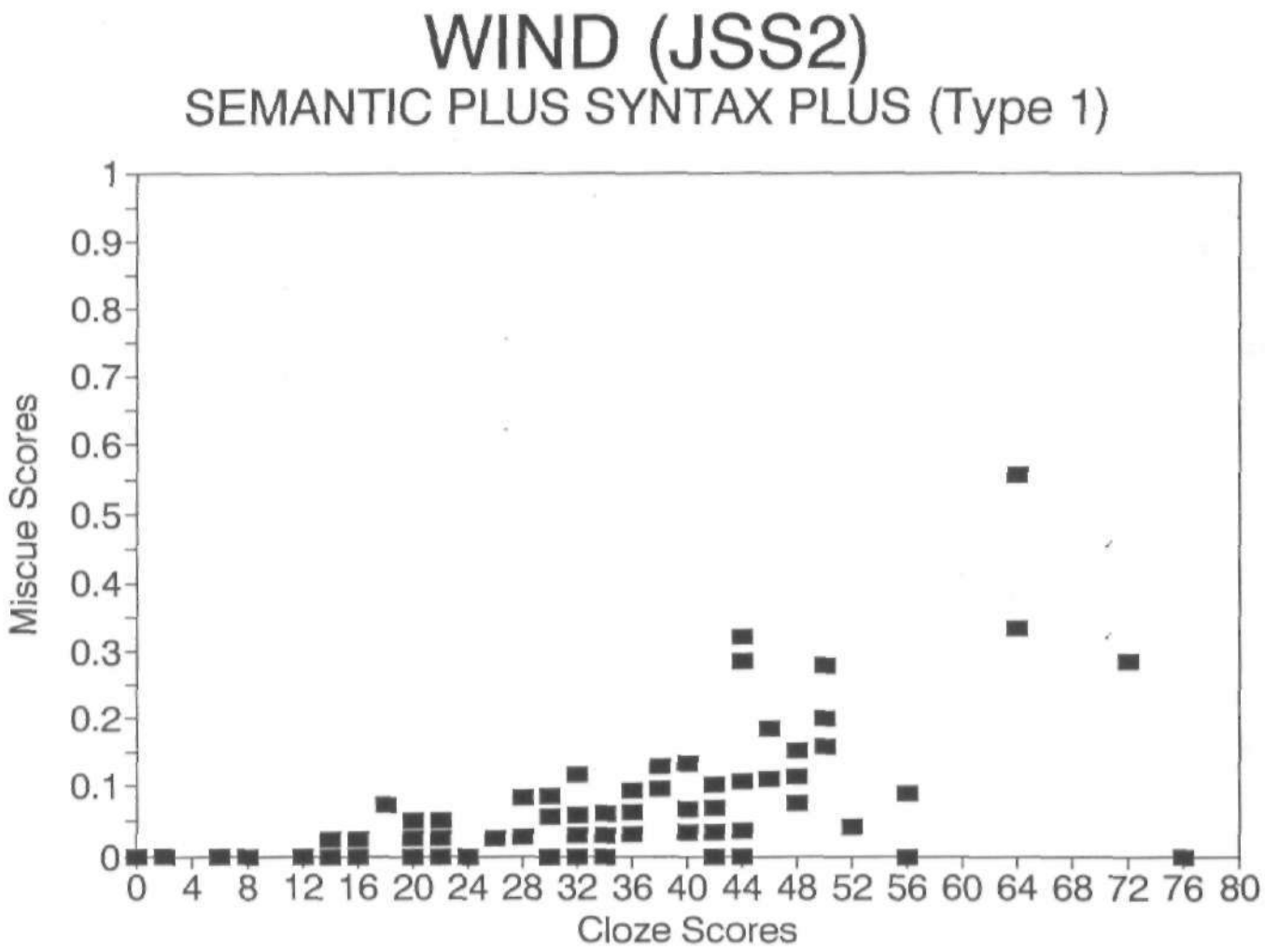


Figure 4.2c. **Scattergramme for TYPE ONE miscues on *Things that affect the way we grow.*** (N= 100)

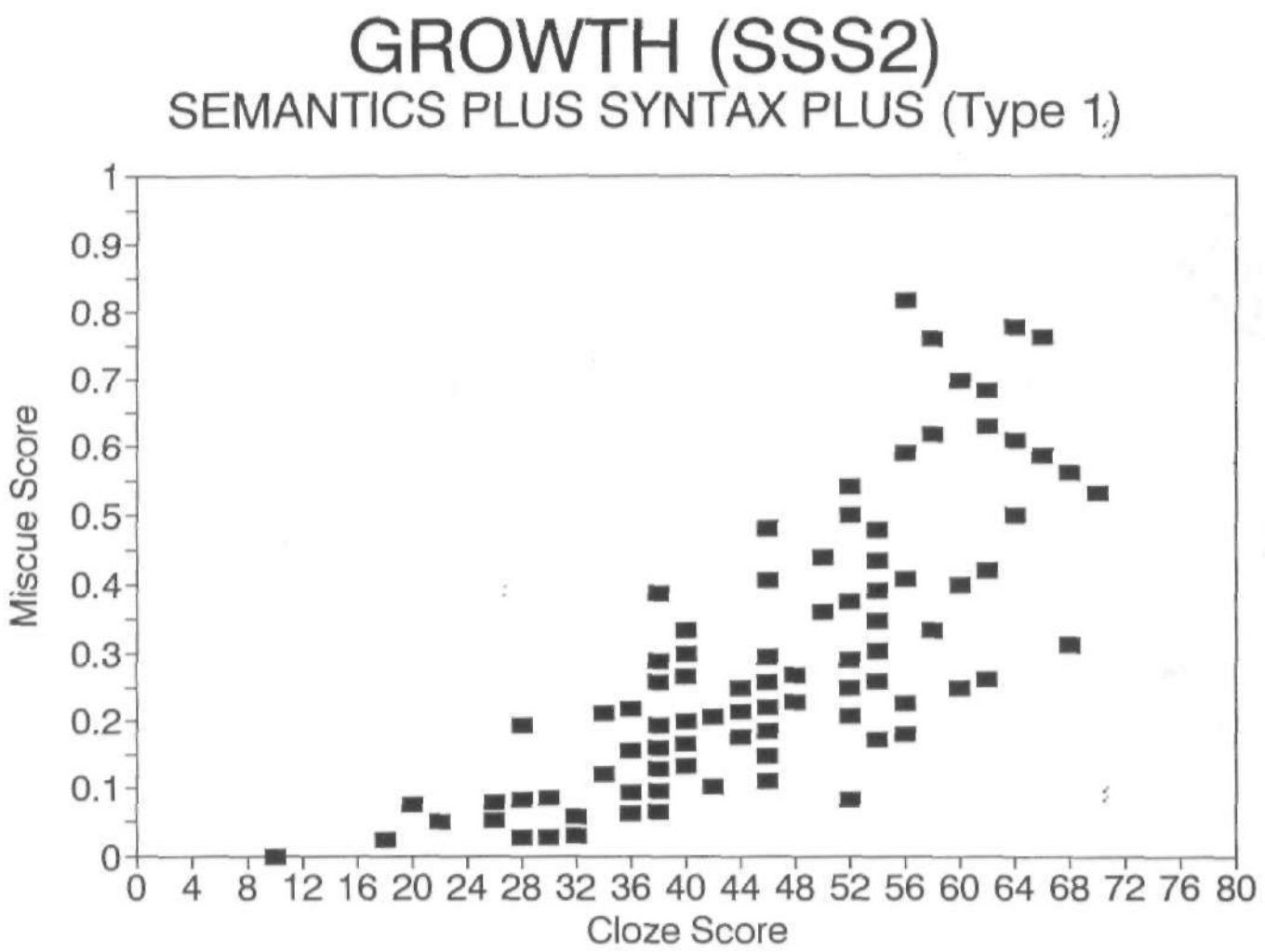
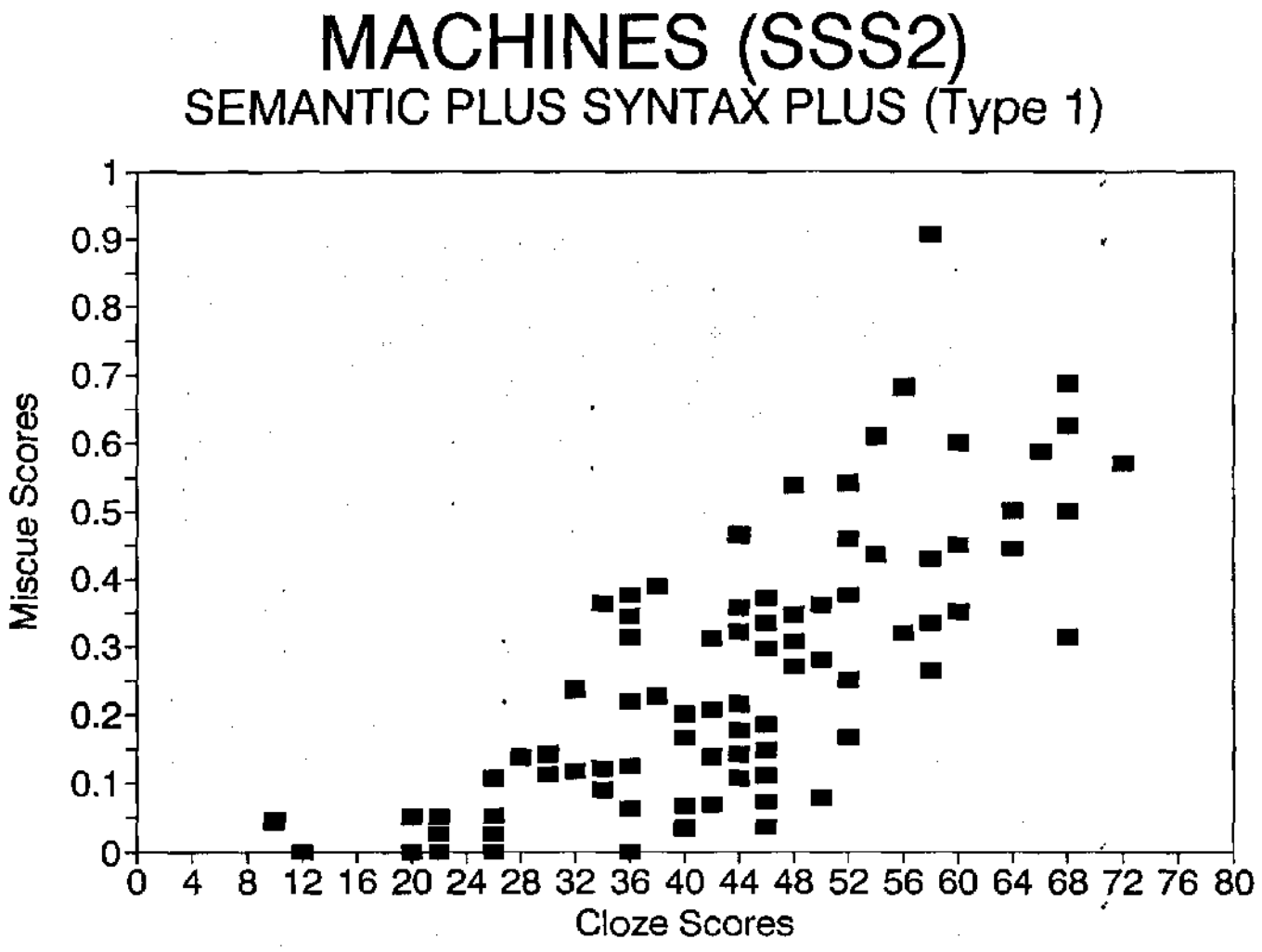


Figure 4.2d. **Scattergramme for TYPE ONE miscues on *Maintenance of machines.*** (N=100)



4.2.2 TYPE TWO miscues: Semantic plus Syntax minus

The scattergrammes in Figures 4.3a-d show the relationships between readers' cloze scores and their use of semantically acceptable but syntactically unacceptable miscues. When a reader's miscue is of the TYPE TWO (Sem+ Syn-) category, there is evidence that he was able to make sense out of what he was reading but was unable to make use of available syntactic information. It can be seen that there is a relatively weak linear relationship between cloze score and TYPE TWO miscues with relatively high scores for this miscue type at all cloze score levels except at the very lowest cloze scores. This is in contrast to the TYPE ONE (Sem+ Syn+) scores which are associated more with high cloze scores. A comparison of the distributions of TYPE ONE miscue scores on *Wind* (Sem+Syn+ in Figure 4.2b) and TYPE TWO miscue scores (Sem+Syn- in Figure 4.3b) scores on the same passage particularly demonstrates how the readers were able to make use of semantic cues on an apparently syntactically difficult text. For example, while the TYPE ONE miscue scores (Sem+Syn+ in Figure 4.2b) were very low (15 percent or below) at cloze scores of 40 percent and below, TYPE TWO miscue scores (Sem+Syn- in Figure 4.3b) even as high as 30 percent and 35 percent occurred at cloze scores between 30 percent and 40 percent. In other words, these scattergrammes show that for these readers access to semantic cues continued even when access to syntactic information was not available.

The four scattergrammes for TYPE TWO miscues discussed above are shown in Figures 4.3a-d below.

Figure 4.3a. **Scattergramme for TYPE TWO miscues on *Care of the eye*.** (N=100)

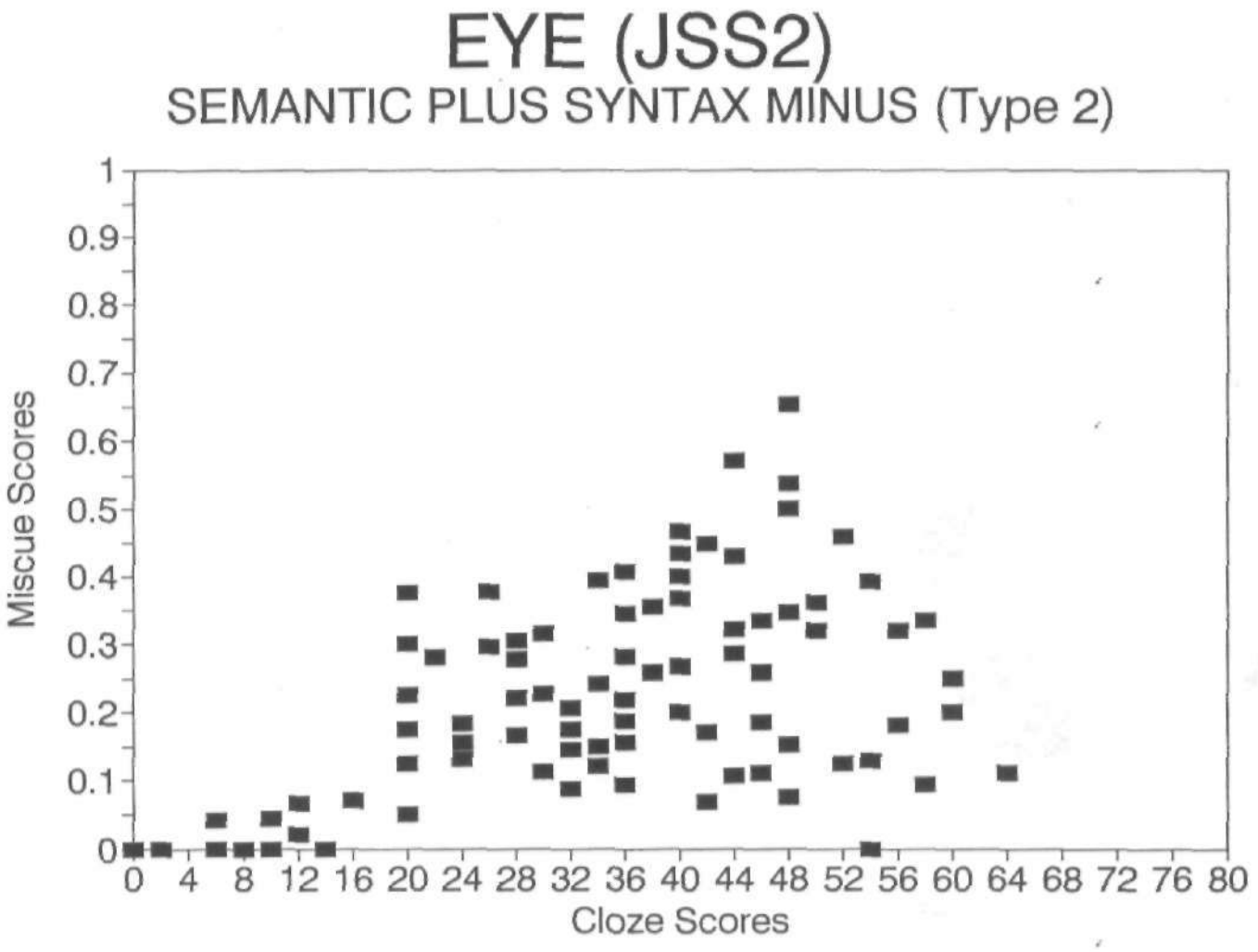


Figure 4.3b. **Scattergramme for TYPE TWO miscues on *Wind*. (N=100)**

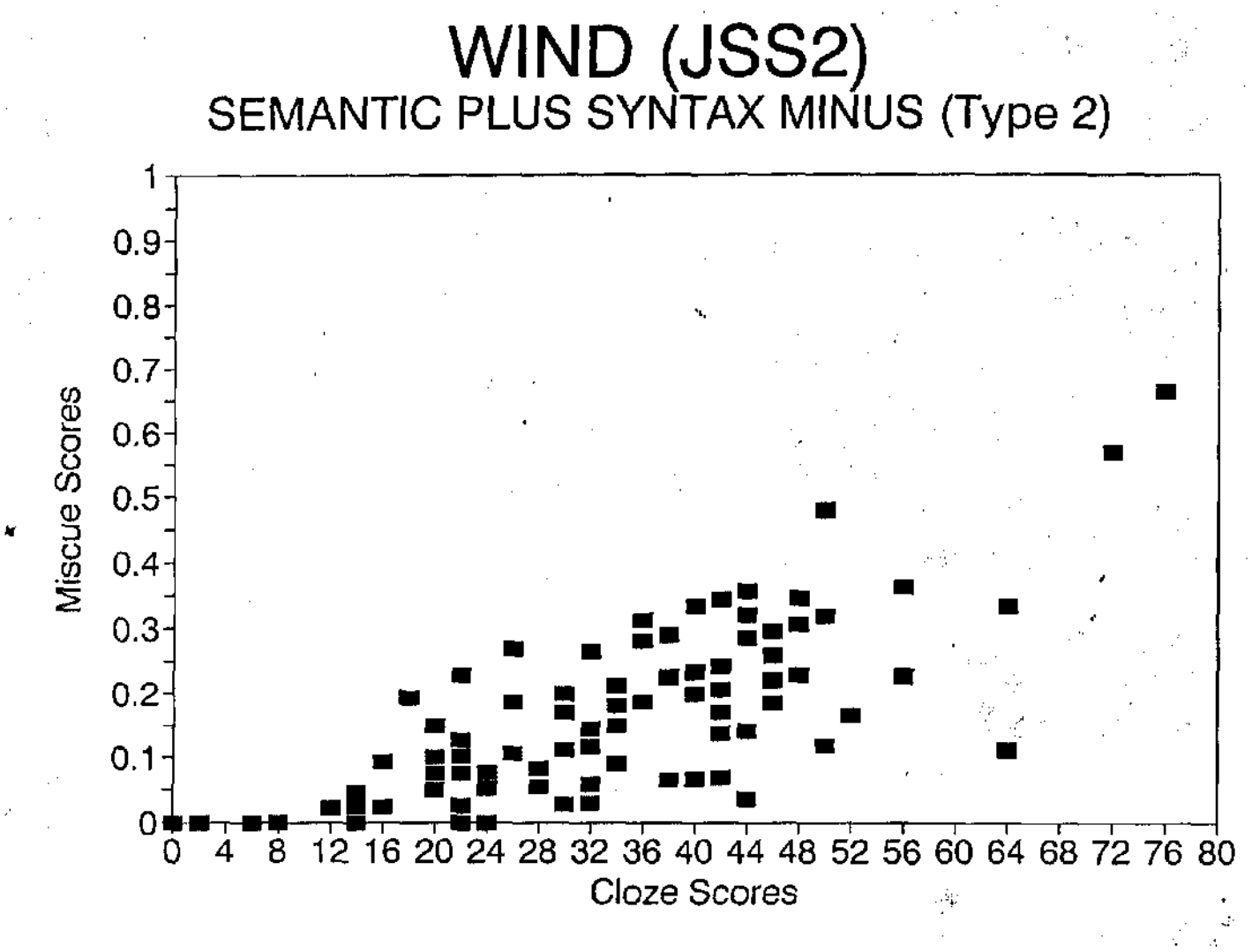


Figure 4.3c. **Scattergramme for TYPE TWO miscues on *Things that affect the way we grow.*** (N=100)

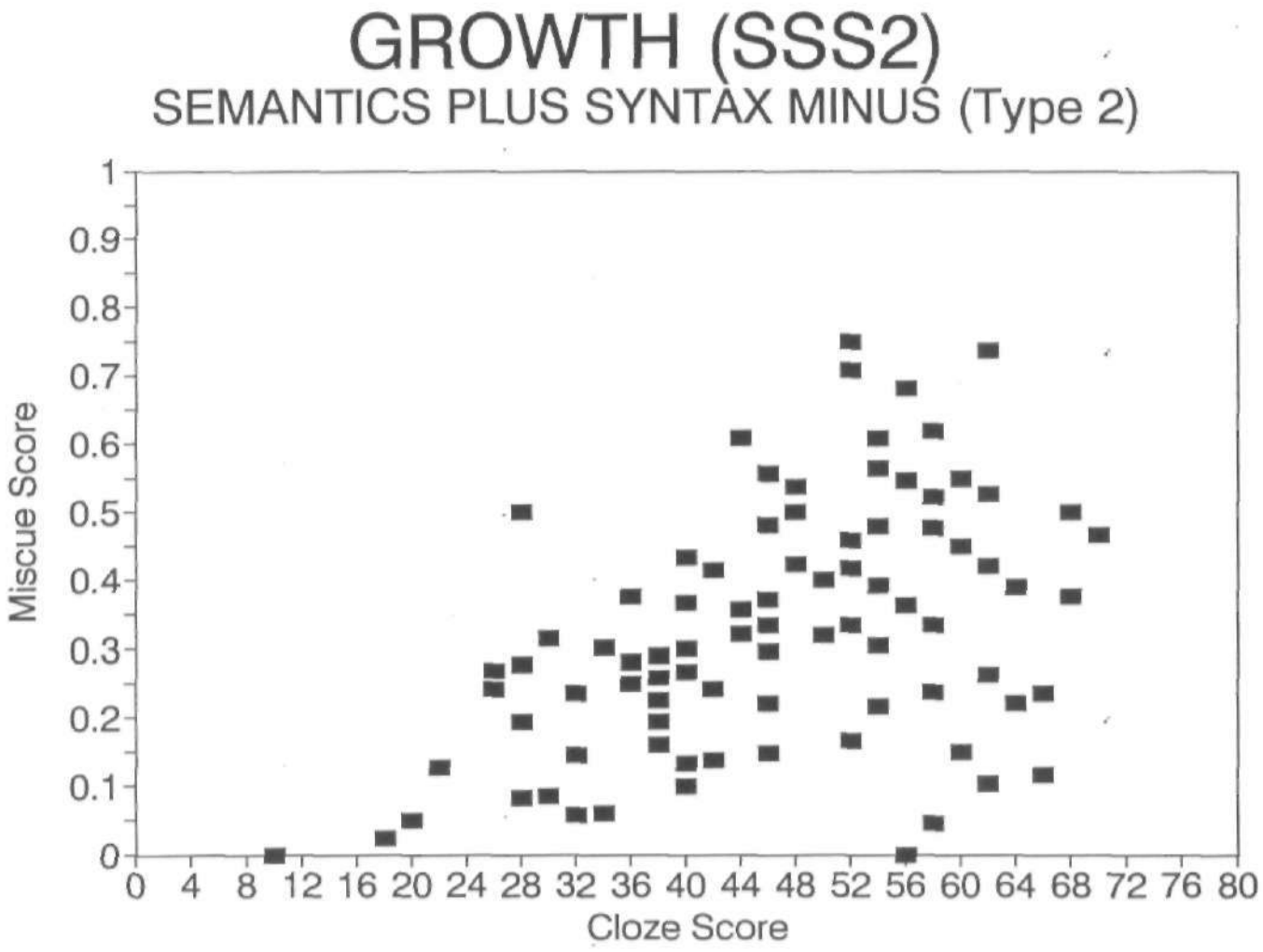
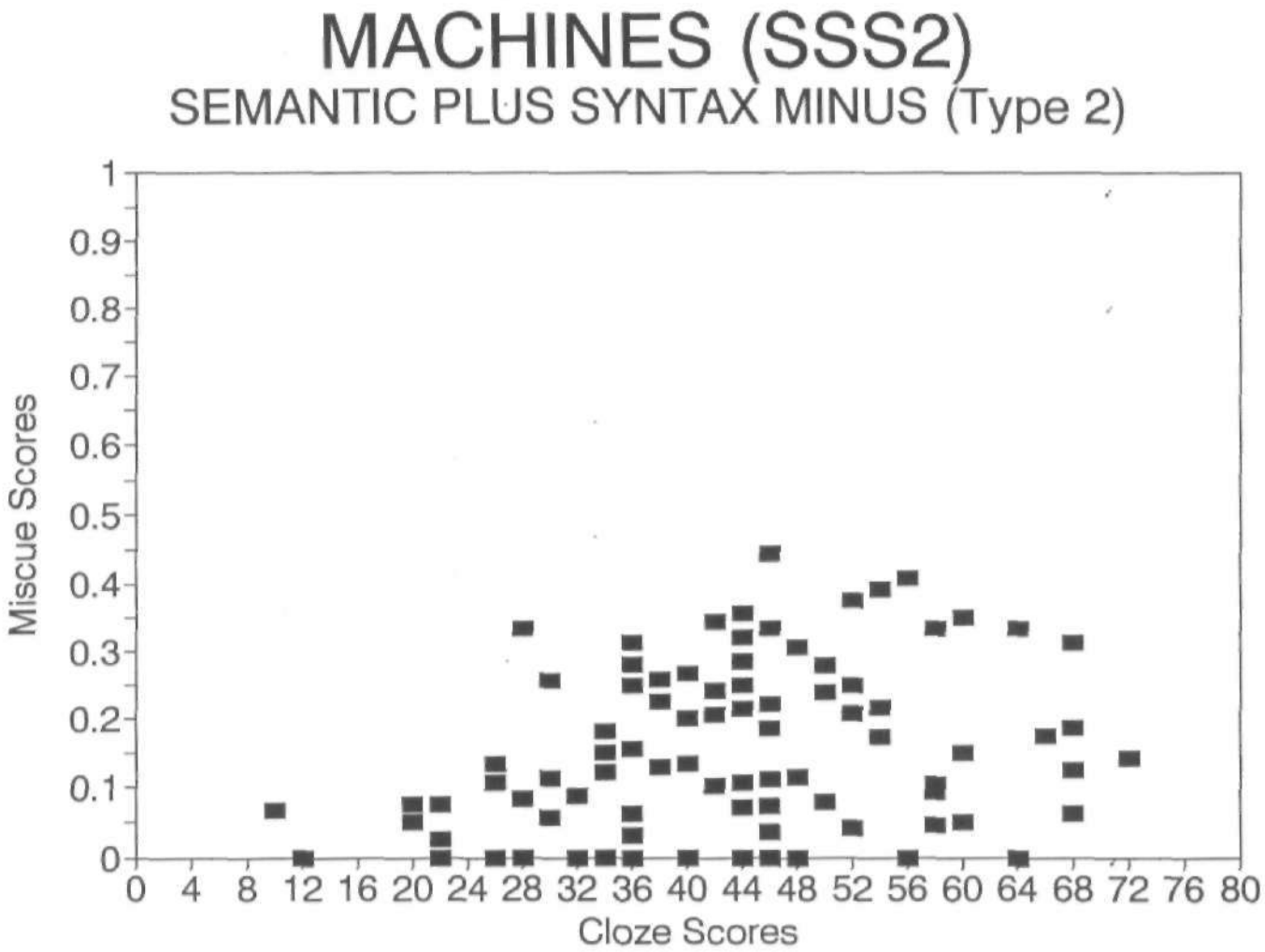


Figure 4.3d. **Scattergramme for TYPE TWO miscues on *Maintenance of machines.*** ($N=100$)



4.2.3 TYPE THREE miscues: Semantic minus Syntax plus

The scattergrammes in Figures 4.4a-d below show the distribution of TYPE THREE (Sem-Syn+) miscues which are those which render a sentence grammatical but not meaningful. The scattergrammes below show that readers' TYPE THREE miscue scores are fairly similar regardless of cloze score. On two of the passages, *Care of the Eye* and *Things that Affect the Way We Grow*, many readers had no miscues in this category. On the other hand relatively higher TYPE THREE miscue scores occur at almost all cloze score levels on *Maintenance of Machines* and, to a lesser extent, on *Wind*, suggesting that access to syntactic information may be related to text characteristics. On the other hand, visual inspection of the scattergrammes for TYPE TWO (Sem+Syn- in Figures 4.3a-d) and TYPE THREE miscues (Sem-Syn+ in Figures 4.4a-d) show that at all cloze score levels readers' TYPE TWO (Sem+Syn-) miscue scores were higher than TYPE THREE (Sem-Syn+), reflecting more access to semantic cues than to syntactic cues on all the passages.

Figure 4.4b. **Scattergramme for TYPE THREE miscues on *Wind*.** (N=100)

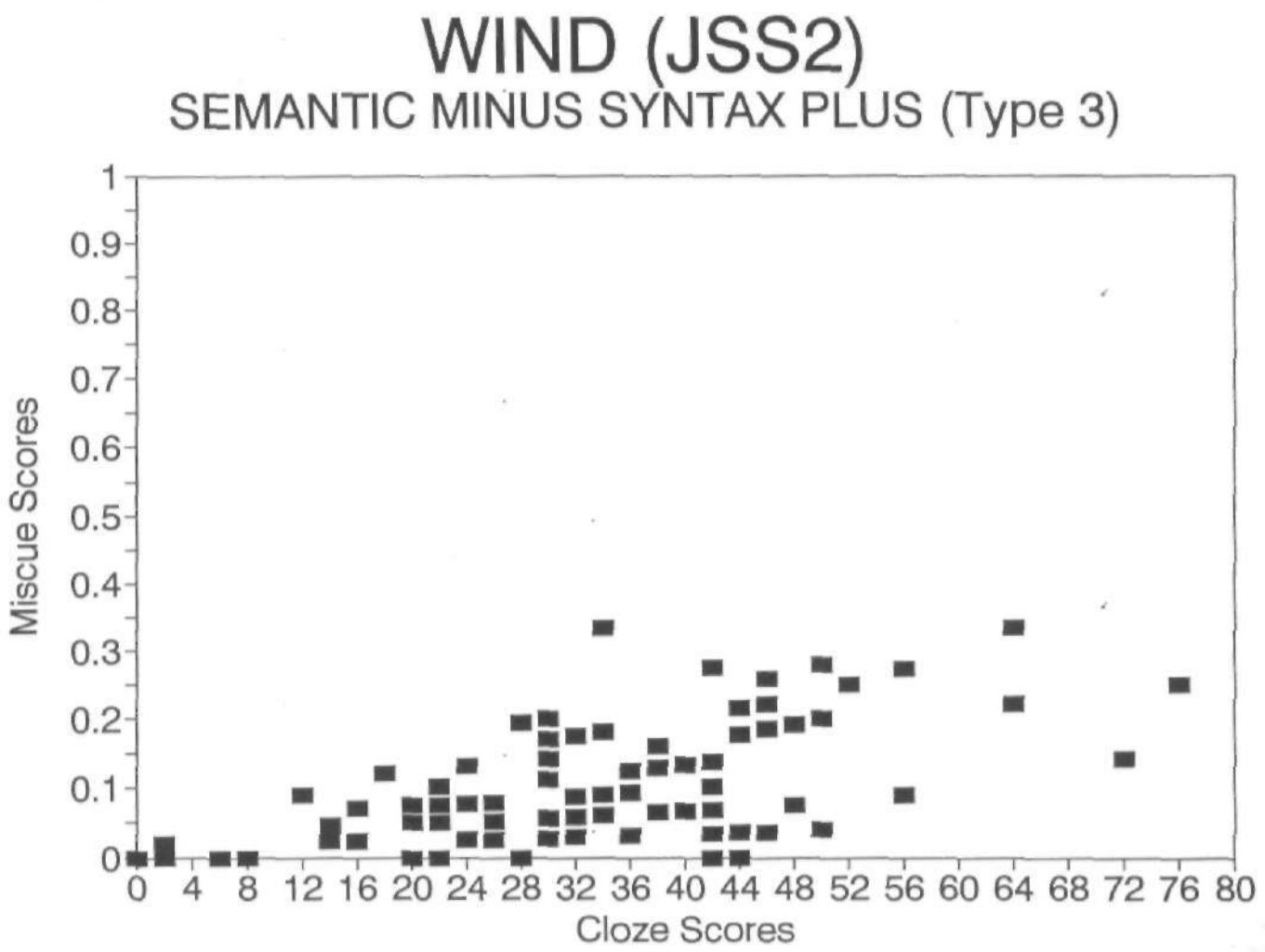


Figure 4.4c. **Scattergramme for TYPE THREE miscues on *Things that affect the way we grow.*** ($N=100$)

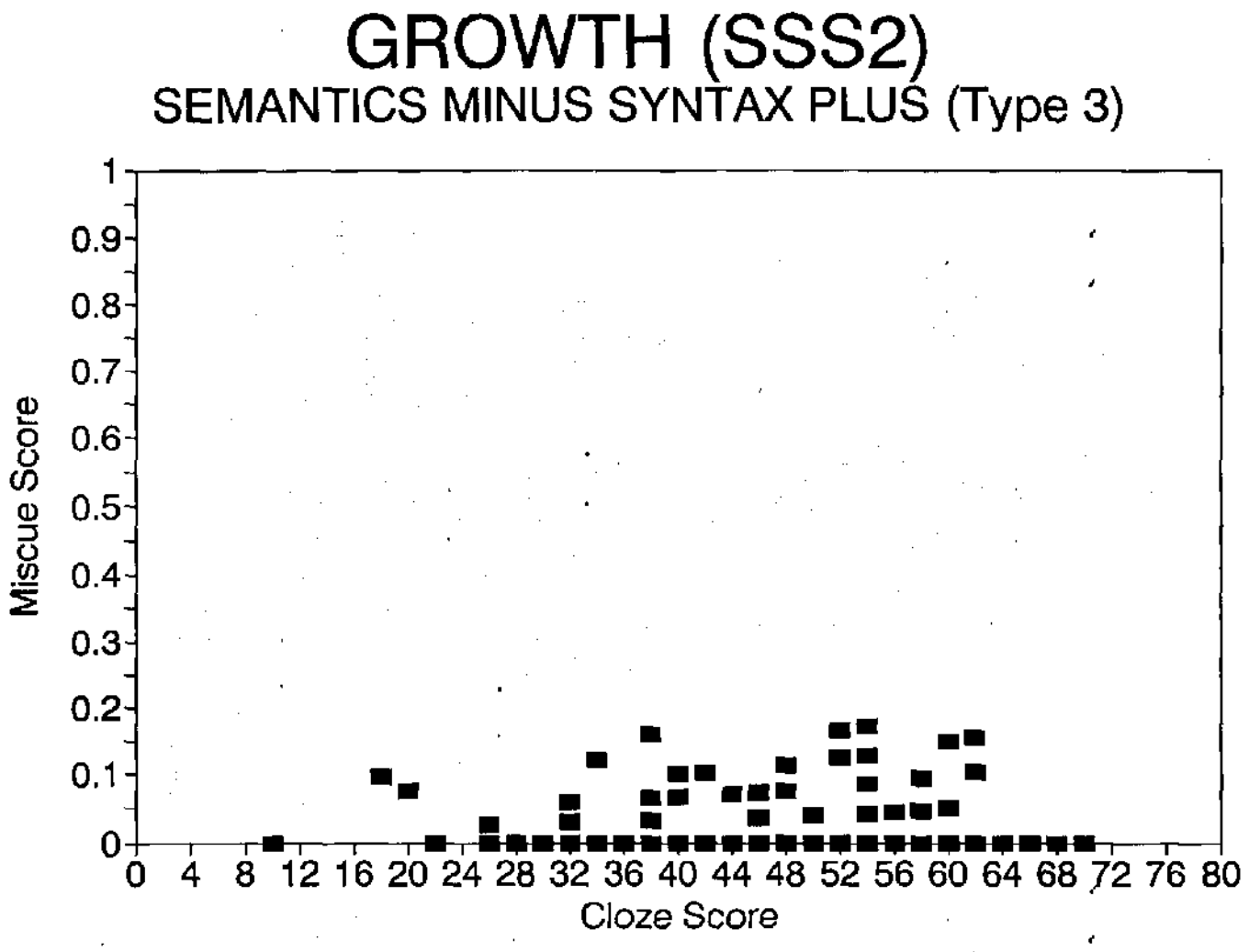
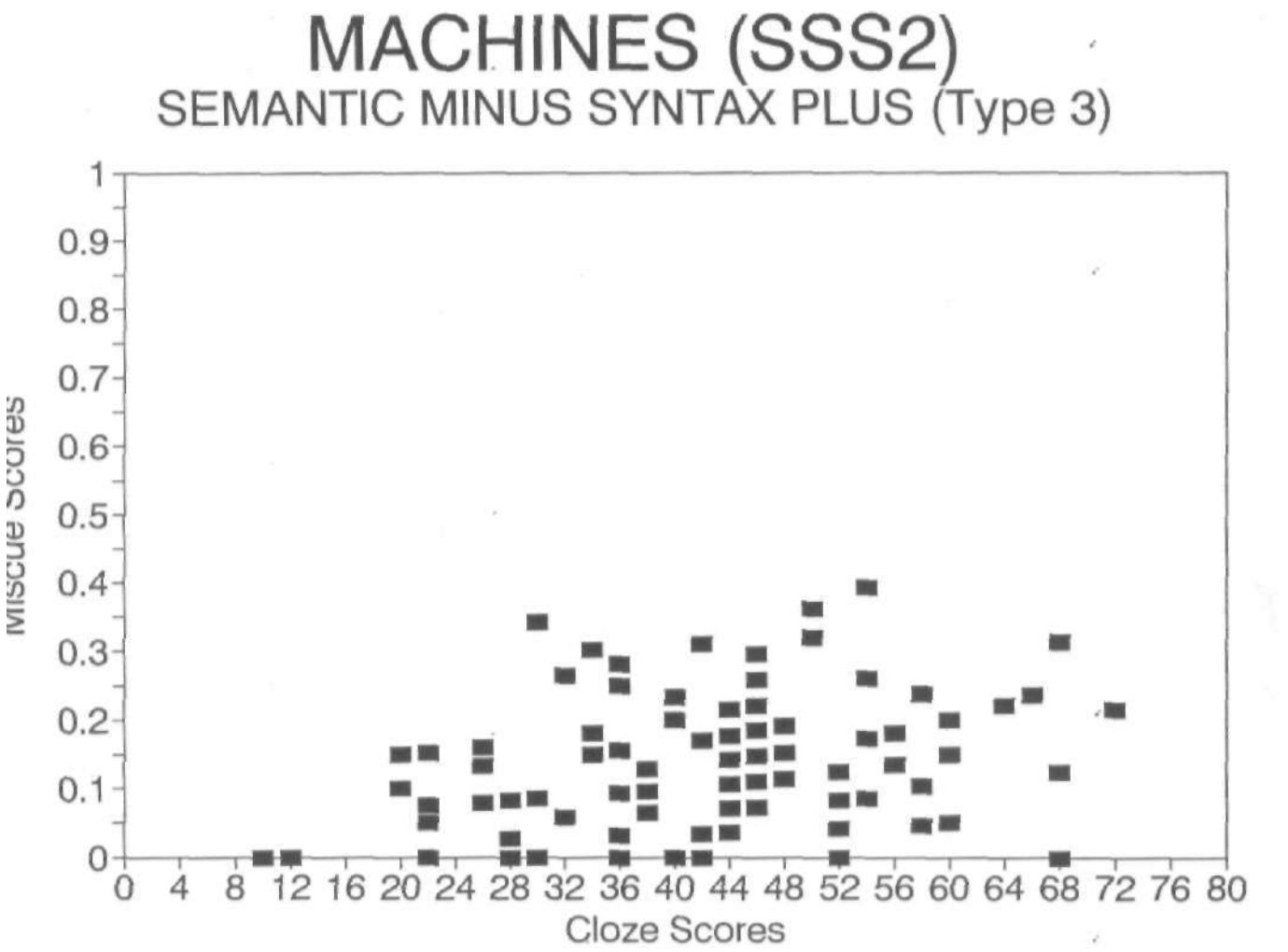


Figure 4.4d. **Scattergramme for TYPE THREE miscues on *Maintenance of machines.*** ($N=100$)



4.2.4 TYPE FOUR miscues: Semantic minus Syntax minus

The scattergrammes in Figures 4.5a-d below present scores of miscues which are both semantically and syntactically unacceptable (Sem-Syn-). Such miscues reflect a total breakdown of comprehension. On each of the passages a similar pattern is clearly displayed. An accuracy level effect is seen in the decrease in proportion of syntactically and semantically acceptable miscues as cloze scores decrease. In general TYPE FOUR (Sem- Syn-) miscue scores of 50 percent and above began to appear at cloze scores below 48 percent on all the four passages and increased to as high as 100 percent at the lowest cloze scores levels. This provides further evidence that readers' access to syntactic and semantic cues is associated with degree of comprehension as measured by performance on the cloze test.

Figure 4.5a. **Scattergramme for TYPE FOUR miscues on *Care of the eye*.** (N=100)

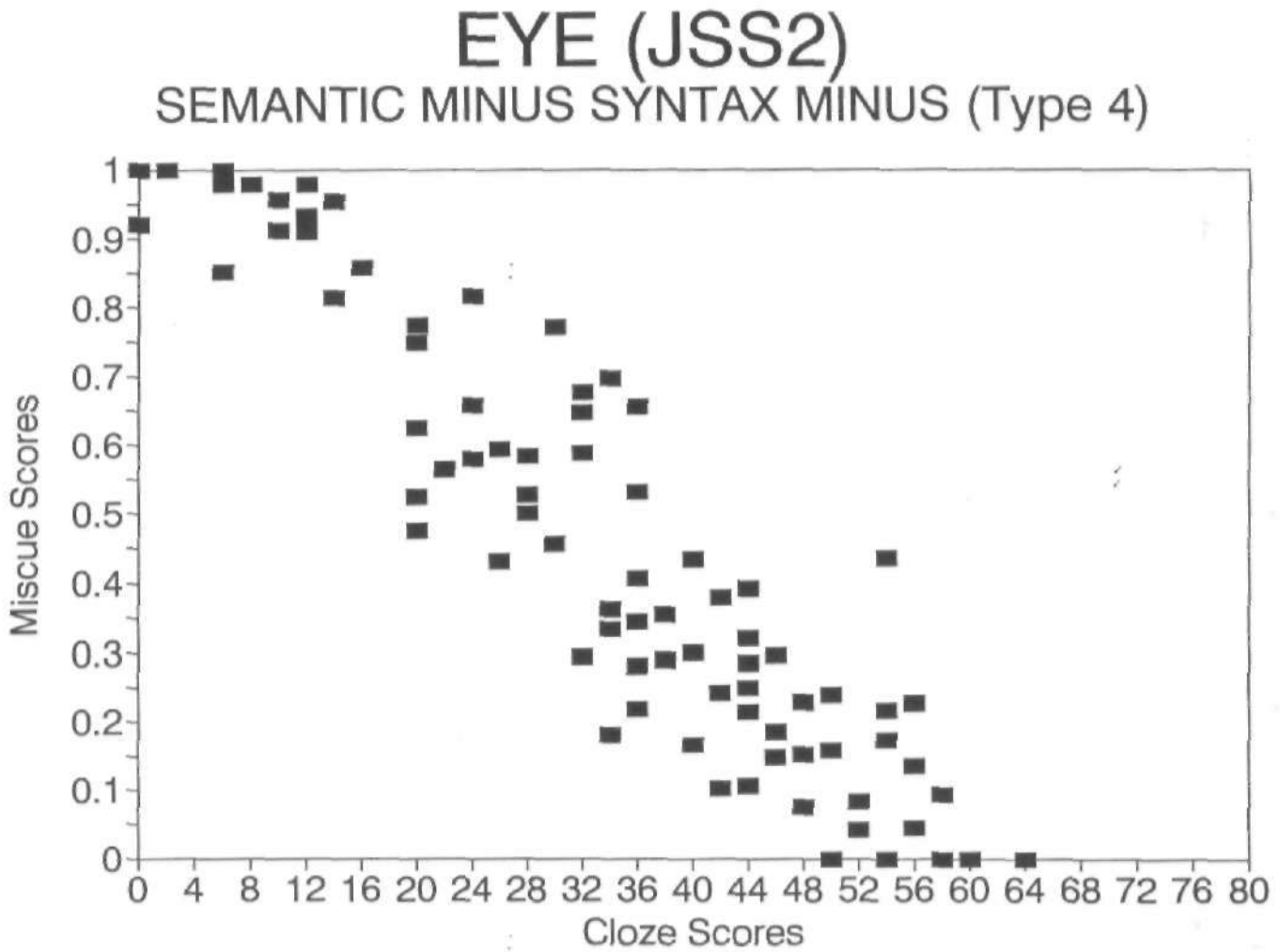


Figure 4.5b. **Scattergramme for TYPE FOUR miscues on *Wind*.** (N=100)

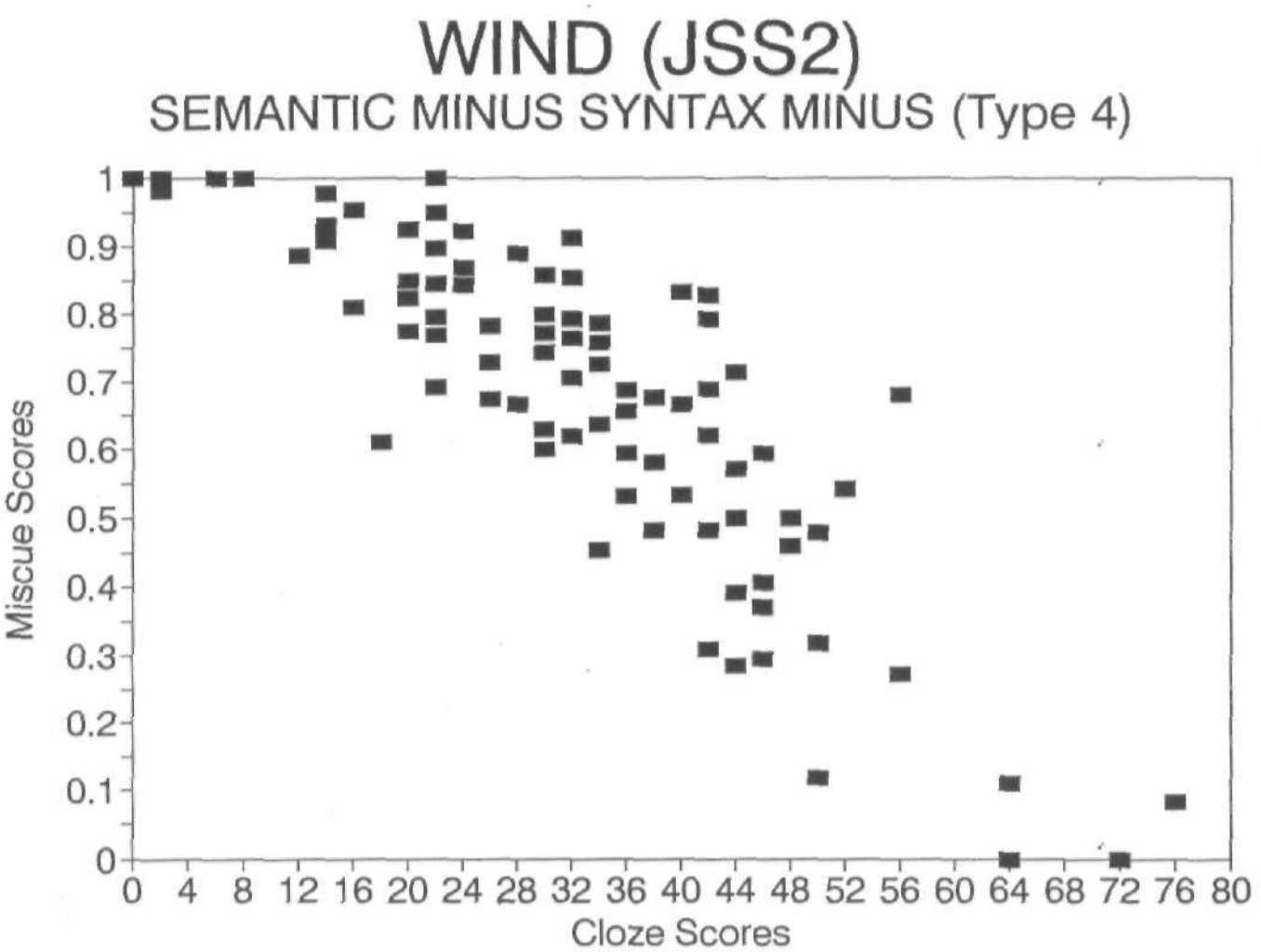
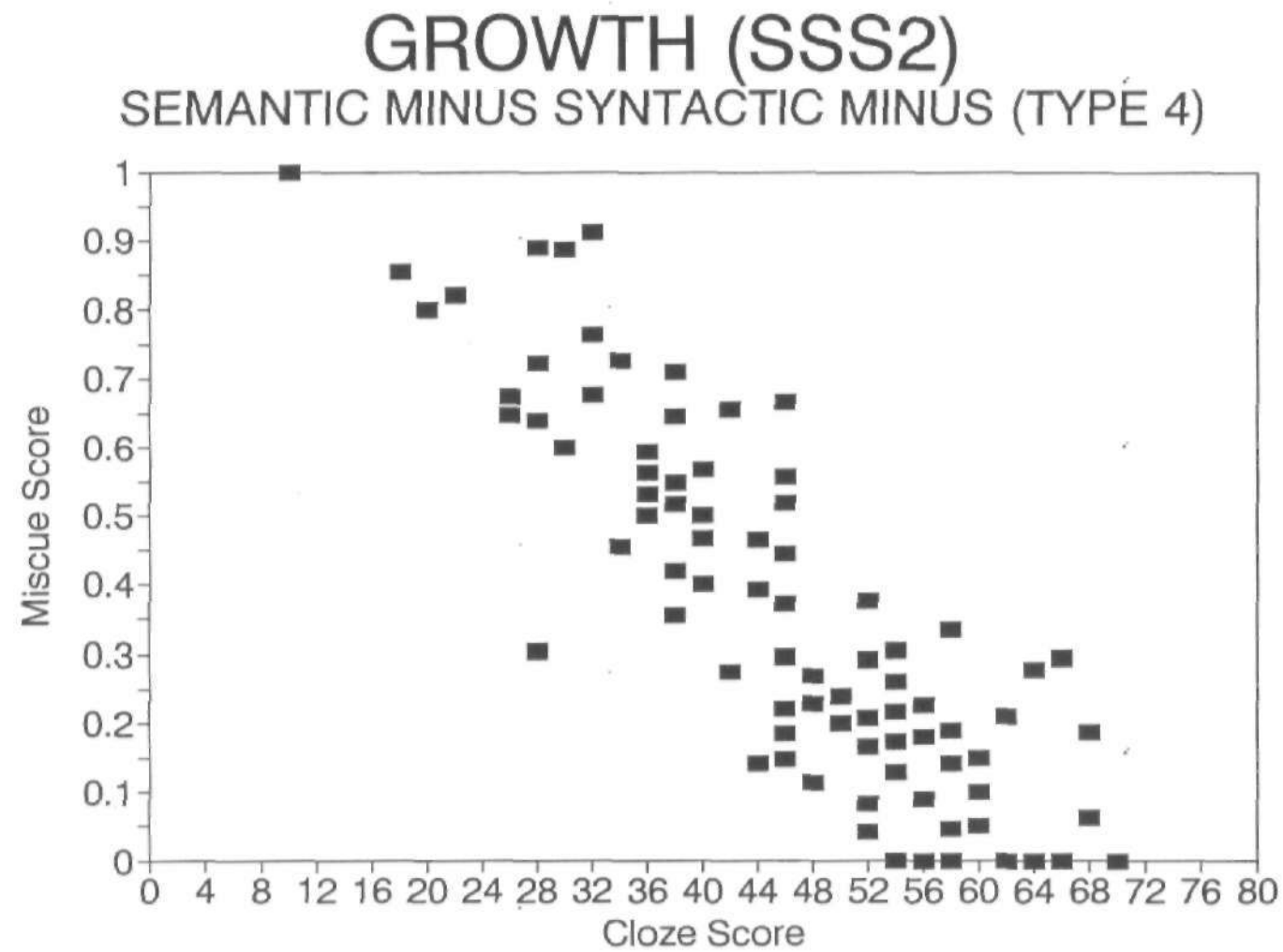


Figure 4.5c. **Scattergramme for TYPE FOUR miscues on *Things that affect the way we grow.*** (N=100)



4.2.5 Summary of findings related to the patterns of changes in Nigerian readers' access to semantic and syntactic cues at different levels of comprehension.

1. An accuracy level effect on miscue quality was confirmed as the proportion of miscues which were both semantically and syntactically acceptable (TYPE ONE: Sem+ Syn+) increased as cloze scores increased. TYPE ONE miscue scores above 60 percent occurred only among readers with cloze scores of 46 percent and above. (See Figures 4.2a-d.)

2. Semantically acceptable but syntactically unacceptable (TYPE TWO: Sem+Syn-) miscue scores revealed that, except at the very lowest cloze score levels, readers continued to make use of semantic information even when they did not have access to syntactic cues. (See Figures 4.3a-d.)

3. Semantically unacceptable but syntactically acceptable (TYPE THREE: Sem-Syn+) miscue scores were generally lower than the scores for the other miscue types and occurred without any relation to cloze score. The higher TYPE THREE miscue scores on passages that contained many deleted function words suggest that students' ability to render a sentence grammatical despite lack of comprehension depends largely on text structure. (See Figures 4.4a-d.)

4. The proportion of miscues which show no access to semantic and syntactic cues (TYPE FOUR: Sem-Syn-) increase as cloze scores decrease. (See Figures 4.5a-d.)

4.3 Objective Three

To find out to what extent readers' access to semantic and syntactic cues are predicted by their cloze scores.

The predictive value of cloze scores is reflected in the correlations between cloze scores and miscue types. Therefore the following Research Question was formulated:

Research Question 4: What are the strengths of associations between each of four miscue types, TYPE ONE, TYPE TWO, TYPE THREE, TYPE FOUR, and cloze scores on each of four texts?

Pearson Product Moment correlations were computed between cloze scores and miscue scores for each of the four miscue types on each of the four passages. In addition, the correlations for TYPES ONE and TWO combined, reported earlier under Research Question One, are included in the table for comparison purposes.

Table 4.3. **Correlations between Cloze Scores and Four Miscue Types on four passages.**

PASSAGE	No.	df	TYPE 1 SEM+ SYN+	TYPE 2 SEM+ SYN-	TYPES 2 & 3 COMBINED (All Sem+)	TYPE 3 SEM+ SYN-	TYPE 4 SEM- SYN-
EYE (JSS2)	100	98	.67*	.52*	.90*	.14	-.93*
WIND (JSS2)	100	98	.62*	.77*	.84*	.62*	-.87*
GROWTH (SSS2)	100	98	.75*	.40*	.88*	.06	-.87*
MACHINES (SSS2)	100	98	.76*	.30*	.75*	.24	-.76*

* $P < .01$

The miscue analysis of the four passages used in the study revealed that certain cloze responses were consistently wrongly predicted by the readers. As will be seen in the examples below, some of the predictions reveal lack of mastery of the syntactic structures used in the passages. Other patterns of responses show readers' attempts to construct meaning using available semantic information. The comparative use of semantic and syntactic cues is reported for each passage.

(A) **Examples from *Care of the Eye.*** (JSS2 Readers)

A1 Text: ***There is an infection of the eye that is called "apollo" (conjunctivitis) in Nigeria.***

There were two deletions in the above sentence which the readers found especially difficult to predict: ***infection*** which was predicted by 35 percent of the 100 readers, and ***Nigeria*** which was predicted by only 9 percent of the readers. The miscues used in place of ***infection*** show that 21 percent of the readers predicted a word which referred to an eye problem (***disease, problem, sickness, injury, illness, eye problem, not well)*** although of these, only injury (3%), illness (2%), and ***eye problem*** (1%) suggest that the readers attended to ***an*** as a cue that the deleted word begins with a vowel. The prediction of ***Nigeria*** was difficult because Nigerian students would have had no opportunity to know that ***Apollo Eye*** is a uniquely Nigerian term for ***conjunctivitis.*** Many readers made imaginative attempts to respond meaningfully. The most frequently used miscue was ***(the) eye(s)*** (35%) followed by ***English*** (7%), while others were ***people*** (6%), ***humans*** (2%),***you*** (2%), ***hospitals*** (2%), ***medicine*** (1%), ***villages*** (1%), ***school*** (1%), ***homes*** (1%) and ***world*** (1%).

A2 Text: ***When people suffer from <u>this</u> infection, their eyes itch, <u>become</u> painful and red, and <u>a</u> discharge may take place.***

This sentence posed severe problems for the readers syntactically. Specifically, the readers found it difficult to predict the verb ***become***, a response made by only 8 percent of the 100 students sampled. The most frequent miscues were not verbs (a total of 68 percent) rendering such constructions as ... ***their eyes itch, <u>it's</u> painful and red*** ... (11%), ... ***their eyes itch, <u>very</u> painful and red*** ... (10%), ... ***their eyes itch, <u>and</u> painful and red*** ... (9%), ... ***their eyes itch, <u>also</u> very painful and red*** ... (5%). On the other hand, the miscues of only 24 percent of the readers were verbs, most of which were not grammatical, and some of which were also not meaningful. The most frequent verb used was ***becomes (7%),*** while the others were ***is*** (4%), ***will be*** (3%), ***are*** (2%), <u>will</u> (2%). ***can*** (2%), ***was*** (1%),***have*** (1%), ***scratch*** (1%) and ***condemn*** (1%).

The article ***a*** in ... ***and <u>a</u> discharge may take place*** was predicted by only 11 percent of the readers. While another 20 percent of the readers substituted a different article, ***the*** (15%), ***this*** (3%), ***those*** (1%) and ***these*** (1%), the majority of the readers predicted either an adjective [for example, ***eye(s) discharge*** (6%), ***water/watery discharge*** (6%), ***apollo*** (3%), ***yellow*** (2%), ***white/whitish*** (2%)] or an adverb [for example, ... ***and <u>then</u> discharge may... (4%), also*** (4%), ***sometimes*** (2%) and <u>*usually*</u> (2%)]. Many of these miscues indicate that the reader understood the meaning of ***discharge*** in the context of this sentence. Only two readers misunderstood the context and predicted ***<u>hospital</u> discharge***.

A3 Text: ***Rest the eye or <u>use</u> eye lotion to get <u>relief</u> from this condition.***

Out of 100 readers only 6 predicted the word ***use*** in the above sentence. However, the majority of the miscues showed comprehension. Twenty four students wrote ***apply*** in place of ***use*** which is highly appropriate and could even be considered a more sophisticated use of language. The word which was most commonly predicted (by 36 readers) was ***put*** which is equally meaningful. However, these readers may not have been sensitive to the absence of ***in*** as in *put in eye lotion* or *put eye lotion in* which results in a slightly awkward construction. Interestingly, nine readers predicted ***rub*** in place of *use*, a word which also showed comprehension as it is appropriately used with ***lotion*** on most parts of the body. The meaning of the word *rub* was apparently not fully understood by these readers or they would have realized that it would not be used for the eye. Another seven readers predicted the word ***wear*** rendering: ***Rest the eye or <u>wear</u> eye lotion....*** This selection is an example of evidence of comprehension by readers with perhaps even less awareness of the subtleties of word meaning.

The responses of 18 readers suggest that they either could not recognise the word ***lotion*** or did not know its meaning. These responses yielded the following meaningless clauses: ***Rest the eye or <u>the</u> eye lotion...*** and ***Rest the eye or <u>your</u> eye lotion...***

The word ***relief*** in the above sentence was not predicted by a single reader. The phrase ***to get relief from*** would appear not to have been familiar enough to the readers for them to predict correctly. However, a number of words were selected by the students which showed evidence of comprehension despite difficulty in producing a grammatical sentence. Examples are:

(a) ...*to get <u>it</u> from this condition*. (30%)

(b) ...*to get <u>free</u> from this condition*.(24%)

(c) ...*to get <u>out</u> from this condition*. (23%)

(d) ...*to get <u>away</u> from this condition*.(14%)

(e) ...*to get <u>rid</u> from this condition*. (8%)

A4 text: ***Particles <u>that</u> get under the upper <u>lid</u> can be more difficult <u>to</u> remove. But someone can <u>help</u> you open the upper <u>lid</u> and blow out the <u>particle</u>.***

The above two sentences contain the word ***lid*** as in ***eye lid***. However only eight students correctly predicted the correct word in either of the two sentences. The most frequent miscue was ***eye*** which was predicted by 46 percent of the readers. The second most frequent was ***part***, used by 29 readers. These responses suggest that the readers understood the sentence but were not familiar with the English words for various parts of the eye. Only one miscue, ***lash,*** is a part of the eye and was used by nine readers, suggesting some, but inaccurate, knowledge of vocabulary used for parts of the eye.

(B). <u>Examples from *Wind*</u>. (JSS2 readers)

This passage contained six deletions of prepositions which readers found particularly difficult to predict.

B1 text: ***What happens when the valve of a car or bicycle tyre is opened? The air comes rushing out.***

The correct preposition, ***out*** was predicted by 41 percent of the readers. Four other prepositions were predicted by the other readers: ***in*** (18%), ***away*** (14%), ***through*** (14%) and ***for*** (13%). The prepositions ***away,*** and ***through*** may be interpreted as meaningful responses as the air rushes away from an open valve and also, rushes through the air from an open valve. The response of ***in*** is more difficult to interpret as it is not clear whether the readers thought of the air rushing in the valve or out of the valve into the place where the tyre was located. The reason for the choice of ***for*** is most difficult to interpret as it renders a completely meaningless sentence.

B2 text: ***This is the clue to the cause of winds.***

Only 14 percent of the readers correctly predicted ***to*** in the above sentence. The most common response was *of* (32%) rendering ***...the clue of the cause of winds.*** Other responses were ***... the clue behind the cause of winds*** (16%); ***... the clue in the cause of winds*** (14%);***... the clue for the cause of winds*** (13%); ***... and the clue about the cause of winds*** (8%). Each of these choices suggests that the readers had an idea about the meaning of the sentence but were, perhaps, unfamiliar with the preposition which is customarily used with the word ***clue.***

D3 text: ***But what causes differences in pressure in the air?***

Only 8 percent of the students predicted ***in*** correctly in the above sentence. On the other hand, 46 percent selected ***of,*** rendering ***...differences of pressure in the air.*** Another 16 percent selected ***... differences between pressure in the air.*** In both

cases the readers' choices showed evidence of comprehension despite the ungrammatical usages.

D4 text: ***This is <u>chiefly</u> due to unequal heating <u>of</u> the Earth's surface.***

In this example, 36 percent of the readers responded correctly. Another 38 percent of the responses were other prepositions: ***<u>on</u> the Earth's surface*** (15%), ***to*** (9%), ***in*** (6%), ***from*** (5%).

D5 text: ***When your back is <u>to</u> the wind, the area <u>of</u> low pressure is to <u>the</u> left.***

The correct response, ***<u>to</u> the wind*** was selected by only 7 percent of the readers. The most commonly selected miscue was ***facing the wind*** (13%) which demonstrates understanding of the sentence although the idea of a *back facing* something is a bit awkward. (One reader solved this problem by responding with ***...back is <u>backing</u> the wind...***) Twelve other prepositions were selected by the readers: ***in*** (13%), ***against*** (8%), ***on*** (5%), ***at*** (3%) ***for*** (2%), ***near*** (2%), ***by, behind, of, with, towards*** (1% each). While most of the readers predicted a preposition, some readers selected adverbs as if the sentence ended with the deleted word, for example, ***...your back is <u>dirty</u>..., your back is <u>wet</u>..., your back is <u>cold</u> ...*** .

D6 text: ***Wind speed indicates, <u>to</u> a certain extent, differences <u>in</u> air pressure between a high pressure region and a low pressure region.***

The expression ***to a certain extent*** was especially difficult for the readers as seen by the fact that only 4 percent correctly predicted ***to***. The most common selection was ***that (19%)***, suggesting that readers may have ignored the comma after ***indicates*** and read the sentence as ***Wind speed indicates that ...*** Similarly, 12 percent of the readers selected ***where*** as in ***Wind speed indicates where ...*** Other readers predicted propositions such as ... ***<u>in</u> a certain extent...*** (18%); ... ***<u>of</u> a certain extent*** (14%); ***<u>for</u> a certain extent*** (13%). The response of 15 percent of the readers was ***is***, a selection for which there were no appropriate semantic or syntactic cues and therefore suggests pure guesswork by the student.

(C) **<u>Examples from *Things that Affect the Way We Grow.*</u>** (SSS2 readers)

C1 Text: ***Generally, disease makes <u>us</u> lose our appetite or <u>desire</u> for food.***

Only ten of the 100 students predicted the text word, ***desire***. In general the responses demonstrated a creative attempt to construct meaning. Most responses showed that the readers recognised that the phrase ***or _____ for food*** was meant to explain the meaning of ***appetite***. The most common responses (out of 100 students) are shown below:

(a) ***...appetite or <u>taste</u> for food***. (46%)

(b)... ***appetite or <u>interest</u> for food***. (25%)

A wide range of words were selected by other readers including ***strength, energy, begging, urge, zeal, quest, hunger, like, love***. In contrast, the miscues of six readers indicate that they predicted that the phrase ... ***or _____ for food*** was an explanation

of the meaning of ***lose our appetite*** rather than ***appetite***. These students responded with ***hatred, lacking, avoidance, giving up, absence*** and ***less emphasis***.

C2 Text: ***Rest ensures that <u>the</u> body has opportunity to <u>recover</u> from strain.***

The text response, ***recover***, was predicted by only 6 percent of the 100 readers. The most frequent miscue was ***relax*** (52%). Another 40 percent of the readers responded with ***rest*** resulting in a less meaningful sentence. Both responses suggest that the readers may either not have had a complete understanding of the meaning of ***strain*** or they did not attend to it as a cue.

C3 Text: ***Did you have enough <u>energy</u> to run about, or <u>did</u> you prefer to lie <u>in</u> bed?***

There were two very frequent miscues in this sentence. The most common was ***on bed*** instead of ***in bed***. This miscue, used by 67 percent of the readers, not only showed comprehension but reflected a more common Nigerian usage than did the original text. The second miscue, however, revealed a problem with access to English syntactic cues. This was the use of ***do*** in place of ***did*** by 54 percent of the readers. These miscues resulted in the following sentence: ***Did you have enough <u>energy</u> to run about, or <u>do</u> you prefer to lie <u>on</u> bed?*** Apparently these readers were unable to recognise that ***Did*** at the beginning of the sentence signalled past tense, having, perhaps, been misled by the present tense in ***run about***.

C4 Text: ***Now think of the days when you have been sick.***

Another problem with access to syntactic cues was revealed in the above sentence. Almost half (45%) of the readers predicted ***time*** instead of ***days*** resulting in ... ***the time when you have been sick.*** These readers did not recognise ***have been*** as a cue for the plural form of the noun in the sentence. On the other hand only 6 percent of the readers predicted the syntactically acceptable form, ***times when you have been sick.***

(D). **Examples from *Maintenance of Machines*** (SSS2 Readers)

D1 Text: ***The use of oil and ball bearings are other ways of reducing friction between moving parts.***

The most difficult part of this sentence was the prediction of ***bearings***, followed by the prediction of ***use***. Only four out of 100 readers predicted ***bearings*** for ***ball bearings*** showing that this was a completely unfamiliar term for most of the SSS2 readers tested. As the cloze scores of these four readers were 72 percent, 68 percent, 54 percent and 48 percent one can see that half of these readers were exceptionally high scorers. The low predictability of this response is reinforced by the fact that no single miscue was predicted more than five times and a total of 53 different miscues were used by the 100 readers. Prediction was made even more difficult by the preceding deletion of ***use*** which was a correct response used by only 28 percent of the readers. However, many students made creative attempts to construct meaning out of the phrase as shown in examples below:

a. ***The putting of oil and ball greasing .....***

b. ***The amount of oil and ball applied ....***

c. *The method of oil and ball grease ....*

d. *The gauge of oil and ball grease ....*

e. *The container of oil and ball connecting ...*

f. *The application of oil and ball greasing ...*

g. *The addition of oil and ball also ....*

D2 Text: *Dirt in parts of a machine will restrict movement and cause wear.*

The unfamiliar usage of *wear* as a noun reduced the predictability of the sentence above. Only 9 percent of the students predicted *cause wear*. Another 15 percent used *prevent wear*, apparently in recognition that *wear* was a noun. However, the sentence this rendered was not semantically acceptable as dirt does not prevent wear. Other responses reflect a general lack of access to either semantic or syntactic cues: for example, ...*will restrict movement and gear wear* (23%); ...*will restrict movement and to wear* (20%);..*will restrict movement and the wear* (16%), and **...will restrict movement and will wear**. (14%)

D3 Text: *As the oil moves round these parts, dirt is collected and after some time, the oil becomes dirty.*

The above example illustrates another problem with use of prepositions which was experienced by most of the readers. Only 8 percent of the 100 children predicted *after* correctly. Of these eight students, seven were high scorers, with cloze scores above 54 percent. All together 15 percent of the readers' miscues were a preposition. Another 43 percent of the readers predicted a verb instead of a preposition. This suggests that these readers did not attend to the cues following the deleted word.

Many of the verbs selected give the impression that the reader assumed that the sentence ended after the deleted word (despite the absence of a full stop there and the presence of a comma after ***time***) and that ***...some time the oil <u>becomes</u> dirty*** was a separate sentence. For example, readers' miscues rendered ***...dirt is collected and <u>removed</u> (10%); dirt is collected and <u>cleaned</u> (4%); dirt is collected and <u>used</u> (2%), (<u>gathered</u> (1%), <u>disposed</u> (1%), <u>thrown</u> (1%), <u>reserved</u> (1%)***. Many of the 26 different verbs selected by the readers showed an understanding of the work done by oil in an engine.

The responses of another 23 percent of the readers suggest that these readers used the entire sentence in predicting the deleted word, ***after***. In this category are the following attempts: ***...dirt is collected and <u>for</u> some time, the oil becomes dirty*** (10%); ***... dirt is collected and <u>then</u> some time, the oil becomes dirty (4%); ...dirt is collected and <u>so</u> some time the oil becomes dirty*** (4%); others **are** ***<u>in</u> some time (3%), <u>at</u> some time*** (2%).

D4 Text: ***If, <u>on</u> the other hand, the <u>engine</u> has no oil at <u>all</u>, the parts inside soon heat up and get damaged during use.***

This is another example of difficulty with use of prepositions. In this sentence almost half (46%) of the students were unable to predict ***<u>on</u> the other hand***. Thirty one percent predicted ***in***, rendering ***<u>in</u> the other hand***. There was no pattern in the rest of the predictions which generally showed lack of access to cues, for example, ***is, car, grease, necessary***.

4.4.1 Summary of findings related to unique processing strategies which may characterise Nigerian readers of English.

1. On each passage there were miscues which showed that many readers compensated for lack of access to syntactic cues by using available semantic information in order to produce a meaningful, but ungrammatical response. This was seen in such examples found in ***EYE:*** A1, A2 A3,***WIND:*** B1, ***GROWTH:*** *C1,* C3, C4, ***MACHINES:*** D1 and D2.

2. Many readers had difficulty with the use of prepositions. In many sentences they predicted a preposition although they were unable to select the correct one. Examples of problems with prepositions are illustrated in C3, C4, ***WIND:*** B1, B2, B3, B4, B5, B6 and ***MACHINES:*** D3 and D4.

3. There is evidence of word by word processing rather than reading an entire sentence before filling in the missing word. In other words, the cues the readers most often used were those before the missing word rather than after, even when the most significant cues came after the blank. Examples are found with ***GROWTH:*** C2 and ***MACHINES:*** D3.

4. The passages contained specialised vocabulary, specific to the topic treated in each passage which were unfamiliar to many readers. However, they were used in the texts without any explanation or examples to assist the students. The miscues of the readers in the study demonstrate a reliance by many on their background knowledge to construct meaningful sentences. Examples are problems with the word ***lid*** in ***EYE:*** A4 and ***bearings*** in ***MACHINES:*** C1. Responses also suggest that readers may have been unfamiliar with ***strain*** in ***GROWTH:*** C2. The problem readers had in predicting ***Nigeria*** in ***EYE:*** A2

falls into this category, in that there was an assumption in the text of prior knowledge which the students didn't actually have.

5. Disregard of punctuation cues was also observed among readers as was seen in ***MACHINES:*** C3 where many readers disregarded the comma and interpreted the sentence as if it were two sentences.

6. The difficulty with sequence of tense observed in ***GROWTH:*** C3 was encountered by the majority of the readers, suggesting that this may be a common problem.

4.5 Discussion of the Research Findings

The findings outlined above are discussed in this section under the following two headings: a. The relationship between cloze scores and reader's access to semantic and syntactic cues; b. Processing strategies of Nigerian JSS2 and SSS2 readers of English as a second language.

4.5.1 The relationship between cloze scores and readers' access to semantic and syntactic cues.

Accuracy level affect. The high correlations reported in section 4.1 confirm that cloze miscue quality is very closely related to cloze accuracy level. Specifically, the correlations obtained between cloze scores and use of semantic cues were .78 for the JSS2 students (n = 200) and .79 for the SSS2 students (n = 200). The r^2 gives coefficients of determination of .6 (JSS2) and .62 (SSS2). In other words, at each class level at least 60 per cent of the variance among the semantically acceptable miscue scores was accounted for by the variance in the cloze scores. (See Table 4.1.)

It is this high correlation that enables confidence to be placed in the predicted comprehension levels. This confidence is reinforced by the fact that the linear relationship between cloze scores and semantic miscue scores were nearly identical for the JSS2 readers and the SSS2 readers. (See Figure 4.1.) Similarly, the predicted comprehension levels were very similar for both class levels despite the fact that different class levels and different passages were used. There was never more than a three percentage point difference between the comprehension level which was predicted by a given cloze score for the two levels of schooling.

It is also interesting to observe the high negative correlations between cloze scores and TYPE 4 (Sem-Syn-) miscues on all the passages. (See Table 4.3.) This demonstration of the accuracy level effect in reverse provides further basis for confidence in using miscue scores as a basis for predicting comprehension levels.

In interpreting cloze scores with reference to comprehension levels, it is important to consider the factors other than cloze score which may have influenced semantic miscue scores. The correlations between semantic miscue scores and cloze scores reported earlier indicated that about 40 percent of the variance in semantically acceptable cloze scores may be due to some other factors. The scattergrammes showing the relationship between cloze scores and the other miscue types similarly suggest that patterns of miscue scores are subject to other influences in addition to accuracy level. These are discussed under text factors and non-text factors.

Text factors. It is obvious that no two text passages can be equated in all respects. If the language of a text is to flow naturally, such factors as sentence length and complexity, vocabulary load, proportion of content and function words, cohesive

elements, and so forth, would be expected to vary from text to text. As Wixson (1979, p.170) observes "... different types of material present readers with different problems, resulting in a variety of miscue patterns." The findings of this study provide strong evidence that at least some text factors contributed to the variance in the miscue scores.

Although some of the above factors are measured by readability formulas (specifically sentence length and vocabulary load), in the present study there was considerable variance in miscue types between passages with similar readability levels. The FOG readability estimate for the two JSS passages were 7.28 for *Eye* and 7.58 for *Wind*. (See Table 3.2a.) According to these estimates both passages should be almost equally suitable for JSS1 readers with *Wind* being slightly more difficult. In fact, the mean cloze score for *Eye* was 37.7 (n=398) while that for *Wind* was 34.7 (n=399) in keeping with the FOG estimates of the relative difficulty of the two passage.

The FOG readability estimates for the two SSS2 passages were 9.24 (JSS3) for *Growth* and 10.1 (SSS1) for *Machines*.(See Table 3.2b.) Again one would expect a slightly better performance on GROWTH than on *Machines*. In fact, the mean cloze score for *Growth* was 47.4 (n=295) while that of *Machines* was 44.3. (n=307).

Having confirmed the similarities between the readability estimates and the cloze scores on the two JSS2 passages and the two SSS2 passages, one would have expected fairly similar patterns of miscues on the two passages at each level. These patterns were presented in Chapter 4 on the scattergrammes showing the distribution of readers' use of each of four miscue types on each passage and will now be discussed miscue type by miscue type.

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miscues was very similar on both passages. However, the scattergrammes showing the TYPE TWO (Sem+Syn-) miscue scores display considerably higher miscue scores on *Growth* than on *Machines*. (See Figures 4.3c and 4.3d.) The reverse is the case with TYPE THREE (Sem-Syn+) scores which were higher on *Machines* than on *Growth*. (See Figures 4.4c and 4.4d.) This suggests that the number and type of function words in *Machines* many have encouraged the readers to use syntactic cues which were not available in the other passage.

There is further evidence of the influence of the function words on use of miscue type by examining the mean semantic and syntactic miscue scores on each of the passages as shown in Table 4.4 below. The semantic miscue scores were obtained by combining the scores of the two Sem+ miscue types (TYPE ONE: Sem+Syn+ and TYPE TWO: Sem+Syn-) while the syntactic miscue scores were obtained by combining the scores of the two SYN+ miscue types (TYPE ONE: Sem+Syn+ and TYPE THREE: Sem-Syn+). From Table 4.4 one can see that for the JSS2 and SSS2 readers, their mean semantic miscue scores were lower on the passage which had a relatively higher proportion of function words suggesting that difficulty in predicting some of the function words may have affected their comprehension. This may be particularly the case with prepositions which were shown in section 4.4 above. However, the mean syntactic miscue scores of the JSS2 and SSS2 students do not show a similar relationship, making it difficult to make an generalisations about the role of function words with a degree of confidence. What is apparent, however, it that each text has its own unique characteristics, including both the combination of function and content words as well as the particular types of function words common to the passage, which may or may not affect access to contextual cues.

Table 4.4. **Mean Semantic and Syntactic Miscue Scores with Proportion of Function words on each of Four Passages.**

PASSAGE	PROPORTION OF FUNCTION WORDS	MEAN SEMANTIC PLUS MISCUE SCORES	MEAN SYNTACTIC PLUS MISCUE SCORES
CARE OF THE EYE (JSS2)	34%	.51	.34
WIND (JSS2)	**44%**	**.22**	**.16**
THINGS THAT AFFECT GROWTH (SSS2)	32%	.61	.31
MAINTENANCE OF MACHINES (SSS2)	**40%**	**.40**	**.39**

Non-text factors. Non-text factors which are known to affect comprehension are prior knowledge about the topic being read and purpose for reading. Related to these is year of schooling and/or age of the reader. Wixson (1979) reports studies of oral reading miscues which suggest that these factors also affect miscue patterns. There is some evidence in the present study suggesting a relationship between prior knowledge and the access to semantic information. As seen from Table 4.5 below, the prior knowledge score for *Wind* was the lowest of all the scores. In other words, the prior knowledge tests showed that the JSS students had considerably less background knowledge about wind as a topic than they had about how to care for the eye. This includes lack of vocabulary knowledge as well as unfamiliarity with the related concepts such as air pressure which were dealt with in the passage. The low mean semantic miscues score for *Wind* may have been a reflection of this unfamiliarity.

Table 4.5. **Mean Semantic and Syntactic Miscue Scores with Prior Knowledge Scores on Each of Four Passages.**

PASSAGE	MEAN PRIOR KNOWLEDGE SCORES	MEAN SEMANTIC PLUS MISCUE SCORES	MEAN SYNTACTIC PLUS MISCUE SCORES
CARE OF THE EYE (JSS2)	35%	.51	.34
WIND (JSS2)	18%	.22	.16
THINGS THAT AFFECT GROWTH (SSS2)	66%	.61	.31
MAINTENANCE OF MACHINES (SSS2)	57%	.40	.39

Purpose for reading as a factor affecting comprehension refers to the motivational level of the reader. For example, motivation varies according to whether one is reading for recreation, for personal knowledge or to pass an exam. Thorton (1972) observed variation in miscue patterns among primary five readers according to their purpose for reading. It is reasonable to expect that the motivational level of the students taking a cloze test would be of importance. Students with a high commitment to the task would be more inclined to examine the text for clues than would poorly motivated students who rushed through the test. In the present study, one can assume that some students were more highly motivated than others. However, as no attempt was made to classify the readers according to their motivational level, the relationship between motivation and miscue patterns was not investigated.

The possible influence of year of schooling on miscue scores must also be considered. There was a three year gap between the JSS2 and SSS2 readers in the study. The possibility of a developmental effect is suggested by the fact that both the mean semantic and syntactic miscues scores of the SSS2 students were higher than for the JSS2 students as shown in Table 4.6 below.

> miscues. Further, one would expect the percentage of syntactically acceptable miscues to exceed that of the semantically acceptable miscues by at least 20 percent. (p.166)

In contrast to the above, in the present study the proportion of semantic acceptable miscues was consistently higher than that of syntactically acceptable miscues. As was shown in Table 4.4 above, on one JSS2 passage the percentage of semantically acceptable miscues exceeded that of syntactically acceptable by 17 percentage points and by six percentage points on the other. At the SSS2 level, the percentages were 30 percentage points on one passage and one percent on another.

On the other hand in the present study many readers encountered some parts of the text where only syntactic information was available to them, and they used this information to produce TYPE 3 (Sem+Syn-) miscues. In other words, there was observed to be a trade off between use of semantic and syntactic information while reading, with a heavier reliance on semantic processing. This finding would appear to be consistent with the interactive compensatory model of the reading process postulated by Stanovich (1980). It adds a new dimension, however, to Stanovich's theory of reading as it introduces evidence of a trade off between semantic and syntactic information in addition to the earlier established trade off between top-down and bottom-up processing. To what extent this may be a unique characteristic of L2 readers has yet to be fully investigated. As was reported earlier, Ewoldt has shown evidence of semantic processing of deaf readers whose access to standard English syntax is even more limited than that of Nigerian L2 readers. This provides further support for the theory that readers can compensate for lack of one cueing system by relying heavily on another.

It must be observed, however, that there was very little evidence of this trade off at the lower cloze score levels. It would appear from observation of the scattergrammes showing TYPE 2 (Sem+Syn-) and TYPE 3 (Sem-Syn+) miscues that the readers with cloze scores below twenty percent either lacked access to semantic or syntactic cues or were unable to make use of such cues in predicting deleted words. Semantic and syntactic cues would not be available to a reader with poor word recognition skills and/or very limited knowledge of English vocabulary and syntactic structure. On the other hand, there is some evidence that not every reader who has acquired basic word recognition skill as well as knowledge of English views reading as an interactive and communicative process. (See Oyetunde, 1988.) Such individuals rarely apply background knowledge or use information from one part of a passage to make meaning out of another part. In other words readers concept of reading may also influence their strategies.

CHAPTER FIVE

CONCLUSIONS

AND

RECOMMENDATIONS

schools and two administered to SSS2 students in Jos. Miscues were judged according to their semantic and syntactic acceptability in a sentence and each student's miscue score for each of four categories of miscues was determined. These miscue scores were correlated with cloze scores. Regression analysis was used to predict comprehension levels associated with cloze scores. Patterns of miscues among readers were also examined to find out about reader strategies among L2 readers of English. The specific objectives of the study are given in 5.0.1. below and the main findings in 5.0.2.

5.0.1 The objectives of this study

1. To find out the levels of comprehension associated with cloze scores on two passages read by JSS2 students and two passages read by SSS2 students.
2. To find out the patterns of changes in Nigerian readers' access to semantic and syntactic cues at different levels of comprehension.
3. To find out to what extent readers' access to semantic and syntactic cues are predicted by their cloze scores.
4. To find out any unique processing strategies which may characterise Nigerian readers of English.

5.0.2 Summary of research findings

The results of the analyses presented in chapter four revealed the following main findings:

1. Comprehension levels which could be predicted by cloze scores were established for JSS2 and SSS2 students. The predicted comprehension levels

associated with selected cloze scores are given in Table 5.1 below. By looking at the table one can select any given cloze score and then read the numbers in the column below to find the predicted percentage of the passage which a JSS2 and SSS2 reader would comprehend if that was the score he obtained on a cloze test.

Table 5.1. **Predicted comprehension levels at selected cloze scores.**

CLOZE SCORE	40	44	46	48	50	52	54	56	58	60	62	64
PREDICTED % COMPREHENSION FOR JSS2 READERS	68	73	76	78	80	83	85	87	88	90	92	93
PREDICTED % COMPREHENSION FOR SSS2 READERS	66	72	75	77	80	82	84	86	88	90	92	94

2. The cloze scores of both the JSS2 and SSS2 readers were significantly related to the quality of their miscues.

   a. The proportion of miscues which were both semantically and syntactically acceptable was associated with high cloze scores and decreased as cloze scores decreased.

   b. The proportion of miscues which were semantically acceptable but which were not grammatical decreased as cloze scores decreased.

   c. The proportion of miscues which were neither semantically nor syntactically acceptable increased as cloze scores decreased.

3. Miscues which were syntactically acceptable but not meaningful appeared at all cloze score levels except for the very lowest. In general, this occurred when the deleted word was a function word.

4. Characteristics of unique processing strategies include reliance on semantic processing when the readers lacked access to syntactic cues. Readers were also found to have problems with prepositions and problems with making use of information that follows the deleted word.

5.0.3 Summary of the discussion of the findings

In considering the relationship between cloze scores and reader's access to semantic and syntactic cues, it was observed that the correlations showed that about 60 percent of the variance among the semantically acceptable miscue scores was accounted for by the variance in cloze scores. This confirmed the "accuracy level affect" and supported the use of semantically acceptable miscues in predicting comprehension levels. About 40 percent of the variance would be accounted for by other factors, particularly by text factors which could include the proportion and type of function words in the passage. There was reason to believe that non-text factors such as prior knowledge, motivation and a developmental affect may also have influenced the readers' access to contextual clues. A heavy reliance on semantic processing as well as evidence of a trade-off between the use of semantic and syntactic information appeared to be consistent with the interactive compensatory model of the reading process. It was observed however that there were many readers with low cloze scores and these readers were unable to make effective use of available contextual cues.

5.1. Implications

5.1.1 Uses of the predicted comprehension levels in Nigerian schools.

The main objective of the present study was to determine what a cloze score means in terms of how well a Nigerian reader of English as a second language can comprehend a given text. The comprehension levels found in the present study to be associated with cloze scores should now make it possible for teachers of JSS2 and SSS2 students to predict the extent to which a text would be understood by a student. For example, a JSS2 teacher could administer a cloze test on a portion of a textbook intended for use in his class. Assuming the cloze test was developed out of a representative section of the book, the teacher could use the cloze scores of the students to predict how well the students could be expected to comprehend the textbook. Bormuth (1971) introduced his report of his search for cloze criterion scores with the following rationale for such criteria in the school setting:

> ...[teachers] can make a cloze test from a sample of the materials they are using in instruction and obtain the student's score on that test. If his score approximates the passage criterion score, it may be interpreted as representing the most desirable level of performance, and the materials would thereupon be judged as suitable for use in his instruction. If his score fell above or below the criterion score, it would be interpreted as showing that he was receiving less than the maximum benefit from those materials; that is, that some important values were being sacrificed by those materials for his instruction--whereupon his instruction would be altered by altering the readability of the materials, by selecting more appropriate materials, or by providing him with a different amount of preparation before he studied the materials. (p.13)

As was noted in the discussion of the research findings (4.5.1) about sixty percent of the variance in semantic miscue scores was found to be accounted for by variance in cloze scores. Some possible text and non-text factors which may influence the other forty percent were also discussed. In considering the application of the

criterion scores in the schools it is necessary to consider the following implications of these factors:

1. In interpreting cloze scores teachers must recognise that the predicted comprehension scores are approximations. The caution expressed by Bormuth in his 1971 report of new cloze criterion scores earlier appears appropriate here:

> ...the criterion scores presented here are probably much superior to any performance criterion presently in use, even though these new criterion scores represent only the crude first approximations to those ultimately sought as passage performance criteria. However, they should not be used by practitioners and researchers without considerable caution... (p.145)

2. It is advisable to examine the passages to be used in preparing a cloze test in order to avoid text which would be likely to distort the predicted comprehension scores. Passages that are selected should be "typical", in terms of sentence complexity and vocabulary load, relative to the rest of the book from which they are drawn.

3. As the predicted comprehension levels were based on expository passages, and in view of the apparent influence of text factors on miscue scores, the findings of the present study should not be applied to non-expository text.

The examples given below show how the predicted comprehension levels can be used to interpret cloze scores to guide educators in making the kinds of instructional decisions suggested by Bormuth. In using the examples below a number of instructional factors affecting reader comprehension must be taken into account. The first is the purpose for reading. Obviously the comprehension level of a reader on recreational reading material need not be as high as on textbooks used in classroom instruction. Secondly, the degree of instructional support students will be given should be taken into consideration. If a textbook is used during the class period the teacher can use a number of pre- and post-reading activities to enhance

comprehension. If, on the other hand, the textbook is designed to be read by the students independently, one would require a much higher level of comprehension for the student to benefit from it. A third factor, which is recognised to be important in Special Education, is the past experiences the student has with textbooks. It is widely recognised that students who have experienced reading failure avoid reading books that appear to be at all challenging to them. One of the first tasks of a Special Education teacher is to select books which are easy for the reader, and to gradually build up his confidence and his skills. This factor should also be taken into account by classroom teachers. As was noted earlier, there is strong evidence that a high proportion of students in schools in Nigeria are expected to read books which are too difficult for them. Years of failure experiences on the part of the readers result in lack of confidence and negative attitude towards reading. Among students for whom this has been the case, books with the highest potential for comprehensibility should be selected.

Example 1: Textbook Selection. Cloze tests are a simple means of comparing the relative difficulty of more than one text for students in a given school. For example, the Ministry of Education may want to find out which of three or four available textbooks for JSS2 Integrated Science to purchase for use in the Government schools in the State. One or two passages from each of the books can be selected and made into cloze tests using the standard procedure described earlier. These cloze tests can be administered to JSS2 students in selected schools in the State. After scoring the cloze tests, the mean cloze scores on each textbook for each school can be obtained. One can then use the predicted comprehension scores to find out the extent to which the text would be comprehended by the average student in each school. This would then serve as a guide in selection of the appropriate text book. For example, one might find that the mean level of comprehension for Textbook A is only 41 percent

while for Textbook B it is 80 percent. Textbook B would certainly be a preferable choice. On the other hand if the mean comprehension score for Textbook C is fairly close to Textbook B, perhaps 85 percent, other factors, such as content and cost may be taken into consideration to select between those two textbooks.

In some states there may be schools with considerably higher standards than others, as for example, some rural and some urban schools. By administering the cloze tests in both types of schools it would be possible to select different textbooks for different schools, according to the various comprehension levels in the various schools.

Example 2: Cloze testing for planning instruction. In this example, it will be shown how a teacher can administer a cloze test in the classroom and use the information obtained in order to plan instruction. The data is drawn from the cloze test scores of the students in the six schools used in the present study. Examples are based on the mean scores for JSS2 students for school one and school five. (See Table 5.2 below.)

Table 5.2. **Mean cloze scores of JSS2 students in 6 schools with their predicted comprehension levels.**

SCHOOL	JSS2 Mean Cloze Score	JSS2 Mean Level of Comprehension
ONE	51%	82%
TWO	43%	72%
THREE	35%	64%
FOUR	34%	59%
FIVE	32%	56%
SIX	20%	34%

It can be seen from the table above that the average level of comprehension for the JSS2 readers in School One was 82 percent while for students in School Five it was only 56 percent. This shows us that the JSS2 textbook could be used fairly successfully in School One. The mean comprehension level is too low for the book to be assigned to students to read independently, but it could be used as part of classroom instruction. The teacher could support the readers with pre- and post-reading activities. Pre-reading activities include activating prior knowledge, vocabulary development activities and guiding the students to set a purpose for reading. (See Thelen, 1982; Pearson, 1985; Klein, M.L., 1988.) Pre-reading questions should be used to stimulate students' curiosity about a passage to be read, activate prior knowledge, lead students to anticipate and elaborate on what they read and focus attention on important information (Moor, Readence and Rickelman, 1989). Post-reading activities include guided class discussion (See Alvermann, Dillon and O'Brien (1987), use of post-reading questioning at literal, inferential and evaluative levels as well as activities which give the students the opportunity to apply the new information gained from their reading (see Pearson & Johnson, 1972).

For School Five, however, where the mean comprehension level was only 56 percent, the textbook is clearly far too difficult for the students for it to be used for classroom instruction. In such cases, the teachers would find it necessary to present the information in the textbook in ways which would not involve requiring the students to depend on reading the book. The teacher would need to use the textbook judiciously during class discussions, drawing the students' attention to the relevant pictures and diagrams and, perhaps, assisting them in reading the captions and end of chapter summaries. In the meantime, ideally there should be a remedial reading

programme in the school to upgrade the reading skills of the students in this school, most of whom are clearly unprepared to cope with JSS level reading material.

Example 3: Cloze testing for meeting individual needs in the classroom. It is important for a class teacher to be able to identify those students who are excellent readers and those who are very poor readers. Both categories of students require some special attention if their learning is to be maximized. By administering a cloze test based on a passage from the text to be used in the class the teacher can identify the students whose comprehension levels fall into either of the extreme categories. An example is given in Table 5.3 below using the scores of the students in one JSS2 class tested as part of the present study.

Table 5.3. **Distribution of students in one JSS2 class of 39 students according to High, Medium and Low levels of comprehension.**

COMPREHENSION LEVELS	**HIGH COMPREHENSION** (Comprehension levels 90% and above)	**MEDIUM COMPREHENSION** (Comprehension levels between 50% - 89%)	**LOW COMPREHENSION** (Comprehension levels below 50%)
NUMBER OF STUDENTS	4	29	6

In this example, it can be seen that the bulk of the students comprehended between 50 percent and 89 percent. In fact the mean cloze score for this class was 43 percent which is the score which predicts 72 percent comprehension. These scores suggest that most of the students would benefit from classroom instruction which included carefully guided use of the textbook as described earlier. However, there were four students in this class with comprehension levels of 90 percent or above. Such

excellent readers would benefit from a more stimulating programme than the normal classroom instruction. As these students can comprehend the textbook fairly independently, they could be given special assignments which involve the textbook along with any additional material on the topic which may be available in the school. On the other hand, there were six students in the class whose reading levels were so low that they are unlikely to benefit at all from the regular classroom instruction unless some special attention is given to them. These students should sit near the front of the class, preferably paired with strong students. The teacher should ensure that they are involved in class discussions while refraining from calling on them to read orally. If Special Education is available in the school, these students would need to be referred for remedial reading instruction.

Example 4: Cloze testing in Special Education. In this example, it will be shown how a teacher can use the cloze tests in the identification of students who require special education services. Two techniques may be used for identification, screening tests and teacher referrals. Although either screening tests or teacher referrals may be used, a combination of the two is most successful in identification. Using the example of JSS2, the Special Education teacher requests the subject teachers to give names of those JSS2 students whom they have observed to be poor readers. The Special Education teacher then administers a JSS2 level cloze test to all of the students. After examining the scores the teacher may select the criteria for entry into a Special Education programme. For example, all students with a comprehension level of 50 percent or below may be considered for special education. The teacher then compares the performance of the teacher-referred students with their

performance on the cloze test to find out if they fall into the category of those being considered for the Special Education programme. In most cases the screening test confirms the information from the teacher referrals. However, sometimes teachers mistakenly refer students who are actually good readers, but who are poorly motivated, exhibit behaviour problems, and so on. On the other hand, the screening test may enable the Special Education teacher to recognise poor readers whom the teachers had failed to notice, particularly very quiet students or students who are clever at hiding their academic problems. The Special Education teacher will make a final selection of students according to the time and resources available for remediation.

Example 5: Cloze testing for evaluation of schools. Programme evaluation is essential in order to ensure accountability, especially in the use of public funds. While SSS3 results may be useful in summitive evaluation, there are obvious advantages in appraising the quality of instruction at the lower levels. Cloze tests can effectively serve as one of the instruments used for this purpose. Using Table 5.2 above, for example, one can see that in School Six, which is a State school, the predicted comprehension level of the average JSS2 student was only 36 percent. Such a poor performance would suggest the need for the State to take urgent measures to bring the standards of the school up to a more acceptable level.

Example 6: Cloze testing in textbook publication. As the readability of textbooks is a major factor in their effectiveness as an instructional tool, writers and publishers can benefit from the information obtained by administering cloze versions of selected

passages on a sample of the target population. The comprehension levels obtained would serve as a guide as to whether the text would be appropriate for the students for whom it has been written. This would enable writers to make necessary modifications before the textbook is finally printed.

5.1.2 Application of the findings related to processing strategies to classroom instruction.

Teachers in the secondary school are in a position to upgrade the reading skills of their students if they are aware of the processing strategies which have been found to characterise L2 readers and of their instructional implications. These are discussed below.

Semantic processing. The evidence of semantic processing among the readers who took part in the present study has important implications for classroom instruction. It is encouraging to observe that many readers continued to search for meaning on text which contained unfamiliar grammatical structures. This has important implications for classroom instruction. Yurkowski and Ewoldt (1986) assert, with reference to deaf readers, that

> Semantics can serve as a bridge for the reader in dealing with difficult syntax. But the bridge must be built with care. Semantic processing depends on clear, well-written text and adequate background knowledge. Reading teachers can provide background knowledge through experiences--field trips, use of media, role playing, etc. (p.246)

The semantic processing of Nigerian readers of English as a second language can similarly be encouraged. This emphasizes the need to train teachers in all subject areas on how to bridge the gap between the students' background knowledge and the new information in a text. Preparation for reading a text should include activities

which activate prior knowledge as well as fill in deficiencies in the students' knowledge. The research of Yurkowski and Ewoldt (1982) has also led them to recommend the use of simple reading material to build background and experience to assist the reader in coping with more complex text. This suggestion could be put into practice by English teachers and Special Education teachers who would need to direct their students to read simple books or stories on a particular topic in preparation for a syntactically more difficult text on the same topic.

Upgrading the ability of Nigerian L2 readers to use English syntactic cues while reading. While building on the semantic abilities of the students, it is also important to develop the syntactic skills of the readers, especially in the areas of identified deficiencies. For syntax to be available as a cueing system, it is not enough for a reader to know rules of grammar. The reader must have internalised syntactic structures so that he can use them intuitively for prediction while reading. This involves increased exposure to standard English models. The implications of this for instruction in Nigerian schools are discussed below.

1. Students need ample opportunity to practise reading. This implies the availability of a variety interesting and well written reading material suitable for a wide range of reading abilities. Extensive reading activities can be encouraged in schools through library programmes and readers clubs. The introduction of School Wide Silent Reading programmes in secondary schools as described by Abe (1985) would build extensive reading into the school timetable.

2. The quality of spoken and written English among teachers at the primary and secondary school levels would need to be upgraded in order to ensure that teachers provide good models of English syntax.

3. The syntactic structures which have been found to be particularly difficult for Nigerian students could be deliberately taught. The uncertainty concerning selection of prepositions, for example, can be reduced if students are first given correct models and then encouraged to practice using them in a variety of meaningful written exercises. Similarly, there would appear to be a need for direct teaching of expressions such as *to a certain extent, after some time*, and *on the other hand*. The findings of the study also suggest the need for improved instruction in sequence of tense.

Upgrading basic reading skills. The study revealed that many readers performed very poorly on the cloze tests and that those readers had virtually no access to semantic and syntactic cues. This suggests that there is an urgent need to upgrade the basic reading skills of these poor readers and to promote the correct concept of reading as personally meaningful communication. Remedial reading classes should be compulsory in JSS1 for all students so identified. Many of the problems observed among the students in the present study could be overcome in such a programme. For example, the practice of reading up to and not beyond an unfamiliar word can be corrected and readers taught how to make full use of context before and after unfamiliar words. The problems of inattention to punctuation as cues while reading can also be dealt with in such lessons. This would also be an opportunity to make up

for deficiencies in specialised vocabulary that the students will be expected to use in their regular JSS2 subjects.

In addition Special Education *reading resource teachers* should be posted to secondary schools for more intensive work with individual students with severe reading problems. The experience of the researcher is that the bulk of the graduates in the area of learning disabilities are absorbed in the secondary schools as teachers of their Nigerian Certificate in Education (NCE) subjects. This could be due partly to ignorance on the part of the school authorities concerning the potential value of their Special Education skills in the schools and partly due to the cost of employing such specialist teachers. There is, therefore a need for an increased awareness of the problem of poor reading ability among secondary school students, an understanding of the role of the Special Education *reading resource teacher*, and a commitment to improving the quality of reading instruction in the schools.

5.2 Recommendations

5.2.1 Cut-off Points for Frustration, Instructional and Independent Levels

It must be noted that in reporting the comprehension levels established in the present, no attempt has thus far been made to suggest cut-off points between frustration, instructional and independent reading levels. It will be recalled that the most widely used criterion scores for cloze tests, such as those of Bormuth (1968) and Rankin and Culhane (1969) were the result of an attempt to find out what scores on cloze tests were comparable to the 75 and 90 percent criteria, attributed to Betts (1946) for use with multiple-choice comprehension tests and Informal Reading Inventories. However, as was reported earlier, Bormuth's subsequent studies disregarded the 75-90 percent

criterion scores after having confirmed that these scores had never been validated and were apparently arbitrary. However, there are advantages to tentatively recommending cloze score cut-off points for frustration, independent and instructional reading comprehension levels. The most practical reason is that it is unrealistic for a classroom teacher to be expected to recall, or have access to, a table of scores such as that presented in Table 5.1 above. It will be recalled that after Bormuth's criterion scores of 44 and 56 percent were established in his 1968 study, Bormuth undertook a very comprehensive study published in 1971 in which he reported three separate criterion scores for each class level. However, despite these efforts to improve on his 1968 study, the scores which textbooks normally suggest are the 44 and 56 percent scores based on Bormuth's 1968 study. One may only speculate as to why this is so, but it is reasonable to assume that it is because it is much easier to have to recall only two scores than it is to have to rely on a table of figures.

The issue of the validity of basing cloze criterion on the 75 and 90 percent comprehension criterion scores must still be considered. It has been observed that these scores have been commonly accepted despite the lack of research evidence of their validity. Simple common sense and personal experience can be used, however, in considering the utility of such scores. Obviously if we pick up a text and understand at least 90 percent of that text, we can confidently apply that knowledge without any difficulty. If we understand at least 75 percent of a text but not as much as 90 percent of it, we are usually making an effort to understand the text and would benefit from some assistance. As an adult this would be in the form a discussion with another reader, perhaps, or simply consultation of a dictionary or other reference book. For students this support would come from the classroom teacher and could,

therefore, be considered to be instructional level comprehension. Finally, if we understand less that three quarters of the text, there are important gaps in our knowledge of the information in the text affecting our ability to relate the information to what we already know and to use it meaningfully. Such fragmented comprehension would be frustration level reading.

Finally, the confidence in tentatively recommending cut-off scores based on the present research came from the remarkable similarity between the scores which correspond with 75 and 90 percent in the present study and those of the earlier cloze criterion research. This is presented in Table 5.4 shown below.

Table 5.4. ***Cloze test percentage scores comparable to 75% and 90% comprehension criteria.***

Traditional Multiple Choice Scores	Alexander (1968)	Bormuth (1968)	Rankin and Culhane (1969)	Present Study
75% Instructional	47%	44%	41%	**46%**
90% Independent	61%	58%	61%	**60%**

It will be observed that the cloze score which is predicted in the present study to be associated with 75 percent comprehension is 46 percent. Specifically, it was found that for the JSS2 readers a cloze scores of 46 percent predicted 76 percent comprehension while for the SSS2 readers a cloze score of 46 percent predicted 75 percent comprehension. (See Table 5.1 above.) The cloze score that predicted 90 percent comprehension in the present study was found to be 60 percent for both the JSS2 and the SSS2 readers. These two cloze scores are remarkably similar to the scores of Alexander's (1968) correlational study of cloze and IRI scores and to the independent level criterion score of Rankin and Culhane (1969). In addition, the

scores are only two points higher than the most commonly applied criterion scores of 44 to 56 percent for instructional level based on Bormuth's 1968 study. This serves as an encouragement to recommend the scores obtained in the present study since, given the importance of ensuring that the reading material given to Nigerian L2 students is not on their frustration level, the higher scores would provide a more conservative prediction of the students' comprehension. In practice, what this means is that secondary school teachers could be taught that if students score below 46 percent on a cloze test, the text from which the cloze passage was drawn is likely to be on their frustration reading level. Similarly, teachers could be taught that reading material on which students' scored 60 percent or above are appropriate for the students to be given for independent reading. With proper training in the use of cloze testing and in the application of these two criterion scores, teachers would have a guideline to use in predicting how well students can be expected to comprehend the material used in the classroom. Some suggestions related to teacher training are made in the next section.

5.2.2 Teacher Training

For effective use of cloze, it is imperative that both pre-service and in-service teachers are fully trained in the construction, administration and interpretation of cloze tests. Some recommendations on how this can be accomplished follow.

Pre-service training. A compulsory course in Content Area Reading Instruction is essential for all pre-service secondary school teachers, both in Universities and in Colleges of Education. Content area reading courses are designed (a) to develop in education students an understanding of the reading process; (b) to help them recognise

the reading demands of their subject area on secondary school students, and (c) to equip them with techniques to help their students develop the skills necessary to benefit fully from the reading material used in each subject. This compulsory Content Area Reading course would include training in the construction, administration and interpretation of cloze tests. Students would be given practice in selecting a passage from their subject textbook and constructing a cloze test from them. They should be given practical experience in administering the test to students in schools. They would then be taught how to score and interpret the tests. Finally, the students would be shown how to use their test results in guiding their teaching as was described in the examples above.

In-service training of content area teachers. Workshops and seminars for teachers are generally recognised to be an effective means of introducing innovations to practising teachers. State branches of the Reading Association of Nigeria (RAN) have been particularly active in conducting workshops on various aspects of reading instruction for teachers. It is recommended that this means of reaching teachers be expanded and intensified, preferably with financial backing by the Ministry of Education, in order to promote the use of cloze testing in schools. To be most effective, workshops should first be mounted for Ministry Inspectors and School Administrators. This is because the experience of RAN has shown that teachers are reluctant to introduce innovations in their classrooms without the backing of their superiors. (See Fuanbial, 1990.) The content of such workshops should be similar to that of the content area reading course for pre-service teachers, but adapted for workshop settings.

Training of secondary school English teachers. The role of English teachers in developing reading skills is different from that of the content area teachers. English teachers have a primary responsibility to develop reading skills which the students need to be successful in their other subjects. For this reason, pre-service training for English teachers should include basic courses in reading theory, developmental and remedial reading instruction as well as reading assessment.

Training of Special Education reading resource teachers. The high incidence of reading failure in schools points to the urgent need for reading specialists in Secondary Schools. Reading resource teachers are needed to upgrade the reading skills of those students who are identified as poor readers. Such specialists would work with individual students, with small groups of students and assist the regular teachers in carrying out assessment and planning instruction. Part of the latter would include guiding teachers in using cloze testing with their students.

At present, Special Educators in the field of Learning Disabilities are being trained as reading resource teachers in the University of Jos, University of Ibadan and the Federal College of Education (Special), Oyo. This training normally includes work in the area of reading assessment. It is recommended that such courses be expanded where necessary to ensure that the students are fully trained in all aspects of cloze testing as well as miscue analysis for diagnostic purposes.

5.3 Suggestions for Further Research

In the present study the comprehension levels which were found to be predicted by cloze scores were based on data obtained from miscue analysis of 200 JSS2 and 200 SSS2 students attending secondary schools in Jos. Because miscue analysis is a very

time consuming exercise, it is unrealistic for any single study of this nature to use a larger sample. Confirmation of the comprehension levels must, therefore, necessarily be done by replication studies. Specifically, the following studies are suggested:

1. Replication of the present study using the same passages, but a different set of JSS2 and SSS2 students, perhaps in other parts of Nigeria.
2. Replication of the present study using different expository passages on JSS2 and SSS2 students in various parts of the country.
3. Replication of the present study with students at other class levels using passages appropriate for those class levels.
4. Replication of the present study using narrative passages.

As the main objective of the present study was to find out the comprehension levels associated with cloze scores, it was deemed necessary to ensure that each sample was randomized. In other words, for each passage two separate sub-samples of 100 students were randomly drawn from the larger sample of students who took the cloze tests at each class level. This means that on both class levels, most of the students whose cloze tests were selected for miscue analysis for one passage were not the same for the other passage. However, the examination of processing strategies carried out in the present study would lead one to suggest that further study could be carried out by analyzing the miscues of one set of students on two or more passages. This would facilitate a more detailed examination of the effect of text characteristics on reader strategies.

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APPENDICES

APPENDIX I

a. Original passages

b. Cloze passages

c. Cover page and practice passage

d. Sample miscue analysis recording forms.

a1. Original Passage

JSS2 EXPOSITORY FOG 7.28

CARE OF THE EYE

You can use your eyes to read as much as you can. But you should read only when there is enough light. You should generally not read in bed unless you can sit up and have something to rest your back against. You should also make sure that there is proper light by the bedside. If you watch television, there should be some light in the room. This will prevent the eyes from getting tired too quickly.

There is an infection of the eye that is called "apollo" (conjunctivitis) in Nigeria. When people suffer from this infection, their eyes itch, become painful and red, and a discharge may take place. People who suffer from apollo should stay away from other people so that they do not pass on the infection. They should see a doctor for treatment. Sometimes conjunctivitis may also be caused by eye strain, for example, from reading too much in a poor light. Rest the eye or use eye lotion to get relief from this condition.

You must be careful not to hurt your eyes either yourself or in play. Keep dangerous things away from your eyes. Sometimes particles get into the eye. Some of them can be removed by washing the eye with clean water. Particles that get under the upper lid can be more difficult to remove. But someone can help you open the upper lid and blow out the particle. If you are having problems with your eyes, see a doctor. You need your eyes to see what is going on around you and to read books. So take proper care of them.

STAN, Nigerian Integrated Science Project, Pupils Book Three. Ibadan: Heinemann Educational Books (Nig.) Ltd.
7.76/7.72/6.32

a2. Original Passage

JSS2 EXPOSITORY FOG 7.58

WIND

Moving air is called wind. A draught is also moving air but it is not as strong as a wind. As strong wind can be very dangerous. Perhaps you have seen pictures of the damage done by hurricanes, where strong winds have uprooted trees, blown the roofs off houses, overturned cars, and so on.

What causes winds? What happens when the valve of a car or bicycle tyre is opened? The air comes rushing out. What makes it do that? This is the clue to the cause of winds. Winds arise because of differences in pressure in the air. The bigger the pressure difference, the stronger the wind.

But what causes differences of pressure in the air? This is chiefly due to unequal heating of the Earth's surface. When the ground is heated, it heats the air above it. The hot air rises because when it is heated it expands and is thus less dense than before. In other words, because it has expanded there are fewer air particles in the same volume of air. So the hot air rises through the heavier colder air because it is less dense. This causes currents in the air and a strong current is a wind. A wind obviously has a lot of energy. Where does its energy come from?

Wind directions are expressed in terms of the directions from which the wind is blowing. Wind direction can be used to determine the direction of a low pressure system and possible bad weather. When your back is to the wind, the area of low pressure is to the left. Wind speed indicates, to a certain extent, the differences in air pressure between a high pressure region and a low pressure region.

Science Teachers Association of Nigeria (1971). Nigerian Integrated Science Project Pupils Book 3. p.102 Ibadan: Heinemann Educational Books (Nig.) Ltd. p.102. 5.56/7.2/10

a3. Original Passage

SSS2 EXPOSITORY FOG 9.24

THINGS THAT AFFECT THE WAY WE GROW

You learnt that personal health enable you to grow and develop normally to your full capacity. When there is absence of good health or when you suffer from a disease, growth and development may be slowed down.

Now think of the days when you have been ill. Did you feel like eating? Did you have enough energy to run about, or did you prefer to lie in bed? Generally, disease makes us lose our appetite or desire for food. When we do not eat, what can happen to our body? It is not difficult to realize that your body cannot make sufficient new cells when it does not have the nutrients to do so. When it cannot make new cells, then growth cannot progress normally. Growth is therefore slowed down. In some instances, an organ may be diseased but the appetite may not be reduced. The person's growth may still be slowed down or he may lose weight. Health care and attention given by the doctor, or nurse, your parents, and other adults help you to avoid disease and enable you to grow normally.

You already know about the importance of exercise for heath. Exercise also has a good effect on growth. Its effect is noticeable in the development of muscles. It make muscles big and strong. When muscles are strong they are better able to resist disease. He have seen how disease can retard growth.

Rest ensures that the body has opportunity to recover from strain. During rest, the body is relaxed and you may fall asleep. It has been shown that rest enables you to do more work afterwards than if you carried on when you are tired. If you are able to plan when to r est daily, you body will benefit more than from unplanned rest. It will regain its strength faster and enable you to grow.

STAN, Nigerian Integrated Science Project. Pupils' Textbook Two, Page 29. Ibadan: Heinemann Educational Books (Nig.) Ltd.

9.8 / 10.6 / 7.3

MAINTENANCE OF MACHINES

You must have seen a car being serviced in an auto-mechanics workshop, or an air conditioner being serviced. This keeps service machines in good repair and it is necessary for it to be done regularly. When machines are in use, their moving parts do work, and so energy is involved. Some of this energy produced by the machine is not available for doing useful work. some is used to produce heat as the friction between the moving parts is being overcome.

In order to reduce the heat produced as the machine words, the friction between its moving parts must be reduced. One way of doing this is to grease the moving parts. But as the machine works, the grease is soon used up and unless this is replenished, more and more heat will be produced, until the machine breaks down. To avoid reaching this breakdown stage, it is necessary to grease the moving parts regularly. The use of oil and ball bearings are other ways of reducing friction between moving parts.

Dirt in parts of a machine will restrict movement and cause wear. Regular removal of dirt from a machine is thus very necessary to ensure the good performance of the machine. In a car engine, oil reduces the friction between the moving parts of the engine to ensure their smooth movement and so obtain good performance from the engine. As the oil moves round these parts, dirt is collected and after some time, the oil becomes dirty. The oil must be changed to keep the engine going smoothly; otherwise the engine will be damaged. If, on the other hand, the engine has no oil at all, the parts inside soon heat up and get damaged during use. Regular checking and changing of engine oil is an important practice recommended for all users of motor vehicles.

STAN, Nigerian Integrated Science Project. Pupils' Textbook Two, p.105. Ibadan: Heinemann Educational Books (Nig.) Ltd. 9.48/9.88/10.96

Name _____ **School** _____

Class _____ **Score** _____

CARE OF THE EYE

You can use your eyes to read as much as you can. But you should _____ only when there is _____ light. You should generally _____ read in bed unless _____ can sit up and_____ something to rest your _____ agáinst. You should also _____ sure that there is _____ light by the bedside. _____ you watch television, there _____ be some light in _____ room. This will prevent _____ eyes from getting tired _____ quickly.

There is an _____ of the eye that _____ called "apollo (conjunctivitis) in _____ . When people suffer from _____ infection, their eyes itch, _____ painful and read, and _____ discharge may take place. _____ who suffer from apollo _____ stay away from other _____ so that they do _____ pass on the infection. _____ should see a doctor _____ treatment. Sometimes conjunctivitis may _____ be caused by eye _____ , for example, from reading _____ much in a poor _____ . Rest the eye or _____ eye lotion to get _____ from this condition.

You _____ be careful not to _____ your eyes either yourself _____ in play. Keep dangerous _____ away from your eyes. _____ particles get into the _____ .Some of them can _____ removed by washing the _____ with clean water. Particles _____ get under the upper _____ can be more difficult _____ remove. But someone can _____ you open the upper _____ and blow out the _____ . If you are having _____ with your eyes, see _____ doctor. You need your _____ to see what is _____ on around you and _____ read books. So take proper care of them.

Name _____ **School** _____

Class _____ **Score** _____

WIND

Moving air is called wind. A draught is also moving air but it is not as strong as a wind. A strong wind can _____ very dangerous. Perhaps you _____ seen pictures of the _____ done by hurricanes, where _____ winds have uprooted trees, _____ the roofs off houses, _____ cars, and so on.

_____ causes winds? What happens _____ the valve of a _____ or bicycle tyre is _____ ? The air comes rushing _____ . What makes it do _____ ? This is the clue _____ the cause of winds. _____ arise because of differences _____ pressure in the air. _____ bigger the pressure difference, _____ stronger the wind.

But _____ causes differences of pressure _____ the air? This is _____ due to unequal heating _____ the Earth's surface. When _____ ground is heated, it _____ the air above it. _____ hot air rises because _____ it is heated it _____ and is thus less _____ than before. In other _____ , because it has expanded _____ are fewer air particles _____ the same volume of _____ . So the hot air _____ through the heavier colder _____ because it is less _____ . This causes currents in _____ air and a strong _____ is a wind. A _____ obviously has a lot _____ energy. Where does its _____ come from?

Wind directions _____ expressed in terms of _____ directions from which the _____ is blowing. Wind direction _____ be used to determine _____ direction of a low _____ system and possible bad _____ . When your back is _____ the wind, the area _____ low pressure is to _____ left. Wind speed indicates, _____ a certain extent, the differences in air pressure between a high pressure region and a low pressure region.

Name _____ School _____

Class _____ Score _____

THINGS THAT AFFECT THE WAY WE GROW

You have learnt that personal health enables you to grow and develop normally to your full capacity. When there is absence of _____ health or when you _____ from a disease, growth _____ development may be slowed _____ .

Now think of the _____ when you have been _____ . Did you feel like _____? Did you have enough _____ to run about, or _____ you prefer to lie _____ bed? Generally, disease makes _____ lose our appetite or _____ for food. When we _____ not eat, what can _____ to our body? It _____ not difficult to realize _____ your body cannot make _____ new cells when it _____ not have the nutrients _____ do so. When it _____ make new cells, then _____ cannot progress normally. Growth _____ therefore slowed down. Health _____ and attention given by _____ doctor, or nurse, your _____, and other adults help _____ to avoid disease and _____ you to grow normally.

_____ already know about the _____ of exercise for health. _____ also has a good _____ on growth. Its effect _____ noticeable in the development _____ muscles. It makes muscles big _____ strong . When muscles _____ strong they are better _____ to resist disease. We _____seen how disease can _____ growth.

Rest ensures that _____ body has opportunity to _____ from strain. During rest, _____ body is relaxed and _____ may fall asleep. It _____ been shown that rest _____ you to do more _____ afterwards than if you _____ on when you are _____ . If you are able _____ plan when to rest _____, your body will benefit _____ than from unplanned rest. It will regain its strength faster and enable you to grow.

Name _____ School _____

Class _____ Score _____

MAINTENANCE OF MACHINES

You must have seen a car being serviced in an auto-mechanics workshop, or an air conditioner being serviced. This keeps service machines in good repair and it is necessary for it _____ be done regularly. When _____ are in use, their _____ parts do work, and _____ energy is involved. Some _____ this energy produced by _____ machine is not available _____ doing useful work. Some _____ used to produce heat _____ the friction between the _____ parts is being overcome.

_____ order to reduce the _____ produced as the machine _____ , the friction between its _____ parts must be reduced. _____ way of doing this _____ to grease the moving _____ . But as the machine _____ the grease is soon _____ up and unless this _____ replenished, more and more _____ will be produced, until _____ machine breaks down. To _____ reaching this breakdown stage, _____ is necessary to grease _____ moving parts regularly. The _____ of oil and ball _____ are other ways of_____ friction between moving parts.

_____ in parts of a _____ will restrict movement and _____ wear. Regular removal of _____ from a machine is _____ very necessary to ensure _____ good performance of the _____. In a car engine, _____ reduces the friction between _____ moving parts of the _____ to ensure their smooth _____ and so obtain good _____ from the engine. As _____ oil moves round these _____ , dirt is collected and _____ some time, the oil _____ dirty. The oil must _____ changed to keep the _____ going smoothly; otherwise the _____ will be damaged. If, _____ the other hand, the _____ has no oil at _____ , the parts inside soon heat up and get damaged during use. Regular checking and changing of engine oil is an important practice recommended for all users of motor vehicles.

c. Cover page and practice passage

NAME ADEDI. FAITH.
AGE 16 yrs old F

LANGUAGES YOU SPEAK ENGLISH AND (UHROBO)
LANGUAGES YOU CAN READ ENGLISH

MAGAZINES AND NEWSPAPERS

Magazines and newspapers are full of information which can help you. Unfortunately, some people do not read them. They only find out things from friends and their transistor.

Some magazines are for women. They have ways to help mothers keep their children healthy. They tell how to prepare clean food in their kitchens.

There are other magazines for primary school children. Boys and girls can read about many different things from them. Perhaps you plan to grow vegetables in your farm. Maybe you want to know how to care for your injured animal. You may know what you want to do in these magazines. Do you like exciting stories? You can have stories like the one of a brave herdsman. He is away from his companion the fought a lion alone.

Another reason to read newspapers is to find out about vacancy jobs. Go through the newspaper. You will learn about kind of work people do. you will read about job vacancy.

Most people read newspapers to get news. News articles tells us what has just happened all over the world.

An example, in England a child was kidnapped from a woman. In Ilorin, police are looking for robbers. They stole some orders from secondary school children. Often the news is good.

Be sure you know about it.

a1. Sample miscue analysis recording form

MISCUE ANALYSIS RECORDING FORM

Reader's number C31 Passage Eye Score 32

#	Text	Miscue	SEM	SYN	1 Sem+ Syn+	2 Sem+ Syn-	3 Sem- Syn+	4 Sem- Syn-	1 & 2
1	enough	much	+	+	✓				✓
2	have	use	+	+	✓				✓
3	luck	head	+	+	✓				✓
4	make	be	+	+	✓				✓
5	project	enough	+	+	✓				✓
6	if	Iffen	+	+	✓				✓
7	should	can	+	+	✓				✓
8	the	your	+	+	✓				✓
9	infection	side	−	−				✓	
10	Nigeria	it	−	−				✓	
11	This	That	−	−				✓	
12	become	it's	−	−				✓	
13	a	it	−	−				✓	
14	People	from	−	−				✓	
15	not	Get	−	−				✓	
16	also	caused	−	−				✓	
17	strain	child	−	−				✓	
18	use	balls	−	−				✓	
19	relief	away	−	−				✓	
20	must	should	−	−				✓	
21	hard	get	−	−				✓	
22	as	too	−	−				✓	
23	things	objects	+	+					✓
24	Sometimes	And	+	−					✓
25	that	can	−	−				✓	
26	lid	eye	−	−				✓	
27	help	be	−	−				✓	
28	lid	eye	−	−				✓	
29	Particle	object	−	−				✓	
30	Problems	Problem	+	−		✓			✓
31	a	the	+	−		✓			✓
32	eyes	eye	−	−				✓	
33	crying	in	−	−				✓	
34	to	the	−	−				✓	
					9/33	3/33	0/33	22/33	27/33

a2. Sample miscue analysis recording form

AGE 12 1/2 M

MISCUE ANALYSIS RECORDING FORM

Reader's number A 29 Passage Wind Score 56

#	Text	Miscue	SEM	SYN	1 Sem+ Syn+	2 Sem+ Syn-	3 Sem- Syn+	4 Sem- Syn-	1 & 2
1	Strong	moving	+	-		✓			✓
2	blown	removed	+	-		✓			✓
3	overturned	and	+	-		✓			✓
4	when	to	-	-				✓	
5	Car	motorcycle	-	-				✓	
6	speed	leaking	-	-				✓	
7	winds	water	-	-				✓	
8	chiefly	wind	-	-				✓	
9	of	on	-	-				✓	
10	heats	rises	+	-		✓			✓
11	expands	rises	-	-				✓	
12	dense	now	-	-				✓	
13	words	cases	-	-				✓	
14	these	they	-	-				✓	
15	in	and	-	-				✓	
16	air	water	-	-				✓	
17	air	cloud	-	+				✓	
18	dense	cold	-	-				✓	
19	current	air	+	-		✓			✓
20	pressure	wind	-	+			✓		
21	weather	wind	-	+			✓		
22	to	on	-	-				✓	
23					0/22	5/22	7/22	15/22	5/22
24									
25									
26									
27									
28									
29									
30									
31									
32									
33									

a3. Sample miscue analysis recording form

F 16

MISCUE ANALYSIS RECORDING FORM

Reader's number E7 Passage Growth Score 36%

#	Text	Miscue	SEM	SYN	1 Sem+ Syn+	2 Sem+ Syn-	3 Sem- Syn+	4 Sem- Syn-	1 & 2
1	Guitar	attack	—	.				✓	
2	it is	known	+	.		✓			✓
3	all	attack	+	-		✓			✓
4	making	better	—	..				✓	
5	did	play	+	-		✓			✓
6	in	built	+	-		✓			✓
7	it	energy	+	--		✓			✓
8	learn	confi	+	-		✓			✓
9	the	play	+	-		✓			✓
10	it	makes	—	.				✓	
11	Sullivan	any	-	.				✓	
12	does	look	--	--				✓	
13	Carroll	stop	+	-		✓			✓
14	growth	play	+	-		✓			✓
15	Can	body	—					✓	
16	the	of	—					✓	
17	Parents	health	-	-				✓	
18	and	teeth	—	-				✓	
19	Ted	husband	+	-		✓			✓
20	known as	types	+	-		✓			✓
21	effect	health	--	..				✓	
22	is	the	—	.				✓	
23	of	what	—	.				✓	
24	and	enough	—					✓	
25	able	working	+	--		✓			✓
26	retard	effect	+	+	✓				✓
27	recover	the	—	—				✓	
28	but	may	—	-				✓	
29	others	help	—	..				✓	
30	Carroll	know	—	-				✓	
31	tired	to rest	—	.				✓	
32	daily	How tach	+	.					
33					1/32	12/32	2/32	18/32	

d4. Sample miscue analysis recording form

AGE 15½ M

MISCUE ANALYSIS RECORDING FORM

Reader's number F27 Passage MACHINES Score 42%

#	Text	Miscue	SEM	SYN	1 Sem+ Syn+	2 Sem+ Syn-	3 Sem- Syn+	4 Sem- Syn-	1 & 2
1	Machines	they	+	+	✓				✓
2	moving	motor	+	+	✓				✓
3	So	their	+	+	✓				✓
4	the	motor	+	−		✓			✓
5	is	are	−	−				✓	
6	as	to	−	−				✓	
7	moving	other	−	−				✓	
8	heat	energy	−	+			✓		
9	moving	outer	−	+			✓		
10	One	the	+	+	✓				✓
11	parts	engine	+	+	✓				✓
12	used	lost	−	−				✓	
13	heat	energy	−	−				✓	
14	use	expanding	−	−				✓	
15	bearings	which	−	−				✓	
16	reducing	the	−	−				✓	
17	Dirt	friction	+	−		✓			✓
18	Cause	then	+	−		✓			✓
19	dirt	parts	−	+			✓		
20	thus	also	−	+			✓		
21	the	a	−	+			✓		
22	oil	it	+	+	✓				✓
23	engine	machine	+	+	✓				✓
24	Performance	Service	+	+	✓				✓
25	after	at	+	−		✓			✓
26	becomes	is	+	−		✓			✓
27	engine	machine	+	+	✓				✓
28	on	in	+	−		✓			✓
29	engine	machine	+	−		✓			✓
30					9/29	7/29	5/29	8/29	16/29
31									
32									
33									

APPENDIX II

Table IIa. **Computation for comprehension levels associated with selected cloze scores on JSS2 passages.**

Table IIb. **Computation for comprehension levels associated with selected cloze scores on SSS2 passages.**

Table IIa. Comprehension levels associated with selected cloze scores on JSS2 passages.

A. CLOZE SCORE (Percent)	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48	50	52	54	56	58	60	62	64	68	72	76
B. No. Correct Responses	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	34	36	38
C. No. of Miscues	40	39	38	37	36	35	34	33	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	16	14	12
D. Predicted Percent Sem+ Miscues	18	21	24	27	29	32	35	38	41	44	47	49	52	55	58	61	64	67	69	72	75	78	81	87	95	98
E. Predicted No. of Sem+ Miscues	7	8	9	10	10	11	12	13	13	14	14	14	15	15	15	15	15	15	15	15	15	15	15	14	13	12
F. Predicted No. of Meaning-ful Responses	17	19	21	23	24	26	28	30	31	33	34	35	37	38	39	40	41	42	43	44	45	46	47	48	49	50
G. Predicted Percent Compre-hension	34	38	42	46	49	53	56	59	62	65	68	71	73	76	78	80	83	85	87	88	90	92	93	96	98	100

Table 11b. Comprehension levels associated with selected cloze scores on SSS2 passages.

A. CLOZE SCORE (Percent)	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48	50	52	54	56	58	60	62	64	68	72	76
B. No. Correct Responses	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	34	36	38
C. No. of Miscues	40	39	38	37	36	35	34	34	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	16	14	12
D. Predicted Percent Sem+ Miscues	11	14	17	20	24	27	30	33	37	40	43	46	50	53	56	59	63	66	69	72	76	79	82	89	95	1
E. Predicted No. of Sem+ Miscues	4	5	7	8	9	9	10	11	12	12	13	13	14	14	15	15	15	15	15	15	15	15	15	14	13	12
F. Predicted No. of Meaning-ful Responses	14	15	19	21	23	24	26	27	30	31	33	34	36	37	39	40	41	42	43	44	45	46	47	48	49	50
G. Predicted Percent Compre-hension	29	33	37	41	45	49	53	56	59	63	66	69	72	75	77	80	82	84	86	88	90	92	94	96	99	100