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TOWARD AN EVALUATION OF SCHEMA THEORY WITH REFERENCE TO ESL/EFL READING COMPREHENSION

by

Berhane Tensay Woldesenbet

M.A. (University of Durham)

Thesis submitted to the Faculty of Arts
of the University of Durham for the Degree of
Doctor of Philosophy

October, 1989



1 1 MAR 1991

Dedicated to:

Almaz, Binyam and Hanna

I confirm that no part of the material offered has previously been submitted by me for a degree in this or any another University.

Signed B.H. Lane-Conway.

Date 27-9-90

ABSTRACT

The purpose of the present study is to gain a better understanding, in a specified way, of the role and effects of background knowledge in the form of cultural schemata on the reading comprehension of culture-specific texts by non-native and native speakers of English.

The study involved the use of questions and passages as major factors in determining the reading comprehension ability of native and non-native speakers of English drawn from contrasted cultural groups.

The data for the present investigation have been gathered from two-hundred and fifty four post graduate students studying in Durham, Glasgow, London, and Strathclyde Universities.

The results of the data are then analysed following the system of programmes known as *Statistical Package for the Social Sciences (SPSS-X)* and using such standard statistical techniques as *t-test, one way and two way ANOVA, and Mann-Whitney U-test.*

The analysis of the data reveals that (a) background knowledge in terms of cultural schemata facilitates/enhances the ability of non-native speakers of English to process information from a given text and (b) there is a significant difference in the comprehension test performance of native and non-native speakers of English due to the effect of interaction of background knowledge, passages and questions.

The thesis is organised in ten chapters. Chapter One outlines the rationale of the study, followed by Chapters Two and Three which consist of a careful overview of the literature on reading comprehension to show the three main theories and to identify the four main areas in which research has taken place. These more general chapters are followed by a full analysis of the schema theory of reading, including analysis of strengths and weaknesses in order to identify the reasons for the investigation undertaken and to supply the necessary theoretical background for understanding such a study and being able to evaluate it.

The central feature of the study is the investigation by experimental methods of the part played by background knowledge in the comprehension of written passages and the analysis of the findings by suitable statistical methods. This forms Chapters Eight and Nine of the thesis. They are preceded by a chapter on methodology and followed by a chapter on pedagogical implications for the ESL/EFL situations.

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CHAPTER ONE

INTRODUCTION

1.0 Reading Theory: A Preliminary Survey

Reading theory is being developed through a wide variety of disciplines. On the one hand, there are the educational psychologists, psycholinguists and reading researchers and on the other hand, there are philosophers, literary critics and rhetoricians.

Even though each of these schools of thought pays little serious attention to the other, there are various interesting and significant points of contact within their work. A detailed analysis of the *two schools of thought* referred to above is beyond the scope of the present study. The discussion that follows is heavily inclined to the former school of thought rather than the latter.

The processes involved in reading have been of interest to psychological theorists and researchers for many years. Reading was earlier thought to be a serial processing of letters making up words and then a combining of these words into sentences. However, soon after the founding of experimental psychology, the letter by letter or serial approach was rejected in favour of the whole word or parallel process approach. This was followed by a recognition indicating that reading may involve more process than decoding a word. However, for the main body of researchers serious investigation of the reading process stopped with the rise of behaviourism. During this time, Bartlett (1932) attempted to call attention to the importance of contextual factors in reading and remembering. Yet his work was ignored for many years (Spiro, 1980).

In more recent years, psychologists and reading researchers have shifted away

from totally overt behaviourism and accepted for study the higher mental process. Various attempts to describe the process involved in reading comprehension are found in information processing research which dominates cognitive psychology.

The current literature illustrates three types of reading models. These three models are termed (1) Bottom-up (which emphasizes the text) (2) Top-down (which emphasizes the contribution of the reader) and (3) Interactive (which recognizes both bottom-up and top-down processes interacting simultaneously throughout the reading process). (see Chapter Two)

In these characterizations it may be helpful to think of top-down as paying most attention to the reader, and the bottom-up as paying most attention to the written text. The basic controversy among these theories concern the location of the source of control in the reading act : Is it the text, the reader or both which control the reading process ? This three-fold characterization of the reading theories serves as a basic organizational strategy to observe the process (physical or mental) of comprehension. In addition, the area of reading comprehension is developed by the four research strands, namely, Readability research, Cloze procedure, Factor analytic studies and Psycholinguistics. (see Chapter Three)

Psycholinguistic research supports the claim that reading is a meaning-driven (Goodman, 1970, Langer et.al 1982), multileveled, interactive hypothesis-generating process (Spiro, Bruce and Brewer, 1980). It is interactive in that reading is driven by structure and content of the text and the reader's prior knowledge (Rumelhart, 1977). It is hypothesis-generating in that fluent readers predict and confirm information while reading the text (Goodman, 1970).

Readers bring to a text a wide range of experiences with the word and with discourse, which they use in constructing a meaningful representation of the text. Their prior knowledge, organized in topical clusters (schemata), provides a context

for comprehension (Anderson, 1977, Spiro, 1980, Morgan, 1980).

The importance of background knowledge and experience in reading comprehension, known as schema theory, is widely accepted by reading researchers (Adams & Bruce, 1980, Adams & Collins, 1979, Anderson, 1977, Langer, 1984, Joag-dev & Anderson, 1977, Stevens, 1980, Spiro, Rumelhart, Brewer, 1980, Alderson & Urquhart, 1988).

In an effort to extend the body of research on the role of prior knowledge in reading comprehension, several investigators have examined the effect of familiarity with the content of the materials. They have shown that reading materials that are based on a familiar topic are comprehended better than materials based on unfamiliar topics, simply because readers possess more relevant prior knowledge about familiar topics (Taylor, 1979, Marr & Gromley, 1982).

The first systematic investigation into the role of prior knowledge in reading comprehension was undertaken by Bartlett (1932). He found that subjects used their prior knowledge of the world to assimilate the text. In addition, he found that over a period what has been read is considerably modified according to schemata stored in memory. Bartlett has contributed immeasurably to our understanding of the construction of the memory process and that is why his monumental work is still very often quoted/cited by numerous investigators concerned with both memory and comprehension.

Since Bartlett, a large number of studies have been undertaken, all designed to contribute to the extension of our knowledge on the effect of prior knowledge upon comprehension. Based on extensive research findings, it has now been firmly established that readers integrate the information in the text with knowledge already stored in memory (Barclay, 1973, Bransford & Johnson, 1972, Bransford, Barclay & Franks, 1972, Dooling & Lchman, 1971, Sulin & Dooling, 1974).

The large body of literature related to the organization of memory and how prior knowledge relates to comprehension and recall has substantially increased our understanding of how reader/text interactions may facilitate or impede comprehension and recall. Comprehending a text requires one to relate the elements in the text to knowledge characterizations in one's own memory structures. Therefore, information retrieval and recall of text are affected by the manner in which prior knowledge has been organized in memory (Anderson, Pichert & Shirley, 1977).

Research on reading comprehension among native speakers of English has shown that the ability to understand text is based not only on the reader's linguistic knowledge but also on one's general knowledge of the world and the extent to which that knowledge is activated during the mental process of reading. The better reader is able to access background knowledge about either the content area of a text (Bransford & Johnson, 1972, 1973) or the rhetorical format structure of a text (Kintsch & Van Dijk, 1975, Kintsch, 1977, Rumelhart, 1975, Thorndyke, 1977, Mandler & Johnson, 1977, Mandler, 1978), the better s/he will be able to comprehend, to store in long term memory and to recall the text.

A well known study is that of Bransford and Johnson (1972). They demonstrated that subjects' abilities to comprehend depend on the amount of context that is given to them. In other words, they found that subjects tended to rate the passage as being more comprehensible if they had earlier received some sort of context before reading and rate the passage as less comprehensible under conditions of either no-context or context after reading. They found that subjects performed at a significantly higher level if they saw a context-evoking picture before reading the passage. Subjects who were given the appropriate context picture only after listening to the passage, did not show improved ability to comprehend. (see Chapter Six)

In addition, studies on native English speakers have shown that not only in-

dividual prior experience of the reader influences which schemata one will activate when interpreting a vague and ambiguous text (Anderson, Reynolds, Schallert & Goetz, 1977) but it also plays a significant role in story comprehension (Mandler, 1978, Stein & Trabasso, 1979, Adams & Bruce, 1980).

Unfortunately, although we are becoming increasingly aware of the role of the readers' background knowledge, most ESL text books contain selections the students know little about. (see Nelson, 1978).

Much less research has been done to investigate the role of background knowledge or schemata in second language comprehension. (see 1.1.4)

Of particular importance and or relevance in ESL/EFL reading comprehension are the culture-specific and discipline-specific studies done by Steffensen et.al (1979) and Alderson & Urquhart (1988) respectively. The study by Steffensen et.al (1979) appears to offer the firmest support for the hypothesis that prior knowledge in terms of familiarity with the cultural components of the text influences how the text is interpreted. Cross-cultural studies offer a rich source of information on how readers comprehend text in relation to their background of cultural experience. Hence, the present study cannot be an exception.

The study undertaken by Alderson & Urquhart (1988) asserted that students from a particular discipline would perform better on tests based on text from their own subject discipline than would students from other disciplines. The students under investigation appeared to have been advantaged by the text in a familiar field of study.

It should be pointed out that, although the present study is based on cultural schemata and their role in comprehension, the research methods employed and the results and implications derived from it are equally applicable to discipline-specific studies.

The foregoing discussion leads us to the contention that meaning is central to schema theory. A fundamental assumption of schema-theoretic approaches to language comprehension is that spoken or written text does not in itself carry meaning. Rather, a text provides directions for listeners/readers as to how they should retrieve or construct the intended meaning from their own previously acquired knowledge. The words of the text evoke in the reader associated concepts, their past relationships and their potential interrelationships. The goal of schema theory is to specify the interface between the reader and the text - to specify how the readers knowledge interacts with and shapes the information on the page and to specify how that knowledge must be organized to support the interaction. The view that language, as a form of social behaviour, is governed by tacit assumptions of reciprocity entails that meaning is not a prerogative of the readers but a matter of mutual agreement to be arrived at through the use of language in an act of discoursal behavior. *'Meaning is what happens inside and between people '* (Stevick, 1976:160).

In the same vein, Widdowson (1976) redefines reading as an interaction between the reader and the writer through the mediation of text. That is any reading comprehension oriented analysis of the communication process through the written text should see reading as an on going cumulative process of interaction between the reader and the writer through the text and should be concerned with the characterization of the effect of different textual elements in this process. Such an outlook on discourse for the purpose of reading will entail discussion on how to facilitate the reader-text interaction and what factors, textual or otherwise, are involved in the better and effective accomplishment of such a process. (see Chapter Four)

Meaning which was assumed by linguists to be the ready made components of the syntactic constructs was extended by philosophers and ethnomethodologists of language to cover a wide range of aspects in language. Thus, the ever increasing interest in the nature of meaning led to a new and ever widening dimension in linguistics.

Rather than being sentence-based, this dimension is based on discourse, and rather than studying the meaning as a pre-tailored component of words and sentences, it considers meaning as something formulated and negotiated within the overall text and with participation of all parties involved in the interaction. (see Chapter Four)

Schema theory suggests what leads the reader to do one or other depends on whether or not the situation of contact with the language provides for the essential condition of communication to be met. This is the condition that enables the reader to perceive the uttering of a linguistic form as originating from the interlocutors' intention to communicate, and to integrate new information to what is given by reference to the perceived intention.

Text as a product is actual and perceptible on the page, but before meanings are realized it has to be converted into the interactive process of discourse. A text, no matter how genuine, has to be authenticated as discourse by the reader. As Widdowson (1984) put it :*Genuineness is a property of the text as a product. Authenticity is a property of the discourse as a process.*

The idea of understanding discourse is a question of interpreting sentences, whether on their own or in combination. Discourse occurs as a realization of linguistic rules in the act of making sense and this inevitably involves an engagement with the language users' cognitive and experential reality. Sentences are artificial constructs which are detached from such reality and so have nothing to do with discourse. Poetry for one offers the most obvious instances and there is a considerable body of literature which deals with the question of how the deviant sentences in poems are to be accounted for in grammatical terms. What is more, ungrammatical sentences (which do not manifest the linguistic rules of a language) can occur as utterances in certain circumstances.

To sum up, the three fold characterization of reading theories (Bottom-up, Top-

down and Interactive) and the four cardinal research strands (Readability, Cloze procedure, Factor analysis, and Psycholinguistics) serve as a basic organizational strategy to observe the processes involved in reading comprehension. Research on reading has shown that the ability to understand a text is based not only on the reader's linguistic knowledge but also on one's background knowledge and the extent to which that knowledge is activated during the mental process of reading. Reading seen as an interaction between the reader and the writer through the mediation of text, unquestionably, meaning holds the central position in schema theory.

The thesis as a whole investigates more fully the areas that have been so far mentioned in this chapter, and because they lead naturally to the chapters on experimental data (Chapters Seven-Nine) that form the heart of the thesis; the ordering and selection of material in this preliminary survey foreshadows the general form of the thesis.

The present study is a response to a number of substantial problem areas in ESL/EFL situations. These areas are encapsulated in the *rationale of the study.*

1.1 Rationale of the study

'For as long as human beings have learned the language of nations other than their own, that learning has been purposive : that is to say, foreign languages have been learned for social and economic contacts and for transmission of ideas' (John & Davies, 1983:1).

ESL/EFL researchers have suggested time and again that non-native speakers of English have more difficulty with reading than with any other of the language skills (cf. Mackay et.al, 1979, Cziko, 1978, Eskey, 1979, Carrell, 1988). If this is in essence true, it becomes apparent that what is needed is an understanding of the variables which affect learner's reading comprehension performance as well as the way they process information that resides in the text.

How is this important skill acquired in the best way possible and what are the problems involved towards achieving this goal? The treatment of these questions will be the gist of the present study.

The rationale for choosing the areas to focus on in the study in question is determined by five problem areas. Namely, English as a language of wider communication, minimal attention to EFL/ESL reading, conflicting L2 research findings, inadequate background knowledge studies and inadequate prior knowledge assessments. These are discussed in the following sections.

1.1.1. Language of Wider Communication

Since English has become one of the world's language of wider communication and an enormous amount of reading material is written in this language, learners are expected to acquire information from the various fields [Specialization] of knowledge through the medium of written English. This leads one to an obvious and tenable assertion that reading in English remain a sine-qua-non to an understanding of the vast body of knowledge. This is much more so in situations where English is the medium of instruction at institutions of higher learning.

Therefore, non-native learners who have achieved a very basic level of proficiency soon realize that, the ability to comprehend a text written in English is perhaps the most important skill they have to acquire.

However, an examination of the relevant literature reveals that minimal attention has been given to the variables which may influence the process of reading by learners of English as a second language. This is particularly true with regard to research into the process involved in reading by learners at the intermediate and advanced levels. Therefore, a plausible explanation for the dearth of relevant research is that reading has held low priority in the ESL class room. The *why* of this state of affair is discussed below.

1.1.2. Minimal Attention to ESL/EFL Reading

Reading in a second language became an almost neglected area particularly in the fifties and sixties when the Audio-Lingual method gained a strong foot hold in second language pedagogy. Hence, in the hey day of the Audio-Lingual method, reading was largely neglected.

The Audio-Lingual approach with its emphasis on oral skills was quickly introduced into the second language and foreign language classrooms. Applied linguists and language educators begun to emphasize the importance of listening and speaking activities and students were unduly exposed to intensive sentence pattern drills.

The advocates of the Audio-Lingual approach to second language learning have widely supported the notion that language is a habitual verbal behaviour best acquired through oral practice. Not only was there a major emphasis on speaking, but the general view was also that it was necessary to separate the oral skills from the written ones because written language was assumed to be responsible for the intrusion of errors into pronunciation, structure and consequently understanding. Convinced of the usefulness of a behavioural or a response-oriented learning theory, Scott (1966) maintained that the teaching of reading should be based on habit formation in order that responses to the stimuli be automatic.

It can be said that it is rather unfortunate that the usefulness and relevance of the Audio-Lingual approach to second and foreign language class room situations was not questioned.

The interest in the area of second language reading is relatively recent, when those directly involved with second language pedagogy reacted strongly against the Audio-Lingual approach. Coupled with this, Cognitive Psychology, Transformational Grammar and Psycholinguistics begun to gain wide spread acceptance and this resulted in revisions and eventual rejection of the Audio-Lingual approach in second

language learning.

Following this shift of emphasis, a large number of researchers in the field of cognitively oriented theories of learning started to observe that the teaching of reading to second language learners had not increased proportionately to the demands for increased skills in it. They underscored the importance of investigating how second language learners comprehend as well as process a text.

The Audio-Lingual method had severe limitations which can be accounted for. The written language (a very important area) had been put aside almost to the point of becoming extinct in second language classes.

This situation is attested by many reading researchers. Among others, Norris (1970) maintains that not only did second language teachers tend to place too much emphasis on the learning of formal rules as well as on the memorization of individual lexical items without the benefit of context but also that students never seemed to be taught to read English at all.

Furthermore, there are a number of studies that have referred to the long over-drawn emphasis of Audio-Lingual methods in second language pedagogy, claiming that those methods resulted in more work being done on the learner's facility with spoken language compared to learners' ability to comprehend written materials. In opposition to this view, Saville-Troike (1973) maintained that the teaching of reading should not wait until the students have developed a high level of proficiency in speaking the language since the development of aural-oral skills do not necessarily contribute to improved performance in the ability to comprehend what is read.

On a similar issue, Eskey (1979) believed that, although it is easier to teach someone to read a language one can speak, reading may be the most important skill to master. He further maintained that written material should be made more appropriate to the needs of the non-native students and should not be limited or

determined by their aural-oral abilities or needs.

The revival of this neglected area of ESL/EFL reading is a recent phenomenon. Language researchers and cognitive psychologists alike embarked on serious investigations about the processes involved in the area of second language reading. Admittedly, much has been done as well as achieved and the importance attached to L2 reading is far superior to what it used to be in the Audio-Lingual era.

However, most of the findings of the various ESL/EFL researchers have been found to be conflicting and contradicting at best with one another. This can be further elaborated by citing some of these conflicting hypotheses regarding the issue in question.

1.1.3 Conflicting ESL/EFL Studies

Among some of the recent contributions in the field of second language learners are Cowan (1976), Clarke & Silberstein (1979), Rigg (1977a, 1977b), Cziko (1978, 1980), Clarke (1979), Ulijn (1980), Flick & Anderson (1980), Elley (1981), Deemer (1978), Alderson (1979, 1980), Alderson & Urquhart (1984,1988), Groebel (1980), Hudson (1982), Johnson (1981, 1982), Carrell (1983a), and Carrell & Wallace (1983). Although most of the work undertaken by them is rather exploratory in nature, the studies warrant close attention because they have provided some useful insights and perspectives into second language learning in general and into reading comprehension in particular.

Several of these second language researchers have attempted to examine the differences and similarities between learning to read one's native language and learning to read a second or foreign language (cf. Cziko, 1978, 1979,1980, Clarke, 1979, Ulijn, 1980, Thonis, 1970, Deemer, 1978, Groebel, 1980). The question of whether or not second language learners' reading skills or abilities in the native language influence or determine the ability to comprehend text written in the target language has been a

very important area of second language reading studies undertaken by second/foreign language researchers.

However, the findings of these studies have been found to be conflicting. To illustrate this issue, I find it necessary to compartmentalize the studies in question into two groups.

The first group consisting of Cziko (1978, 1980), Clarke (1979), Ulijn (1980) and others with similar views and findings, see reading skills or abilities in the second language as being of paramount importance. This group attempted to examine the differences and similarities between learning to read one's native language and learning to read a second or a foreign language. Based on the comparison of the results of both native and non-native groups of readers, they concluded that although the L2 reading process is basically similar to native language reading, it is more in the sense that non-natives also use cue systems in the text (i.e grapho-phonic, syntactic and semantic). They maintain that an important distinction between the two kinds of reading centers around the use of the semantic level information in the text. From this group, suffice it to mention only Cziko's study for purposes of clarifying the issue in hand. To the best of my knowledge, Cziko's (1978) study is a fair representative of the rest of the researchers in the group who came up with almost similar results.

Cziko (1978) showed that the differences in the performances between different proficiency groups of non-natives readers is more with respect to the ability to use the semantic and discourse constraints and less regarding the ability to use the syntactic elements. The findings of his study suggest that when reading anomalous text both advanced second language learners of French and native speakers of French scored significantly higher than the lower level learners. On the other hand, all subjects regardless of their proficiency level seem to be able to make good use of syntactic elements. From these results Cziko (1978) concluded that despite some basic

similarities, there are significant differences in the way native and non-native readers comprehend text. Cziko (1978) found that non-natives paid more attention to syntactic and grapho-phonic information and less attention to the meaning in the passage. The performance of more advanced non-native readers, however, seemed to closely approximate the performance of the natives. Cziko's recent study (1980) is similar to the one mentioned above except the nature of the experimental task was different. While in the earlier study, subjects were required to silently read comprehension passages, in the latter study, the task was to read orally. From this second experiment, Cziko (1980) found that subjects differed in their measured comprehension performance with those who were native speakers of French and second language learners with a high level of competence in French scoring higher than those at intermediate French.

Cziko (1978, 1980) produced evidence that native French speaking students as well as learners with a high level of competence in French have the ability to process text in a top-down manner. Whereas beginning and intermediate level learners of French as a second language seem to use a bottom-up strategy relying heavily on graphic information.

However, on the question of advanced non-native readers, Cziko fails to tell us whether his finding significantly implies there is hardly a difference in reading performance between advanced non-native and native readers.

As mentioned earlier, I will briefly discuss the findings of the second group in an attempt to show whether similar studies can possibly have dissimilar findings.

The area of research examining whether L1 reading skills or abilities are transferable to L2 reading brings the second group of researchers such as Thonis (1970), Deemer (1978), Groebel (1980) together.

They all came up with empirical evidence that for the non-native readers, the

skills in word recognition and comprehension of text written in English can be built upon the native language literacy they already possess. This plausible argument is based on the assumption that reading involves some basic skills that can be used in any language. (cf.Clarke, 1979 [Reading Universals])

The group that falls within this school of thought, again to the best of my knowledge, are fairly represented by the works of Groebel (1980). In the study undertaken by Groebel (1980), native speakers of Hebrew and native speakers of other languages (both University students in Israel) read the three texts written in English. Each text contained five multiple choice questions designed to test reading abilities such as finding the main ideas and supporting information, making inferences, drawing conclusions, recognizing the writer's tone and attitude etc. Groebel (1980) found that the correlation between comprehension in Hebrew and comprehension in English was statistically significant. Interestingly, Groebel also found that the scores in English were lower for non-native speakers of Hebrew who were mainly of Arabic and Russian descent. This, according to Groebel (1980) raised the possibility that unknown factors may be involved. One such factors could well be that of effects of disparate systems of orthography. Groebel (1980) concluded that reading skills in the native language constitute a source of possible transfer to second language learning. However, Groebel (1980) and associate do not give us a clear account of the transference of skills or abilities from one language to the other.

To sum up, the *Cziko group* maintains that despite some basic similarities between L1 and L2 reading, the latter depends much more on the learner's level of reading proficiency in the target language (L2), and they see reading skills or abilities in the *second* language as being of paramount importance. On the other hand, the *Groebel group* asserts that the skills in word recognition and comprehension of text written in English (L2) can be built on literacy skills in the native language that non-native readers already possess. They also consider that the subjects' reading skills

or abilities in the native language help to develop comparable efficiency in reading in the second language.

Although it is admitted by researchers in the field that these competing hypotheses do have different implications for the teaching of reading, there is lack of evidence whether reading ability in the first language can be transferred to reading ability in the foreign language. However, some evidence suggests that proficiency in the foreign language may be more closely associated with foreign language reading ability (Alderson, 1984).

Commenting on the same subject, Alderson (1984:20) says, *'More plausible but elusive, is the notion that problems in foreign language reading which are due to language have to do with semantic and discourse processing and are related to problems of conceptualization - Word meaning.'*

Furthermore, the pertinent question that pervades the entire ESL/EFL reading process, the question of whether the problems associated with foreign language reading have to do with language or reading is left open. Nonetheless, our present knowledge about this issue rests on the answers given by Alderson (1984). It is important, however, to note that he answered this question cautiously. Alderson (1984:24) says, *'The answer, perhaps inevitably, is equivocal and tentative - it appears to be both a language problem and a reading problem but with firmer evidence that it is a language problem [for low levels of foreign language competence] than a reading problem.'*

From the research findings cited above, it can be concluded that ESL/EFL researchers have found it difficult to assign the exact proportions of language skills and reading skills in the full comprehension of texts. Furthermore, in a number of recent studies the emphasis has switched to the place of prior knowledge as a very important element in reading comprehension. This important aspect of reading will be taken

up further in the section to follow.

1.1.4. Contradictory BGK Studies

A number of researchers in the area of L2 reading comprehension have shown the significant role background knowledge (BGK) plays in understanding text. Of particular note are, Hudson, (1982), Johnson, (1981), Carrell ,(1983a) and Carrell & Wallace, (1983) among others. (see 6.2.1)

The divergence between the findings of the studies undertaken by Hudson (1982) and Johnson (1981, 1982) and Carrell (1981) and Carrell & Wallace (1983) is highly significant. The recent findings by Carrell and others (1983) are also in sharp contrast with Carrell's earlier studies (1981a,1981b) as well as with those of Steffensen et.al (1979). (see 6.2.2)

Given the contradictory findings, there is a clear need for more research evidence to support a schema theoretic view of second language reading in which prior knowledge is seen as a powerful variable influencing reading comprehension performance.

The findings of Carrell at one time [1981] and Carrell & Wallace at the other [1983] are one of the best examples of self contradictory findings ever found in the literature. In 1981 Carrell found that there were statistically significant differences in the comprehension ratings of Japanese and Chinese subjects when reading Native, European or American Indian culture stories. Carrell (1981) concluded that the cultural origin of the story may influence comprehension and recall of text by ESL readers. However, the recent studies by Carrell (1983a) and Carrell & Wallace (1983), found no significant effects of prior knowledge in ESL subjects reading comprehension. Contrary to expectations, the studies found that among subjects whose native language is not English, the understanding and recalling of a text is not dependent upon prior knowledge.

To one's dismay, in both studies, the authors have offered very little in the way of a theoretical explanation for their findings, admitting the fact that it is difficult to interpret such findings (Carrell, 1983a). Furthermore, in the studies by Carrell (1983a) and Carrell & Wallace (1983), the way prior knowledge has been assessed is questionable. Their exclusive reliance on the use of Bransford and Johnson's (1972) vague ambiguous passage such as *Washing Clothes* and *Balloon Serenade* may have confounded results. (see 6.2.1)

For all intents and purposes, the *Washing Clothes* passage deemed as familiar material remained incomprehensible to the subjects in the study simply because of its extreme ambiguity. There is also the possibility, however remote, that there are cultural differences in the ostensibly simple task of *Washing Clothes.* Though not absolutely necessary, it is highly probable that the passages used were not any where at the extremes of a familiarity-unfamiliarity continuum. One of the passages, *Washing Clothes,* is presented in Chapter Six. (see 6.1.3)

By way of summary, one serious limitation of the study undertaken by Carrell (1983a) is that of treating the familiarity variable as dichotomous, not continuous. The other is that in using material of contrived ambiguity, the findings may not be generalized to instructional materials normally used in class room settings.

In addition, one thing of note is that a written recall procedure as used by Carrell & Wallace (1983) may not be the most appropriate measure of reading comprehension performance of non-native subjects. It is possible that the subjects' limited written production skills in English may have affected comprehension performance. As had been already found time and again that ESL learners' receptive language competence is far in advance of their production ability. (Goodman & Goodman, 1978).

From the foregoing discussion, it can be concluded that because of the limitations in the design, Carrell (1983a) and Carrell & Wallace (1983) have not been able to focus

satisfactorily on the effect of prior knowledge in ESL subjects' reading comprehension performance.

Recent studies which have examined the role of prior knowledge in second language reading have overlooked the importance of prior assessment of the amount of prior knowledge subjects possessed.

1.1.5 Inadequate Prior Knowledge Assessment

The types of questions used to assess background knowledge as well as reading comprehension have been rather ill-defined and poorly controlled. For instance, Gall (1970) observed that while much has been written about the criteria for identifying effective questions, few researchers have explored the relationship between the questions and the answers to the questions.

Johnson (1980), who has also taken a close interest in the development of question types, has pointed out that the classification of reading comprehension questions has progressed quite slowly and the current trend in research pertaining to the area is to differentiate questions on the basis of what is involved in answering the question and where the information comes from rather than focussing on the surface structure of the text.

From the review of the literature on second language reading, it is also evident that no study has specifically dealt with the effects of prior knowledge upon the ability of learners to respond to different types of comprehension questions in connection with the text. (see 7.7.1)

Related to the specific issue of the role of prior knowledge is that of individual differences in the amount of information already possessed by subjects before the task of comprehension in the second language. (see 7.7.1.1)

An examination of performance on different question types should reveal impor-

tant qualitative differences between ESL/EFL readers. It will then be possible to assess whether in fact ESL/EFL readers integrate textual material with prior knowledge.

Hence, it is felt that a fruitful line of investigation should examine not only the effect of prior knowledge in ESL/EFL comprehension, but also examine the subjects' abilities to respond to different types of comprehension questions. This is what the present study attempts to accomplish.

The discussions which lie within the rubric of the rationale of the study can be aptly summarized as follows:

ESL/EFL researchers suggest that non-native speakers of English have more difficulty with reading rather than with any other skills (see Mackay et.al, 1979, Cziko, 1978, Eskey, 1979, Carrell, 1988).

ESL/EFL reading specialists (Carrell, 1983a, Hudson, 1982) readily admit that the area of background knowledge has been neglected in ESL/EFL reading instruction. In addition, minimal attention has been given to the variables which may influence the process of reading by second language learners. This is particularly true with regard to research into the process involved in reading by learners at the intermediate and advanced levels.

Therefore, a plausible explanation for the dearth of relevant research is that reading has held a low priority in the ESL/EFL classroom situation.

Furthermore, in ESL/EFL studies, the way prior knowledge has been assessed is questionable at best. Recent studies which have examined the role of prior knowledge in second language reading have overlooked the importance of a prior assessment of the amount of prior knowledge subjects possessed. As a result of this, findings in ESL/EFL studies are not so definitive in indicating the relationship between back-

ground information and reading comprehension. (see 8.2.5.2)

Most importantly, in ESL/EFL studies the types of comprehension questions used to assess reading comprehension have been rather ill-defined and poorly controlled.

Taking all the aforementioned factors into account, the present study sets its objectives and hypotheses as follows.

1.2. The Purpose of the Study

Students in one classroom may represent many differences of background knowledge and bring to the reading task an enormous diversity of many languages and cultures.

The role that cultural schemata play in the reading comprehension is highly significant. A number of studies by various reading researchers have shown that when there are differences in the cultural backgrounds of the author and the reader of a text, problems may arise because schemata are instantiated inappropriately by the reader. Through membership in a culture, an individual has a privileged information which is represented in a rich system of schemata (Adams & Bruce, 1982, Steffensen & Colker, 1982). On the same subject, Johnson (1981) has shown that the cultural origin has more effect on comprehension than the level of syntactic or semantic complexity. (see Chapter Six)

Carrell and Eisterhold (1983:566) say, *'As ESL teachers and as reading teachers our responsibility is to minimize reading difficulties and to maximize comprehension by providing culturally relevant information.'*

In addition, Urquhart (1987:388) says,

'It is now widely accepted, at least in theory, that comprehension is affected crucially by the reader's relevant background knowledge. This knowledge may relate to the

reader's general cultural background.'

The present study emphasizes a prior knowledge approach to L2 reading problems. The particular purpose of the study is to examine the effects of prior knowledge in the form of cultural schemata on the comprehension of culture-specific texts by second language readers as well as native speakers of English against the background discussed in the earlier section and sub-sections.

The major goal is to come to an understanding of the variables which affect ESL/EFL learners' reading comprehension performances as well as the way they process information that resides in a text.

Although the study in question is based on cultural schemata and its role in reading comprehension, the research methods employed (Chapter Seven) and the results (Chapter Nine) and implications (Chapter Ten) derived from it are equally applicable to discipline-specific studies.

The hypotheses formulated to carry out this research are indicated in the following section.

1.3 Hypotheses

For the sake of convenience, the hypotheses of the study are presented in two parts. Hypotheses that have to do with reading *per se* fall under *Reading Ability* and those related to background knowledge are put under *Existing Knowledge* as shown below.

1.3.1 Reading Ability - Hypotheses A

In connection with reading abilities of native as well as non-native speakers of English the following hypotheses were investigated.

1. There is a significant difference in comprehension test performance between be-

tween native and non-native speakers of English due to Question type (textually explicit, textually implicit and schematically implicit) and passage type (PE01 & PB02).

2. Comprehension performance of L2 readers is directly related to linguistic competence in the target language.

3. Higher level of cognitive processing is manifested by linguistic ability.

4. One comprehension question type (TE, TI or SI) is more (or less) significant in determining reading comprehension differences between native and non-native speakers of English in particular and reading comprehension *per se* in general.

5. Skilled reading is a direct result of linguistic competence.

1.3.2 Existing Knowledge - Hypotheses B

This refers to the prior knowledge of the subjects under investigation. The following hypotheses were postulated.

1. There is a difference in comprehension test performance due to differences in cultural schemata.

2. The interestingness of a culture-specific passage has an effect on reading comprehension.

3. Background knowledge in terms of cultural schemata facilitates/enhances the ability of non-native speakers of English to process information from a given text.

4. There is a relationship between prior knowledge in terms of cultural schemata and reading comprehension.

5. There is a significant difference in comprehension test performance of natives and non-natives, due to the effect of interaction of background knowledge, passage

type, and question type.

The analysis and findings based on the above hypotheses are given in Chapters Eight and Nine respectively.

1.4 Testing the Hypotheses

The present research is concerned with both native and non-native speakers of English. As the investigator is himself an Ethiopian, it seemed sensible to use Ethiopian and British students of a similar stage of education in Durham and in big cities like London and Glasgow, where there were sufficient Ethiopians.

Seeking to determine specifically whether a knowledge of the language had a greater effect on reading comprehension than the cultural origin of the text, the investigator clearly needed two culture-specific passages carefully constructed. That is, one passage that required a certain amount of Ethiopian background knowledge (henceforth referred to as PE01) and another that required a certain amount of English background knowledge (henceforth referred to as PB02), in order to compare the readabilities of both English native speakers and Ethiopians.

As will be detailed later on in the study, such passages were then subjected to careful procedures of validation. Having prepared three sets of reading comprehension questions, namely, Textually Explicit, Textually Implicit and Schematically Implicit items, they were then subjected to further tests themselves to see whether the majority of the subjects could answer them without reading the passages. This was followed by two successive pilot studies designed to find out the passage-dependency of the items set to measure reading comprehension. In addition, six lecturers, all of whom native speakers of English, reviewed the content validity of the tests (see 7.8).

In order to find out the amount of prior knowledge subjects possessed on each culture-specific passage, a prior knowledge test (PKT) was administered. The two

passages plus their accompanying questions were then ready for administering.

The tests were administered to two groups: One set of Ethiopians in Glasgow and London, and another set of British in Durham, who were all post graduate students in the Social Sciences, and a further confirmatory group from Durham, referred to as *Other Nations* (that is, students whose first language is neither English nor Ethiopian) was also used. The results were then compared and put through standard statistical processes. It is these results that are then used to verify whether the hypotheses have been duly validated. (see Chapters Seven, Eight and Nine)

A standard item analysis was carried out of the fifty-four items used for the present investigation giving facility values and discrimination indices for each item, for the whole population and for each of the three sub-groups (British, Ethiopian and Other Nations) separately. Furthermore, the internal consistency of the tests were measured by a statistic known as Kuder-Richardson Formula 20, which is a widely used measure of internal consistency.

1.5. Limitations of the Study

A number of limitations are apparent in the present study. First, the study is limited by the relatively small size of the sample. Second, the findings of the current study are based on quantitatively oriented analyses of research. Therefore, it is quite possible that important elements like individual differences might be camouflaged. The third limitation of the study is related to the subjects' ability in L1 as well as L2. Selecting good or poor first language readers versus high or low foreign language proficiency might have been more reflective of current research interests. Fourth, the possibility that other text-related variables, such as linguistic complexity of text which might influence comprehension performance, was not examined. Fifth, the study has relied upon only two comprehension measures. If other measures such as free and controlled associations, and pre-questions were used, it would have been

possible to compare the strengths and weaknesses of the measures in order to have a better understanding of all the processes involved in L2 reading comprehension.

Lastly, there were one or two problems in the form of the test as it was actually administered on this occasion. Some items used for this investigation were noted as difficult to understand or had no apparent correct answers and some items were wrongly categorized as reported by two or more of the six native speakers of English who reviewed the content validity of the tests.

A particular problem is related to Schematically implicit items. There is a considerable debate as to whether SI questions exist and if so what proportion of the answers are to be found entirely in the passage and what proportion related to background knowledge. The authorities in the field take slightly different positions on this issue. In the light of this debate, it is necessary to be cautious when interpreting the present results. Nevertheless, it is possible to draw some tentative conclusions about this area, conclusions which may, of course, be questioned if the theoretical issues are resolved in one direction rather than another.

1.6. Problems Encountered

The problems encountered while conducting the pilot studies as well as the main study were of varied nature. For a start, the cooperation expected of post-graduate students was found to be minimal. A number of factors could be attributed to the apparent lack of cooperation which cannot be reiterated readily as it can be one area of research in its own right. However, the most common and obvious ones were pressure of work and too many personal commitments.

One problem area may be attributed to fear of test. For instance, some students insisted on knowing what the test was all about prior to the administration of the test. This was contrary to the ethics set by the investigator that the whole objective as well as the contents of the study should be concealed from the testees.

From those who volunteered to read the test, some declined to complete the booklet which contained the prior knowledge tests, the passages and comprehension questions for reasons of their own. However, three students were honest enough to disclose the fact that they do not like reading such an unpleasant passage which had to do with death.

The other problem was in relation to setting a fixed time to administer the tests. It was nearly impossible to get all of the students at the same time and place. A point of time that suited one was completely unsuitable to another would be (volunteer) participant. Locating a central place to administer the tests was another major problem as students lived in different halls of residence as is the case in big Universities like London, Glasgow, and Strathclyde. These problems were solved by holding different sessions at different times and places, although the ideal session should have been only one.

The last problem is in relation to the enormous amount of time spent to approaching every individual student in order to confirm his acceptance or rejection to sit for the tests. One could be willing to do the tests but may decline to show up during the actual administration of the tests.

These problems affected the size of the sample to be used in the study.

1.7. Organization of the Study

A preliminary survey of the theories of reading, the rationale, the purpose, as well as the limitations of the study are presented in Chapter One

Chapter Two starts with the different definitions given to reading comprehension by the wide variety of disciplines closely associated with it, followed by a discussion of the three theories of reading : Bottom-up, Top-down, and Interactive. Since theories and their protagonists are inseparable entities, the views of the recognized proponents

of each theory are presented. The strengths as well as the weaknesses of each theory of reading are discussed.

Chapter Three characterizes the patterns of development in terms of theory and research in reading comprehension. To this effect, it takes up brief discussions on the four reading comprehension research strands : Readability, Cloze Procedure, Factor Analysis and Psycholinguistics. The historical development of these reading research areas, its merits and demerits are treated.

Some of the relevant features of these developments particularly in relation to the interactional aspects of discourse, to the different aspects of meaning, to the cooperative principle emphasized by some philosophers, and to the way these help us look at the simplification of texts (a procedure sometimes adapted to try to make texts more available to learners) are discussed in Chapter Four.

Chapter Five goes on to deal with the fundamental assumptions of the schema theoretic view of language comprehension. While Chapter Five deals with the aspects of schema theory, Chapter Six cites some of the findings (with particular reference to ESL/EFL reading comprehension) available in the literature on schemata theory.

The remaining Chapters deal with the actual investigation undertaken in the light of the theoretical issues discussed in Chapters Two-Six. Chapter Seven covers the methodology the investigator employed in the present study.

Chapter Eight gives the results of the investigation, while the analysis of those results is given in Chapter Nine.

Finally, the implications of the findings of the study are considered in Chapter Ten.

It is hoped that this arrangement of relevant material helps the reader to move from the theoretical to the practical and to see the significance of the actual results

in the light of the hypotheses which have been postulated.

The following chapter reviews the three main theories of the reading process along with the views of the proponents of each theory. The weakpoints of the theories are also discussed.

CHAPTER TWO

APPROACHES TO READING COMPREHENSION

2.0 Introduction

A multi-dimensional view of comprehension resulted in a multi-faceted definition of comprehension by a wide variety of disciplines closely associated with it.

Among a host of definitions cited in one form or another throughout this thesis, the following, although few, will illustrate the point in question. Reading specialists such as Wilson (1983) say, *'No one really knows what comprehension is.'* Others such as Smith (1982) say, *'Comprehension is a state or condition where no uncertainty exists.'* This refers to what Smith termed as *'Reduction of uncertainty by elimination of alternatives.'* Brown (1980), Beck (1981), and Weaver (1980) define comprehension as the *'goal, sine-qua-non and core of reading '* respectively. Furthermore, while Bloomfield (1930, 1962) and Fries (1961) attest that *'comprehension is a bottom-up processing of information,'* conversely, others like Goodman (1981) and Smith (1982) say *'it is a top-down processing of information.'* Those who defined comprehension as a synthesis of both bottom-up and top-down processing of information include Spiro (1980), Anderson (1977, 1986), Rumelhart (1980), and Durkin (1980) among others. Thus it can be seen from the discussion above that there is no one definition of comprehension unanimously agreed upon.

The purpose of this Chapter, in the face of all these definitions, is to examine the salient characteristics of reading comprehension in the light of the different models of reading comprehension found in the literature of reading research. To this end, the theories of reading comprehension and the views of the recognized proponents of each theory are discussed in the sections to follow.

2.1 Comprehension Theories

Theorists classify models of reading into three main types : Bottom-up, Top-down and Interactive theories.

Bottom-up theory emphasizes the reading text, Top-down theory emphasizes the reader and one's contribution to the text, while Interactive theory recognizes both Bottom-up and Top-down processes of reading. Whether this dichotomy of the text on the one hand and the reader on the other is a plausible view of reading comprehension remains to be seen in the following sections and sub-sections.

2.1.1 Bottom-up Theory

If reading is initiated by visual stimuli and requires little input from the reader, the processing is referred to as bottom-up. Alternative terms are *Text-driven* (Spiro, 1980, Durkin, 1980), *Data-driven* (Rumelhart, 1980, Anderson, 1977), and *Outside-in* (Smith, 1982).

Bottom-up theorists such as Bloomfield (1933, 1942, 1961), Fries (1962), and Gough (1972), among others, view reading as a process of responding to a printed text by decoding the graphic symbols to arrive at the meaning. Such a view, that is, reading from the part to the whole by simplistic grapheme by grapheme, morpheme by morpheme of the visual configuration, is in absolute agreement with the conception of text as an autonomous representation, and of meaning as entirely resident in the text ready to be extracted by the reader through the use of static linguistic signs. Here reading is considered as a chain of word perceptions and hence propositions are built only on prior identification of words. The reader in this model does not exercise interpretive functions, nor is his contribution to the text based on his background knowledge taken into account seriously. The counter-argument to this theory or strategy or model is discussed at length. (see 2.1.1.3)

Although its weaknesses by far outweigh its strengths (see 2.1.1.3) the insight that resides in this theory cannot, in any meaningful sense or by any stretch of imagination, be discarded once and for all from the theories of the reading process. Hence, the works of the two recognized proponents of bottom-up theory, namely, Bloomfield and Fries, will be treated briefly in the following two sub-sections.

2.1.1.1 Theory of Bloomfield

Bloomfield defines reading as follows:

> *'In order to read alphabetic writing one must have an ingrained habit of producing the phonemes of one's language when one sees the written marks which conventionally represent these phonemes. A well trained reader, of course, for the most part, reads silently but we shall do better for the present to ignore this fact, as we know that the child learns first to read aloud. The accomplished reader, then, has an over practised and ingrained habit of uttering one phoneme of English when he sees the letter 'p', another when he sees the letter 'i', another when he sees the letter 'n', still another when he sees the letter 'm', still another when he sees the letter 'd', and so on. In this way he utters the conventionally accepted word when he sees a combination of letters like 'pin', 'nip', 'tip', 'nit', 'dip', 'mid'. What is more, all readers will agree as to the sounds they utter when they see in conventional combinations, such as 'pid', 'nin', 'pim', 'nip', 'nid', 'nim', 'mim'. It is the habit which we must set up in the child who is to acquire the art of reading. If we pursue any other course we are merely delaying him until he acquires this habit in spite of our bad guidance '*
>
> (Bloomfield & Barnhart, 1961:10,26).

Accordingly, the first task of reading then, is learning the code or the alphabetic principle by which written marks conventionally represent phonemes. The meaning of the text is expected to come naturally as the code is broken based on the reader's prior knowledge of words, their meanings and the syntactical patterns of his language.

For Bloomfield writing is merely a more or less systematic attempt at making pertinent visual records of language utterance and hence merely a device for recording speech. Bloomfield (1961) further argues that writing (something artificial and relatively modern) is closely related to drawing pictures to represent a message and in fact seems in every instance to have grown out of picturing. The conclusion which Bloomfield draws is that since picturing is not based upon language, threfore, the art of writing is not a part of language. The analogy drawn by Bloomfield to substantiate his assertion about writing is equating a picture with understanding: *'Since one who knows the conventions of drawing can understand the picture even if he doesn't understand the language'* (Bloomfield,1961:384).

Therefore, Bloomfield conceives reading as decoding writing into speech. Bloomfield's approach clearly delineates the study of word from the study of word-meaning. Taken together, Bloomfield is contented with his reasoning that goes: *'Since a child enters school with a basic command of his spoken language, the basic task of learning to read is the learning of printed equivalents for his oral vocabulary.'* (ibid). Such is the central theme of Bloomfield's theory.

I will go over the bottom-up theory by way of remark later on in section 2.1.1.3. However, this theory cannot be complete without taking Fries's contribution into consideration. The next sub-section deals with the theories of Fries.

2.1.1.2 Theory of Fries

Fries (1962), in agreement with Bloomfield, defines reading as essentially a decoding process. Fries (1962) was certainly aware of what was in his time termed as

the *Broader Concept of Reading.* That conception includes the cultivation of a whole array of techniques involved in understanding, thinking, reflecting, imagining, judging, evaluating, analyzing, reasoning and in making emotional and social judgements. However, he considered such activities as the *use of reading* and not as constituting *the reading process* (Fries, 1962). His contention is that each one of the abilities listed may be subject to development and has been achieved by persons who could not read.

As with Bloomfield, this approach assumes the primacy of language and talk. Consequently, Fries says,

> *'Writing is the substituting of patterns of graphic shapes to represent the language signals of a code for the patterns of sound waves that have been learned as representing the same language signals and reading is the responding to the language signals represented by patterns of graphic shape as fully as he has already learned to respond to the same language signals of his code represented by patterns of auditory shapes '* (Fries, 1962:119).

The only difference between reading and listening according to Fries (1962) is the means of connection to the human nervous system: in the former case, the stimulation of the nerves in the ear.

On the relation of meaning to decoding, Fries tries to clarify his position by saying that,

> *'Merely pronouncing words or word calling is neither reading nor talking. Instead, the response to the graphic sign must also elicit a meaning response '* (Fries, 1962:120).

Furthermore, in reply to Chall's (1967) inquiry on the question of meaning, Fries had the following to say:

> *'Our approach is not certainly a phonic approach. It is not an approach that gives primary emphasis to decoding...we have to insist that our type of approach gives primary emphasis to reading for meanings. '* (in Chall,1967:343)

Fries's lip service to meaning on the one hand and his views on the issue of the reading process and the process of learning to read on the other, make his inconsistencies vivid.

On the process of reading itself, Fries says

> *'The first stage of learning to read is the transfer stage during which the child is learning to transfer from the auditory signs for language signals, which he has already learned, to a set of visual signs for the same signals '* (Fries, 1962:123).

Fries elaborates,

> *'The process of learning to read...is the process of transfer from the auditory signs to the new visual signs...Learning to read, therefore, means developing a considerable range of habitual responses to a specific set of patterns of graphic shapes '* (ibid.).

In either way, Fries (1962) takes the reading process and the process of reading as a matter of habitual responses to graphic shapes. As Fries's theory is a stone throw from Bloomfield's, it is not difficult to guess that for Fries reading is essentially a decoding process. Therefore, if reading is taken as a matter of habitual responses to graphic shapes, obviously, the emphasis is classified as decoding.

In short, the Bottom-up theory views reading as a process of responding to a printed text by decoding the graphic symbols to arrive at the meaning. It assumes meaning as entirely resident in the text ready to be extracted by the reader through

the use of static linguistic signs. In addition, the theory does not take into account the contribution of the reader to the text. In the light of the foregoing discussion, the most outstanding weaknesses underlying this theory are given in the following sub-section.

2.1.1.3 Weak Points of Bottom-up Theory

The major objections to the bottom-up theory are listed below.

First, the area that should be disputed outright is that bottom-up theorists allow no interaction of higher level processes on the lower level processes. But the fact of the matter is that, a number of studies as indicated by Brewer (1972) confirm that letter recognition is faster for words than non-words: that more text is seen per a given exposure duration if material is in words or sentences: that readers often actually see words which are not present when confronted with typographical errors. In the literature, this objection is often termed as the problem of linearity which results in cognition being effectively isolated from perception. (cf. Chafe, 1974).

Second, certain studies show that since letters are decoded directly to meaning, reading exists without a letter to sound transfer. Exclusive letter to sound transfer implies that the deaf cannot learn to read, but they do.

Third, bottom-up theorists also do not allow that the lexical search process is affected by previously acquired information. Brewer's (1972) example illustrates this point clearly: *The painter said the new paint was lighter, but his assistant had trouble picking it up.* Therefore, from this and other infinite numbers of examples, it becomes apparent that at the level of awareness both preceding and following information contribute to the reading given a particular lexical item.

Fourth, the problem of integrating sentences and propositions has been given little or no attention by the bottom-up models. (cf. Mitchel,1982)

Fifth, bottom-up theory views reading and comprehension as separate entities. Suffice it to mention two assertions made by Fries. Fries (1962) one of the proponents of bottom-up theory, recognizes, in his dichotomous approach, that comprehension cannot be excluded from reading. But in actual fact he excludes it by saying,

> *'Such skills as understanding, thinking, reflecting, imagining, judging, evaluating, analyzing, reasoning and making social and emotional judgements are all matters of the uses of language and are not limited to the use of reading. As such comprehension per se does not constitute the reading process '* (Fries, 1962:118).

Furthermore, Fries relegates comprehension to a peripheral status by saying,

> *'Reading proper is the process of transfer from the auditory signs for the language signals to the new visual signs for the same signals, that is, the visual replaces the auditory as the means of connection to the human nervous system and once that connection is made, then all the other language processing skills proceed as usual and one such ability is comprehending '* (Fries, 1962:119-120).

This view of comprehension is in complete disharmony with that of top-down theory. For instance, Goodman's (1967) description of reading as partial use of available minimal language cues selected from perceptual input on the basis of the reader's expectation, is the cornerstone of the top-down model. What this means is that comprehension is essentially a memory process by which stored information is retrieved from memory and related to encountered dicourse. The reader makes predictions on the basis of the knowledge s/he brings to the text, excluding some alternatives in advance. These predictions reduce the amount of visual information needed by the reader (Smith, 1975). Therefore, without the expectation of predictions derived from knowledge of the world, the reader would be obliged to make *painstaking and excessive*

use of the full range of decoding processes resulting in a severe burden on short-term memory, so that even if s/he could comprehend individual clauses or sentences, s/he would be unable to relate them to the rest of the text (cf. Ingram, 1973). In Trabasso's (1981) terms, *absence of top-down structures* necessarily entails increased use of *linguistic skills* to derive sentence meaning and infer a model or framework.

Fifth, according to Sanford and Garrod (1981) *secondary processing* is much more costly in terms of attention capacity than *primary processing* (top-down), which utilizes conceptual expectation derived from stereotyped knowledge of the world–scenarios. This important concept is not taken into account in the bottom-up models.

Sixth, in addition to the objections mentioned above, there is much empirical evidence accumulated against the bottom-up models at all recognized levels of processing, be it in letter-word recognition or syntactic and semantic interpretations (cf. Rumelhart, 1975, 1977, 1980, Anderson et.al., 1977, Adams & Collins, 1977, Pichert & Anderson, 1977, Marshall, 1981, Steffensen, 1981). (see Chapter Five)

In summary, the bottom-up theories have little to contribute to the full notion of comprehension including what role it plays in the process of reading. Suffice it to quote Mitchell (1983:133) at this appropriate junction: *'For many of the theorists, comprehension is thoroughly mysterious if not magical.'*

2.1.2 Top-down Theory

Alternative names for this model found in the literature are the *hypothesis test model* (Rumelhart, 1980), the *concept-driven* model (Anderson, 1977) and the *inside-out* model (Smith, 1982).

The essence of these models is that the analysis of the sensory signal begins centrally, rather than peripherally, with the derivation by the listener/reader of a hypothesis regarding the information in the sensory buffer. From this hypothesis, the

listener/reader generates a list of distinctive sensory features that such information would have if it was present. These features are then compared to the externally generated features, resulting in a match (perception and comprehension) or a mismatch (generation of new hypotheses) until a match is obtained. (cf.Carpenter & Just, 1977).

In the same vein, Anderson (1977) notes that the text is not read line by line, but rather the reader samples the text to either confirm or reject hypotheses about its content. At the top are the conceptual hypotheses which are generated by the reader based on his knowledge of both the world and the language (Durkin, 1980) at the bottom is the print of the writtten text.

According to top-down theory, comprehension is essentially a memory process by which stored information is retrieved from memory and related to encountered discourse. Here, the reader makes predictions on the basis of the knowledge s/he brings to the text, excluding some alternatives in advance. These predictions reduce the amount of visual information needed by the reader (Smith, 1978) and therefore, prevent the *combinatorial explosion* (de Beaugrande & Dressler, 1981) which would result from wholly bottom-up processing. Smith says, *'Processing requirements can be reduced by prediction or the prior elimination of unlikely alternatives '* (1978:67).

Predictions are generated by various sources of overlapping nature. For instance, Smith, (1978) emphasizes the importance of three levels of information in generating predictions: Orthographic, Syntactic and Semantic, whereas, Haber & Haber (1981) identify five sources which restrict alternative forms or sequences and therefore, reduce processing requirements. They are Visual input, Spelling rules, Syntactic rules, Semantic rules and World knowledge. Although this point would be taken in section 2.1.2.1, it is worth noting that top-down approach to text comprehension is primarily concerned with the semantic or conceptual level.

The proponents of top-down or inference-driven processing (Smith, 1973, 1975, 1978, 1980, Goodman, 1967, 1976, 1979, 1981, Mitchell, 1984, among others) claim that input is interpreted and enriched by one's expectations or by the context in which the information is presented. They have cited reading errors where the reader substituted related words which were semantically and syntactically appropriate to the context as indicators of top-down processing. For instance, a reader substituting the word *lady* for *woman* must be doing more than merely decoding print. The errors indicate readers' use with regard to what they know about the language and what they are actually reading to construct a meaning from the text. In addition, research in semantic priming has reflected the importance of top-down processing for word-identification tasks (Kintsch & Miller, Baker & Brown, 1984, Mitchell, 1984, Stanovitch & West, 1983).

Since Frank Smith is one of the most recognized top-down theorists, his views and contributions to the theory will be discussed at length in the section to follow.

2.1.2.1 Theory of Smith

There are areas of disagreement and agreement between the proponents of bottom-up and top-down theories, i.e. Bloomfield and Fries on the one hand and Smith and Goodman on the other respectively. The main point of agreeement lies in the fact that access to the print is a necessary part of the reading process. The main point of departure for the top-down theory is that it strongly emphasizes the contribution of the reader as an indispensable element in the reading process. Smith (1982:10) says,

> *'No top-downer would want to claim that reading is not an interaction with the text in any sense. Just because meaning has to be brought by the reader does not mean that any meaning will do, access to the visual information is a necessary part of reading but*

it is not sufficient '

Smith, admittedly recognizes the importance of visual information which any reader possesses, as reading involves both visual and non-visual information all the time it takes place. By the same token, Smith, (1982) asserts reading as an interaction between the reader and the text and one aspect of his/her *non-visual information* is knowing how to read in the sense of recognizing print.

Reading is not decoding written language to spoken language. As opposed to the bottom-up theorists, Smith irrevocably dismisses the idea that a reader, as a matter of priority, first decodes written language to speech for comprehension to happen. He says:

> *'It is not necessary to say what a written word is before we can comprehend its meaning. We no more need to say a written word is "cat"in order to understand it, than we need to say that particular animal is a "cat"in order to recognize it '* (1982:136).

Smith's argument, plainly put, is that we can learn to recognize words in as much as we learn to recognize any other of the many and varied objects around us, not through the modification of spoken language but directly from meaning.

Further, Smith emphasizes strongly that reading is a matter of bringing meaning to print. He says, *'It is neither necessary nor possible for writing to be comprehended by a process of decoding written symbols into speech. Instead, written language must be directly attacked for meaning'* (1975:184). Or put differently, *'It is only by understanding what you read that you can read aloud or to yourself. The sound must come last and can be dispensed with altogether'* (1975:180).

This claim is justified if one pays a look at the four observations about the differences between spoken and written language which Smith (1975, 1978, 1982)

came up with.

In the first instance, Smith asserts,

> *'We get meaning from the visual properties of print and not from sound. Otherwise how could it be possible to detect misspelled words in a sentence like, "The none tolled hymn." If meanings were accessible through the sounds of the words, there could be no basis for saying that misspelling exists here. Nor is there any basis upon which to account for the differences in case of reading between the misspelled and the properly spelled versions of such a sentence mentioned above '* (Smith, 1975:181).

Secondly, some words such as *'read'* and *'wind'* are only differentiated in speech but not at all in writing. Smith says, *'Our articulation of such sentences as: "He winds his watch while the children read "or "I read yesterday that the winds would be strong,"depends on the meaning which precedes their spoken counterparts'* (ibid.).

Thirdly, meaning in speech is often conveyed by intonation but in writing the meaning must be understood before the proper intonation can be produced.

Lastly, Smith (1978) vehemently opposes the idea that we need the alphabet to help us remember the names or meanings of all the written words we recognize. He says,

> *'We can all recognize and recall many thousands of words in our spoken language vocabulary and many thousands of different faces and animals and plants and objects in our visual world without any such clues. Why should then this fantastic memorizing capacity suddenly fail in the case of reading? '* (Smith, 1978:182).

Based on the observations stated above, it is not a matter for debate to say that

any written language is read directly for meaning. This statement, however, doesn't in any way, override the use of phonics (the sounding out of words by letter sound correspondence). Phonics are of use for elimination of alternatives. Smith (1982) emphasizes that the strategy as *sounding it out* is in fact dependent on meaning in the first place. That is, it should be noted that phonics only work if the meaning of the word is already known in advance. Smith (1975:184) says,

> *'The use of phonics is neither the only, nor is it the best and most natural strategy for word identification. Children learn phonics through reading, they do not learn to read through phonics '*

The second major area of disagreement between the bottom-up and top-down theorists is that *'reading is not a consequence of reading words and letters.'* According to Goodman (1976c) the notion that being careful to perceive, recognize and process each letter or each word is necessary to successful reading is atheoretical common sense that is totally inappropriate to understanding the reading process.

Reading for meaning is not only the best strategy but an alternative which is not dependent on word and letter identification. In fact, normal reading demands comprehension prior to and even without the identification of words. (cf. Smith, 1978)

This claim is supported by several experimental factors. First, if letters are arranged into meaningful words, twice as many can be recognized in the same time as a non-meaningful sequence of letters. Second, if a reader is *making sense* of a passage, less than one half of the *distinctive features* of letters are actually needed and used (Smith, 1978) and hence at least three quarters of the visual information available in the text must actually be ignored (Smith, 1982). Thirdly, the brain which determines what we see and how we see it, does not see everything in front of the eyes, nor does it receive information from the eyes continuously (Smith, 1982). Therefore, it can be

concluded, based on the facts presented, that reading is selective and by and large dependent on non-visual information. It is at this point that Goodman (1970) defined reading as:

> *'A selective process involving partial use of available minimal language cues selected from perceptual input on the basis of the reader's expectation and as this partial information is processed, tentative decisions are made, to be confirmed, rejected or refined as reading progresses '*

This area of conflict with the bottom-up theorists is based upon extensive empirical evidence brought forward by studies in experimental psycholinguistics. Simply put: the brain does not have the time to process every bit of the information in front of the eyes.

Meaning is one essential area which brings about a wide rift between the two opposing views of information processing. That is, meaning is brought to print as viewed by top-downers, whereas bottom-up theorists claim that it is rather derived solely from print. On this issue Smith confirms: *'What transfers behind the reader's eyes in the reader's brain, makes far greater contribution to reading than the print in front of the reader's face'* (1984:4).

The non-visual information, no matter whether the text is unfamiliar or not, is more important in constituing the core of reading after all, *'reading is only incidentally visual'* (Kolers, as in Smith, 1982:2).

Smith does not in any way, deny the importance of visual information one derives from text, but what he says is that the reception of visual information is filtered by the brain of the perceiver which makes a far greater contribution to reading than the print itself. (cf. Smith, 1984)

The aforementioned areas of disagreement between the top-down and bottom-up theories are sufficient enough to understand what the two opposing theories stand for and thereby help one to have a clear opinion as to which theory is adequate and powerful enough to define and/or describe the reading process in general.

Smith's theory of reading is based on two disciplines. They are Information-Processing Psychology and Psycholinguistics. On these two disciplines, Smith, (1975:2-3) says,

> *'The underlying theoretical perspective of information processing psychology is that the primary function and activity of the human brain, at least with respect to its commerce with the outside world, is actively to seek, select, acquire, organize and utilize information about the world and Psycholinguistics is concerned with how individuals learn, use and comprehend language. '*

Smith maintains that understanding comprehension theoretically is of crucial importance in the study of reading for teachers as well as researchers. He further notes emphatically that comprehension in reading is a matter of making sense of text, of relating written language to what we know already and to what we want to know.

It is worth noticing the following interesting concepts which are the cornerstones of Smith's views on comprehension.

> *'Comprehension is a state and it is not the opposite of ignorance but the opposite of confusion or simply put, one comprehends the situation that he is in if he is not confused by it. Comprehension is the lack of confusion, lack of confusion is a condition where no uncertainty exists and information is that which reduces uncertainty by the elimination of alternatives and therefore, comprehension is*

the condition of having cognitive questions answered... hence, the absence of uncertainty ' (Smith, 1978:14-15).

The information processing model naturally has a common meeting ground with Psycholinguistics if one examines closely the following brief but important points made by Smith with regard to the comprehension process *per se.*

(i) Reading from perception of visual information to comprehension is *purposeful, selective and anticipatory.* (1982:3)

(ii) Comprehension is relative to the knowledge and purpose of the individual receiving it (1982:16).

(iii) Comprehension is specific to the precise nature of the individual's uncertainty (1975:34).

Smith equates his model of comprehension with the perception of the world, in that it goes behind the reader's eyes to the cognitive structures in the head. Smith (1978) suggests that the theory of the world that we have in our heads is just like any theory in science having the same kind of composition and serving exactly the same function by way of providing a useful summary of everything learned, influencing how new data are perceived and interpreted and lastly by being a fruitful source of useful hypotheses about the future.

Regarding the theory of the world in our head Smith sums it up in this way:

'Contrary to scientific theories, the theory of the world in our head is implicit knowledge. It serves as the basis of our comprehension by generating questions, predictions and plans based on what is already known. However, the questions we ask in reading are almost invariably implicit, we are not generally aware of the questions that we ask or even that we are asking them ' (1978:126).

What Smith suggests is that our theory preceds our actual experience, which in turn, either confirms our predictions or rejects or forces an alternation in our theory. Therefore, comprehension can be accomplished if we are able to interpret our interactions with the world in the light of our theory (Smith, 1982).

As a concluding remark, Smith (1982) reaffirms that predictions are the questions we ask the world based on our theory and comprehension is receiving the answers to these questions. Further, he claims that *'the ability to construct a theory of the world is innate and the ability to predict and learn is a natural process... a natural part of being alive and growing up'* (Smith, 1978:87-88). This is why Goodman and Smith (1971, 1979, 1981, 1982) invariably agree on the notion that reading is a natural process which in many ways does not need to be learned, rather, the job of the teacher is not to interfere with it.

This last notion put forth by Goodman and Smith, needs some further explanation to see whether it holds true or has a pervasive effect on both native as well as non-native readers. This controversial issue shall be discussed in Chapters Three & Four of this Thesis. But for the moment, the concentration being on Smith's theory of the world, it would be taken up further as follows.

The most important questions which ought to be raised here are: How is the theory structured and what are, if any, the basic components the structure consist of? Smith (1975, 1982) answers these questions by saying that three basic components are reckoned within the structure of the theory. They are:

i. Categories

ii. Rules for category membership and

iii. Interrelations among the categories.

The first skill needed in reading, as a natural process, is the prediction of mean-

ing and the sampling of surface structures to eliminate uncertainty. Prediction, as has been discussed, is the basis of comprehension, and comprehension of the world, and it prefigures the question to which comprehension is the answer. Prediction helps us to select alternatives, thus various alternative meanings are eliminated and various alternatives remain, minimizing uncertainty in advance, and relieving the visual system and memory of overload in the process of reading (Smith, 1982).

The second skill is the ability to make the most economical use possible of visual information. After prediction, Smith maintains,

> *'The reader selects...among his remaining alternatives by sampling the surface structure, looking for limited matches or correspondences exhaustively, he brings meaning or a limited set of alternative meanings to it '* (1975:94).

Smith makes his position clear to the proponents of the bottom-up theory once again, by saying :

> *'Just as in recognition of other perceptual objects, we do not need to process all the information available, so too in reading, we select only those distinctive features which are necessary for the purposes at hand. When we identify meaning in text...it is not necessary to identify individual words. We can make sense of text directly from the distinctive features of print '* (Smith, 1978:117).

Smith admits, from start to finish, how essential visual information is. However, he emphasizes, at considerable length, the contribution of the reader to comprehension which is the sine-qua-non of the reading process.

By way of summary, I would like to quote Smith here, although what he says in the following quotation have been presented earlier in this section in bits and pieces.

Here is what Smith says to the dismay of the bottom-up theorists:

> *'Neither individual words, their order, nor even grammar itself, can be appealed to as the source of meaning in language and thus of comprehension in reading. Nor is it possible to decode from the meaningless surface structure of writing into the sounds of speech in order to find a back route to meaning. Instead, some comprehension of the whole is required before one can say how individual words should sound or deduce their meaning in particular utterances and even assert their grammatical function. I am not saying that any utterance can be taken to mean anything, with most utterances only one interpretation is intended and usually there is little argument about the interpretation that should be made. But this argument does not explain how decisions about meaning are reached and how the essential ambiguity of surface structure is overcome '* (Smith, 1978:75).

Put together, central to top-down theory is the notion that comprehension is a memory process by which stored information is retrieved from memory and related to encountered discourse. Its approach to text comprehension is primarily concerned with semantic level, emphasizing strongly that reading is a matter of bringing meaning to print. In addition, the theory takes the reader as an indispensable element in the reading process. Concepts like sampling, expectation, prediction and non-visual information are the building blocks of top-down theory.

Top-down theory, like any other reading theory, is not without some shortcomings of one kind or another. Some of the criticisms levelled against it are given below.

2.1.2.2 Weak Points of Top-down Theory

The major objection with regard to the top-down theory is that the top-down models fail to generate testable hypotheses. Instead of promoting research, the claims were pronounced some what dogmatically. For instance, there was little serious attempt to reconcile these proposals (the major claims of the top-down approach, eg., that only units of meaning enter the reader's memory system) with what is known of the parameters of our perceptual and memory system.

The minor objection applies directly to the claims of Smith, the recognized top-downer. Let us first of all take his views on words and sentences. Smith (1973:77) claims, *'Individual words do not carry any information about how they should be articulated.'* Nonetheless, there are quite a number of lexical items (for instance, PERmit and perMIT) which obviously give some information about how they should be articulated at first sight. In addition, Sticht et.al. (1974:64) assert: *'Smith seems to use a very broad and loose definition of reading such that errors at the word level do not prohibit reading as long as meaning is retained.'* Sticht et.al. object that this does not do justice to reading as a communication activity which must take the textual sense into more careful account.

Further, Smith (1982:15) regards comprehension as:

> *'A state or condition where no uncertainty exists, that is, when we have no unanswered questions. Comprehension in reading, then, is a matter of making sense of text, of relating written language to what we know already and to what we want to know. '*

Implicit in such a statement is Smith's strong conviction that comprehension is relative to the knowledge and purposes of the individual receiving it.

This top-down emphasis of Smith on the question of subjectivity and relativity

brought about the protests extended by critics in the opposite camp. Obviously, Smith's view implies that someone who has no unanswered questions about a topic can be said to comprehend a book about that topic on any reading of it or even before reading the book as long as no new questions are raised by the book itself. But how, on Smith's views can new questions be raised if comprehension depends in the first place on what the individual already knows and needs or wants to know ? If for example, one neither already knows or needs or wants to know anything about some complex aspects of DNA research, no matter how crucial it may be, can one be said to comprehend this area ? In such a situation one is neither confused nor uncertain and so according to Smith one can comprehend. But is it not true that one is simply ignorant of the field of research mentioned above ?

In addition, to the objections raised against Smith's views, the following statements deserve a close attention. Smith says *'Reading is an interaction between a reader and a text. There is a reciprocal relation between the two.'* (Smith, 1982:11). And yet, he is inconsistent when he claims, *'the reader must clearly exercise control (1982:3) in the reading process and is not under the control of the text'* (1982:2).

These, are then, the main criticisms of the top-down model found in the relevant literature. The following section deals with the third type of reading model known as Interactive Theory.

2.1.3 Interactive Theory

As the name implies, interactive theory takes into full account the valid assumptions of bottom-up and top-down processes or models and combines them into a coherent whole.

Adams and Collins (1977) claim that in such models, top-down and bottom-up processes operate simultaneously at all different levels of analyses, they work to pull the various fragments of knowledge and information into a coherent whole.

The interaction between the content of what is being read and prior knowledge, remain essentially the central theme of interactive model of comprehension. To this effect, Beck (1981:79) says,

> *'The notion that the meaning of a text is constructed as opposed to being extracted from the textual materials serves to point out that comprehension is an interactive process between previously acquired knowledge and the content of what is read '*

The forerunners of this theory have laid considerable emphasis and attention on the role that prior knowledge plays in the comprehension process, which later became known as schema theory.

This contemporary theory, that is, schema theory, was pioneered and developed by Bartlett as far back as the 1930s. Bartlett, father of much of contemporary Cognitive Psychology used the term schema(ta) in his classic book *Remembering* (1932), which obviously occupies a prominent position in many theories of comprehension to date.

Bartlett says, *'Comprehension consists of an effort after meaning...such an effort is simply the attempt to connect something that is given with something other than itself'* (Bartlett, 1932:227).

Central to the interactive theories are the reader and knowledge of the world. That is, the reader makes an active contribution via the text against his world [knowledge] in a manner which is intertwined, aiming towards the creation and/or construction of a complex scenario refining it progressively (cf. Anderson, 1977, Spiro, Adams & Collins, 1979, Adams & Bruce, 1980, Beck, 1981, Tierney & Pearson, 1981).

Rumelhart (1980), one of the proponents of this theory, recognizes that bottom-up processing proceeds from part to whole and top-down processing goes from whole

to part without denying the fact that activation in reading is a two way communication flowing in both directions. He claims, when an event occurs in the sensory system, it activates certain low level knowledge units (feature detectors) which in turn activate more probable higher level processes. Then the higher level units initiate conceptually driven processing which filter back down to check for goodness of fit. Essentially, the partially activated process moves up through the system with increasingly comprehensive levels of analysis. The higher levels begin to activate from top-down and flow back to make contact with other information activated from the bottom-up or to search for predicted input. However, for the skilled reader both types of processing occur at all levels simultaneously as s/he proceeds through the text, making the most use of printed information, redundancy of the language and contextual information with minimal effort (Adams, 1980, Fisher, 1981). In other words, when these two processes are in proper balance and interpretation is consistent with expectations, the information processing will proceed smoothly.

Therefore, Rumelhart's model draws together many levels of information in a multiple process, pattern-synthesis stage. Processing of information, at any level, can affect processing at any other level and hence the interpretation of parts and wholes must proceed together.

This view of the reading process considers reading to be a multi-level interactive process (Kintsch & Miller, 1984). The person must process surface features as well as bring his/her own knowledge to the act of reading (Just & Carpenter, 1980, Rumelhart, 1980).

Many researchers hold the interactive view of reading and have focussed their attention on processing capacity. They recognize the human mind is a limited capacity processor (LaBerge & Samuels,1974). This view proposes that the reader can direct attention to particular sub-processes only by taking attention from deeper levels of

analysis. Furthermore, the level of analysis emphasized will be the one which would be retained the longest (Craik & Lockart, 1972).

Further, interactive theories are opposed to piece-meal comprehension of discourse. As Rumelhart puts it: *'...the process of understanding discourse is the process of finding a configuration of schemata that offers an adequate account of the passage in question'* (1980:47).

The Interaction theory gathers much of its momentum from the tenets of Schema theory which are discussed succinctly as follows.

First, schema theory makes a very clear claim about what comprehension is all about. That comprehension is the filling of schemata, the matching of information from the text with slots in the schemata. What Smith claims, *'Making sense of the world by relating new experience to the already known'* (1975:10) exactly fits the definition given to comprehension in the light of schema theory . It is not much of a debate that we usually know what to do in a situation by relating new experience to the familiar and already known. Discourse understanding, then, means activating and filling the appropriate schema from the print recognition through and to whatever level of processing we want or need.

Secondly, schema theory can account for both the similarities and differences in comprehension which occur in text comprehension (Spiro, 1979). Reading is not passive but active and motivated by the expectations and desires of the individual. Thus, the purpose of the reader as well as his/her own schemata with varying slots, default values, recognition of fit and evaluation of goodness of fit, account for the differences. The similarities in comprehension derive from the similarities among schemata which are themselves derived from personal experience which is thoroughly social and in most respects similar. In short, the individual has a major role in comprehension and thus comprehension is as similar and different as individuals are.

An adequate account of the text data, then, depends on individual purposes. As Brown (1980:454) puts it: *'...understanding is not an all or nothing phenomenon, it must be judged against the criteria set by the reader as a goal of activity.'*

Third, schema theory recognizes both top-down and bottom-up processing in comprehension (Rumelhart, 1980:41, Collins et.al., 1980). Such a theory is required by the experential evidence accumulated in reading research. Further, such dual-simultaneous processing seems to be required by the common experience of reading as the *'progressive refinement from the initial model to more and more refined models of the text '* (Collins et.al., 1980:38).

Fourth, schema theory can account for a great deal of learning. For schema theory, learning is the process by which new schemata are developed. There are three processes posited to account for learning (Rumelhart, 1980). The first is *accretion* or fact learning , the retrieval of stored information about a text or event. The second is *tuning*, by which existing schemata evolve or change to be more *in tune* with new experience. The third process is *restructuring*, a process by which new schemata are created. There are two basic ways new schemata can be formed in this theory. First, by analogy ,*'a new concept is like an old one except for a few differences,'* (Rumelhart, 1980) which are substituted into a copy of the old schema. Second, new schemata can be induced from the experience of the repetition of certain spatio-temporal configurations.

This concept of comprehension by means of schemata implies a subject, the one who comprehends and who in some sense transcends and controls the process. The control is not absolute, since the schemata are presented to the subject with a high degree of givenness by experience which itself is influenced by the social fabric of culture as well as by invariants in nature, even, perhaps, the nature of the subject, a question not taken up by this theory. However, though there is a degree of givenness of

the schemata, the subject is active in the recognition of fit (of fillers from experience to the slots of the schemata), in the evaluation of the goodness of the fit, and constantly through out the learning process. This is a welcome aspect of schema theory. Schema theory vis-a-vis reading comprehension will be discussed at length in Chapters Five and Six.

It is deemed necessary, at this point, to take up a model that illustrates the tenets of interactive theories. One such model is that of Goodman and is treated in the following section.

2.1.3.1 Theory of Goodman

The theory of interaction is no where better demonstrated than in the work of Goodman (1976, 1979, 1981). Therefore, it is relevant to go through the interactive model of Goodman briefly.

Goodman (1981) claims that his model is interactive in that the goal of reading is constructing meaning in response to text, requiring interactive use of grapho-phonic, syntactic and semantic cues to construct meaning, using print as an input and meaning as output.

Goodman's theory basically revolves around the notion that language processes must be studied in the context of their use without being dissected, stopped or unnnaturally constrained to maintain the relative significance of constituents to wholes. This is why Goodman is opposed to the view of reading which involves detailed, sequential perception and identification of letters, words, spelling patterns and large language units.

Therefore, the entire reading process is seen by Goodman as *getting to meaning* (1973) *geared to the reconstruction of the message* (1969). On the basis of this understanding with regard to the reading process, Goodman (1976b:472) defined reading as

'A complex process by which a reader reconstructs, to some degree, a message encoded by a writer in graphic language.'

Goodman's theory of reading can best be understood if the main or key terms he used to describe reading are explained: *Interactive, Psycholinguistic, Active, Constructive, and Tentative* (1979).

Interactive is understood to mean the contribution of the reader to the given text. Goodman (1979) maintains that the reader's input to meaning is as significant as the textual input, that is, what the reader brings to the text is as important as what the author did in understanding the meaning a given reader constructs.

The term *Psycholinguistics* as an interactive process, according to Goodman, captures the subject side *Psycho* and the textual side *Linguistics.* Goodman became well known by one of his 1967 article entitled *'Reading : A Psycholinguistic Guessing Game,'* which became popular in the literature on Reading. Therefore, Goodman describes reading as *'Linking together of optical, perceptual, syntactic and semantic cycles, all of which are utilized by the reader in the service of constructing meaning '* (1979:658).

The term *Active* is used to describe the contribution of the reader to the reading process using the strategies of sampling, predicting, confirming and correcting (Goodman, 1979b) depending on the linguistic textual cues. Briefly what Goodman (1976) asserts here is that the reader, concerned for meaning, brings to his reading the sum total of his experience and his language and thought development.

The term *Constructive* is interesting in that there is nothing in the shape or sequence of any letters or groupings of letters which in itself is meaning because meaning is in the mind of the writer and the reader, and therefore, it is the reader who constructs a message in interaction with written language (Goodman, 1973, 1976). Further, the meaning of the text is not given all at once, but little at a

time. It is important to bear in mind that as Goodman (1979) asserts that we only know the parts when we have created the meaning for the whole. Thus, the whole which obviously can only be constructed from the parts of the text by the reader's contribution is, therefore, the prerequisite for the proper knowledge of the parts.

Goodman says,

> *'Reading involves the partial use of available minimal language cues selected from perceptual input on the basis of the reader's expectation. As the partial information is processed tentative decisions are made to be confirmed, rejected or refined as reading progresses. Hence, reading is a Psycholinguistic guessing game. '*
>
> (1976a:498).

Goodman's term *Tentative* is understood in the light of expectation, selectivity and guessing. The syntactic, semantic and grapho-phonic strategies are used to guide the process which selects graphic cues. Goodman (1976:498) claims, *'The ability to anticipate that which has not been seen is vital in reading just as the ability to anticipate what has not yet been heard is vital in listening.'*

Further, reading as a rapid series of guesses, proceeds in cycles of guessed and anticipated meaning. Confirmation and modification of the predictions is always tentative to some degree (Goodman, 1979).

A summary of Goodman's model of reading is given below.

The reader:

1. scans along a line of print from left to right and down the page, line by line.
2. fixes at a point to permit eye-focus. Some points will be central and in focus, some will be peripheral, perhaps his perceptual field is a flattened cycle.

3. begins the selection process. Picks up graphic cues, guided by constraints set up through prior choices, language knowledge, cognitive styles and strategies learned.

4. forms a perceptual image using these cues and anticipated cues. This image then is partly what s/he sees and partly what s/he expected to see.

5. searches (in memory) for related syntactic, semantic and phonological cues. This may lead to a selection of more graphic cues and to re-forming the perceptual image.

6. makes guesses or tentative choice consistent with graphic cues. Semantic analysis leads to partial decoding as far as possible. This meaning is stored in short term memory as the reader proceeds.

7. checks (if no guess is possible) the recalled perceptual input and tries again. If a guess is still not possible, the reader takes another look at the text to gather more graphic cues.

8. tests (if s/he can make a decodable choice) it for semantic and grammatical acceptability in the content developed by prior choices and decoding.

9. regresses (if the tentative choice is not acceptable semantically or syntactically) by scanning from right to left along the line and up the page to locate a point of semantic or syntactic inconsistency. When such a point is found, the reader starts over at that point. If no inconsistency can be identified, s/he reads on seeking some cue which will make it possible to reconcile the anomalous situation. If the choice is acceptable, decoding is extended, meaning is assimilated with prior meaning and prior meaning is accomodated if necessary. Expectations are formed about input and meaning that lies ahead. Then the cycle continues.

Goodman (1976) affirms that the steps involved in his model do not necessarily

take place in sequential form as outlined and secondly, although the outline is complex, in fact, it is not complex enough to account for the actual behaviour of readers.

In summary, Goodman hypothesized in his model that the reader must bring expectations from memory to the reading task and suggested that the original perceptual image of graphemic cues was formed and stored in short term memory where the cues are related to phonological, syntactic and semantic cues. These cues are sent to the short term memory for comparison with the perceptual images which are relayed from the text. If these cues match, comprehension is achieved.

Goodman's model is ideal for the native speaker. He readily admits that the skilled reader is one who knows the language so well that he can take a sample of cues presented and predict the surface structure as well as make inferences as to the deep structure.

However, whether this plausible analysis based on the Psycholinguistic model of reading comprehension can also be directly applied to second language reading comprehension is questionable.

So far, we have seen that Interactive theory is a better equipped theory capable of explaining the processes involved in reading comprehension. It operates in the reading process by combining the valid assumptions of the two theories into a coherent whole. Due to the fact that the interactive model takes into account the strength of both bottom-up and top-down models by avoiding the weaknesses attributed to each model, it becomes obvious in all respects that interactive theories are the most preferred approach to the theory of the reading process. However, this does not mean that it is absolutely free from criticisms. Therefore, some of the objections levelled against the interaction theory are presented.

2.1.3.2 Weak Points of Interactive Theory

The most general criticism is that, at present, the model is not sufficiently detailed on the one hand (cf. Mitchell, 1982), and on the other, it is too particular, thus lacking a comprehensive general theory (Harker, et.al. 1982). In short, the theory is in its infancy, an admission its proponents are quick to make.

More specifically, the model may be criticized for not delineating the constraints on the number and type of processes which can simultaneouly occur in parallel. If the information processing capacity of the reader is not to be assumed infinite, such constraints are required. And even if an infinite capacity is assumed (and it is clearly not infinite) some accounts of the actual processing of readers must be given.

Related to this is the recognition that insufficient attention has been given to the basis on which various kinds of hypotheses are generated and to the varying influences of each knowledge source, differing strategies and various reading conditions (Mitchell, 1982).

Fundamental to the last concern is that there is no general account of how schemata are acquired and how a piece of discourse is recognized as an instantiation of a schema (Harker, et.al., 1982).

Further, Smith claims, this is so, due to the committment of many in this approach to lean on an extremely narrow conception of comprehension that characterizes computer-based models of language (1983).

Schema theory is central to the theory of Interaction. The Interactive theory gathers much of its momentum from the relatively recent schema theoretic account of reading. Schema theory of reading represent the forefront of reading research today. The Schema is the most sophisticated and promising theoretical construction offered by the reading researchers to explain the processes involved in reading comprehension.

As such, Schema theory will receive an elaborated treatment in Chapters Five and Six. However, its weakpoints are briefly mentioned in the following paragraphs with the aim of improving the theory.

First, although reading comprehension is given the definition of *'the process of choosing and verifying conceptual schemata to account for the text to be understood'* (Meyer, 1981:3), the *how* of choosing and verifying as well as the meaning of *to account for* are left without either adequate exposition or theoretical grounding.

Secondly, Rumelhart himself recognizes the problem which the creation of new schemata poses for schema theory :

> *'Schema induction does cause some difficulty for the notion of schemata. In order for schema induction to work properly, we must posit some aspects of the system sensitive to the recurrence of configurations of schemata that do not, at the time they occur, match any existing schemata. Such a system is not a natural part of a schema-based system '* (1980:54). (see 5.3.5)

The problem Rumelhart acknowledges is that recognition in schema theory is in terms of fitting pre-existent schema. How, then, can a case of *recurrence* be recognized if there is no pre-existent schema available to signal a second or third case of the same or similar thing? Schema theory as it stands, cannot account for this process which is required by a comprehensive theory of learning. A further difficulty, which Rumelhart fails to recognize, is how a configuration can be recognized as such if there is no schema for it?

The third weakness of schema theory which is related to the difficulty of schema induction is the problem of understanding the new. This problem is posed, most pointedly, by a consideration of a non-literal use of the language. Ortony says, *'Any theory that claims to account for the nature of human language comprehension has to*

be able to account for non-literal as well as literal uses of language' (1980:359).

Metaphor is one of these non-literal uses of language. Ortony (1980 :361) says, *'Metaphor is more than a linguistic and psychological curiosity, it is closely linked with learning of the new.'* In the same vein, Ortony reiterates :

> *'It is also a means of conveying and requiring new knowledge and of seeing things in new ways. Metaphors, then, can be a way of knowing and a way of coming to a new understanding. They are wide in scope, extending from the highest pinnacles of scientific endeavour to the most lowly explanations in the classroom or introductory texts. In other words, metaphors are an important ingredient in learning and understanding '* (Ortony, 1980:361).

In short, it seems that metaphors are credited with creating schemata. However, it is not necessary here to dwell on the difficulty which metaphoric comprehension poses for schema theory. Theorists within schema theory recognize this fact.

On the same issue, Ortony says,

> *'This is not the place to attempt a detailed, well worked out account of the processing and structural aspects of metaphoric comprehension in schema theory nor do I think that such an account is yet possible '* (1980:361).

Similarly, Spiro notes:

> *'We know next to nothing about the process of conceptual change...perhaps metaphor, with its capability of describing something new in terms of what is already known, plays an important role...unfortunately it is probably the case that psychology will have to undergo its own conceptual change, if an understanding of that essential learning phenomenon is ever to ensue '* (1980:271).

Clearly then, metaphor is an outstanding difficulty for schema theory.

The criticism which the interactive theory received are due to its incompleteness and infancy stage. The second criticism is due to its reliance on a *narrow conception of comprehension* (Smith, 1983). However, there is every cogent reason to believe that the interactive theories are adequate enough to describe the reading comprehension process nearly to its entirety. The landmarks of this theory warrant this assertion.

The most important landmarks of the interactive theory are (a) that world knowledge plays a very significant role in the reader's activity, that is, the interaction between the reader and the world aims towards creation/construction of a complex scenario. The guiding principle is the notion of comprehension understood as the fitting of the text against the reader's world in a manner which is completely interconnected (Anderson, 1977), and (b) that the reader makes an active contribution to reading, often termed *construction* of meaning (Beck, 1981, Anderson, 1977, Tierny, & Pearson, 1981) or *creation* of meaning (Collins et.al., Spiro, 1979, Adams & Bruce, 1980).

By way of summary, this Chapter reviewed the major characteristics of reading comprehension in the light of the three theories: Bottom-up, Top-down, and Interactive. The views of the proponents of each theory (Bloomfield and Fries for bottom-up, Smith for top-down and Goodman for interactive) were discussed in an effort to show how comprehension is viewed differently by the different theorists. For instance, for bottom-up theorists the focus of attention is the text, while for top-downers it is the reader. The interactive theorists recognize both bottom-up and top-down processes.

In addition, the weaknesses as well as the strengths of each theory have been discussed in order to show which theory is capable of making an outstanding contribution to understanding the processes as well as the salient features of reading comprehension. From the review of the literature, it becomes clear then, that the

theory that should be most preferred is the interaction theory. Because the interacting model attempts to take into account the strong points of both the bottom-up and the top-down models and tries to avoid the criticisms levelled against each, it should be clear that interaction theories offer the most promising approach to the theory of reading.

Furthermore, the criticisms which it has received are due to either its incompleteness (due to its relative infancy) or to an undue reliance on a narrow conception of comprehension, rather than upon any fundamental flaw in theoretical or experimental design. These reasons are sufficient for preferring interaction theory.

The following chapter characterizes the patterns of reading comprehension in terms of research and historical development. To this effect, it takes up brief discussions on the four reading comprehension research strands (readability research, cloze technique, factor analysis and psycholinguistics). The historical developments, taking 1970 as a benchmark, are presented. The bulk of the discussion revolves around some related questions such as:

1. Is there any causal relationship between how long/short a sentence is and how difficult/easy it is to understand? [Readability]

2. Is comprehension unitary or a complex of different sub-skills? [Factor Analysis]

3. Are we sure of how or in what way second language is measured by the cloze procedure? Are we also sure of how a person's learning style may affect his/her score?

4. Is a Psycholinguistic model of reading equally applicable to describe the process of second language reading? etc

Toward the end of Chapter Three, Chomsky's transformational grammar, Fillmore's case grammar, Text researchers and Schema theory are briefly treated, since

they have made our knowledge more extensive and refined in understanding reading comprehension.

CHAPTER THREE

COMPREHENSION VIEWED FROM THE ASPECTS OF DIFFERENT RESEARCH STRANDS

'One of the paradoxes of learning from reading is that you must know a lot before you can learn more '

(Just & Carpenter, 1984:308).

3.0 Introduction

The purpose of this chapter is to characterize the patterns of development of reading comprehension based on the various theories of linguistic explanation.

Our knowledge of reading comprehension is basically defined by four research strands. Namely, Readability research, Cloze procedure, Factor Analysis, and Psycholinguistics.

In addition, the emergence of Transformational Grammar, the resurrection of a centuries-old Case Grammar, research in Artificial Intelligence and Schema theory have made our knowledge of the processes involved in reading comprehension both extensive and refined.

This chapter covers the above areas of research into reading comprehension in three major topics: the big four research strands, a shift of attention and the practices of teaching comprehension which are discussed in the sections to follow.

3.1 The Four Research Strands

The main four research strands which our knowledge of the comprehension process is based upon are Readability research, Cloze Technique, Factor Analytic Studies and Psycholinguistics. The insights gained from each area of study and the weak-

nesses attributed to it, will be highlighted in the following sub-sections.

3.1.1 Readability Research

Readability research aims at studying what made texts easy or difficult to understand. It has a fairly long history stemming back to Gray and Leary (1935) and Lorge (1939), carried on by Flesch (1948) and Klare (1963). Basically, what the research told us was that long words and long complex sentences were hard/difficult to comprehend. However, whether this is true or not remains to be seen later in this section.

Educators and reading specialists have long argued that one of the most effective and efficient strategies for teaching reading is to match the ability level of the students as closely as possible to the difficulty level of the text (Broughton, 1978). A too difficult text leads to student frustration, a too easy one to student boredom. For this reason, much research had been done to develop valid readability formulae to match native English readers' abilities.

Unfortunately, little research has been directed to the process of reading for non-native the English learner to developing reading formulae for evaluating reading texts for the English learner, or to the testing of the validity of using readability formulae developed for native English readers in a second or non-native language context (Cziko 1978).

Current knowledge of the processes of learning a language and of the process of learning how to read in a language are insufficient to develop readability formulae based on reading theory. For this reason, no currently used formulae purport to measure readability directly. Bormuth (1966) stated that reading formulae have prediction validity only. He further explains that the variables they measure do not cause the difficulty of the passage. While admitting to these limitations, he does not believe that this indirect measure of difficulty lessens the usefulness of these formulae,

since the linguistic variables they measure do reflect the content variables in ordinary writing and therefore can predict difficulty variance among written material.

Research into text readability, is a relatively new area of development although concern about readability certainly is not. For instance, Lorge, Klare (1944, 1954 respectively) mention that almost eleven hundred years ago the Talmudists, concerned with dividing daily readings of the Torah into sections of approximately equal words and idea density, were the first to develop word frequency counts.

Before the invention of the printing press, the problem of matching a student to a suitable text didn't occur since the only textbook in a classroom belonged to the teacher who dictated his copy to the students. It was only after 1445 that textbooks became accessible and important to the pupil (Kelly 1969). Once text books became an integral part of the learning process the problems of matching unskilled readers to suitable texts was traditionally solved by choosing authors whose style was *'simple'* (Kelly, 1969). This determination of simplicity was based on subjective judgements alone.

It was in the teaching of reading to children that educators first studied readability in a systematic manner. One researcher of note was L.A. Sherman (Klare, 1954) who became interested in sentence length while comparing different writing styles. As Klare (1963:42) stated in his history of readability, *'No writer before the time of the present day readability work has spoken so prophetically of it.'* Sherman's (1893) findings indicated that the length of a sentence affects readability, that a given writer is consistent in the average length of his sentences, and that sentence complexity decreases as sentences get shorter. Almost every readability formula uses sentence length as a measure of difficulty.

Another contemporary of Sherman is the psychologist, Kitson (Klare, 1963) who decided that sentence length and word length, as measured by syllables, were good

indicators of readability. Both scholars took the initial steps which were to lead to the development of readability formulae.

Although the first readability formula for children was published in 1923, it wasn't until 1934 that the first two formulae for adult readability were published by Ojeman and Dale, and Tyler (Klare, 1963). These are generally classified as detailed formulae since they analyze up to two hundred factors which may contribute to reading difficulty. Based on the results of comprehension tests, these factors were correlated to obtain the best predictors. Ojemann (Klare,1963) determined that the best predictors were number of simple sentences, prepositions, and prepositions plus infinitives and vocabulary. Dale and Tyler chose technical words, hard non-technical words, and indeterminate clauses as their predictors (Klare, 1963).

This period of formulae ended around 1938 with a shift in interest to more easily used formulae. Some researchers simplified existing formulae, others used efficiency as a criteria for the development and adoption of new formulae (Klare, 1954). The Lorge formula, first published in 1939 and then recalculated in 1948 to correct an error, is generally held to be the first modern easy-to-use formula (Klare, 1974). It was at this time that Rudolf Flesch, the person most responsible for popularising readability, began his work in the field. He felt that existing formulae were unsatisfactory for adult level materials because they placed excessive emphasis on abstract words while failing to use sentence length as a measure of difficulty (Klare, 1963).

According to Flesch (1948) three factors were important in determining readability, namely: sentence length, abstractness, and interestingness (readers interest in the subject matter). He based his first formula on average sentence length, number of suffixes and prefixes and number of personal reference words, a category which included names, pronouns and words related to people. The resulting score gave the school grade level of the text. Flesch recalculated this formula almost immediately

due to computational errors. Because of the difficulty of its application, the revised formula was divided in two parts: *reading ease and human interest.* The scale for both parts measured from 0 to 100, with 0 reflecting unreadable material or material lacking human interest and with 100 reflecting very readable material, or material of high human interest (Flesch, 1948).

In 1948, Dale and Chall developed their own formula in reaction to the drawbacks they found in applying the Flesch formula. They felt that the counting of personal references over simplified a very complex idea (Williams, 1974).

Klare (1963) in his review of readability formula grouped the next period of research from 1953 - 1957 calling it the years of specialized formulae. Far less work was done during this period because of the realization that a satisfactory way to measure comprehension had not been found. Although this problem is still not solved, new methods such as Taylor's Cloze test (1953) were being used to evaluate a reader's comprehension of reading material.

After 1960 many formulae were developed and revised but only a few dealt with adult readers. One of these was the Fry Readability Graph which correlated highly with other well known formulae and could be used on both primary and secondary material (Fry, 1968, 1977). Unlike previous formulae, the Fry graph is not a formula, however, it is based on factors which are usually included in readability formula, i.e. syllables per one hundred words per sentences.

In short, readability formulae depend solely on the two measures of word difficulty and sentence length. However, these variables do not directly reflect the properties of a text which make it difficult for a reader to read and comprehend (Perera, 1984, Anderson, 1987). Anderson says, *'....the application of a formula in reverse, revising a text to make the sentence shorter and all the words simpler, doesn't increase comprehension'* (1987:40). This aspect of criticism based on empirical research done

by many reading specialists is given in detail. (see 4.3.1.1.2)

There is no general causal relationship between how long a sentence is and how easy it is to understand. There are several sources of reading difficulty as maintained by Perera (1984:274-276) such as:

(i) When the subject matter is outside the reader's knowledge and experience. In the following sentences knowledge of word meanings and grammatical construction is not enough.

> *'What is known about the Ravana gang? That it posed as a fanatical anti-muslim movement, which in those days when pigs' head could be left with impunity in the court yards of Friday mosques, was nothing unusual.'* (As in Perera, 1984:275).

(ii) Unfamiliar vocabulary may be a source of reading difficulty as in the following sentences.

> *'Some plastic articles are made by heating and shaping a piece of thermo-plastic sheet which has previously been made by extrusion, or by clandering, or which has been polymerized as a sheet'* (Perera, 1984:275).

(iii) Other difficulties could arise as a result of grammar and unclear or unfamiliar patterns of discourse organization.

The complexity of a text may be indicated by the linguistic factors which are measured by formulae. However, an aggregate statistical model of readability formula does not take into account the interaction of properties of the individual with other properties of the text which are indispensable components of reading comprehension.

To conclude this subsection, basically what readability research told us was that long words and long complex sentences were hard to understand. But we are not sure whether long words and sentences caused the difficulty or were merely symptoms of content that was hard to read for other reasons, such as concept density (Pearson, 1985, Perera, 1984, Anderson, 1987). (see 4.3)

3.1.2 The Cloze Technique

The Cloze Test is a procedure developed in 1953 by Taylor in which every *nth* word of the passages to be read is deleted. Readers are then asked to fill in the missing words. The number of correctly replaced words divided by the total number of deletions gives a number which can be used either as an index of a student's understanding of the passage or as an index of the difficulty of the passage itself. Later research has shown that this procedure can be used to rank passages in order of difficulty.

A number of research projects on the assessment of reading passage difficulty have been conducted using the cloze test. Among the variables studied are: the effect of differing cloze passages on scores, the effects of scoring by exact word replacement against appropriate word replacement, and the effect of deleting words at different frequencies (5th or 7th word or 10th word).

In 1946, Betts established standards of comprehension of reading material which continue to be used to this day (King, 1979). According to these criteria, 90% correct responses to comprehension questions of a reading passage means that the student can read this material independently, 75% correct responses indicate that the material is suitable for reading with help (instructional level), and 50% correct or less means that the student is working at the frustration level. Bormuth (1967, 1968) determined from his research that a cloze score of 44% corresponded to a comprehension score of 75% and that a 57% cloze score corresponded to a 90% comprehension score.

However, it must also be noted that, as a result of further research, Bormuth speculated that these criteria were based on insufficient and faulty data. He determined that, contrary to current practices and to accepted reading frustration theory, *'students should receive easier material for use in their supervised study for text book reading, than they should get for their independent study, for reference and voluntary reading'* (1971:72). At the same time, he cautioned that his results may have been due to a bias in the model used to evaluate his research. Nonetheless, his study does point out the need to research long accepted theories in a more systematic, unbiased manner.

The Cloze technique has been with us for some decades now. Taylor (1953), Rankin (1965) and Bormuth (1967, 1969) used it to great advantage in refining research in comprehension and readability.

However, it must be noted that despite much research on the cloze procedure, researchers are still not sure of how or in what way second language is measured by this procedure nor are they sure of how a person's learning style may affect his score (Stanfield & Hansen, 1983). Furthermore, the cloze test is a test of active production of language which may not be a prerequisite for successful comprehension of a reading text (Schultz, 1981, Alderson, 1978, 1979, 1980).

If nothing else, we have been able to know that we had a good dependent variable, for measuring comprehension. It was objective because it did not depend on a test writer's judgement about what questions were important to ask, and it was easy to score. However, it should be noted that the cloze test is more a measure of lower order language ability than of higher order reading ability (see Alderson, 1978, 1979a, 1979b, 1980).

The following sub section deals with skills-oriented view of comprehension which ultimately led to the third reading comprehension research called Factor Analytic

studies of comprehension.

3.1.3 Factor Analytic Studies

This section is sub divided into three headings: Skills view, a skills model and factor analysis of comprehension.

3.1.3.1 Skills-oriented View of Comprehension

One concern in reading research has been to determine whether reading is a unitary or a manifold activity. Many researchers have set about determining what are the major aspects or components of reading, and have come up with models which emphasize the various skills or dimensions of reading, or simply with listing of subskills.

The assumption is that each of these skills might be related to a different outcome in reading (Gardner, 1977). Clymer (1972), for example, discusses the nature of reading and relates four aspects to four outcomes of increasing levels of complexity. (see Appendix A)

The question of the existence of distinct skills in reading is of immediate relevance for teaching. If they are found to have independent status in a psychological sense, then it becomes important to determine their relative weight in the comprehension process in general, i.e. whether they operate in some kind of implicational fashion so that some are more *basic* than others. This question is taken up later on in the section to follow.

3.1.3.2 A Skills-oriented Model of Comprehension

Gray (1960) classifies reading skills into a model which is based on

> *'.... previous analyses of the steps involved in reading for specific purposes, the results of factor analyses of reading, other studies which sought to analyse reading into its components, and results of previous efforts to classify important attributes and skills. '*
>
> (Gray 1960:8)

Gray (1960) distinguishes four aspects in reading:

i. Word Perception, including pronunciation and meaning.

ii. Comprehension, which includes a clear grasp of what is read.

iii. Reaction to and evaluation of ideas the author presents.

iv. Assimilation of what is read, through fusion of old ideas and information obtained through reading.

He represents these in a diagramatic form as a set of concentric circles in order to show their interrrelationship. (see Appendix B)

Skills for word perception, located at the centre of the diagram, are considered essential for comprehension to take place, and include both the recognition and understanding of the meanings of individual words in the context of a given passage. Comprehension, in the second band going outwards, refers to grasping the meaning of continuous discourse, and includes three levels:

(a) Literal (*reading the lines*),

(b) determination of implied meanings (*reading between the lines*),

(c) implications beyond those things actually stated (*reading beyond the lines*).

Reaction, in the next band, involves an inquiring attitude and the application of criteria or standards of judgement in order to evaluate what is read. It also includes emotional response to content, which may be related to value judgements and appre-

ciation of literature. Finally, Assimilation or fusion of ideas, in the outermost band, is achieved through the reader's combining information obtained from the text with her/his previous experience, it involves applying critical judgement, creative thinking and is described as *an act of discovery.*

Although Gray (1960) stresses that these four aspects operate simultaneously and that reading is a *unitary* act, it is difficult to see whether this claim is true or not, from the evidence presented. His account may be related to Fries (1960) in that the core of his diagram (word perception) is the sole aspect unique to reading while all the others are common to language interpretation.

Gray emphasizes the interaction and overlapping of the various areas of reading. It is in fact difficult to justify the particular demarcation he has established. One might ask, for example, is an inquiring attitude *exclusively a feature of reaction* or does it pervade the whole reading process and even motivate it? Is there a real difference between determining implied meanings and comprehending beyond what is stated (i.e. Gray's second and third levels of comprehension)?

It is suggested that these questions are unresolvable within a skills view of reading, and that some clarification may be expected from a consideration of the process of reading, which will be dealt with at a later stage in this study. (see Chapter Four). In the meantime, the following subsections review studies which attempt to establish the independent status of skills using the technique of factor analysis.

3.1.3.3 Factorial Analysis of Comprehension Skills

Research into comprehension skills has been done primarily by subjecting data to factor analysis. This is the method for determining the number and nature of underlying variables (or factors) among a larger number of measures. A factor is a construct, a hypothetical entity, that is assumed to underlie tests, scales, items and measures of almost any kind (Kerlinger, 1964).

A major study of comprehension skills using this technique is that of Davis (1964). Davis surveyed the reading skills that had been identified in previous research, and found considerable overlap among them. He thus grouped several hundred of them into nine clusters which he thought could be isolated from each other, and tested these by means of five-choice objective items. Factor analysis of the data yielded nine factors or *components* of comprehension. However, only two of these could be measured with sufficient reliability to warrant their use for practical purposes. These two were *knowledge of word meaning* and *reasoning in reading* - that is, the ability to see the relationships of ideas.

The original data of the study have been subjected to further analysis by a number of investigators, including Davis himself, and the interpretation of results is not always consistent. Davis' own (1968) study tested eight sub-skills and succeeded in identifying five factors as making a unique contribution to reading comprehension. These factors were:

i. Memory for word meanings

ii. Drawing inferences from the content

iii. Following the structure of the passage

iv. Recognizing the writer's purpose, attitude, tone and mood

v. Finding answers to questions asked explicitly or in paraphrase

The first two of these factors accounted for the largest percentage of the variance, thus apparently confirming the importance of word knowledge and of what in his previous study Davis had called *reasoning in reading.* Thus, in general terms, this study tended to support the multidimensional view of comprehension.

Two other analyses performed on the same data with different statistical techniques are those by Thorndike (1917) and Spearitt (1972). Thorndike's study pro-

duced only three factors, of which the first accounted for the greater portion of the covariance while the other two did not admit to any clear cut psychological interpretation.

Spearitt's (1972) study, using a technique called maximum likelihood, yielded four factors similar to those found by Davis' later study, but didn't support the fifth in the list shown earlier in this section, that is, *finding answers to questions.* Spearitt expresses some reservations about his results, although the four skills are differentiated, some of them are *only just so.* The most differentiable factor is *vocabulary*, just as in the Davis and Thorndike studies. With respect to the other factors, Spearitt speculates whether reading comprehension tests, as distinct from word knowledge tests, do not in fact measure one basic ability which may well correspond to *reasoning in reading.*

Several other studies have failed to identify separable skills in comprehension altogether. Harris (1968) studied seven areas of comprehension of various types of literature: recognition of synonyms, figures of speech, summary of ideas expressed or implied, author's tone and intention, characterization, relationship between technique and meaning, and missing parts of elliptical statements. He concluded that (a) comprehension ability was a common skill irrespective of literary passage, and (b) that one general factor accounted for the greater part of test variance. Lenon (1962) reported the results of twelve studies, of which six produced only a single general factor.

Clark (1972) conducted an extensive survey of research on reading skills, and came to the conclusion that:

'One may claim with any confidence only that components of comprehension are (1) a strong verbal factor (which is common to all studies and may be regarded primarily as a function of a range

> *and depth of word knowledge) and (2) a paragraph comprehension factor or cognition of meaning in terms of units of information and general intention of the author '* (Clark, 1972:80).

He further suggests that in a number of studies, a general comprehension factor may be differentiated into two components with unique variance:

> *'Comprehension of explicitly stated material, including a variety of fact finding, cognition of literal meaning tasks and Comprehension of implied meanings concerned with inferences, generalization, prediction of outcomes, and similar reasoning-type skills '*
>
> (Clark, 1972, 80-81).

A fresh insight into the question of whether comprehension is unitary or a complex of different sub-skills is provided by an empirical study conducted by Lunzer & Gardner (1979) in secondary schools. These researchers initially hypothesized eight sub-skills, and ran two sets of tests to verify the independent existence. The first consisted of a set of passages each accompanied by a set of 20 or 30 questions designed to measure the purported skills. The second consisted of a different passage and item type for each putative skill.

Factor analysis of the results showed that in both tests, a single factor accounted for the greater part of the variance, specifically 71% in the first test and 81% in the second. They conclude that these results fail to provide evidence that the different tasks in the comprehension tests call on different subskills and suggest instead that those tasks should be regarded as activities which are a part of reading rather than as distinct abilities within the reader.

Lunzer & Gardner (1979) also took up the issue of whether there are lower, and higher-order comprehension skills, namely, a lower level requiring only recognition of the meaning of words and literal comprehension of phrases and sentences, and a

higher level which is essential for inference, establishing salience, and so on.

Although the level of facility yielded by the tests (as per number of questions answered correctly) appeared to indicate that - given similar passages, tasks requiring lower level processing in the sense above are more readily solved than those demanding further thinking. Lunzer & Gardner (1979) reason that this is partly due to the way in which the passages are written and of the kinds of questions they admit. Thus, they argue that a *literal comprehension* item may be much more difficult than an *inference* item depending on the text from which they are drawn.

Following this line of argument, Lunzer & Gardner (1979) question the validity of the two level construct as correlating with levels of difficulty for the reader, and reformulate their hypothesis whether *'... there exists an identifiable group of pupils whose performance on higher-level tasks is defective to a degree which would not be predicted on the basis of their performance on lower-level tasks'* (Lunzer & Gardner, 1979:61).

To test this hypothesis, the researchers clustered pupils into three groups (poor, average and high achievers) on the basis of their scores on a comprehension test. They then predicted each pupil's performance on five *higher-level* tasks based on his performance on three *lower-level* tasks through a complex statistical procedure, and compared the figures thus obtained with the actual scores. The results failed to support the hypothesis that some readers may *possess* lower-order skills but not higher order ones, and showed that in fact it is possible for readers to be successful on more demanding items and to score poorly on less demanding items. Lunzer and Gardner (1979) conclude from this that individual differences in reading comprehension reflect one general aptitude that they describe as *the pupil's ability and willingness to reflect on whatever it is he is reading* (Lunzer & Gardner, 1979:64).

Similar results were obtained by Harrison & Dolan (1979), who worked with

similar data as Lunzer & Gardner (1979). The former researchers' comment on the fact that postulated higher and lower-order skills do not correlate with readers' performance is that:

> *' This is startling until one considers that one frequently reads a passage, skipping words which one doesn't understand, yet is able to make inferences about the content and to note the salient features '* (Harrison & Dolan, 1979:17).

They conclude that the correlations yielded by comprehension tests are of a type not suitable for factor analytic purposes. Their quotation, as well as Lunzer & Gardner's conclusion tend to reinforce the view that, although, highly complex, comprehension is a unitary process.

If readability, Cloze procedure, and Factor Analytic studies represented the conventional wisdom concerning reading comprehension, then psycholinguistics (the interface between psychology and linguistics) was considered to be the hope of the future in the early 70s. The following section deals with comprehension from a psycholinguistic point of view.

3.1.4 Psycholinguistics

There appear to be almost as many psycholinguistic views of comprehension as there are psycholinguists. Therefore, only the aspects of the discipline which have a direct bearing on ESL/EFL reading comprehension would be pointed out.

Both Cognitive Psychology and Constructive Theory stress the reader's contribution to the process of ascribing meaning, and regard comprehension as resulting from an interaction between his knowledge and the text.

In the 70s psycholinguistics had tremendous, immediate and unprecedented appeal. Part of its appeal stemmed from the impact that Chomsky's (1957) views had on

the psychology of language into the sixties. Based upon numerous studies, there was a genuine feeling that behaviouristic views of language development and processing would have to be replaced by views that were both naturalistic (people who are born with a genetic capability to learn language) and cognitive in orientation. Furthermore, these research studies seemed to suggest that the transformational generative grammar created by Chomsky might actually serve as a model of human language processing. However, there was a ready-made theory waiting to be applied to reading comprehension: Psycholinguistics. (cf. Pearson,1985)

Beginning in the late sixties and extending into the mid seventies, considerable empirical and theoretical work was completed within the psycholinguistic tradition. The influence of psycholinguistics on reading is nowhere better demonstrated than in the work of Kenneth Goodman (1965) and Frank Smith (1971). (see 2.1.2.1 and 2.1.3.1)

For both Goodman and Smith, looking at reading from a psycholinguistic perspective meant looking at reading in its natural state, as an application of a person's general cognitive and linguistic competence. Their views will be taken up later in this section.

The following two notions have been central to understanding reading from a psycholinguistic view:

(i) There is a limited capacity for processing information. Only six or seven items of information can be held in short term memory, and while they are being processed only one item may get stored in long-term memory every five seconds.

(ii) There is a trade-off between visual and non-visual information: the more the reader knows behind the eyeball, the less he needs to rely on the visual input in order to identify a letter, a word or a meaning. Conversely, the less background knowledge he can drew upon, the more difficult it is for him to comprehend, and

the slower reading tends to be (Smith, 1975).

This approach to reading relies on a constructive theory of perception. This theory maintains that stimuli from the environment are not used in their raw form, rather, they act as clues that become meaningful through the mediation of perception. i.e. what the individual perceives as significant, depends only partially on stimulation, the perceiver must go beyond the sensory data and bring to bear conceptual knowledge, his expectations and his biases.

Cognitive structures play a major role in determining what the individual must look for (i.e. expectations) and how one is to grasp external happenings (i.e. perception). Turvey (1974) maintains that perception is the result of constructive activity on the part of the perceiver and it is neither passive nor direct.

This view advocates the primacy of conception over perception. Therefore, we see what we expect to see, just as we hear what we expect to hear (Goodman, 1970-71). The two processes, however, stand in a reciprocal relation to each other. That is, impressions received through the screening of our conceptions are in turn synthesized into concepts which will later aid in the interpretation of new perceptions (Strang, 1972). This relationship has been described as an interaction between thought and language (Goodman, 1967), or between the individual and the world (Smith, 1975).

This approach to reading stresses the reader's central concern with meaning, and the role of the reader's knowledge in ascribing an interpretation to the graphic input. It characterizes reading as an interaction between the reader's knowledge and the text, in which the reader does not in fact *read* all the material on the page, but makes only partial use of the visual information available, supplying non-visual information about the subject matter, about the language, and about reading - from his knowledge store or conceptual image of the world. Goodman defines reading as follows:

> *'Reading is a selective process. It involves partial use of available minimal language cues selected from perceptual input on the basis of the reader's expectation. As this partial information is processed tentative decisions are made, to be confirmed, rejected or refined as reading progresses '* (Goodman, 1970:108).

The reader's activity has been characterized as *guessing game*, in which the reader proceeds through cycles of prediction and feed back, anticipating what is to come in the text and selecting the fewest possible clues to verify if his expectations were correct. The reader does this

> *'... by sampling, relying on the redundancy of language and his knowledge of linguistic constraints. He predicts structures, tests them against the semantic context which he builds up from the situation and the ongoing discourse and then confirms or disconfirms as he processes further language '*
>
> (Goodman, 1970/73: 136).

This approach suggests that reading as a cognitive activity cannot be conceived apart from the related processes of perception, comprehension and learning. While perception is conditioned by and reciprocal with comprehension, the latter is not essentially different from learning in that both are brought about by the generation and listing of predictions. Comprehension results from perceptions that fit into the individuals cognitive structure, whereas learning involves a reorganization of the reader's knowledge in order for the incoming data to make sense.

By contrast, with the conception of reading or the decoding from symbol into sound, the central claim of the *mediated* and *immediate* identification approach (Smith, 1971) is that the reader can get at meaning without necessarily transforming the graphic sequence into an aural input. Smith makes the specific contention that the

identification of words may precede the identification of their constituent letters, and that, similarly, the identification of meaning may occur prior to the identification of individual words. Smith posits that the reader may resort to two modalities of processing, which he labels *mediated* (i.e. through the prior identification of constituent elements) and *immediate* identification (ie. directly from print to meaning).

Two sources of evidence are adduced in support of a non-sequential view of reading that show that readers use their previous knowledge to ascribe meaning to print.

The first is the study of errors in reading aloud. These errors show a general tendency to preserve meaning, and attest to the fact that readers are sensitive to the syntactic and semantic environments in which the words occur. The errors of children learning how to read show a progression from those involving visual similarity, to those substituting words for others which though visually more dissimilar - accord with the context. Thus *John said* for example, might be initially misread as *John sand* and later on as *John told me.* Goodman (1973), interprets this progression in terms of a differential use of the graphic input: while beginning readers rely on a maximum of visual information to deduce meaning from print, fluent ones use a minimum of visual clues and are able to predict the structure of the passage on the basis of meaning.

Kolers' (1970) study of errors made by adults reading geometrically transformed text showed that in 70% of the cases, the words misread involved the same part of speech as the correct word. Other experiments in which English - French bilinguals read texts written partly in English and partly in French again indicated that subjects read according to their knowledge of syntax instead of reading what was actually printed. Thus they inadvertently corrected syntactic distortions in the original text, so that *made resound the earth* for example became *made the earth resound* and similarly,*in a cell dark* became *in a dark cell.*

A further type of error involves misreading words by translating them from one language into the other. Kolers comments by saying that *'subjects were treating words in terms of their meanings rather than in terms of their appearance on the page'* (1970/73:48).

A second type of evidence that readers are more concerned with meaning than with the precise sequential identification of letters and words comes from studies showing that the rate at which information can be processed doubles when information is embedded in a meaningful context. For example, twice as many letters can be perceived per unit time when organized in words than when presented singly, similarly, twice as many words can be percieved when organized in sentences than when presented in random strings (Huey, 1908, Cattell, 1885).

Smith (1971) resorts to the notion of limited processing capacity to argue that these higher rates indicate that the reader is not identifying letter by letter or word by word, but is anticipating the text on the basis of previous knowledge of units at *higher levels* (e.g. words, sentences) to achieve a more efficient intake of information at *lower levels* (eg. letters, words). He reasons, furthermore, that the reader who concentrates on the precise identification of every word will fail to read for meaning: the reader's short term memory will become easily loaded with information from within the boundaries of individual words or word sequences. If on the other hand, one reads for meaning as in skilled reading, one can overcome this limitation by taking in information in bigger chunks. In this case comprehension not only precedes word identification, but makes it unnecessary and wasteful. If individual words happen to be identified, it is as a by-product of comprehension rather than as its basic.

Smith (1971) defines comprehension in everyday terms *relating the new to the already known* or in terms of information theory, as the *reduction of uncertainty by elimination of alternatives.* (see 2.1.2.1)

An account of comprehension involves a consideration of how cognitive structure is assumed to be organized. Smith's (1971) as well as Smith and Holmes' (1971) accounts make reference to three aspects of the organization of cognitive structure: categories, rules and relationships.

(i) A category is *a decision to distinguish certain objects or events from others.* Thus if we are able to perceive two objects as *same* we decide that they belong in the same category. This decision, however, does not depend on absolute physical properties of the object, but rests with the perceiver.

(ii) A rule is understood as a specification of the features that define an instance of a category. A category may be defined by several such rules so that the same object may be categorized differently, depending on the particular rule the reader is invoking.

(iii) A network of interrelationships holding among the categories, for example, property relations ((Fred has two arms), class inclusion (x is y), the fact that some categories of objects do things (fingers grasp), while others have things done to them (eg. canaries are caged) and so on.

These interrelationships enable the individual to comprehend new information and to integrate it into his previous knowledge as a coherent whole rather than accumulate it as separate data.

A visual configuration is a bundle of features that the reader may use to reduce uncertainty in different domains, or at different *levels* (eg. letter, word, meaning). The features which are significant for distinguishing categories from each other at one level may not be so for distinguishing them from another, the categorization of an event such as a letter or a word, therefore, depends on the interrelationships the assumed category is perceived to hold with its environment. We do not perceive objects and events in isolation, but as part of the whole integral experience.

For example, two graphically identical words can be indistinguishable by reference to features at the word level, but may be categorized differently by reference to features of a syntactic and semantic nature which derive their significance from relations holding in the context of a sentence.

Smith and Holmes' (1971) model assumes that the reader's knowledge of features is implicit and that he has internalized *criteria* lists or *rules* that inform him of the features that are significant relative to the distinctions he wants to make. The level at which he processes information is ultimately dependent on the featural set he is attending to, or to *questions the brain is asking* (Smith, 1975).

This brings to the fore that comprehension is not an automatic consequence of being exposed to a sequential array of visual patterns. The reader must have the intention to read and apply himself to the task by actively attending to the text. It accords, too, with evidence that the reader's behaviour is adaptive and that his intention or purpose provides him with a task whose structure is the prime determinant of the heuristics he follows in order to comprehend.

It has been shown, for instance, that readers are selective in their processing of various classes of features (i.e. graphics, phonetics, syntactic, semantic) depending on whether they *read for meaning* (either for pleasure or study reading, for example), for words (as in looking up a word in a dictionary or telephone directory), or for spelling (as in proof reading), and further, that they utilize a variety of approaches to different types of text (e.g. poetry, news, dictionary etc) (Gibson & Levin, 1975).

Following an information theory approach, Smith and Holmes (1971) adopt the stance that meaning cannot be defined by reference to a fixed code such as the linguistic, and that there is no *intrinsic* meaning to words and sentences. Rather, meaning can only be defined in terms of the alternative possibilities it eliminates in the reader's repertoire, or, in other words, in terms of the uncertainty it reduces. Meaning

and comprehension then become reciprocal terms: meaning (i.e. in information) is achieved through the reduction of uncertainty (i.e. comprehension).

Further, Goodman (1971:135) described reading as a *'psycholinguistic process by which the reader, a language user, reconstructs a message which has been encoded by a writer as a graphic display.'* He views reconstruction as being a cyclical process of sampling, predicting, testing and confirming. Reconstruction being inherently *whole* i.e. opposed to a reading letter by letter approach (Gough, 1972). This wholistic approach (i.e. internally recreating a replica of the textual message by taking good advantage of the redundancy inherent in language) has been called an analysis by synthesis approach to language performance (Halle & Strevens, 1964,1967).

Once the reconstruction has taken place, its accuracy is tested against previous information. If it is in agreement with previous knowledge, then the cycle of sampling begins again. If inconsistency is associated with reconstruction, compensatory strategy can be adopted. However, if uncertainty arises one should resort to guesses however wrong or right they may be. It is at this point that Goodman (1967) referred to reading as a *psycholinguistic guessing game.* This is to the advantage of the most fluent readers (native speakers of the target language) who can use a minimum sampling of text in deriving the meaning using world, language, and reading knowledge as a substitute for all the redundant features of the text.

Furthermore, Smith (1971) attests that letter by letter or word by word reading is detrimental to comprehension for the simple fact that one word is forgotten before the next and the relationship will be in disarray.

Goodman & Smith's work, by and large, reflects the theory of linguistic comprehension that regards sentences as expressing or conveying meaning in the context of the assumption that comprehension is achieved as a result of *knowing the known.*

However, a constructive approach to linguistic meaning, as originally put forward

by Bransford et.al. (1972), sustains that language only provides abstract cues for the reader to build up interpretations out of his own knowledge. The central premise of this approach is synthesized in the following statement put by Palermo:

> *'The meaning is not considered to be in the sentence but in the people who hear it. Linguistic input is a cue used to recreate information that the listener already has of the world '* (1978:164).

Bransford & McCarrell (1974:200) characterize linguistic knowledge as,

> *'knowledge of abstract cues or directions for creating meaning, and linguistic comprehension as the grasping of relations. Comprehension involves cognitive contribution on the part of the comprehender and depends upon one's cognitive, alinguistic ability to activate knowledge that will allow relations to be grasped. '*

In line with this, the authors point out that the meaning ascribed by subjects does not always coincide with that which a sentence may be said to *express directly*, but it often includes more information than that specified in the semantic description of a sentence. They give convincing evidence from a number of studies for the kinds of assumptions that subjects are likely to make on the basis of their abstract knowledge of relations such as spatial relations, instruments used, and perceived consequences of events. This is discussed in Chapters Five and Six.

Bransford & McCarrell's (1974) study is based on the premise that knowledge entails knowledge of relations rather than of isolated entities and that comprehension involves the *grasping of relations.* The authors underscore that subjects make cognitive contributions during comprehension and that the resulting interpretations cannot in any meaningful sense be said to be *committed* to the text, that at least some of these contributions are prerequisite for comprehension to occur, and that subjects are likely to make considerable efforts to comprehend, creating situations in

which relations can be grasped. Their considerations about the subject's knowledge pave the way for the recent line of inquiry into comprehension and the processing of discourse: Schema theory.

For others, the influence of the psycholinguistic tradition (particularly the use of transformational-generative grammar as a psychological model) on views of reading comprehension was quite direct. For instance, the studies of Bormuth (1966,1969), Bormuth (1971), Carr (1971), and Pearson (1974-75) reveal a rather direct use of psycholinguistic notions in studying reading comprehension.

Such was the scene in the early seventies. The conventional modes of research, while still strong, were being challenged by a new interloper from the world of linguistic research: psycholinguistics.

However, due to some of its inadequacies, the stance of Psycholinguistics was questioned and challenged by other areas of language research as discussed in the following section.

3.2 A Shift of Attention

Contemporary areas of research in language processing such as Chomsky's transformational grammar, Fillmore's case grammar, researchers in artificial intelligence and schema theory have made our knowledge of reading comprehension both more extensive and refined. We view comprehension very differently from the way it was perceived in the early seventies.

However, a detailed discussion particularly on transformational grammar , case grammar or text analysis for that matter, is beyond the scope of this thesis. Therefore, these areas will be touched upon in the following way.

3.2.1 Fillmore and Chomsky

The force behind the shift from behaviouristic to cognitive views of language was

Noam Chomsky (1957, 1965). He exposed the prevailing views on the psychology of language for their gross inadequacies and provided an alternative model (transformational grammar) for language processing. The motivating force behind the exodus from a narrow psycholinguistic view based upon transformational grammars was another linguist, Charles Fillmore. In 1968, he published a paper in which he argued for the resurrection of a centuries-old case grammar approach to linguistic explanation. Case grammars are based upon the different relationships between the verb in the sentence and the case (nominative, accusative, recipient, etc) that the nouns take in relationship to the verb.

Fillmore's grammar was appealing to psychologists and educators who were experiencing great difficulty with models of comprehension based upon a transformational generative grammar. Those very models that had seemed to be sensible and alluring had not withstood tests of empirical verification. With their emphasis on transformations to realize a variety of surface structures from a single deep structure, transformational models had to stress an analytic view of comprehension. Yet researchers (e.g. Bransford et.al., 1971) were collecting data that indicated that comprehension consisted of synthesis (integrating ideas) rather than analysis (decomposing ideas). Other researchers (e.g. Sachs, 1967) found that comprehension and recognition memory seemed to be more sensitive to semantic rather than syntactic factors, contrary to the emphasis in a transformational model. Still others like Pearson (1974-75), found that the predictions from a derivational theory of complexity (i.e. the theory that comprehension difficulty varies as a function of the number of transformations necessary to travel from the surface structure of a sentence to its deep structure) were exactly the opposite of results obtained in several comprehension studies.

In such a milieu, something like Fillmore's case grammar was quite appealing; it emphasized *synthesis* rather than *analysis* and *semantic* rather than *syntactic* relations. In addition, case grammar allowed one to begin to examine relations that

held between linguistic ideas that crossed sentence boundaries.

3.2.2 Text Researchers

The psycholinguistic tradition based on Chomsky's transformational grammar, had concentrated upon the sentence as a basic unit of analysis. Somewhere in the early to mid seventies, the propositions (basically a verb plus the nouns, adjectives and adverbs that go along with it) replaced the sentence as the basic unit of analysis. Researchers in artificial intelligence began using it in the early seventies (Minsky, 1975, Schank, 1973). Lindsay and Norman (1972) discussed propositions in their revolutionary experimental psychology text book. Kintsch (1974), Rumelhart (1975), Frederiksen (1975), Thorndyke (1977) and Stein and Glenn (1977) were all using propositions to parse texts and analyze recall protocols by the mid into late 1970s.

The proposition fits nicely with an emphasis on case grammar. Just as the verb is the centre of a proposition [another way of defining a proposition is as a predicate (active or stative) and its arguments (noun, adjectives, adverbs)], so the verb is the central node in a case grammar parsing of a sentence. All other form classes revolve around the verb. Also, many of the case relations in a case grammar are relations among propositions (e.g. cause, condition, time, manner).

As research progressed into the late 1970s, no new revolutions occurred. The perspective that spawned case grammars and propositions persisted, but the problems researchers addressed changed substantially. In the early 1970s text researchers were still preoccupied with relations within and between sentences, and their research reflected this emphasis on what is called *microstructure*. Text researchers in the late 1970s were more concerned about relations that obtain between whole episodes in stories or whole paragraphs or sections in informative text; this holistic emphasis is called *macrostructure*.

Accompanying this shift in the study of text was a shift in the study of how

human memory is organized, in particular how humans are able to store and retrieve large bodies of information. This latter movement came to be called *Schema theory*

3.2.3 Schema Theory

Researchers in this period tended to fall into two categories: those who tried to characterize relations among ideas in texts and those who have tried to charaterize relations among ideas stored in human memory. Neither group denied the importance or necessity of the other's work, each group simply chose to emphaisize one area in preference to the other. Hence, researchers like Rumelhart (1975), Stein and Glenn (1977), and Thorndyke (1977) gave us plausible macro structures for narrative material in the form of story grammars. Researchers like Meyer (1975) or Halliday and Hasan (1976) tried to provide more general structural accounts that would apply equally well to expositions.

Alternatively, the works of Schank (1973), Minsky (1975), Anderson (1977), and Rumelhart (1980), Rumelhart and Ortony (1977) were more concerned with the structure of knowledge within the human processors (i.e. readers). Still others, such as Kintsch (1974) or Frederiksen (1975) seemed to be trying to provide a balanced emphasis on text and knowledge structure. These differences were more a matter of degree than of kind. All of the researchers were concerned with human information processing, they simply tended to emphasize different aspects of the processing. Therefore, researchers focusing on the structure of the text were likely to emphasize something like the number of high level propositions within the story that were recalled. Conversely, those emphasizing the structure of the reader's knowledge were more likely to dwell upon something like non-textual inferences made during recall of how a reader's prior knowledge determines aspects of the text that will be remembered. In other words, the former group were likely to highlight text structures while the latter were likely to highlight knowledge structures.

Into the late seventies Metacognition came into the picture. It seemed a logical extension of the rapidly developing work on both schema theory and text analysis. These areas emphasized declarative knowledge, knowing x or y or z is true, but were scant on specifying procedural knowledge, knowing how to engage a strategy for comprehension or memory. This is precisely the kind of knowledge that metacognitive research has emphasized. The key words associated with metacognition reveal its emphasis: awareness, monitoring, control and evaluation.

Two parallel strands of research dominated the work in metacognition. The first, metamemory research, revealed that along with the capacity to remember more information, human beings develop tacit and explicit strategies for remembering. The second line of research, metacomprehension, is more typically associated with strategies that readers use while they are reading as they monitor, evaluate and repair their comprehension of written text.

Given the tremendous outpouring of research on basic processes in comprehension since the mid-seventies, it is fair to ask what we have learned from it all. Here is a sampling of some insights that we have gained: Prior knowledge (in the form of Schemata) influences our comprehension to a much greater degree than earlier research would have suggested.

Although Schema Theory is treated at length in Chapters Five and Six, Anderson (1984) has summarized the influences that schemata play in our comprehension in the following generalizations:

(i) Schemata provide ideational scaffolding for assimilating text information. Schemata have slots that readers expect to be filled with information in a text. Information that fills those slots is easily learned and remembered.

(ii) Schemata facilitate the selective allocation of attention. They guide our search for what is important in a text, allowing us to separate the wheat from the chaff.

(iii) Schemata enable inferential elaboration. No text is ever fully explicit. Schemata allow us to make informed guesses about how certain slots must have been filled.

(iv) Schemata allow for orderly searches of memory. For example, suppose a person is asked to remember what he did at a recent cocktail party. He can use his cocktail party schema, a specification of what usually happens at cocktail parties, to recall what he ate, what he drank, to whom he talked, and so on.

(v) Schemata facilitate editing and summarizing. By definition, any schema possesses its own criteria of what is important. These can be used to create summaries of text that focus on important information.

(vi) Schemata permit inferential reconstruction. If readers have a gap in their memory, they can use a schema, in conjunction with the information recalled, to generate hypotheses about missing information. If they can recall, for example, that the entree was beef, they can infer, that the beverage was likely to have been red wine.

So powerful is the influence of prior knowledge on comprehension that Pearson and Spiro (1982), Johnston (1984), have found that prior knowledge of topic is a better predictor of comprehension than is either an intelligence test score or a reading achievement test score.

It is fair to conclude that more research about reading comprehension practices has been conducted since 1975 than in the 100 years prior to 1975 (Pearson, 1985). One reason for this is that we understand the basic processes involved in comprehension better than we used to. Reading comprehension research related to education tends to fall into one of three categories (see Pearson and Gallagher, 1983).

(i) Some studies attempt to describe what is going on in the name of reading comprehension, either in schools or in text books.

(ii) Other studies attempt to try out different ways of teaching or allowing students to practice reading comprehension strategies or activities. They try to evaluate competing practices over some periods representing what we might call pedagogical experiments.

(iii) A few studies with more of a programme evaluation examine a practice or set of practices embedded into a larger curriculum.

As the present study is aimed at bringing about a plausible account of teaching reading comprehension in ESL/EFL situations, obviously, it falls within category (ii), although category (i) and (iii) are equally important, each requiring a separate treatment in its own right.

However, since the study is directly related to category (ii), it is appropriate to mention some relevant points regarding the practice of teaching comprehension *circa* 1970.

3.3 The Practice of Teaching Comprehension

Unlike the late 1970s and early 1980s, there were few complex and thorough analyses of how comprehension was taught in classrooms prior to the 1970s. The following attitudes and practices regarding the teaching of reading comprehension skills seem evident:

(i) Many scholars wondered whether comprehension skills could be taught at all.

(ii) Some thought it was a matter for the later grades, to be dealt with once decoding skills were mastered.

(iii) Most thought that comprehension skill resulted from practicing separable skills within a balanced scope and sequence extending across the elementary years.

(iv) The most common criterion for sequencing comprehension skills was from literal

to inferential to creative.

(v) Children's ability to answer questions was considered to be the most basic piece of evidence that they could comprehend and was thought by many to be the best path to nurturing comprehension.

A very important question that should be raised here is, *'can comprehension be taught?'* The answer is both yes and no. Perhaps the clearest argument for the resistance of comprehension to direct teaching came from the philosophy underlying the so called *linguistic readers* that were fairly popular from 1963 through the early 1970s. These readers forbade asking comprehension questions in the early books. The rationale for avoiding comprehension questions at all in the early grades was that once children could decode written symbols into a speech code, they could comprehend by listening to themselves say the words. Therefore, questions were considered superfluous (Pearson, 1985).

However, not all reading series adopted the decoding first, comprehension later philosophy absolutely. The relative emphasis given to decoding versus comprehension activities in the early versus later grades indicates a bias toward this decoding first-comprehension later view point (see Chall, 1967)

A balanced diet of separable skills reveals a solid reliance on making sure that many different skills are practised at all grade levels (see Pearson & Johnson, 1978).

The progression from literal to inferential to creative comprehension comes packaged in many different ways: from *getting* the facts straight, to *using* the facts, reading the lines to reading *between* the lines to reading *beyond* the lines. But the underlying philosophy is the same: students cannot do anything with the facts until they have understood them, hence literal comprehension has to be emphasized first. The evidence for this progression comes from Guszak's (1967) study.

Further, the dominant reliance on questions for assessing the *instructing* comprehension emerges clearly in Guszak's study in that era. There is reason to believe that patterns have changed little since that period.

There is little evidence from this period to support the suggestion that the research and theoretical work about the process(es) of comprehension were influencing practice in comprehension instruction. Note for example, the widespread use of long lists of comprehension skills in the face of factor analytic studies demonstrating few distinguishable skills. This tension between research and practice seems to transcend historical periods: It will resurface when we evaluate the impact of more recent research and theory on current practices.

The following chapter highlights the reading process in a discoursal framework emphasizing discourse as meaning potential and discourse as interaction between the writer, the text and the reader. It concludes with an examination of simplification of texts.

CHAPTER FOUR

READING IN A DISCOURSAL FRAMEWORK

4.0 Introduction

For a long time, linguists concentrated on the study of language in its structural compartments such as phonology, morphology and syntax rather than trying to characterize what functions these structures perform in communication and what the language users intend by the use of such structures. Or put in another way, their [linguists] works concentrated on describing language structure *per se*, largely ignoring the operational functions (the communicative aspects) of language.

Chomsky's (1957, 1965) reaction against the behaviourists' linguistics was considered a step forward in the study of language largely because he looked at the rules underlying the surface forms of sentences in a language. However, Chomsky was much concerned with the idealized, standardized and decontextualized form of language, because he considered the user's *competence*, not *performance*, to be the grammar of one's language.

As a result of this shortcoming, frameworks for analysis were adapted from different disciplines such as philosophy, sociology, ethnomethodology etc. These were often concerned with real data frequently in contexts larger than single sentences.

Furthermore, meaning which was assumed by linguists to be the ready made component of syntactic constructs was extended by philosophers and ethnomethodologists of language to cover a wide range of aspects inherent in language.

This chapter will explore some of the relevant features of these developments particularly in relation to the interactional aspects of discourse, to the different as-

pects of meaning, to the cooperative principle emphasized by some philosophers, and to the way these help us to look at the simplification of texts: a procedure sometimes adopted to try to make texts more understandable to learners.

There are three main sections in this Chapter. The first one is meaning and discourse which includes different views of meaning, writer-text-reader interactions which again are further explained by notions such as writer's plans, writer's intentions and notion of utterances. The second section is on the cooperative principle. This section is sub-divided into three aspects of the cooperative principle, namely: rules in an act of discourse, interpretation of utterances and the processes of interpretation. The final section on simplification of texts deals with techniques used in simplifying texts and disadvantages of simplification. The section is concluded by some relevant suggestions to improve simplification methodology.

The following section emphasizes the growing interest undertaken by linguists, philosophers and ethnomethodologists to incorporate the approaches to the study of linguistic meaning with the nature of meaning in real communicative situations.

4.1 Meaning and Discourse

The study of discourse constitutes a shift of emphasis away from the study of language as a system of forms accountable for in terms of their internal relationships (language as an object), to a preoccupation with functional aspect of use (language as a means of communication). This shift involves an interest in the ways in which language is actually used, and in explaining how these ways which are often *deviant* as compared with grammatical or semantic norms, are quite interpretable.

A central concern of discourse is the relationship between grammatical form and communication function (Halliday, 1970), or between system and behaviour (Lyons, 1972). Its aim is argued to be the establishment of a framework in which these two may be systematically related.

For a broader but at the same time basic understanding of both discourse as a process and discourse as a product meaning holds a central position. The following sections discuss the role that meaning plays in communication. Gricean maxims also merit attention in this connection.

4.1.1 Different Views of Meaning

None of the approaches to meaning and study of language was compatible with the nature of meaning in actual communication situations. Although, they extend from the sentence onwards, they, as Widdowson (1979) argues, had not gone much beyond relationships between contiguous sentences.

The linguistic scope of meaning faced a greater challenge from the notion of communicative competence, put forward by Hymes (1971) as an extension of linguistic competence. For Hymes, the acquisition of communicative competence in language was not independent of the contextual and socio-cultural features of the heterogeneous speech community. In this context Halliday's meaning was to be seen as *meaning potential* which could be associated with Hymes Communicative competence. Halliday maintained that the structure of sentence and other units is explained by derivation from their function. In order to understand the linguistic structures in functional terms, Halliday says,

> *'We have to proceed from the outside inwards interpreting language by reference to its place in the social process. This is not the same thing as taking an isolated sentence and planting it out in some hot house that we call social context. It involves the difficult task of focusing attention simultaneously on the actual and the potential, interpreting both discourse and the linguistic system that lies behind in terms of the infinitely complex network of meaning potential that is what we call culture '* (Halliday, 1979:4-5)

For Halliday (1976) various components of meaning derive from the different functions of langugage (e.g. experential, interpersonal and textual), and grammatical structure is regarded as the means by which these various components are integrated together.

The Ethnomethodologists took a still more flexible approach to meaning. Meaning for Garfinkel (1967) is *situated meaning* i.e. meaning is constructed in specific contexts by actors who must actively interpret what they hear for it to make sense (Gumperz & Hymes, 1972)

Cicourel (1973) illustrates the difference between the meaning from the linguistic and ethnomethodological viewpoint as follows:

> *'Linguistic and methodological approaches to problems of meaning differ markedly. The former has stressed formal properties of language which would be relevant for the development of logical relationships and rules to describe the association between sound patterns and the objects, events or experiences to which they refer. The latter approach has been concerned with the process whereby rules said to cover interactional settings are constructed, as well as with the assessment of claimed measurement of the actual implementation of rules in specific circumstances. Ethnomethodology emphasizes the interpretive work required to recognize that an abstract rule exists which could fit a particular occasion while linguists minimize the relevance of interactional syntactic rules for semantic analysis. The ethnomethodologists view meaning as situated, self-organized and reflexive interaction between the organization of memory, practical reasoning and task. Linguistic rules are seen as normative constructions divorced from the cognitive*

reflection and ethnographic settings in which speech is produced and understood ' (Cicourel, 1973:100)

The above few points briefly illustrate the linguists ever-growing dissatisfaction with their approaches to the study of the linguistic meaning and their desire to incorporate more and more into their theories to make them more compatible with the nature of meaning in real communicative situations.

But their sentence based approach to language was too limited to deal with the real contextual meaning.

Consequently, in order to accommodate the potential or situated meaning operationally created in the actual communicative situations, the linguists kept on working on the manageable dimension of meaning called pragmatics to deal with the determinants of the unmanageable dimension of meaning (Kempson, 1975).

Leech (1979) maintains that *meaning* or *sense* should be studied by semantics and *use* or *force* to be dealt with in pragmatics. He presents a set of postulates arguing that the semantic representation of a sentence is distinct from its pragmatic interpretation, that semantics is *rule-governed* while Pragmatics is *principle-constrained.* One is conventional and the other is *non-conventional*, one is *formal* and the other *functional* etc. Leech concludes that because of these differrent kinds of regularities on each of the levels, the separation of semantics from pragmatics is justified.

But this compartmentalization of meaning into semantics and pragmatics, though justifiable for certain methodological purposes, fails to provide a framework for the study of language in its actual communication. As a consequence of this failure, the need for an alternative framework is felt. The conflation of semantics and pragmatics, though not justifiable for theoretical descriptive reasons (cf. Leech, 1979) is supported, and the scope of linguistics-semantics is broadened to include most of the elements from a pragmatic perspective (Lyons, 1977). The required framework

would be based on the whole discourse and the text which presents it rather than being based on individual sentences, and would make the study of *Language in real contexts* possible.

The need for such a discourse based framework was felt more by the people involved in the applied aspects of language study: the applied linguists. This is mainly because the existing sentence-based linguistic frameworks couldn't provide them with sufficient insight into the preparation of materials to meet their pedagogic objectives specified in the light of the language function, i.e. communicative language teaching.

In an attempt to highlight the language in operation or the communicative aspect of language teaching, Candlin (1976) regards meaning as composed of four layers namely: notional meaning, referential meaning, sociolinguistic meaning and contextual meaning (which is not manageable by sentence-based linguistics).

Thus the ever-increasing interest in the negotiated and *situated* nature of meaning led to a new and ever-widening dimension in linguistics. Rather than being sentence-based this dimension is based on discourse, and rather than studying the meaning as a pre-tailored component of words and sentences, it considers meaning as something formulated and negotiated within the overall text and with the active participation of all the parties involved in the interaction. This dimension of linguistics which studies *Language in real context* is referred to as discourse processing.

My main concern in this section is to achieve an integrated view of reading in its relation to discourse. Therefore, this section suggests that the view of language as meaning potential enables us to achieve an integrated approach to meaning in discourse, both from a linguistics and socio-psychological standpoint.

What I have in mind when referring to an integrated approach to meaning is an account of what *meaning* of a text is, and at the same time, an account of the com-

municative activity through which the reader is capable of comprehending a written text as intended by the writer on the basis of his knowledge of the language. This is further explained in the section that follows:

4.1.2 Writer - Text - Reader Interaction

The meaning of a text is often succinctly stated in its title, for example, *An Introduction to Applied Mathematics.* In this title, the second part specifies the field of knowledge to which the text refers while the first indicates the status that the treatment of the topic is intended to have against the background of the reader's assumed knowledge and within the field itself. The two parts synthesize the *content* that the writer wishes to communicate.

Content is usually described in terms of a hierarchical arrangement of propositions in the form of a semantic tree (cf. Grimes, 1975, Meyer, 1975) or Macrostructures (Van Dijk, 1977).

However, propositions can only *make sense* to the reader provided that one ascertains the intention with which they are said. The meaning of a text, therefore, can be said to correspond to what has been studied under propositional and illocutionary value.

Any reading and comprehension-oriented analysis of the communication process through the written text should see reading as an on-going cumulative process of interaction between the reader and the writer through the text and should be concerned with the characterization of the effect of different textual elements of this process.

Such an outlook on discourse for the purpose of reading will entail discussion on how to facilitate the reader-text interaction and what factors, textual or otherwise, are involved in the more effective accomplishment of such a process.

It might be useful, at this point, to try to get an understanding of what is involved

in the use of language in texts. de Beaugrande and Dressler (1981) define text as *communicative occurrence.* I share Widdowson's view (1984) that text cannot be se as an occurrence since it has no dynamism of its own, does not itself communica A text is activated by human agency providing the means whereby communicati can be achieved. However, de Beaugrounde and Dressler appear to agree that fi of their seven constitutive conditions of textual Communication (namely, cohesio coherence, intentionality, acceptability, informativity, situationality, intertextuality are user-centered and have nothing to do with the text itself, but with its use interaction.

Widdowson has the following to say on text,

> *'Texts do not communicate, people communicate by using text as a device for mediating a discourse process. It is this process, which is the communicative occurrence. Texts are simply a static configuration of linguistic signs which have to be interpreted in a particular way if they are to serve their mediating purpose. '*
>
> (Widdowson, 1984:12

The view that language, as a form of social behaviour, is governed by a tac assumption of reciprocity, entails that meaning is not a prerogative of the reade but a matter of mutual agreement to be arrived at through the use of language i an act of discoursal behaviour. This point might be substantiated by the statement of Stevick and Widdowson. Stevick (1976:160) says, *Meaning is what happens insic and between people* In the same vein, Widdowson (1976) redefines reading as i interaction between the reader and the writer through the mediation of the text.

How is meaning created in discourse ? An understanding of how meaning created in discourse requires that *given* be defined by reference to the two participant in a communicative act. It requires, among other things, a schema of what is know

by the partner, and of what is currently in one's active memory (Winograd, 1977). The concept of *given and new* needs to be qualified, therefore, when looked at from the point of view of communicative process such as reading. see 5.2 and 5.5)

For the reader *given* acquires a different significance in that it denotes information that is readily available to one at the time of the communication, and not simply that which one already knows and has stored in his memory. It is from this conception of given that stems that of *activated* knowledge (cf. Bransford and Johnson, 1973) as well as that of *foregrounded information*, information that is assumed by the writer to be in the reader's consciousness (Chafe, 1972, 1974).

Analysis of a schema for structuring information centered on the communicative properties, conceived as an abstract given new sequence, provides a basis for doing away with the distinction between the reader's cognitive and performative knowledge, and this, in turn, leads to an alternative interpretation of what this dichotomy records as an observed fact, namely, that a reader may have an understanding of a linguistic form but not be able to make a sense of it as a piece of communication.

The schema suggests that what leads the reader to do one thing or another depends on whether or not the situation of contact with the language provides for the essential condition of communication to be met. This is the condition that enables the reader to perceive the uttering of a linguistic form as originating from the interlocutor's intention to communicate, and to integrate new information into what is given by reference to the perceived intention.

It is necessary to posit an ideal situation in which reader and writer share a common interest and strive to creative meaning under the assumption of mutual cooperation.

The notion of *plan* has been hypothesized to claim that the writer provides guidance to the reader in interpreting his text (Freedle & Carroll, 1972). Plans

denote the driving force behind communicative behaviour. They are of interest in so far as they enter the generation and comprehension of text. The following section explains this assertion.

4.1.2.1 The Notion of Plan

The guidance resulting from the writer's plan must be assumed to concern one's tactical utilization of the linear sequence, so as to structure information from the perspective of a hypothetical audience. Although the writer's text is of necessity sequential, and so is input for the reader, meaning is expressed and ascribed through a behavioural act, and as such exhibits the hierarchical structure that characterizes all behaviour. It is assumed that the linearity of text leads the reader to construct a hierarchical message.

The idea of plan is congruent with the view that,

> *'A text only provides directions for listeners and readers as to how they should retrieve or construct intended meaning from their own previously acquired knowledge '* (Adams & Collins, 1979:3)

In the ideal situation posited here, comprehension involves the reader's willingness to behave according to the writer's instructions and his reconstruction of a message similar in structure to the writer's overall plan.

Not all situations of course conform to this ideal. On the one hand, the reader may have a multiplicity of purposes and may not wish to follow the path laid out by the writer: One may choose to forge one's own way through the text and devise a plan that fits one's purpose. On the other, one may not qualify as the ideal reader for whom the level of difficulty of the text was originally envisaged. While the first situation involves a voluntary departure from the writer's plan, the second involves a partial or total breakdown in communication.

In addition to having the intention to communicate a certain content, the writer intends that one's intention be so recognized. In other words, one intends that one's message be readily understood. These two intentions, having to do with the *what* and the *how* of one's message, subtend one's expressive effort.

The writer's plan to communicate a certain content functions as a holistic guide and as a motivation for the linguistic choices one makes. Thus, there is one sense in which one may be said to *know* what one wishes to say before saying it. This knowledge, however, is in no way exact. One need not, for example, know in advance the exact wording or perhaps the order in which one is going to present his argument.

As one writes, the linguistic forms that one uses take on special meanings that were perhaps not originally envisaged as part of one's holistic plan. Implications and conceptual structures are created, establishing provisional agreements that respond to one's intention to facilitate the reader's task and ensure the comprehension and acceptance of one's message. In order to decide how to present one's material, one needs to continually assess what is *given* both in relation to the reader's long-term knowledge and to the knowledge shared with the reader at each stage of the communicative act in which they are both participating. This involves the writer in predicting the reader's informational needs, switching roles with one's hypothetical reader, and, from this new standpoint, feeding back information to the writer as to the intelligibility of one's text. The degree of explicitness that one builds into the text (or the rate at which one introduces new information) is dependent on this strict monitoring or control of coherence. Thus, in the course of being written, the writer's original plan becomes constrained by the requirements of internal consistency that arise out of his text. The writer's plan then adopts a form of its own. The text becomes a particular universe of discourse in which the way something is said constitutes an intrinsic part of what is said. Thus, there is also a sense in which the writer cannot be said to *know* what he wants to say until he has put it into words. *'Our*

saying begins to acquire a meaningful organization after the fact, not before' (Tyler, 1978:130).

The text that results from this two-phase plan is *a phenomenon of emergence rather than a pre-conceived plan.* Its structure emerges retrospectively, projecting both forward to accord with the initial global intention, and backwards to accord with the preceding linguistic content (Tyler, 1978).

The interpretation of textual forms depends on the reader's ability to infer the connection they bear with what is *given* in the situation. This involves his ability to recognize them as within the range of possibilities that accord to a rule (what potentially makes sense), and his ability to recognize them as fulfilling a communicative function (what actually makes sense).

Communicative function or meaning was defined by reference to the writer's intention. What makes sense to the reader, therefore, is what he can perceive as contributing to the development of text in the direction of an assumed intention. What are then the notions involved in the writer's assumed intention ? The answers to this important question are given in the following section.

4.1.2.2 The Notion of Intention

Each element in the text, namely, word, utterance, sentence, etc. must be seen as aimed at engaging the reader's ability to bring elements from his own knowledge into the foreground (Chafe, 1972) or into his *present consciousness* (Oller, 1974). Interpretation of these elements requires the reader to establish inferential links between them and his previous knowledge (including knowledge of what has just been perceived) on the one hand, and with the writer's intention on the other.

The interaction between the reader's knowledge and the assumed goal of the text defines the reader's *modus operandi* as one of predicting meaning on the basis of his

expectation, and securing feedback from the incoming text.

The assessment of informational value entails the prediction of meaning as a function of a larger hypothesized structure, schema or plan. As the reader follows the flow of information along the linear sequence, s/he weighs the informational value of each element on the basis of what has gone before, and, according to one's expectations, of its likely contribution to an assumed whole. At the same time, feedback from subsequent elements either confirms or modifies one's conception of the whole.

This interpretation is not exact. Given the nature of schematic knowledge, the reader interprets each element as an instance of a type, though not as an exact replica of it. A written text becomes *given* for the reader in a unique act of discourse through the mutual conditioning of schema and instance, parts and wholes, predictions and feedback, and writer's creative act.

The meaning ascribed through this double inferential process from parts to whole and from whole to parts is what the reader judges to be the most likely intended interpretation at a certain point in the discourse, but is subject to readjustment and modification as one integrates subsequent text into one's conceptual structure.

The assessment of information structure, therefore, requires the reader to constantly readjust his appreciation of what functions as given and new, to change *focus* and be ready to take in text from a constantly changing perspective.

Through this process, the reader is capable of extracting out of the surface structure of the text a synthesized message or a summary, which represents the essence or gist of the author's message.

It must be assumed that, in spite of the differences existing in the readers' private worlds, they are able to get *the same* message because they cooperate with the author. This means that they recognize what the author has said (propositional content), as

well as what he has meant (i.e. illocutionary content). In fact, there is evidence that readers agree as to what *the meaning* of a text is (Meyer, 1975).

On the other hand, the reader(s) may understand the writer's message, but refuse to accept it. This partial breakdown of communication stems from the writer's failure to properly assess the reader's non-cognitive (performative) aspects of his knowledge: attitudes, and biases. This happens if/when the writer's position is contrary to the reader's and the writer fails at the same time to assess the reader's willingness to co-operate. Consequently, the writer manages the interaction without establishing the necessary preparatory conditions for his message to be accepted. These conditions should aim at convincing the reader to switch allegiance to the writer's side. Finally, the writer may inadequately assess the reader's cognitive knowledge. An over-estimation of the reader's background results in an unintelligible text and underestimation of it results in a boring one. That is, the writer might overestimate the reader's knowledge, hence leaves much to be inferred. Or the writer may underestimate the reader and hence may have too many *enabling acts* (Widdowson, 1984), which will distract the reader from the focal information. Either way there will be a communicative dysfunction because the cooperative principle have not been put into effective operation. (see 4.2)

On the other hand, the reader is not free from problems as well, for obvious reasons listed below:

i. The reader may not have the linguistic competence necessary to recognize the clues to the meanings offered.

ii. The reader may allow his own reality, attitudes and ideas to override his ability to perceive the clues.

iii. The reader may not have the interest or purpose in what the writer has to say.

If reading and writing activities involve the realization of linguistic rules to create discourse, in the way Widdowson (1984) suggested, then certain consequences follow, which are of direct relevance to the teaching of these abilities.

Text, as a product, is actual and perceptible on the page, but before meanings are realized it has to be converted into the interactive process of discourse. A text, no matter how genuine, has to be authenticated as discourse by the reader. Widdowson (1984) maintains that genuineness is a property of the text as a product and authenticity is a property of the discourse as a process.

The meaning that is thus derived from a text can never be total or complete because it is conditional on the extent to which different kinds of knowledge of writer and reader correspond, and the extent to which the reader is prepared to engage in the interaction on the writer's terms. I strongly agree with Widdowson's statement that

> *'the effectiveness of communication in written language corresponds to the degree of congruence between writer intention and reader interpretation '* (1984:51)

This assertion leads to the notion of utterances which is further discussed below:

4.1.2.3 The Notion of Utterances

The reconstitution of the writer's original interactive discourse forms the textual clues provided. This heavily depends on the writer and reader sharing knowledge of different kinds. These are:

i. The realization of linguistic rules in accordance with the cooperative principle,

ii. Knowledge of the subject matter referred to,

iii. Knowledge of particular conventions of communication.

It follows from these that reading cannot be dissociated from norms of social behaviour and cultural values. To borrow Widdowson's (1984) words: *Reading is contingently and not essentially a linguistic affair.*

Brown and Yule (1984) share exactly the same view as Widdowson on analysis of language. This is what they say:

> *'One of the pervasive illusions which persist in the analysis of language is that we understand the meaning of a linguistic message solely on the basis of the words and structure of the sentence(s) used to convey that message. We certainly rely on the syntactic structure and lexical items used in a linguistic message to arrive at an interpretation, but it is a mistake to think that we operate only with this literal input to our understanding '* (1984:223)

It is possible that one can recognize when a writer produces a perfectly grammatical sentence from which one can derive a literal interpretation, but may not claim to have understood, for the simple reason that one needs more information. At the opposite extreme, one can point to linguistic messages which are not presented in sentences and consequently cannot be discussed in terms of syntactic well-formedness, but which are readily interpreted.

The distinction between sentence and utterance is crucial to an understanding of how language is used in reading or any other communicative activity for that matter. The sentence and the utterance are alternative expressions of linguistic rules. The sentence manifests the rules for the purpose of demonstration or display, whereas the utterance realizes the rules for the purpose of communication. The sentence is a unit of analysis whose meaning or signification is established by paradigmatic association with other sentences, whereas the utterance is a unit of use whose meaning or value is established by its syntagmatic combination with other utterances in context

(Widdowson, 1979, 1984).

The fundamental misconception commonly held by linguists is that they talk about language use in terms of a sequence of sentences, and of extending the scope of grammar *beyond the sentence* as if texts were the same kind of unit as sentences but bigger. Widdowson (1984:41) says, *'Sentences do not occur in language use although, of course, the linguistic rules which sentences exemplify are realized in language use as utterances.'* Let us take for a moment an expression like:

John's Picture

Only when such an expression is used can we understand what particular value it realizes:

i. Whether it refers to the picture of John.

ii. Whether a picture John has bought.

iii. Whether a picture John has painted.

iv. Whether John intends to paint.

v. Whether John is always talking about painting.

Hence the general communicative realization of linguistic rules as utterances and the analytic manifestation of linguistic rules as sentences are distinct modes of operation. Therefore, the sentence suggested is irrelevant to the study of text in its relation to discourse and to the process of reading. The idea of understanding discourse is a question of interpreting sentences, whether on their own or in combination.

Discourse occurs as a realization of linguistic rules in the act of making sense and this inevitably involves an engagement with the language user's cognitive and experiential reality. Sentences are artificial constructs which are detached from such reality by definition and so have nothing to do with discourse. So it is that we can have

utterances which do not correspond with sentences, which can only be understood in defiance of linguistic rules as codified by grammarians.

Poetry offers the most obvious instances of this phenomenon and there is a considerable body of literature which deals with the question of how the deviant sentences in poems are to be accounted for in grammatical terms.

Furthermore, ungrammatical sentences (which do not manifest the linguistic rules of English) can occur as utterances in certain circumstances. For example let us have a look at the following utterance which is taken from Widdowson (1984:45).

Was there a holiday tomorrow?

Its occurrence can be attested as an utterance in many circumstances.

Further, Is it not also possible that a language user can create meaningful paradox out of semantic anomalies? As in the expressions:

Boys will be boys.

Business is business.

The above examples show how the realization of rules are distinct from their manifestation. This realization is brought about by the employment of certain *Procedures* (Widdowson, 1984) which provide linguistic elements with appropriate interactive value.

Widdowson (1984:46) says, *'The context itself doesn't determine the meaning of utterance any more than does the code itself.'* The relation of code to content requires some necessary procedures. You cannot account for any kind of behaviour by simply stipulating rules. The language user has certain definite ideas about how one usually talks about things so that he is conscious of a set of basic utterance types constituting a reference for the normal realization of rules.

In language use, what is said in the course of conversation does not simply make independent reference to a single state of affair. The propositional content of an utterance is organized so that it sustains an ongoing interaction whereby the knowledge of the addresser is adjusted to the knowledge of the addressee to their mutual satisfaction. The procedures whereby this is brought about have been described by Grice (1975) as deriving from what he calls *The Cooperative Principle.* I will touch upon this important area in the next section for the simple reason that applications of procedures of this kind enable the language user to realize not only linguistic rules for propositional development (as is demonstrated in Sacks 1972), but also they enable the user to identify conditions to be met in the performance of different illocutionary acts, even when these conditions are given muted expression in the interest of social acceptability, an important aspect of co-operation. This has to do with what Labov (1972) calls *Modes of Mitigation and Politeness* and Searle's (1975) *Indirect Speech Acts.*

The following section will make explicit the kinds of assumptions that normally bear on every day interpretation of language: The Cooperative Principle.

4.2 The Cooperative Principle

Grice (1975) provides the general principles that govern the conduct and interpretation of conversation irrespective of subject matter. These have to do with the use of language in an interactive situation. That is, they make explicit reference to the existence of a Speaker and Hearer engaged in a joint effort towards communication. Grice defines this principle as follows:

> *'Make your conversational contribution such as is required at the stage at which it occurs, by the accepted purpose or direction of the talk exchange in which you are engaged '* (Grice, 1975:45)

Grice assumes under this principle a number of unspoken assumptions that have

been acknowledged to be instrumental in guiding speakers and hearers in their interpretations. Grice distinguishes four *maxims* under this principle, which he denotes as maxims of quality, relevance, quantity and manner.

Grices's maxim of quality involves two sub-maxims:

i. Do not say what you believe is false, and

ii. Do not say that for which you lack adequate evidence.

The tone of these maxims is prescriptive rather than descriptive. The question is, to what extent is communication impaired if such maxims are not followed, and how strictly need they be followed?

Grices's definition of the general principle suggests that they only need to be followed to the extent that they can further the speaker's purposes in a conversation. In fact, the speaker may lead the hearer to believe that he can back up what he says without necessarily being certain that he can (for this would probably produce more silence than talk). This is not to be seen as a deliberate effort to mislead, although it can be, rather, the speaker may advance his views as if thinking aloud, organizing his thoughts in the process, for the sake of furthering the conversation, and at the risk, of course, of being challenged. What is essential for discourse to proceed is that the hearer should assume that S [speaker] holds the appropriate beliefs.

On the other hand, S may commit himself to a course of action because he has implicated so by what he has said. He may, for example, make a statement that is interpreted as a promise by virtue of its conforming to accepted norms, and he is held responsible for fulfilling it. Thus the principle allows certain manipulation of speech according to the S's intentions, but at the same time sets constraints of a conventional nature.

The principle of relevance involves an evaluation on the part of the speaker of

what might be of interest to the hearer, and is closely related to that of informativeness. On the other hand, the fact that an utterance is said, even if its relevance is not immediately apparent, entitles the hearer to infer that what is said is of relevance to him.

Taking an example from Widdowson (1977a), if one of two persons in a room says *The door is open*, and it is within the hearer's sight that it is so, his reaction will be to seek a hidden meaning, an implied relevance to the statement. If the utterance is not informative as it is, the hearer will assume that its purpose must lie beyond the words. He may possibly interpret it as a command, or choose to ignore the implication that the speaker is asking him to close the door, and merely acknowledge that he has heard it: *So I see.*

The principle of quantity involves an evaluation by the speaker of what is known by the hearer, and the regulation of the amount of information that the speaker includes in his speech. Grice calls it the maxim of quantity and spells it out in two sub-maxims:

i. Make your contribution as informative as required

ii. Do not make your contribution more than is required.

Sacks puts it this way:

> *'It is a general rule of conversation that it is your business not to tell people what you can suppose they know '*
>
> (Sacks, 1971, cited in Couthard 1977:75)

The principle of manner refers to the need for the speaker to make his contribution as clear and orderly as possible in order to facilitate the hearer's task in interpretation.

These principles or maxims of the cooperative principle underscore the existence

of a basic assumption of reciprocity. Underlying them is a basic requirement for speaker and hearer to be constantly assessing their interpretation of events in the light of the other, an awareness of the reciprocal nature of the conversation, and the need of an effort to establish a common ground so that the interaction may proceed. Also underlying them, is a basic fact about language: that words are the vehicle of meaning, not the meaning itself.

Grice points out that these principles are normally followed, but that it is a feature of conversation that they may be and are violated or *flouted.* An open violation signals to the hearer that it is obvious that the speaker intends it to be recognized, he also intends the hearer to interpret it by reference to the maxim and to find in it an implied meaning. The example cited earlier on the uttering of *The door is open*, illustrates a violation of the maxim of relevance which suggested to the hearer the implication that the speaker wanted him to close the door. Grice exemplifies a violation of the maxim of quantity citing the case of a philosophy don who, asked to write a letter of reference for a former student who was applying for the lecturership in philosophy, wrote the following:

> *'Dear Sir, Jones' command of English is excellent, and his attendance of tutorials has been regular. Yours faithfully '*

Because in the context more (and relevant) information would be expected, the scantiness of the letter in fact suggests to the reader that Jones is not a desirable candidate for the post.

The interpretation of these *conversational implicatures* as Grice calls them, is dependent on knowledge shared by the participants, but is not predictable from the context in which they are made. The hearer may recognize their intended meaning, but not be willing to acknowledge it. In this respect, interpretation by reference to the cooperative maxims again illustrates the problem posed in the discussion of the

perspective from which illocutions are achieved. This problem indicates that intended meanings may need to be actively negotiated in the course of interaction.

It is important to note that Grices maxims, although essential, cannot be automatically applied in the writing/reading processes. Suffice it to quote Widdowson (1984:51).

> *'Some of Grices maxims are in potential opposition. Thus in respect to the maxim of manner at a particular point in developing an interaction, the writer may have to decide whether to be brief at the risk of obscurity or ambiguity, or whether to ignore the injunction to be brief in the interest of greater clarity '*

The next section deals with how rules are realized in act of discourse.

4.2.1 Rules in an Act of Discourse

Research by Searle (1969) focused on establishing rules in the form of abstract conditions that must be satisfied for an utterance to be interpreted as a given illocution, but did not illustrate the manner in which those conditions are actually met. Some questions arose regarding the nature of these rules that could not be clarified without reference to how such rules operate in the context of communication.

This section is concerned with the realization of rules in an act of discourse, and draws mainly from the work of Labov (1972 a,b). This author, just as Searle, is interested in formulating *rules of discourse.* By contrast with the latter, however, Labov, who is a sociolinguist, works with real language data and illustrates the manner in which postulated rules come to be realized in attested instances of speech.

Widdowson (1977a, 1979b) discusses Labov's rules and refers to them as *interpretive procedures.* The notion of procedures stems from ethnomethodologists' dissatisfaction with attempts to specify situational constraints on interpretation in

rule form. These researchers point to the difficulty of attaining precise formulations in terms of rules, and observe that a major aspect of the user's behaviour cannot be said to occur in strict accordance to the rules. They argue that the meaning of utterances is *indexical.*

> *'Indexicality refers to the fact that the interpretation of communicative acts always without exception depends upon the speaker's background knowledge. For this reason, the spoken message is always an imperfect realisation of what was in the minds of speakers and hearers. '* (Gumperz, 1972:22-3)

Interpretation is therefore bound up with occasions of use, and the constraints operating upon it cannot be fixed beforehand but are *created* by participants during the conversation. The participants establish the *rules of the game* as they go along. The meaning of an utterance is seen as undergoing a modification as the interaction proceeds, and to be reinterpreted in the light of subsequent utterances which redefine the context which informs their interpretation. This position stresses the indeterminacy of meaning as an essential property of communication and defines interpretation as an *on-going accomplishment* (Garfinkel, 1967).

It follows from the quotation above that interpretation requires the user to follow a general strategy for making sense where by he must refer to his conceptual structure in search of information that will make up for the incompleteness of verbal expressions. His background knowledge includes that which he shares with his interlocutors. In this regard, Garfinkel's view of shared knowledge, as paraphrased by Gumperz, is as follows:

> *'The basis of culture is not shared knowledge but shared rules of interpretation, not common substantive information, already acquired, but 'common sense' knowledge of what can account as reasonable, factual, related and the like '* (Gumperz, 1972:304)

This quotation appears to entail that it is *common sense* knowledge, as opposed to *substantive* knowledge, that enables the user to perceive utterances as meaningful in the context of speaking.

However, one's knowledge of the world, in the abstract, is capable of being instantiated in various ways, and be used to ascribe different interpretations.

In this sense, *substantive* knowledge is not different in kind nor is it independent from *common sense* knowledge, in that interpretation, defined as the *grasping of relations,* must of necessity make reference to it, and in turn modify it. In this sense, knowledge is always in the process of being modified, readjusted and enriched through its interaction with the outside world. It follows from this that the notion of interpretive procedures, or rules of interpretation, cannot be conceived apart from the assumed structure of the user's knowledge. The work of Labov (1972 a,b), to be exemplified below, fulfills this requisite by using as a frame of reference the kind of rule devised by Searle (1969). At the same time Labov's work also illustrates the operation of the cooperative principle.

4.2.2 Interpretation of Utterances

Labov's (1972 a,b) work is essentially aimed at establishing how one comes to interpret utterances in a certain way. He is concerned with the identification of illocutions in actual conversation, and focuses on the manner in which the conditions for the realization of illocutionary acts are satisfied. His analyses therefore complement Searle's in that they attempt to make explicit what the subject does in order to realize that *X counts as Y in context C.*

Labov invokes the concept of shared knowledge in order to formulate *rules of interpretation* that can explain how consecutive utterances are heard as a coherent sequence. About these rules he asserts:

> *'— The form of discourse rules is independent of particular propositions being asserted, challenged, or denied. These rules have to do with in variant relations between the linguistic units and actions intended or interpreted. Discourse rules also contain references to unstated assumptions about social relations, which involve the concepts of shared or social knowledge, the roles of the speaker and addressee and audiences, their rights, and obligations, and other constraints that have not appeared before in the array of linguistic primitives '* (Labov, 1972a:125)

Labov illustrates the operation of these rules by reference to pairs of utterances in which there is no overt relationship between what is said and what is done, and attempts to make explicit the process whereby linguistic forms are ascribed particular communicative functions in context. (see Labov, 1972a, Labov & Fanshel, 1977)

The researchers illustrate how this rule may be instantiated by the use of a wide range of linguistic realizations. Just as an example, Labov illustrates the realization of rules for illocutionary force as follows:

i.	Existential Status:	Have you dusted yet?
		You don't seem to have dusted this room yet.
ii.	Consequences:	How would it look if you were to dust this room?
		This room would look a lot better if you dusted it.
iii.	Time Referents:	When do you plan to dust?
		How long will you let this go on?
		I imagine you will be dusting this evening.
iv.	Other Preconditions:	
a.	Need for the Action:	Don't you think the dust is pretty thick?
		This place is really dusty.

b. Need for the Request: Are you planning to dust this room?

I don't have to remind you to dust this room.

c. Ability: Can you grab a dust rag and just dust around?

You have time enough to dust before you go.

d. Willingness: Would you mind picking up a dust rag?

I'm sure you wouldn't mind picking up a dust rag and just dusting around.

e. Obligation: Isn't it your turn to dust?

You ought to do your part in keeping this place clean.

Uses of the rule for Indirect Requests (Labov & Fanshel, 1977:83) discloses several features regarding rules and interpretation that extend and complement the groundwork laid out by Searle (1969) in an important way.

The discussion suggests that rules for illocutionary acts are better conceived as abstract knowledge categories which come to be instantiated in discourse when a number of conditions as specified in a rule have been satisfied. The realization of these rules is mediated by *procedures* or *rules of interpretation* whereby participants draw on their shared knowledge in order to infer the likely relationship holding between an utterance and one of the conditions attendant on the assumed interpretation.

Labov illustrated the fact that the interpretation of an utterance is always tentative, and does not retain its identity in a larger context, it is only in retrospect, as a product, that the illocutionary value of a given stretch of language can be ascertained. It also made apparent that the meaning of an utterance may need to be negotiated in a goal-oriented transaction in which participants aim at bringing their worlds into convergence.

An utterance may be said to have a given illocutionary value only when speaker and hearer have agreed that the conditions obtained for the utterance to be interpreted in a certain way. That is, when illocutionary intention and perlocutionary effect have been brought in line with one another.

This procedural aspect of interpretation is not describable within rules. By their very nature, these rules leave it open to the user to decide

(a) Whether or not the conditions satisfy the procedures at a particular point in the discourse and if they do not,

(b) Whether and how to make use of the rules in order to conduct the conversation toward his desired goal(s). This aspect may, however, be said to be entailed by such rules, in so far as interpretation is dependent upon the participants' ability to perceive where an utterance lies along the various dimensions (conditions) of illocutionary force.

This section touched upon the question of meaning and interpretation in discourse. The notion of illocutionary force emphasized the intentional nature of communication, and specified that the meaning of an utterance includes not only that related to its propositional content (a kind of *literal* meaning), but also that related to its illocutionary force, i.e. the intention with which the utterance is said.

Illocutionary value is not inherent in the form of an utterance. There exist, nevertheless, certain established conventions which regulate the way in which what speakers say can be related to what they do, which enable users to infer the relationship between the grammatical form of a sentence with the illocutionary function of the act of uttering that sentence. These conventions operate at the level of speech acts, i.e., at the level of language use. By reference to them, for example, the expression *Can you pass the salt,* uttered at the breakfast table, is usually interpreted as a request for action, *Please pass the salt,* and not as a request for information

concerning the person's ability to pass the salt. The meaning of an utterance needs to be agreed upon, or negotiated during interaction, and is established when speaker and hearer agree that their purposes have been satisfied.

The rule against which illocutionary force is to be ascertained are abstract, and have to be instantiated on particular occasions. These rules, like schemata, allow a degree of flexibility in their use, yet speakers are aware of and recognize when a rule has been violated. This attests to their *objective* character, i.e. to the fact that they may be considered to constitute an aspect of the user's *knowledge* or *competence.*

The cooperative principle, as a set of tacit assumptions, drew attention to a central feature of language use: the speakers' mutual reliance on each other's willingness and commitment to cooperate towards the progress of the interaction. It also stressed the language user's reliance on common sense as a general method of interpretation.

This principle enables us to link the results of a necessarily static analysis of the function of utterances in terms of abstract rules, with the dynamism that springs from their linguistic realization. Rules specify a dimension of *what* is comprehended and thus objectify illocutions as abstract functional categories. The cooperative principle, on the other hand suggests *how* speakers and hearers smooth out discrepancies in shared knowledge so as to arrive at interpretations that are, ultimately, always subjective. Thus this principle allows the establishment of a fundamental relation in the study of language use: that between the individual's hypothesized knowledge, and his utilization of this knowledge in behaviour. Let us now attempt to apply these rules to the interpretation of written text by readers.

4.2.3 The Processes of Interpretation

The fact should be stressed here that a linguistic form is considered normal to the extent that it may be seen to conform to reasons that the user estimates are adequate for fulfilling a communicative purpose. If the user is cooperative, it is

reasonable to assume that he will show a preference for those forms that require the least good reason for their interpretation. The assessment of good reasons, however, is a likelihood judgement, and therefore the notion of normality remains an essentially relative one.

This points to normality as a basic strategy of interpretation. As such, it plays an important role in directing the reader's expectation. There is an obvious danger of circularity, however, in asserting that the hallmark of what is normal is what is expected, for what is expected is what is normal.

Where do expectations come from? According to Turvey (1974), they originate from knowledge of three kinds:

(i) Knowledge of the language

(ii) Knowledge of the world

(iii) Knowledge of what has just been perceived

The first two cannot exist as independent entities within the reader, and hence may be considered jointly. As to the third, as far as discoursal interpretation is concerned, it cannot be considered without reference to an interlocutor.

The reader's assessment of normality would, therefore, entail a *knowledge* that contain forms that are potentially meaningful and a *knowledge* of what satisfies his expectations when attempting to recover the writer's message from a written text. The relationship between these two kinds of knowledge bears directly on an understanding of the process of interpretation. It suggests that normality is both what the reader *knows* and his interpretative strategy, that is rooted in knowledge and leads back to it. This relationship entails the reader's capacity to *turn round his own schemata* in an effort to interpret discourse.

This discussion circumscribes the issues that need to occupy our attention in

order to achieve an integrated view of reading in discourse. The notion of normal and actual occurrence is discussed as follows in relation to the means through which competence is realized in performance, i.e. the grammar of the language and finally, in relation to the realization of information structure by the reader and the writer in acts of communication.

Normal occurrence entails the user's awareness that certain events in the language occur in accordance to a rule.

The rules by reference to which something occurs in the language are rules of the Searlean type. These rules are expressed as sets of conditions which allow for a range of possible instantiations. The extent to which something occurs involves an awareness of the degree of conformity to a rule of the instances recognised to fall within its scope. It involves in other words, an implicit recognition by the user that certain occurrences are more common or more normal than others.

The domain in which a rule applies relates to the size of the linguistic group where the rule has a given validity. A domain may range from the most abstract and hence largest, commonly denoted as the linguistic community, to the most concrete and at the same time smallest: the reader.

Some linguistic forms have been codified as rules in the community at large and have a high potential for communication. They constitute *the grammar* of the language and are in this respect considered as standard or normal.

Some others are less codified, such as those existing in certain fields or areas of discourse (e.g. English for Science and Technology). Some are still less codified, such as those pertaining to the idiosyncratic style of a particular author (e.g. in literature), or those belonging to the *private language* shared by the reader and his friend(s). All of these constitute special uses of the language, some of which have been described in terms of rules of use (Widdowson, 1973a, Mountford, 1975). At

another level, attempts to describe the conventional structure of stories encapsulated in schema (Kintsch, 1974), for example, may also be seen as a type of rule of use.

As the name implies, such rules are to be regarded as efforts to describe the particular conditions that can serve as a reference point against which a variety of instantiations within the domain of application of a rule may be interpreted.

Both rules of grammar and rules of use are then, ways of describing *whether and to what extent something occurs* in the language, or, in other words, what is generally agreed as a norm within a linguistic community. They function at different levels of generality, simultaneously informing the reader's expectations regarding the likely development of text and embody that aspect of his communicative competence generally denoted as his *knowledge of the language.*

While normal occurrence can be understood by reference to rules, actual occurrence must be understood as a behavioural act which is informed by rules and at the same time demands the exercise of the readers creativity within the limits that they establish. This brings us to a consideration of what I want to emphasize as the essential rule or condition of communication: a rule that governs the user's assumptions regarding the knowledge shared with his interlocutor.

In my interpretation of actual occurrence, the fulfilment of this condition requires the reader to assess the informational value of textual elements relative to what is generally agreed on the one hand, and to what is concurrently agreed with his interlocutor on the other. Thus, the rule is fulfilled, that is, something *actually* occurs for the reader, when he can judge elements in the text to cohere with what is *given* at a certain point in the communication.

The extent to which this occurs is the degree to which one is capable of integrating what one reads into one's conceptual structure with the writer's goal.

Actual occurrence, then, entails realizing the rules, so that what is intended as communicative by the writer becomes informative for the reader. It entails, in other words, the creation of meaning in an instance of discourse. This is another aspect of the reader's competence, namely, his *ability to use* the language.

The preceding discussion of normal and actual occurrence indicates that within the framework of communicative competence the reader's knowledge is both cognitive and performative. It includes an awareness of what counts as normal in the community at large (what occurs), as well as an awareness of what counts as normal in an instance of discourse (what actually occurs).

Because knowledge is relevant to the individual only in so far as it can be instantiated in behaviour, both cognitive and performative knowledge must be seen as conditioning each other in an act of reading. Cognitive knowledge undergoes a constant restructuring and reorganization as a result of the reader's *doing* interpretation. Thus, what *actually* occurs in reading becomes part of the reader's schematic knowledge.

It is generally agreed that knowing and doing are reconciled through the reader's ability to use the language. A consideration of this ability defines the condition for successful communication. The process is successful to the extent that reader and writer cooperate with each other and interpret a linguistic form from the perspective of the other. That is, ability to use the language entails a cooperative effort whereby the participants in the discourse strive to bring each other's knowledge to bear on interpretation.

In short, the discussion provides the necessary constructs whereby the reader's knowledge of the language and one's ability to use it can be seen as subtending both one's competence and one's actual interpretation through one's engagement in discourse.

Any reading comprehension-oriented analysis of the communication process through the written text should see reading as an on-going cumulative process of interaction between the reader and the writer through the text and should be concerned with the characterization of the effect which different textual elements have on this process.

Such an outlook on discourse for the purpose of reading will entail discussion on how to facilitate the *reader- text* interaction and what factors, textual or otherwise, are involved in the effective accomplishment of such a process. This is the theme of the preceding section.

It might be also useful, at this point, to try to get an understanding of what is involved in the use of language in texts. On the notion of texts, Widdowson says, *Texts are simply static configuration of linguistic signs which have to be interpreted in a particular way if they are to serve their mediating purpose* (1984:125). (See 4.3)

But the question is, *How are texts, as static configuration of linquistic signs, readable and interpretable in the easiest way possible?* The established axiom over the years in the theory of reading is that unsimplified texts are difficult to understand and hence should be done away with in foreign language classrom situations. Whether this is an indisputable fact or not is large enough issue to warrant somewhat extended treatment in the remainder of this chapter. The following section covers the notion of simplifying texts in general and some of the disadvantages of simplification in particular.

4.3 The Notion of Text Simplification

Different views are held by different Applied Linguists regarding the notion of text simplification. Their views on the subject in question are discussed throughout this section.

Davies(1984) says, *'Simplification belongs to the special class of deliberate pro-*

duction which is labelled pedagogic'. Widdowson (1974) shares Davies' view that simplification can be seen as a process in which the teacher or his agent consciously adjusts the language presented to the learner. Tammola (1979) is of the opinion that in simplification the learners are not presented with a simpler language system but with a restricted sample of the full system.

A useful distinction is made by Widdowson (1978) on simplification between what he terms *simplified versions* and *simple accounts.* As Widdowson suggests simplified versions are passages which are derived from genuine instances of discourse by a process of lexical and syntactic substitution, in other words, a simplification of the language code. On the other hand, a simple account represents not an alternative textualization of a given discourse but a different discourse altogether. Widdowson (1978:88-90) maintains that:

> *'... in simple account it is the use of the code, the discourse itself, that is changed, recast to suit a particular kind of reader. Simple accounts are to be preferred to simplified version in that a simple account is a genuine instance of discourse designed to meet a communicative purpose... A simplified version... is not genuine discourse, it is a contrivance for teaching language. '*

However the distinction is a difficult one to maintain and most rewritings will be partly simple accounts and partly simplified versions. It is difficult to draw a neat boundary between simple accounts and simplified versions particularly when it comes to second language learning/teaching. One cannot disagree with Davies' view that in the case of the foreign language learner all materials, including the spoken, may be simplifications. Davies (1984) says,

> *'Simplification of reading materials refers to the selection of a restricted set of features from the full range of language resources*

for the sake of pedagogic efficiency ' (Davies, 1984:183)

If the view of simplification is to make information available to the reader, considering the need of the reader as primary makes a world of difference, since what is meant by simple, therefore, is determined by the needs of the reader and all discourse must be relevant to the reader (Davies 1984).

Simplification is extensively used to prepare materials for language learners. The techniques of simplifying texts are discussed briefly in the next section.

4.3.1 Techniques of Simplification

Most of the simplification techniques being used today were being developed in the 1940s (West, 1964). However, the appropriateness and effectiveness of simplification is being questioned in the light of new insights into language, whether it should be avoided and replaced with other techniques. The issue will be taken up later on in this section.

Linguistic and content simplification are the two common techniques of traditional simplification. A brief account of these techniques is illustrated with some examples in the section to come.

4.3.1.1 Linguistic and Content Simplification

What is involved here has been summarized by Mountford (1976:151) who says,

> *'Simplifying syntax involves basically a process of detransformation in which complex sentences are broken up into simple or compound sentences; nominalizations are resolved in separate sentences, tense relationships are standardized, modal meanings may be lexicalized, and anaphoric links are filled in '*

Structural simplification involves some reduction in syntactic complexity. For

instance, single sentences become three sentences or more. Content reduction (which omits references) is thought to contribute to syntactic simplification. Nevertheless, it is quite possible that the simplified version could as well be too complex structurally.

Paraphrasing is the other principal technique of linguistic simplification. The need for it arises mainly through the use of restricted word lists. The result of paraphrasing is usually expansion (a word is replaced by a phrase). The following examples, taken from Honeyfield (1977:433) will illustrate the point.

Original	*Paraphrase*
(i) wealthy	*(i) very rich*
(ii) his disasters	*(ii) this great change in his fortune etc*

There are two main approaches to content simplification. First, a book or story may be completely rewritten so that there is merely a retelling of the plot (West,1964). A tangible example is found in the many simplified versions of folk tales. The second one is abridgement. Here a simplified version follows the language and order of the original more closely, but omits incidents or whole passages considered to be less important. Much incidental information is omitted, statements are substituted by functionally equivalent statements, though not identical in meanings to omitted sentences.

This may be illustrated by the following examples quoted in Davies (1984:190) and also quoted in Honeyfield (1977:433).

Original	*Simplified*
(i) He gazed in stupified astonishment on the small rebel for some seconds, and then clung for support to the copper.	*(i) He couldn't believe he heard rightly.*
(ii) There was a general start. Horror was depicted on every countenance.	*(ii) They could hardly believe it.*

From the examples given above, it can be seen that the practice of simplifying texts over the years concentrated only on providing restricted sample of the full system. However, traditional simplification has got some merits, even though, its weaknesses have been found to outweigh its strengths in many ways as indicated below. The major weaknesses are technically termed as *expansion, reduction and obscurity.*

4.3.1.1.1 Expansion

Here the reader has to cover more words to get a given amount of information. This is simply because simplifying involves expansion, which results from paraphrasing and detransformation. In expansion, the information content of material becomes diluted, or less densely packed. Honeyfield (1977:434) says:

> *'In simplified material, information tends not to be localized in relatively isolated, relatively unpredictable items requiring high points in the reader's attention, as it is in a normal text. Information is spread out uniformly over the whole text to a much greater extent than in normal material. Thus there is a flattening out of the normal system of information distribution '*

This can be illustrated by comparing short stretches of simplified and unsimplified text such as the following. As quoted in Honeyfield (1977:434)

Unsimplified	*Simplified*
(i) You never saw a more brillant metallic lustre than the scales emit.	*(ii) You never saw a more beautiful gold than is given off by the body of the bug.*
(ii) I hope you haven't been so foolish as to take offence at any little brusquerie of mine.	*(ii) I hope you have not been so foolish as to have become angry.*

The most striking change here is the elimination of all low frequency items. This implies that each word in the simplified versions is entitled to the same amount of attention. Conversely in the unsimplified versions, less frequent words such as *brilliant, metallic, lustre, emit, take offence, brusquerie* stand out as requiring more attention.

We see that more significant information is localized in these terms and hence this seems to fall in line with information theory, which holds that less frequent and therefore less predictable items carry more information (Lyons, 1969).

Research by Richards (1974) on word familiarity, has shown that native speakers of a language have a fair degree of awareness of the relative frequencies of vocabulary items in that language. Moreover, Goodman (1973:154) says:

> *'Reading is a process in which the reader picks and chooses from the available information only enough to select and predict a language structure which is decodable... this is not a process of sequential word recognition. A proficient reader is one so efficient*

in sampling and predicting that he uses the least (not the most) available information necessary. '

In addition to this view, if we accept that readers are somehow aware of relative frequencies, and that less frequent items generally carry more information, it seems likely that substantial variation in information density is a normal feature of text, and part of the normal way in which written language functions as a system of communication.

4.3.1.1.2 Reduction

Simplification of syntax may reduce cohesion and readability. Since syntax has semantic and rhetorical functions, a reduced syntax may be inadequate for a given information load.

Honeyfield with regard to simplifying materials for ESL readers says,

'In fact, it is by no means that we need rigorous structural control in reading material for second language learners. The traditional philosophy seems to be: give them only what they have already been taught. But this seems too restrictive, since a reader can often decode written sentences he would not write or speak '.

(Honeyfield, 1977:435)

Moreover, Honeyfield (ibid) observes,

'Reading is potentially a valuable source of exposure to the language in something like its full form, so that learners are not completely restricted by the steps of a structural syllabus. '

The approach used by simplifiers of materials like Davies (1975) for native speakers (children), although more intuitive, was guided by some rules, for example, limiting sentence length.

Some readability researchers have claimed that sentence length correlates highly with syntactic complexity (see Glazer, 1974).

However, no recent study has focused specifically on the contribution of sentence length *per se* to comprehension.

Preliminary findings from a study by Davidson, Wilson and Hermon (1985) show that sentence length alone accounts for a very small percentage of the variance in the comprehension of texts. Average sentence length is correlated with complexity of internal clause structures, which in turn is correlated with the presence of markers of subordination and of connectives (*So, or, because, when, if, and* etc.) which make explicit the meaning relation between clauses. Hence, long sentences usually consist of syntactically connected clauses with conjunctions or other markers of connection. The results of Davidson, et.al. (1985) suggest that texts with long sentences are comprehended as well as short sentences.

Connectives in sentences are not necessarily what makes a long sentence difficult. There is a body of evidence which suggests that, far from being a source of difficulty, the presence of conjunctions facilitates comprehension, particularly when two clauses could be connected in more than one way, such as in a *reversible* way.

Let us see Anderson's (1987:32) examples.

1. I moved the switch. The lights went off.

2a. I moved the switch, because the lights went off. (To turn them back on)

2b. The lights went off because I moved the switch. (Turning them off)

Anderson (1987) maintains that if there is no connective, the reader is not always able to make the correct inference, especially if it is not clear from the context which inferences (if any) should be made.

Further, Anderson (1987:33) gives us another example.

3. Let's fill the bird feeder with seed. The cat hasn't been active lately.

4a. Let's make the cat more active by filling the bird feeder.

4b. It's safe to fill the feeder because the cat isn't active.

The two sentences in (3) can convey two very different meanings as in (4a) and (4b). The presence of explicit connections is often helpful to the reader if the context does not make sentence connections obvious to the reader (Anderson, 1987:33).

There is a vast body of literature in support of what I have been discussing. For instance, Pearson (1974-75) has shown that children prefer sentences containing an explicit connective such as *because* , and understand them better than implicitly connected sentences. Irwin (1980) showed for somewhat longer texts that students comprehended reversible causal relationships among sentences better if an explicit conjunction was used. In a subsequent study, Irwin & Pulver (1984) found that students' comprehension of reversible causal relationships was improved if the conjunction was explicit and not simply left to be inferred.

It is understandable that conjunction adds to average sentence length in the text, but its presence facilitates comprehension. If sentence length is a factor in comprehension it would be expected that longer sentences would pose a greater problem for students who are poor readers than for those with better reading ability. However Irwin and Pulver (1984) found no interaction between sentence length and reading ability.

There is evidence that increases in sentence length do not necessarily impede understanding .

A study of adult's comprehension of difficult and unfamiliar material by Charrow and Charrow (1979) compared revisions of the *jury instructions* done according to the

guidelines of readability formula. One set of revisions was done by simplifying words and shortening sentences in order to decrease the readability score computed for the passages. The other set of revisions focused on the important pieces of information in the instruction, eliminating distracting less important phrases and drawing attention to the central concepts.

For example, compare the original and revised versions of part of the definition of *contributory negligence* done by Charrow & Charrow (1979:1354).

5a. [original]

An essential factor in contributory negligence is that it contributes as a proximate cause of the injury. (17 words)

5b. [revised version]

If the plaintiff was contributorily negligent, he actually helped cause his own injury, through his own negligence. (17 words)

Although sentences (5a) and (5b) are the same length and the vocabulary in both cases is technical, the infrequent clarification of sentence structure and vocabulary caused increased comprehension.

The revisions made in (5b) were not much different in readability level from the original but they significantly improved the subject's ability to recall and paraphrase the instructions. On the other hand, revisions which aimed at lower readability scores resulted in no greater recall than the original forms, or in some cases even poorer recall (Charrow and Charrow, 1979).

On complex features of syntax, Anderson (1987:34) says,

'... that difficulty of comprehension is not linked in a simple way to complex features of sentence syntax. That is complex features of

sentence structure do not necessarily present a problem every time they occur. For example, if the context fits the complex structure and justifies its use, the structure may not be difficult to comprehend '.

However, one should not forget that if there may be a mismatch between features of a sentence and the context in which it occurs, or if processing a complex structure in some way exceeds the attentional resources of the reader, comprehension will be difficult.

As we have seen in the studies just reviewed, difficulty of sentence structure is not an *absolute value* as it depends on several variables such as interaction with other text features and most importantly with features of the reader.

By the same token, there is no general causal relationship between how long a sentence is and how easy it is to understand. This is not to say that sentence structure has no effect on how well a sentence can be understood. It is easy to imagine many ways in which the length and complexity of a sentence could make it hard to understand and conversely, how sentences may be written so as to make their meaning easy to understand. What is not easy to characterize is some general definition of sentence complexity. The reason for this is that sentence complexity is not an absolute value. Specific sentence features do not always introduce difficulty into the processing of the sentence that contains them. Sentence features interact with other sentence features and with features of readers, in many cases where difficulty of comprehension has been revealed by experimental measures as in the Irwin and Pulver (1984) studies cited earlier.

A long sentence may be hard to understand simply by virtue of its length, all other things being equal, just because it contains a large number of words to identify and access. But we may compare sentences of exactly the same length, with the

same words and find that they differ in complexity. Irwin and Pulver (1984) used the following sentence pairs:

6a. Because Mexico allowed slavery, many Americans and their slaves moved during that time.

6b. Many Americans and their slaves moved to Mexico during that time, because Mexico allowed slavery.

The subjects, who were asked to answer comprehension questions about these sentences, were 3rd, 5th and 8th grade students, as well as college students. As noted earlier, the versions of the sentences with connectives, though longer, were understood better than the single clause sequences. What surprised the experimenters, however, was that the version with the preposed adverbial clause (6a) was difficult for younger subjects, those in the 3rd and 5th grades. They predicted that (6a) would always be easier than (6b) because the order in which the clauses are mentioned coincides with the general cause - before - effect ordering that is generally preferred. This was the case for older and more skilled readers, who had no trouble in matching the order of mention with the meaning of *because* . But apparently the younger and less skilled readers did not use the cause - effect ordering in the same way to overcome the difficulty they had in understanding the sentence structure.

Sentence length and complexity are measured in a sample of text in computing its readability. These variables do not, however, directly reflect the properties of a text which make it difficult for a reader to read and comprehend. Anderson (1987:40) says. *'As is well known, the application of a formula in reverse, revising a text to make the sentences shorter and the words simpler, does not increase comprehension.'*

The complexity of a text may be directly indicated by the linguistic factors which are measured by formulae. They may appear to be powerful indicators of complexity because of the inappropriate use of an aggregate statistical model, not taking into

account the interaction of properties of the individual with other properties of the text.

4.3.1.1.3 Obscurity

Simplification often obscures communicative structure. Mountford (1976) has suggested that simplifiers, especially when working with science and technology material, should preserve and make more explicit the communicative structure of texts. Mountford (1976:146) says:

> *'A text appears to have another kind of structure [besides formal devices of cohesion] in which the information to be conveyed is organised as a series of acts of communicatin which together compose the rhetorical structure of the discourse '*

By *acts of communication* Mountford means such things as classifying, describing, illustrating by examples, drawing conclusions, presenting supporting evidence etc. In effect he suggests that in concentrating on vocabulary and sentence structure, simplifiers often fail to notice communicative structure and sequence signals (which explicity mark this structure).

Although Mountford does not say so, presumably the readability of such material is impaired. He does suggest that communicative structure is an essential feature of original, unsimplified material, and that learning to recognise it is an important training for ESL students (Mountford 1976:150). He suggests a new approach to simplification in which a simplifier would use an *interpretative strategy*, which he calls *recreation* as a way of *treating facts and concepts to make them more accessable.* Let us see the examples Mountford used to substantiate his approach.

[Unsimplified]

> *The term photosynthesis literally means building up or assembly by light. As used*

commonly, photosynthesis is the process by which plants synthesize organic compounds from inorganic raw materials in the presence of sunlight... (p.153)

[Simplified]

The term photosynthesis means building up or making with light. We may define the way in which the term is commonly used as the process by which plants combine, or synthesize, organic compound, such as carbohydrates and sugar, from inorganic compounds such as carbon dioxide and water. The process takes place in the presence of sunlight ... (p.158)

This, as can be seen, seems to lean towards writing a linguistic translation. Mountford sets as the focus of his approach in this study *the shift of emphasis from analysis of text materials in terms of frequency counts of linguistic items, to the creation of appropriate discourse and the strategy required to accompany.* He says *simplification is a conscious act of language use, not the automatic result of employing a restricted code system* (1975:20). He has pedagogic interests in proposing his notion of simplification and takes the ultimate aim of simplified material for teaching comprehension to be *to develop a skill so that learners can cope with authentic unsimplified material* . However, Mountford (1975:183), contradicts himself by saying:

> *'... a simpler kind of discourse can be created (a) by explicitly signalling the illocutionary force of utterances and by selection of acts from within the same universe of discourse, (b) by reducing the complexity of information items in information systems and by regulating the complexity of linguistic encoding in terms of lexical selection and cohesion and syntactic structure and (c) by explicitly signalling the interactive relationships between propositions. '*

This is a stone's throw from the traditional approaches to simplification. He also fails to tell us the differences and or interrelations between authentic and unsim-

plified materials. Nonetheless, as one of the proponents of simplification, Mountford deserves the credit for having reviewed different traditional approaches to simplification (Palmer, 1933, West, 1950, Flood, 1957).

4.3.2 Making Unsimplified Texts More Accessible

There is some scope for improving simplification methodology, especially in the area of communicative structure. This will involve retelling or recommunicating the message rather than the present tendency towards writing a linguistic translation. Another possibility is the greater development of some currently used techniques for contextualizing unknown words, so that a student can more readily infer their meanings (Honeyfield, 1977).

Although some improved simplification techniques are feasible, it seems that whatever is done, simplification will always tend to obscure important features of unsimplified text, just by being different in significant ways. When a reader encounters the summary that a simplified text almost inevitably represents, the scope for and the need for the creative interpretation required by the original have been greatly reduced (Honeyfield, 1977). The following practical suggestions serve as an alternative approach.

If students are to tackle unsimplified material, they need to see how they can extract the desired information from a passage without understanding every word. Getting wanted information does not entail knowing every word. This is simply because the information carried by unknown words may not be needed for a particular purpose in hand or where it seems that unknown words carry significant information, it is always possible to resort to context or find out contextual cues. However, conventional comprehension exercises do not develop a conscious understanding of how one can guess an unknown item from its content. Cloze exercises have been suggested as a means of developing proficiency in utilizing context cues, yet cloze exercises of

the conventional type force students to focus on many redundant items (e.g. articles, prepositions) conveying little information.

Perhaps the Cloze exercises needed are mainly those containing content word deletions. Students can be helped to see how the information needed to fill a particular blank can be found in some portion of the text coming before or after the blank and the reasons why any given response is or is not acceptable. It is worth mentioning Honeyfield's (1977:438) four main types of such reasoning:

Syntactic: The blank is preceded by *the* - threfore the word is probably a noun.

Semantic: The word before the blank is *hairy* - therefore the missing item probably refers to part of a plant or animal.

Rhetorical: The preceding sentence contains *East* and suggests a relationship of contrast. The missing item may be *West.*

Factual: Example:
One fifth of the world's surface is ..... Here the amount is too small to be ocean and also too small to be simply land. The missing item could be *desert.*

There could be other useful types of exercises to develop guessing of unknown words, but I believe that Honeyfield's approach is practical and hence manageable in ESL classroom situations.

Reading should be for meaningful purposes. However, conventional comprehension exercises trivialize the purposive aspects of reading by requiring students to

seek or recall, numerous small items of information which merely represents narrow pedagogical preoccupations of a material writer. Such exercises are not based on any purposes an intelligent reader might actually have in reading a passage outside the classroom. For a reader who has a definite aim, an unsimplified passage is not necessarily difficult (Honeyfield, 1977). Unsimplified material differs in simplicity or complexity and in principle it should be possible to grade such material for students at different levels of English reading ability. Unfortunately it is not yet clear exactly how we should go about doing this. In the first language situation, readability formulae have been widely used, (cf. Gilliland, 1972), but it is not at all clear to what extent these formulae are applicable to the second or foreign language situation.

Traditional simplification involves limiting syntax and vocabulary through de-transformation and paraphrasing. These processes reduce information density, and also disrupt the normal system of information distribution, , since low-frequency items are not used. Further, the highly restricted syntax that is often used may be inadequate for a given information load, and so may reduce cohesion and readability. Also, in concentrating on syntax and vocabulary, simplifiers often lose sight of communicative structure - the way in which information is organized in texts for particular communicative purposes. All these factors may limit the effectiveness of simplified material in training learners to read unsimplified English. Some modifications to traditional simplification, such as paying more attention to communicative structure (content rather than language) and adopting a more intuitive, less rigid approach to syntax and vocabulary control is, among others, needed.

Textual difficulties in reading should not be viewed independent of the reader. For pedagogical relevance, Roe's (1978) notion of difficulty deserves a mention here.

Roe (1978) in his investigation of difficulty in the science texts, analyses the whole science discourse into two main systems, the contents or the message, or the

subject matter and the form or the carrier of the contents. He calls the former the *prototype* systems, and the latter the *realization* systems. The latter according to Roe, consists of four different models: Verbal, Mathematical (No.s, figures), Schematic (tables, diagrams) and Hybrid (which he defines as *'instances of realization in which features of more than one kind of realization are so interpersed that they are mutually interdependent)'* (Roe, 1978:54). He (p.147) says,

> *'The notion of difficulty in science texts, as distinct from the notion of difficulty of science, or difficulty which can be traced to idiosyncracies in the reader lies ultimately in the non-isomorphism of the set of systems which constitute science on the one hand and the set of realizations which constitute science text on the other. This non-isomorphism is ultimately determined by the nature of the realization systems which mediate between the two. '*

According to Roe's argument, the difficulty in reading science text is attributable to the fact that the *realization* systems are linearly organized and as such are at odds with the *proto-type* systems which are typically systemic. He asserts:

> *'... complex and sophisticated as words may be, they are nevertheless all members of a single class of physically perceivable objects. Language enables us to establish rich patterns of interrelationships between words in these linear strings, but the fact remains that acts of naming, rules of syntax and other source of written language cannot match prototype systems in terms of complexity, multi-dimensionality and variability. All of these factors must be reduced to the common denominator of words before they can be realized as text. And what is lost in the process may be recovered only with difficulty if at all. '* (ibid)

Such a line of argument would disregard the reader's role in the reading process. Whereas it is in the light of the reader's active involvement in a negotiatory interaction between himself and the writer (through the text) that a message is reconstructed. As such, the notion of difficulty in reading any type of text cannot be viewed without taking the reader and all the related factors into consideration.

Roe's characterization of the science text into two systems of the *message* and the *carrier* would imply that meaning or message is expected to be carried ready made by the text without any involvement on the part of the reader in its creation and negotiation. This is contrary to the *situated* nature of meaning.

What has not received adequate attention in Roe's characterization of the notion of difficulty is the reader. The difficulty of text is not an absolute matter, but it is relative to reader and to factors that affect reading. Simplification of text does not solve difficulty in reading, rather, it will tend to obscure important features of unsimplified texts.

To sum up, the shift of emphasis from the study of language as a system of forms/structures to functional aspects of language use in actual communication situations, has made our understanding of language more extensive. Language study is no more the sole property of linguists alone. A wide range of aspects inherent in language have been extended by philosophers and ethnomethodologists.

Meaning holds the central position in the communicative aspect of language teaching and in language in real contexts. This ever increasing interest in meaning led to a new and ever widening dimension in language study: discourse processing. This in turn, necessitated our understanding of reading from discourse points of view. Such a development on discourse entailed discussion on how to facilitate the reader-text interaction and what factors are involved in the better and effective accomplishment of such a process.

One of the factors that has been assumed over the years by text simplifiers is the notion of difficulty in texts. However, difficulty in reading should be viewed in terms of the specific textual factors in relation to the particular factors, such as background knowledge on the part of the reader involved, rather than being considered as inherent in a certain text type. This notion captures the flavour of schema theoretic account of reading comprehension which is discussed in the following Chapter.

CHAPTER FIVE

A SCHEMA THEORETIC VIEW OF READING COMPREHENSION

> *'...to completely analyze what we do when we read would almost be the acme of a psychologists' dream for it would be to describe very many of the most intricate workings of the human mind, as well as to unravel the tangled story of the most remarkable specific performance that civilization has learned in all its history. '*
>
> (Huey 1908/1968:8 as quoted in Anderson & Pearson, 1988)

5.0 Background

Recent theoretical research on human memory has been stimulated by the discovery of the concept of the *memory schema.* The notion of schema was first introduced by Head (1920), who claimed that anything that enters consciousness is charged with its relation to something that has gone before. A memory schema, as it is typically conceptualized today, is a cluster of knowledge (a set of concepts and associations among concepts) that defines a more complex and frequently encountered concept. The revival of interest in memory schemata as a theoretical construct is principally attributed to two lines of research (Thorndyke et.al ,1979).

The first line of research conducted in the domain of Artificial Intelligence research, has sought to define new data structures for encoding complex descriptions of the world. For example, *Frames* (Minsky, 1975, Winograd, 1975, Kuipers, 1975), *Scripts* (Schank & Abelson,1975,1977), *Scenarios* (Sanford & Garrod, 1981), *Plans* and *Prototypes, Event Chains* (Trabasso & Nicholas, Warren, 1979), *Interpretations* (Urquhart, 1987).

A second area in which schemata have received extensive treatment has been that of memory for connected dicourse. Bartlett's (1932) studies of prose memory led him to conclude that memory for a story consisted of a schema or plot framework and some associated details from the passage. Extending Bartlett's early ideas, several researchers have begun to use schemata to model the underlying memory structures that encode prose information (Rumelhart, 1975, Schank, 1975, Thorndyke, 1976, 1977, 1978, Kintsch, 1975, Van Dijk & Kintsch, 1977, Winograd, 1977, Dooling & Christiansen, 1977, Pichert & Anderson, 1977, Anderson, Spiro & Anderson, 1977, Anderson, Reynolds, Schallert & Goetz, 1976, Bobrow & Norman, 1975, Kuipers, 1975, Minsky, 1975, Rumelhart & Ortony, 1977, Schank & Abelson, 1977).

Among the central points shared by schema theorists are the following:

1. A schema represents a prototypical abstraction of the complex concept it represents. For example, a *FACE* schema might contain two eyes, a nose, a mouth and two ears, even though a particular face missing one or more of these features is still a face.

2. Schemata are induced from past experience with numerous exemplars of the complex concept it represents. Perhaps, we abstract the concept of a face after seeing many of them.

3. A schema can guide the organization of incoming information into clusters of knowledge that are *instantiations* of the schema. This represents a goal directed focusing of processing by active memory schemata. So when we catch a glimpse of a head, we consult our face schema and hence know what features to look for on it.

4. When one of the constituent concepts of a schema is missing in the input, its features can be inferred from *default values* in the schema. So if the face is in shadows and we can not see the mouth, we may still reasonably infer that it has

two lips.

What then is the relevance of schema theory into the reading comprehension process?

The fundamental assumption of schema theoretic view of reading comprehension is that we comprehend something only when we can relate the new experience to an existing knowledge structure. This basic notion of language comprehension is further elaborated under six headings, namely: The role of schemata in reading comprehension, Processing of information, Definition of schema as a theoretical construct, Schemata and inference, Discourse and inference, and Alinguistic ability and inference.

The section that follows gives a brief account of the role of schemata in reading followed by two sub-sections explaining how schema models are structured and how the reading process is analyzed.

5.1 The Role of Schemata in Language Comprehension

A fundamental assumption of the schema theoretic view of language comprehension is that the process of comprehending a text is an interactive one between the listener/reader's background knowledge of content and structure and the text itself. The text alone does not carry meaning, rather, a text only provides guidance for listeners/readers as to how they should construct the intended meaning from their own previously acquired knowledge (Carrell, 1983, Adams & Collins, 1979).

Above all, it is a common understanding that one's linguistic competence is one part of one's total background knowledge and hence comprehending words, sentences and discourse involves much more than just relying on one's linguistic competence (Adams & Collins, 1979, Carrell, 1983).

Minsky (1975) suggests that perception is a schema-based process occurring

over time which involves filling in details, collecting evidence, testing, deducing and interpreting on the basis of knowledge, expectations and goals. Minsky hypothesizes that this complex process can take place rapidly because the schemata which have not been filled with perceptual information are filled by default assignments based on stereotypic expectations derived from past experience. Kuipers (1975) hypothetical example of room perception illustrates default assignments: if a quick perceptual scan of a room indicates that there is a clock on the wall, hands may be assigned to the internal representation by default even though this particular clock does not have hands.

A number of schema theorists have focused directly on memory and have shown that memory performance is frequently influenced by schema based expectations Bartlett (1932) found that the subjects expectations and experiences distorted their recall of an unusual North American Indian Folktale. Spiro (1977) found that recall of passages can be influenced by expectations based on information presented after reading the passage. Piaget and Inhelder (1973) showed that memories can be modified by schema development occuring between learning and recall. Anderson and Pichert (1978) have shown that an activated schema can aid retrieval of information in a recall task. It appears (Brewer & Treyenes, 1981) that there are five different ways in which schemata might influence memory performance:

1. They can determine what objects are looked at and encoded into memory (Encoding)

2. They can act as framework for new information (Framework)

3. They can provide schema-based information which becomes integrated with episodic information (Integration)

4. They can guide the retrieval process (Retrieval)

5. They can determine what information is to be communicated as output (Communication)

5.1.1 A Schema Theoretic View of Reading

Reading may be described as the process of translating graphemic strings into spoken words. However, what is meant by reading is not the ability to decode the words but the ability to extract meaning, both explicit and implicit from the written text (see Chapter Two and Four). Therefore, it can be said at the highest level, one has successfully read a passage if one understands it both as it was intended by the author and in terms of its impact on oneself. This presumes, that one has extracted the information provided by the text, which in turn depends upon having comprehended the individual sentences, which depends upon having processed the clauses and phrases of those sentences, which depend upon having recognized the component words of those units, which depend upon having recognized their component letters. (Adams & Collins, 1979).

When reading is analyzed in this way, the component levels of processing appear to be organized hierarchically. The dependency could be in some sense unidirectional. The traditional analysis of reading for instructional programs focused on starting at the bottom, with single letter recognition and successfully work up through the higher level skills. The problem with this approach is that when one is reading a meaningful passage, one is not reading its component letters, words and sentences in the same way as when they are presented in isolation (Adams and Collins, 1979). Rather processing at each level is influenced by higher as well as lower order information. Thus, individual letters become more perceptible when they are embedded in words (Reicher, 1969, Wheeler, 1970). By the same token, individual words are recognized more easily when they are embedded in meaningful sentences (Tulving, 1963). Unfamiliar words may be processed more easily if they are embedded in a familiar story

(Wittrock, Marks & Doctorow, 1975). Sentences that are more coherent integrating the underlying semantic relations may be assimilated more easily than those that do not, irrespective of their syntactic complexity (Haviland & Clark, 1974, Pearson, 1974, 1975). So, *the wisdom of bottom up instructional strategies is challenged, and all empirical findings based on isolated process have to be nullified for they leave us without a good working model of the reading process* (Adams & Collins, 1979:2).

Many authorities on the field agree (Bobrow & Norman, 1975, Schank & Abelson, 1975, Adams & Collins, 1979, Rumelhart & Ortony, 1977, Rumelhart, 1980) that schema theory provides a structure powerful enough to support the interactions among different levels of processing in reading. A fundamental assumption of schema-theoretic approaches to language comprehension is that spoken or written text does not in itself carry meaning. Rather a text provides directions for listeners/readers as to how they should retrieve or construct the intended meaning from their own, previously acquired knowledge. The words of a text evoke in the reader associated concepts, their past interrelationships and their potential interrelationships. The goal of schema theory is to specify the interface between the reader and the text - to specify how the reader's knowledge interacts with and shapes the information on the page and to specify how that knowledge must be organized to support the interaction. This is elaborated in the next sub-section.

5.1.2 Structural Organization of Schema Theoretic Models

A schema theory is basically a theory about knowledge, it is a theory about how knowledge is represented and how that representation facilitates the use of knowledge in particular ways (Rumelhart, 1980). A schema is composed of a hierarchy of schemata embedded within a schemata. In other words, a schema is a network of subschemata each of which carries out its assigned task of evaluating its goodness of fit whenever activated (Rumelhart, 1980, Adams & Collins. 1979). The repre-

sentation at the top of the hierarchy is sufficiently general to capture the essential aspects of all members of the class (Schank & Abelson, 1977). For example, the schema for a *FACE* consists of a configuration of subschemata, each representing a different constituent of a face. Say, mouth, nose, ear, etc. These sub-schemata would in turn, consist of a configuration of sub-schemata, the process would never end. However, Rumelhart (1980) says that there must be a set of sub-schemata that are elementary in the sense that they do not consist of a further breakdown in terms of sub-schemata. Such elementary schemata correspond to what Norman & Rumelhart (1975) call *Primitives.*

Let us take some more examples, this time Schank and Abelson's (1975) example, *Going to a restaurant* : The top level representation would include such information as that a restaurant is a commercial establishment where people pay money to have some one else prepare their food and clean up after them. At the level beneath this global characterization are more specific Schemata, like going to dinner or going to a fast hamburger operation. Schemata multiply while the scope of each narrows. However, Adams & Collins (1979) confirm that the power of this structure derives from the fact that the top level representation of any schema simultaneously provides an abstraction and conceptual frame for all the particular events that fall within its domain.

Because the schema specifies the interrelationships between its underlying components, once any element is specified, it can be understood in the proper context. For example a *COUNTER* is mentioned within a restaurant schema, it can immediately be understood as a place at which food can be served and not anything else.

An important element or schema within a schema may be thought of as a slot (Minsky, 1975) that can accept any of the values that are congruent or compatible with the associated schemata. Hence the comprehension of a situation or story involves

the process of instantiation whereby elements are bound to appropriate slots in the relevant schema. However, a text, normally, may not explicitly provide the element to be bound to a particular slot. In such a case the reader may assign default values, as mentioned earlier. The point is that default assignment will be determined by the values associated with its slots. The exactness or precision of the default description depends on the specificity of the values. For instance, if one knew that, the restaurant in the story was an authentic Japanese restaurant, the default assignment might be that the customer sat on a cushion rather than a chair (Schank & Abelson, 1975). The following section deals with how these levels/processes of interpretation are carried out.

5.2 Processing of Information

Within the schema theory, the process of interpretation is guided by the principle that all data must be accounted for (Bobrow & Norman, 1975). Every input event must be mapped against some schema and all aspects of that schema must be compatible within the input information. This requirement results in two basic models of information processing or sometimes referred to as basic sources for activation for schemata. They are Bottom-up processing and Top-down processing, referred to as *data driven activation and conceptually driven activation* respectively (Norman & Bobrow, 1975).

Bottom-up processing is evoked by the incoming data. The features of the data enter the system through the best fitting, bottom-level schemata. As schemata converge into higher level schemata, they too are activated. In this way, the information is propagated upward through the hierarchy, through increasingly comprehensive levels of interpretation. Whereas Top-down processing works in the opposite direction. It occurs as the system searches for information to fit into partially satisfied, higher order schemata.

An important aspect of a schema theoretic account of reading comprehension is that top-down and bottom-up processing should be occuring at all levels of analysis simultaneously (Rumelhart, 1976). The data that are needed to instantiate or fill out the schemata become available through bottom-up processing, top-down processing facilitates their assimilation if they are anticipated or are consistent with the readers conceptual set. Bottom-up ensures that the reader will be sensitive to information that is novel or that does not fit an ongoing hypotheses regarding the content of the text, top-down processes help the reader to resolve ambiguities by gathering alternative possible interpretations of the incoming data.

A crucial idea for a schema theoretic account of reading comprehension is that it involves the coordinated activity of schemata at all levels of analysis. As schemata at the lower levels (e.g. visual features) are activated, they evoke schemata at the next higher level (e.g. letters), as these schemata are activated, they, in turn, trigger their own superordinate schemata (e.g. words). In this way, through bottom-up processing the input data are automatically propagated up the hierarchy toward more meaningful or comprehensive levels of representation. At the same time schemata at higher levels are emptying to fill their slots with elements from the levels beneath through top-down processing. Again, the theory is that, for the skilled reader both top-down and bottom-up processing are occurring simultaneously and at all levels of analysis as one proceeds through the text (Rumelhart, 1976).

A necessary assumption here is that schemata exist at all levels of abstraction (Abelson 1975, Rumelhart & Ortony, 1977). At the letter level the schematic descriptions may be relatively concrete and specific. For example the schema for *K* might consist of three sub-schemata.

> *' a vertical line on the left, an oblique extending upward from near the centre of the vertical line to a point to the right of and*

perpendicular with the top of the vertical line, a second oblique line extending down ward for somewhere along the bottom half of the first oblique line to a point directly beneath the top end of the first obligue line and perpendicualr to the bottom of the vertical line ' (Adams & Collins, 1979:7)

At the extreme, semantic descriptions may be very abstract and general. For example, consider Rumelhart & Ortony's (1977) tentative version of the problem-solving schema. In it there are three variables: a person P, an event E, and a goal G. The schema has a two step structure:

1. E causes P to want G

2. P tries to get G until P gets G or until P gives up.

Each of the elements like Cause, Want, and Try are themselves schemata, just as the letters in the schemata for words are themselves schemata. Rumelhart & Ortony's version of the try schema has two variables which are bound in the problem-solving schema: a person P, a goal G. The proposed steps are:

1. P decides on an action A, which could lead to G

2. While any precondition for A is not satisfied P tries toget A.

3. P does A.

On a very general schematic level, Winter (1976) suggested that there is a basic rhetorical routine underlying discouse structure which consists of two parts: Problem and Solution, together with a situation, which provides the setting for the problem, and an evaluation, which provides an assessment of the effects of the solution. He gives the following examples (as in Widdowson, 1983:58)

I was on a sentry duty. (Situation)

I saw the enemy approaching. (Problem)

I opened fire. (Solution)

I beat off the enemy attack. (Evaluation)

(cf. Winter, 1976, Hoey, 1979). The claim is not that all discourse conforms invariably to this schema but that this represents the normal or unmarked sequence which serves as a point of reference and a basis for anticipation (Widdowson, 1983:58).

The problem solving and trying schemata reflect what Newell and Simon (1963) have called *Means-ends analysis.* In *means-ends* analysis, whenever a goal cannot be obtained directly, an appropriate sub-goal is set up to attain the original goal. Newell & Simon (1963) argued that such problem solving provides many human motivations and actions. It follows that a full understanding of many stories by and about people depends on being able to interpret their events in terms of something like the problem solving and trying schemata that Rumelhart & Ortony (1977) have outlined.

In order to give a more detailed description of what is theoretically happening as one reads, it is easiest to consider different levels of processing: namely, letter and word processing, syntactic and semantic processing, and processing at the interpretive level. In each case, the basic argument in favour of a schema-theoretic explanation of these processes is that they cannot be explained in terms of bottom-up processing and that the top-down influences seem to be too automatic and too well structured to be attributed to simple guessing.

For clarification purposes, let us see the following text in terms of how a reader might arrive at an understanding of it. Taken from Adams & Collins (1979:9).

' A poor man came to a large house during a storm to beg for food.
He was sent away with angry words, but he went back and asked.
'May I, at least, dry my clothes by the fire, because I am wet from

the rain?' The maid thought this would not cost anything, so she let him come in. Inside he told the cook that if she would give him a pan and let him fill it with water, he would make some stone soup. This was new dish to the cook, so she agreed to let him make it. The man then got a stone from the road and put it in the pan. The cook gave him some salt, peas, mint and all the scraps of meat that she could spare to throw in. Thus the poor man made a wonderful soup out of practically nothing. '

The following analyses of this text illustrate how reading comprehension depends as much on the readers previously acquired knowledge as on the information provided by the text.

1. That the man came to the house because he was hungry, and the maid sent him away because she didn't want to give away her master's food.

2. That the poor man asked to dry himself by the fire because he thought the maid might let him in, and he wanted to get into the house so he could get some food.

3. That the maid let him in because she felt sorry for him and did not realize his request was a ploy to get food.

4. That the man suggested making stone soup because he thought the cook might be fooled into thinking that the stone could be used to make soup and, if so, she would throw in scraps of food as she normally does in making soup.

5. That the cook agreed because she thought the man knew about a novel dish, and she did not realize he had invented the dish as a ploy to get food.

6. That the cook did not realize that the man had contributed nothing to the soup.

7. That the reason the soup tasted good was because of the ingredients the cook added.

None of these motivations and causal connections is in the passage itself. There is a large amount of the reader's world knowledge that must be invoked in order to construct such an interpretation for the stone soup fable.

The process of comprehending the passage at the semantic level looks like the following.

The fact that the man is poor triggers the notion that he does not have much money or wealth. The large house he comes to, therefore, must not be his own house. Begging is one means of obtaining food and the fact that the man does not have money satisfies the pre-condition for begging. Because the reader tries to interpret action in terms of the problem-solving and trying schemata, s/he will bind the poor man to the person P in both schemata, and the begging of food to the action A in the trying schema that could lead to some goal G. Because no goal and no initiating event are specified in the story, the reader makes the default assumption that the man is hungry (event E) and his goal G is to eat. It is the need to satisfy these slots in the problem-solving schema that forces these assumptions. Obviously, they could be wrong, the man might be seeking food for his dog or wanting to rob the house, but the default values are assumed unless and until the reader is forced to revise them.

When the poor man is sent away with angry words the reader similarly makes a default assumption that a resident of the house sends the poor man away, not because the poor man offended the resident but in order to preserve property (i.e. food). When the poor man comes back for permission to dry his clothes, this does not fit the earlier goal of wanting to eat, so the reader assumes that the poor man's goal has changed to getting dry from the storm mentioned in the first sentence. The reference to the maid in the last sentence of the first paragraph binds her to the resident who sent the poor man away originally. To fill the slots in the problem-solving schema, the reader assumes that the maid's goal in letting the beggar come

in is to make him happy, out of a general kindness to the poor. This is reconciled with her earlier refusal of food, because the action taken in this case does not violate the means by which she can please her master.

Inside, the man apparently adapts another new goal of teaching the cook how to make the stone soup. The reader has no schema for making stone soup, it is new to the reader as well as the cook. But the reader, in order to understand the story, must have a schema as to how to make soup in general. One of the conditions for making soup is violated, namely, that the basic ingredients be edible or meat bones or scraps. This triggers the reader to look for another goal for the poor man's action. The fact that the cook put a lot of scraps into the soup means that she has supplied the base for the soup. This suggests that man's original goal of getting food might be his goal in making stone soup. There is nothing in the story that says he eats the soup, but the cook says the soup tastes good, which implies that it has been made. The default value, when people perform some task together, is that both share the fruits of labour, so that the reader should assume the poor man gets to eat the soup. Therefore, the reader can make sense of this episode in terms of the man's reaching his original goal of obtaining food.

Furthermore, the clever reader will see that the number of independent goals for the poor man can be reduced to one, if the man's request to dry himself by the fire is interpreted as a sub-goal to getting into the house, and getting into the house is, in turn, a sub-goal of getting food. This interpretation works because an alternative to begging for goods is conning someone for goods. The way the con operates here is that the man has the goal to get food, which the maid wants to prevent. By asking to dry himself by the fire the man takes an action which leads to getting food, but which the maid thought was directed to getting dry. She therefore, misinterpreted his action and was conned.

Thus, the reader can make sense of the actions and motivations in such a story through a variety of inferences and default assumptions. This involves the use of a wide variety of world knowledge from the schema for problem solving, to the schema for maids, to the schema for how to con somebody.

At the interpretive level, an understanding of the interrelationships between the character and events in a story typically requires a host of complex inferences. But the goal of the reader gets beyond that of following the story, in addition, the reader seeks to interpret or impose a structure on the passage as a whole. Say, as in the stone soup story, the convergence of a more specific lesson or moral within the theme might be something like: *Where there is a will, there is a way.*

The power of Schema theoretic model of reading lies in its capacity to support these interactions through a single, stratified knowledge structure and a few basic processing mechanisms (Adams & Collins, 1979).

We will now look at a different passage which leads to the conclusion that the knowledge embedded in schemata forms the framework for our theories and the configuration of these schemata forms the basis for our understanding.

> *' Business has been slow since the oil crisis., Nobody seemed to want anything really elegant any more. Suddenly, the door opened and a well dressed man entered the show room floor. John put on his friendliest and most sincere expression and walked toward the man. '* (Rumelhart, 1980:43)

People do not arrive at automatic interpretations of this text all at once. As the sentences are read, schemata are activated, evaluated and refined or discarded.

For instance, the first sentence is usually interpreted to mean that business is slow because of the oil crisis, therefore the story is about a business that is suffering

as a result of oil crisis. Frequent hypothesis involve either the selling of cars or of gasoline or hypotheses about economy in general. The second sentence, about people not wanting elegant things anymore, leaves people with the gas-station hypothesis. *Elegant* just does not fit with gas station hypothesis. Therefore, the gas station hypothesis is weakened, but not always rejected.

On the other hand, people with an hypothesis about the general economy or about cars have no trouble incorporating this sentence into their emerging interpretation. In the former case, they conclude that people do not buy luxury items and in the latter they assume that people do not buy large, elegant cars. The third sentence clinches the car interpretation for nearly all readers. The *showroom floor* clearly invalidates the gas station interpretation and strongly implicates automobiles, which are often sold from a show room. Moreover, the occurrence of a specific event does not fit at all well with the view that the passage is a general discussion of the state of the economy. Finally, with the introduction of John, we have an ideal candidate for the *Seller*.

The process of comprehension is very much like the process of constructing a theory, testing it against the data currently available and as more data become available, the theory will be specified further and default values are refined.

But where do these theories come from? The theories are schemata. Through experience we have built up a vast repertoire of such schemata. For example we have schemata for salesmen, the kinds of motives they have, and the kinds of techniques they employ. We have schemata for automobiles, including for the oil crisis, what kinds of effects it has on what kinds of businesses.

The knowledge embedded in these schemata form the framework for our theories. It is some configuration of these schemata that ultimately forms the basis for our understanding (Rumelhart 1980).

Lastly, a reader fails to correctly understand a passage for reasons implicit in schema theory as to why this might occur. It could be that :

(1) The reader may not have the appropriate schemata. In this case it would be difficult to understand the concept being communicated.

or (2) The reader may have the appropriate schemata but the clues provided by the author may be insufficient to suggest them. Here the reader will not understand the text without appropriate additional values.

or (3) The reader may find a consistent interpretation of the text but may not find the one intended by the author. Here, the reader may understand the text but may misunderstand the author.

Studies along this line were carried out by Bransford and Johnson (1973). They studied the comprehension of texts for which subjects could not provide the appropriate schemata, texts in which the schemata were potentially available but there were not sufficient clues to suggest the correct ones. The results indicate that comprehension does not simply follow from knowledge of the language (see 6.1.3). As Rumelhart (1980:48) says,

> *'The bottom-up information is inadequate to indicate the comprehension process appropriately but once the appropriate schemata are suggested, most people have no trouble in understanding the text. '*

This assertion is further explained in view of the basic assumptions of schema theory in the following section and sub-sections.

5.3 Schemata Defined

Schema as a cognitive device is powerful enough to account for the human comprehension of objects, ideas, actions, events and sequences of events and actions in

everyday life. It is an abstract to which individuals bind their experience with real life experiences, situations, events, roles etc. A schema can be said to be a data structure with slots that accommodate new incoming experiences. A schema cannot be thought of as a concept, rather, it is a whole range of phenomenon.

Further, Kant (1787), Head (1920), and Woodworth (1938) considered experiential background as the common element of schema. The focal theme these authors derived as being central to the meaning of schema is that *anything that enters consciousness is related to something that has gone before.*

More recent researchers (Bobrow & Norman, 1975, Chafe, 1976, Fillmore, 1975, Minnsky, 1975, Rumelhart, 1975, 1977, Schank & Abelson, Winograd, 1975) define schema as *the building blocks of cognition.* They contend that schemata are the fundamental elements upon which all information processing depends. Schemata are employed in the process of interpreting sensory data, (both linguistic and non-linguistic), in retrieving information from memory, in organizing actions, in allocating resources and generally in guiding the flow of processing in the system.

In addition to its previously understood attributes, a schema theory embodies a prototype theory of meaning, i.e. a schema underlying a concept stored in memory corresponds to the meaning of that particular concept. Meanings are encoded in terms of the typical or normal situations or events which instantiate the concept.

Rumelhart's (1978) analogy for schemata are plays. His view of internal structure of a schema corresponds to the script of a play. The characters, in play, which can be played by different actors at different times without changing the essential nature of the play are analogous to the variables of a schema. These variables can be associated with different aspects of the environment on different instantiations of the schema. As indicated earlier, the author uses the schema for a concept *Buy.* Such a play at the very minimum would have at least two people, some merchandise and some medium

of exchange. At the outset of a play one character would be the *Purchaser*, who would have some medium of exchange called the money. The second person is the *Seller* who would possess the object in question or rather the *Merchandise*. Then by an interaction called *Bargaining*, a bargain would be struck and the seller then agrees to give the merchandise to the purchaser in exchange for a quantity of the money.

Rumelhart maintains that this would be the generic schema of the play script which can be modified by varying the ways of playing the play *Buy*. i.e., the merchandise would vary, the seller and the purchaser would vary in status, occupation, sex, nationality, age etc., the money would vary in amount and whether it was actually money or otherwise and finally the bargaining itself would also vary in form. Still, the author claims, though all these variations, as long as the fundamental plot remained the same, it would be said that the *Buy* play was being performed.

This example of the buy play, in Rumelhart's belief, essentially corresponds to the associated knowledge about the variables of a schema.

This knowledge about the typical values of the variables and their interrelationships is called *variable constraints*. These constraints serve two functions in schema theory.

1. They keep in identifying the various aspects of a situation with the variables of the schema. For example, using the *Buy* play construction in observing the case of *Buying*, the purchaser is not likely to be observed as the object which would serve as money because we know that the purchaser is normally an animated object.

2. Variable constraints serve as default values or initial *guesses* (Minsky, 1975) if a transaction of *Buying* takes place but one does not see the money, it is then inferred that there was money and that the money probably was money that amounted to the value of the merchandise. With the default values, then,

the schema helps an individual make inferences about unobserved aspects of a situation.

Another view of the schema theory is that of Thorndyke & Yekovich (1979). These authors define a schema as a cluster of knowledge that describes the typical properties of the concept it represents. This cluster comprises a set of concepts and associations that describe the properties of the concept in question. Schema represent the underlying knowledge of complex and disparate concepts such as objects, percepts, events, sequences of events and social situations.

As an example they offer the concept of a *birthday party.* People's thoughts of a birthday party, they claim, generally include a person whose birthday it is, other party-goers, presents, cake, ice-cream, decorations, party favours and events (e.g. games) that relate them all. This is the authors' view as the general *birthday party* knowledge that may be presented by a BIRTHDAY schema. This schema details the concepts and events that occur within this large event. Thus, a schema provides a parsimonious description of the stereotypical case of the complex concept it represents.

Rumellhart & Ortony (1977) define schema as an abstract representation of a generalized concept or situation. A representation involving schemata would merely have pointers to subschemata. For instance, in the authors' *Stroll* schema, the phenomenon merely points to the *Walk* schema. A schema represents generic knowledge. That is, it represents what is believed to be generally true of a class of things, events or situations.

In the work of Palmer (1975), a face schema includes slots for a mouth, nose, eyes, and ears. Encoding a particular object is conceived to be a matter of filling the slots in the schema with the features of the object. Part of the schematic knowledge is the specification of the constraints on what normally can fill the slots. Palmer's research states that an object will be recognized as a face only if it has features that

qualify as eyes, mouth, a nose etc. To be sure, the constraints on the slots in a *Face* schema are flexible enough so that we can permit some variations such as a sketchy drawing in a comic strip or the exaggerated portrayal in a political cartoon, or even the stylized and transformed representation in a three-dimensional painting. Nonetheless, the author states that there are limits beyond which an object is no longer a face. Because it indicates the typical relations among its components, a schema is a knowledge structure. A face schema will represent the relative spatial positioning of the eyes and nose. Another attribute of schemata within its structural significance is that it exists at various levels of abstraction and embed one within another (Rumelhart & Ortony, 1977). Schemata, according to Bartlett (1932) are *cumulative, holistic, assimilative blends of information* .

Schemata, our organizational structure, are defined by Piaget (1952) as *the process of assimilation and accomodation as one adapts to an environment and develops cognitively* . When such an integration is not possible, a temporary loss of equlibrium occurs and one must either modify an existing schema to incorporate the new knowledge or create a new schema that will be consistent with the new knowledge.

Because the concept of schemata, as organizers of human experience is so general, the preceding definitions of schemata differ from each other in some details. Even in the early schemata research (Kant, 1781, Head, 1920, Woodworth, 1938, Bartlett, 1932) each investigator proposed a model which differed from the others in precisely what a schema was, how it was structured or how it was used.

Recent research (Adams & Collins, 1979, Rumelhart, 1975, 1977, Rumelhart & Ortony, 1977, Anderson, 1977) has synthesized a composite description of schemata. In spite of differing orientations, several common assumptions underlie the different formulations of schema theory. These commonalities include five attributed properties of schemata: Concept Abstraction, Hierarchical Organization, Instantiation,

Prediction and Induction which will be discussed in the sections to follow.

5.3.1 Concept Abstraction

A schema represents a prototypical abstraction of the concept it represents. In some models (Rumelhart, 1975, 1977, Mandler & Johnson, 1977, Thorndyke, 1977, Stein & Glenn, 1978) this particular structure is represented by a *grammar* that specified both the concepts within the schema and the rules for combining them. For example, the plot sequence for story grammar of a brief story may normally involve :

i. The introduction of the main character and the problem to be solved.

ii. One or more episodes directed at solving the problem.

iii. An event or sequences of events to resolve the problem by the protagonist.

iv. An attempt to achieve a goal

v. Outcome of the attempt.

These descriptions of typical organizations constitute what the authors agree to be schemata for a story structure. That is, these schemata describe the syntax of narrative stories.

In other models (Rumelhart & Ortony, 1977, Schank & Abelson, 1977) the structure is represented as a network or script of related properties or event sequences. The constituent properties may consist of perceptual features, semantic primitives, states or events in the world, or other schemata. For example,

> *'A script is a structure that describes an appropriate sequence of events in a particular context. It is made up of slots and requirements about what can fill those slots. The structure is an interconnected whole and what is in one slot affects what can be in the other. Scripts usually handle everyday type situations. A script*

is a predetermined, stereotyped sequence of actions that define a well known situation. '

According to the researchers scripts are extremely numerous. For instance, we have a *restaurant* script, a *birthday* script, a *football* script, a *class* room script and so on. Each script has players who assume roles in the action. A script takes the point of view of one of these players and it often changes when it is viewed from another players point of view.

To know when a script is appropriate, script headings are necessary. These headings define the circumstances under which a script is called to play. For example, the headings for the restaurant script would be concepts having to do with hunger or restaurants, and so on in the context of a plan of action of getting fed.

Scripts organize new input in terms of previously stored knowledge. In the example of the restaurant script given previously, many items that are part of the restaurant script are added by the reader. The story does not need to say that a waitress took the customer's order or that the customer ate the hamburger. These elements are part of the story because the restaurant script requires them. Therefore, in understanding a story that calls up a certain script, the script becomes part of the story even when it is not spelled out.

5.3.2 Hierarchical Organization

Schemata are organized into a generalization hierarchy in memory. The hierarchy relates concepts of different degrees of specificity. For example, the schema for a birthday party specifies and elaborates a more general *Party* schema. Both have many of the same properties, however, the properties of the birthday party are more precisely determined than for the generic party. As an example, a party can be thought of as having *food* as one of its properties, while a birthday party would specify *cake and ice-cream* as the typical foods. Changing the level in the generalization

hierarchy changes the constraints on the constituent properties.

5.3.3 Instantiation

The properties that characterize a schema are represented as variables or slots that can be filled whenever the schema is used to organize incoming information. The process of matching input to slots in the schema is called *instantiation* of the schema. The process of instantiation allows the organization and encoding of incoming information into familiar, coherent, conceptual representation. Again, *The Birthday Party* schema will be used to illustrate the point.

Suppose one is told: *John's birthday party was a success. He appreciated both the angel cake and the new sweater.* Using prior knowledge of a *birthday party* schema it can be assumed that the cake was John's birthday cake and that the sweater was his present.

5.3.4 Prediction

In the previous example it was illustrated that schemata allow for reasoning from incomplete information. This reasoning takes the form of expectation about information we expect to obtain to fill the slots in the currently active schema. Predictions of this nature help to guide the interpretation of incoming information and support inferential processes that match input to expectations. This was the case in deciding or inferring that the *sweater* was a birthday present. That is default values are supplied by the general schema when explicit information is not included in a story. (see 5.3.3)

5.3.5 Induction

Schemata are formed by induction from previous experiences with different examples of the generic concept. It is presumed that schemata develop through a process of successive refinement. As one accumulates additional experiences with a

concept, the expectations for the expected properties of slot fillers, and of the concept become more clearly defined. Considering how a *birthday party* schema develops over the years, it leaves one to consider the aspect of repeated attendance at birthday parties. This in turn serves to develop and modify the knowledge of party formats and tradition. These properties of schemata and the examples provided are the general descriptions of the structure of schemata provided by Thorndyke and Yekovich (1979).

The development of schemata-based theories is in its infancy. However, the various definitions have tried to show how many domains exist to which the concept of a schema can be applied.

One of the key processes in a schema theoretic account of cognitive processing is inferencing. Therefore, the following sections emphasize the importance of inferencing in reading comprehension.

5.4 Schemata and Inference

The use of inference during reading has received much attention in the literature on reading research. Some theorists and researchers have begun to define inference in such a way as to make it synonymous with reading comprehension (Flood, 1981). Theorists assert that the study of inference provides an excellent method for examining the processes in comprehension. Both comprehension and inference occur in the mind of the reader, both are acts of human cognition and both require an interaction of text and reader knowledge. Flood (1981) stated that by focusing upon inference as a reflection of comprehension, researchers can examine variables as text elements, existing schemata, and other interaction. From this it is understood that inference is critical to comprehension and can be equal to it in some contexts. Collins, Brown, and Larkin (1980) presented two views of inference. The view usually found in the literature concerning cognitive psychology and artificial intelligence is that inferences

fill missing gaps between text structure by recourse to context and knowledge about the world. Anderson & Shiffrin (1980) explain that inferences embellish or elaborate the text. The alternative view is that inferences synthesize an underlying model which refines, organizes and auguments the surface structure of the text. Thorndyke (1976) in his work on inference, stated that a major function of inference in comprehension was to provide an integrating content for interpreting information and establishing coherence and continuity.

A number of theoretical and empirical statements in the literature suggest that inference is an important characteristic of reading comprehension (Singer, 1978, Olson, 1972, Duffy 1981, Flood, 1981, Goetz & Armburster, 1980, Sanford & Garrod, 1981).

Kintsch & Miller (1984) declare that some inferences can be simply derived from active knowledge structure so that they have little affect on readability. Other types of inference require searching for and activating new knowledge structures. The resources expended in this type of processing undoubtedly affect the text's readability (Goetz & Armbuster, 1980). This has implications as depth of processing theory is expanded to include inference. Thus, if a reader were processing at deep meaningful level he would be more likely to engage in inferential processes because they are vital components of comprehension. Consistent with this is Just & Carpenter's work (1980) concerned with eye fixations. They found readers make longer pauses where processing loads were the greatest. These places included where readers encountered infrequent words, new information and inferential material.

Successes in inferencing information during reading appears to be important in differentiating good and poor readers. Carrell et.al. (1983) believed poor comprehenders can recognize both explicit and implicit materials, but they are less able to use these than good comprehenders. In this research, the poor reading comprehen-

ders not only recalled fewer ideas from the text, they also added more unacceptable thematic intrusions to the material recalled.

In training to increase inferential ability, Carr, Dewitz & Patberg (1983) found inferential training helped poor readers more than good readers. Their conclusion was that this difference occurred because the good readers already had and used these inferencing skills.

There has been considerable research on the importance of existing schemata, use of context and the ability to draw inferences in reading comprehension. A few studies have attempted to investigate how these processes interact in children. Research by Pearson, Hanson & Gordon (1979) explored the role of background knowledge in relation to comprehension of textually explicit and implicit material. Their results indicated prior knowledge was significant. It was specially important in making inferences.

One of the key processes in a schema-theoretic account of cognitive processing is inferencing. As Anderson and Pearson (1984:269) put it:

> *'...We will demonstrate that inferences can occur either at the time of initial coding of text information into memory or at the time the information is retrieved from memory. The reason for devoting a special section to inferences is to acknowledge their centrality to the overall process of comprehension '*

Four kinds of inferences can be identified in reading comprehension. They are termed schema selection, slots instantiation, assignment of default values and deficit of knowledge, which are discussed below.

5.4.1 Schema Selection

Inferences may be involved in the process of deciding what schema among many

should be called into play in order to comprehend a text. One paradigm of studies designed to investigate schema selection inferences involves presenting students with an ambiguous text to permit two or more interpretations and later asking them to recall it. Then, on the basis of theme-revealing intrusions into subjects recall protocols, one can infer the schema that a given reader selected to provide the best account of the data in the text.

The paradigm is illustrated in a study by Anderson, Reynolds, Schallert & Goetz (1977) who presented college students with two texts. One text permitted the interpretation of a prisoner planning his escape from a cell or that of a wrestler trying to get out of his opponent's hold. The second permitted the interpretation of four people getting together to play cards or that of a quartet about to begin their weekly music practice. Physical education majors and music majors tended to select the specialized schema (wrestling or quartet) for only that passage consistent with their experience, selecting the more common schema (prisoner or cards) for the other passage. The study suggested the following conclusions:

i. Schema selection is often based upon inference.

ii. The schema one selects influences the amount and nature of recall.

iii. Once a schema has been selected, even by inference, it will drive other inferences.

5.4.2 Slots Instantiation

This kind of inference is involved in the process of instantiating slots within a selected schema. A reader typically makes inferences when deciding that a particular character or item mentioned in a story is intended to fill a particular slot. Evidence for this kind of inference comes from a slightly different research paradigm. Subjects are given a passage written in language so general and vague that it is difficult to remember by itself. This refers to the passage (see 6.1.3) worked out by Bransford

and Johnson (1973).

Some subjects are given the title, *Washing Clothes* before they read the passage, some after, others not at all. Passage recall is enhanced only for the condition in which subjects are given the title before reading. Without a title which allows subjects to invoke a schema, a reader cannot decide what to do with the information in the text. Once a reader is able to activate the *Washing Clothes* schema, however, even the vague terms in the text can be matched with the appropriate slots (eg. *Somewhere else* = Laundrette). Hence memory for the text is improved. Anderson (1984:271) says,

> *'The broader point to be made is that even normal texts, with no intentional ambiguity, are rarely completely clear about what text items ought to instantiate which slots within the schema that has been selected, usually the reader has to decide '*

5.4.3 Assigning Default Values

The third type of inference is when a reader fills a particular slot in a schema by assigning default values in the absence of any specifically substantiating information in the text.

Writers rely on the fact that there is a considerable amount of knowledge that they share with their audience. When it can be assumed that their audience will be able to infer accurately what shared knowledge has been omitted, writers will usually omit it (Clark & Haviland, 1977, Grice, 1975). It is this process of filling slots by default that most people think of when they are told that an inference has been made. Pearson, Hanson & Gordon (1979) found that differences in prior knowledge of the topic accounted for large differences in children's ability to answer inferential questions. Nicholson & Imlach (1981) have reported even more convincing evidence for the influence of knowledge on slot filling inferences. They found that when children

were given texts about familiar topics that they often resorted to prior knowledge to answer inference questions, even when the text provided explicit information that could have been used.

5.4.4 Deficit of Knowledge

The fourth kind of inference in comprehension involves drawing a conclusion based upon lack of knowledge. This has a logic, *If x were true, I would know it were true. Since I do not know x to be true, it is probably false.* Lack of knowledge inferences come into the picture when an interrogator (teacher or experimenter) imposes a task upon the reader demanding such reasoning.

So far, we have seen uses and kinds of inference we routinely make while reading. However, inferences become more complicated at discourse level since discourse takes various forms, structures and styles. The following section takes up this discussion.

5.5 Inference and Discourse

Comprehension can refer both to the process whereby the component sentences are understood and to the way in which the message itself is understood. The former is the domain of psycholinguists discovering the processes whereby a person comes to interpret isolated sentences in the language. Many linguists would assume that the sentence is the largest clearly definable entity in a language (Lyons, 1968) and therefore, forms a natural unit of analysis. Sentences can be grammatical or ungrammatical, and meaningful or meaningless, depending upon whether they are constructed in accordance with the appropriate linguistic rules. A proper aspect of the study of psycholinguistics is therefore the way in which knowledge of grammar is applied to sentences in order to parse them into an appropriate representation (Sanford & Garrod, 1981). Therefore, the sentence is easily defined and hence a seemingly tractable and relatively simple entity to work with. On the other hand, full discourse is not. Discourse can take many forms, different structures, different styles and so

on. Needless to say, discourse is obviously made up of sentences.

One way of tackling comprehension is thus to suppose that a discourse consists of sentences and that the meaning of discourse is a sum of the meanings of all the sentences making it up. And hence the message to be conveyed goes far beyond the individual sentences which make up a text. At this stage, inference plays a very crucial role in comprehension proper.

Let us see the example of Sanford & Garrod (1981:5):

(1) *Jill came bouncing down the stairs*

(1') *Harry rushed off to get the doctor.*

This is naturally interpreted by most readers that Jill injured herself and Harry called a doctor. What would the interpretation be like in the following sentences?

(1) *Jill came bouncing down the stairs*

(1') *Harry rushed over to kiss her.*

This suggests that the message in a text is dependent on the reader bringing in additional knowledge to come up with a coherent interpretation of the whole passage instead of being tied to the literal content of the sentences.

Thus in reading sentences (1) and (1') above, it is not arguable that the reader is drawing a variety of inferences such as: *falling* and *hurting* and then *consulting doctors.* Therefore one way of characterizing this additional component of text meaning is in terms of the inferences which the skilled reader must make in order to connect the meanings of the various sentences in a sensible way (Sanford & Garrod, 1981).

Textual inferences fall into four basic categories according to Trabasso, et.al. (1980, 1981), namely, lexical inference, inference of space and time, extrapolative inference and evaluative inference as illustrated below.

5.5.1 Lexical Inference

This type of inference is needed to solve problems of lexical ambiguity or nominal reference. See the following examples.

(2) *Mary had worked in the hospital for years.*

(3) *The woman was truly outstanding in the theatre.*

Here, the reader will have to infer that the *theatre* is used in the usual sense of operating theatre. If one reads (3) in isolation, the interpretation would be most likely that the woman would be taken as an actress. The other form of inference which is termed *anaphoric* is related to the interpretation of the *woman* as referring to *Mary.*

5.5.2 Inference of Space and Time

Here, in order to understand a narrative text the reader should be able to understand the events and episodes described in some sort of spatio-temporal framework. For instance :

(4) *Thomas went to the theater on Wednesday .*

(5) *He bumped into an old friend of his.*

Here, sentence (4) serves as a setting for sentence (5) to be interpreted by readers who will automatically infer that the event described occured on Wednesday and in the theatre.

5.5.3 Extrapolative Inference

In examples (1) and (1') it has been pointed out *Jill bouncing down the stairs and Harry calling the doctor.* Readers here, are bound to extrapolate based on the two events in order to make a link between them. *Jill bounced down the stairs. She hurt herself. Harry went out to call a doctor.*

5.5.4 Evaluative Inference

This inference comes into the picture when the value or significance of an event depends upon the text in which it is presented and it is up to the readers to understand what the text is all about. The following examples will help to illustrate this type of inference.

(6) *Harry could only find one pound in his wallet.*

Here, in the context of an expensive meal in a restaurant, it would have an entirely different significance from the same sentence in the context of buying a packet of cigarettes. Therefore, the significance of the event described depends upon our knowledge of what will happen in a certain context.

However, it would be foolish to assume that the process underlying one type of inference could be described adequately without reference to the others (Sanford & Garrod, 1981). To this effect, see the following sentences borrowed from Schank (1975).

(7) *John wanted to go to Hawaii.*

(7') *He called his travel agent.*

(7") *He said they took cheques.*

How can one interpret *he* in (7")? Of course, a lexical inference is called for. Under most circumstances *he* is taken as reference to John, but in this case (7") it refers to the travel agent. Nonetheless, in order to come to the right conclusion, the reader will have had to draw an extrapolative inference to the effect that it is the travel agent who requires payment and it is he who determines whether or not a cheque was acceptable. Thus, what started as lexical inference ends up requiring an extrapolative one. The process of inference goes further than this. Comprehension depends upon one's cognitive alinguistic ability and this is explained in the following

section.

5.6 Inference and Alinguistic Ability

Rather than simply describing a text as a linguistic object, it therefore seems more appropriate to describe it as a series of instructions which tell the reader how to utilize the knowledge he already has, and contingently modify this knowledge in the light of the literal content of the discourse itself. The problem of text comprehension then becomes more than one of the interpretation of isolated sentences (Sanford & Garrod, 1981). Along the same line, Bransford & McCarrell (1974) characterize linguistic knowledge as knowledge of abstract cues or directions for creating meaning and linguistic comprehension as the grasping of relations. Bransford, et.al. (1974:200) say,

> *'Comprehension involves cognitive contributions on the part of the comprehender, and depends upon his/her cognitive alinguistic ability to activate knowledge that will allow relations to be grasped '*

The researchers point out that the meaning ascribed by subjects does not always coincide with that which a sentence may be said to express directly (i.e. its semantic description), but that, in fact, it often includes more information than that specified in the semantic description of a sentence. They give evidence from a number of studies to illustrate the kinds of assumptions that subjects are likely to make on the basis of their abstract knowledge of relations, such as: inferring spatial relations, inferring instruments used to carry out acts, inferring consequences of input events, and creating situations that justify the relations between two events. Each relation is discussed as follows:

5.6.1 Inference of Spatial Relations

> *'If understanding involves relating input information to general knowledge, the semantic product resulting from this process should often include more information than that directly expressed in the input '* (Bransford & Johnson, 1973:384)

Bransford & Johnson (1972) examined subjects' memory for sentences like the following.

(8) *Three turtles rested BESIDE a floating log and a fish swam beneath them .*

(9) *Three turtles rested ON a floating log and a fish swam beneath them.*

They hypothesized that the subjects' knowledge of spatial relations would make them more prone to infer that the fish swam beneath the log as well as beneath the turtles in the case of sentences like (9), (since the turtles were on the log) than in the case of sentences like (8). A recognition task confirmed that in fact subjects hearing sentences like (9) were more likely to think that they had heard novel sentences expressing the probable inference, for instance,

(9') *Three turtles rested on a floating log and a fish swam beneath it*

than subjects hearing sentences like (8') were likely to think that they heard its novel counterpart,

(8') *Three turtles rested beside a floating log and a fish swam beneath it.*

Sentence (8') is neither consonant with the actual input sentences nor with their understanding of the situation.

Bransford et.al. reported a similar finding with regard to understanding spatial relationships among objects.

(10) *There is a tree with a box inside it, and a chair is on top of the box. The box is*

to the right of the tree. The tree is green and extremely tall. (Bransford et.al., 1973:386).

Subjects were expected to know that: *The chair is to the right of the tree* or *The tree is to the left of the chair*, although this information was not there. In a recognition task, subjects were more likely to choose a sentence like *The tree is to the left of the chair* than they were to choose a sentence *The chair is to the left of the tree*, since it violated the overall set of the relationships.

5.6.2 Inference of Instruments

Johnson, Bransford & Solomon (1973) showed that subjects also make assumptions about objects never mentioned in the sentences they hear, but which denote the instruments used to perform the actions that those sentences refer to. The subjects in this study were read a series of short descriptions designed to suggest particular inferences about instruments used to carry out actions. For example:

(11) *John was trying to fix the bird house. He was POUNDING the nail when his father came out to watch him and to help him do the work.*

Subjects in a control group heard stories in which the verb implied either no instrument or different one from that implied by the original story, as in:

(12) *John was trying to fix the bird house. He was LOOKING for the nail when his father came out to watch him and to help him do the work.*

Then both groups heard an identical sentence designed to test their memory for the hypothetical inference, in this case,

(13) *John was using the HAMMER to fix the bird house when his father came out to watch him and to help him do the work.*

As expected, the subjects in the experimental group proved to be more likely

to think they had actually heard this sentence before than were the subjects in the control group.

5.6.3 Inference of Consequences

Johnson et.al. (1973), investigated false recognition memory for inferences subjects make about perceived consequence of events. An experimental group heard stories like the following:

(14) *The river was narrow. A beaver hit the log that a turtle was sitting on (beside) and the log flipped over from the shock. The turtle was surprised by the event.*

This invites the inference that as a consequence of the log's flipping over, the turtle would get knocked over into the water.

A control group heard a similar story except that the turtle was beside the log rather than on it. In a recognition task, the two groups heard an identical sentence, like,

(15) *A beaver hit the log that knocked the turtle into the water.*

As a result, subjects hearing the experimental version of the story were more likely to think they had heard the critical recognition items than subjects hearing the control version.

5.6.4 Creation of Justification

Bransford & McCarrell (1974) used a recognition paradigm to investigate a class of items where the relations between two events have to be justified. Example:

(16) *The floor was dirty because Sally used the mop.*

Since *because* is a condition that explains or justifies the relation between the two phrases, it can be assumed that the mop was dirty.

One is also bound to create an elaborate situation when confronted with the following sentences.

(17) *John missed the bus BECAUSE he knew he would have to walk to school.*

(17') *John missed the bus SO he knew he would have to walk to school .*

(18) *Bill is able to come to the party tonight BECAUSE his car broke down .*

In sentences 17 and 17'the relationship between the two phrases can be justified in the *BECAUSE* version if one assumes that John wanted to walk to school. On the other hand, this assumption does not seem to play any part in understanding the *SO* version of the sentence.

In sentence (18) a process of fabricating a situation should be created in order for it to make sense. Most people would come up with something like the following: *Bill was originally going to leave town, but now he couldn't leave because his car broke down. Since he could not leave, he could come to the party, since the party was in town.*

Thus, these studies illustrate the kinds of cognitive contributions subjects make to comprehension and indicate that these assumptions based on the subjects knowledge of the world are a constitutive part of what is comprehended, as well as of what is subsequently recalled.

Bransford & McCarrell (1974:204) conclude from the results of these studies that

> *'... information directly expressed by sentences cannot always be equated with the information available to the comprehender. Comprehenders do not simply store the information underlying sentences, but instead use linguistic inputs in conjunction with other information to update their general knowledge of the world '*

The researchers point out that this is not only true of sentences but of sets of sentences as well. It is the assumption, like the ones illustrated above that allow subjects to intergrate information from different sentences into a coherent whole. Subjects hearing semantically connected sentences have been shown to integrate the information in them and to form holistic, semantic ideas which include more information than any of the sentences originally heard (Bransford & Franks, 1971).

In line with the view that linguistic knowledge precludes *knowledge of meaning* the latter understood as meaning sufficient to achieve comprehension, a constructivist approach as opposed to interpretive approach sustains the view that language only provides abstract cues for that reader to build up interpretations out of his/her own knowledge. Unless the reader can build up a context in which a sentence can be interpreted, the sentences are seen as having no meaning at all (Weimer, 1974). Palermo (1978) emphasizes that the meaning is not considered to be in the sentence but in the people who hear it. Linguistic input is a cue used to recreate information that the listener already has of the world (Palermo, 1978). Comprehension is achieved only when the comprehender has sufficient alinguistic information to use the cues in the linguistic input in order to create an interpretation. Thus it is possible that:

> *'one may have knowledge of the language and yet fail to understand utterances unless one is able to activate appropriate alinguistic knowledge. '* (Bransford & McCarrell, 1974:204)

In short, both comprehension and inference are acts of human cognition and both require an interaction of text and reader knowledge. *Knowledge* entails knowledge of relations rather than of isolated entities and comprehension involves the grasping of relations. Readers make cognitive contributions during comprehension and the resulting interpretations cannot in any meaningful sense, be said to be committed to the text alone. Hence, readers are likely to make considerable efforts to comprehend

by creating situations in which relations can be grasped.

In summary, a schema theory is basically about knowledge, how knowledge is represented and how that representation facilitates the use of knowledge in particular ways. The revival of interest in memory schemata as a theoretical construct is attributed to two lines of research, namely, artificial intelligence and the study of memory for connected discourse.

Central to schemata theory of reading are: We comprehend something when we can relate the new to the known and the process of comprehension is an interaction between the reader's background knowledge and the text.

An important aspect of a schema theoretic account of reading comprehension is that the two modes of information processing (bottom-up and top-down) occur at all levels of interpretation simultaneously. The power of schema theoretic model of reading lies in its capacity to accommodate interactions through a single, stratified knowledge structure based on these processing mechanisms.

The results of various studies on schema theory show that comprehension does not follow from knowledge of language alone. If appropriate schemata are activated, there will be no trouble in understanding a text.

One of the key processes in schema theoretic account of cognitive processing is inferencing. When the message to be conveyed in discourse goes far beyond the individual sentences which make up a text, inference plays a significant role in comprehending the text. Research findings suggest that inferential training helps poor readers.

In this chapter, attempt has been made to pinpoint the importance of schemata-theory in the reading comprehension process in general and its structural organization in particular.

The following chapter, entitled *Applied Schemata*, cites some of the schemata theoretic studies done in relation to ESL/EFL reading comprehension. The discussion is compartmentalized into Lingustic-bound and Culture-bound schemata studies.

CHAPTER SIX

APPLIED SCHEMATA

6.0 Introduction

The large body of literature related to the organization of memory and how prior knowledge relates to comprehension and recall has substantially increased our urderstanding of the reading process. (see Chapter One)

Research on reading comprehension has shown that the ability to understand text is based not only on the reader's linguistic knowledge but also on one's general knowledge of the world.

The more the reader is able to access background knowledge about either the content area of the text (Bransford & Johnson, 1972, 1973, 1974, Anderson, et.al., 1977) or the rhetorical structure of a text (Kintsch, 1977, Rumelhart, 1975, Kintsch & Van Dijk, 1975, Thorndyke, 1977, Mandler & Johnson, Mandler, 1978), the better s/he will be able to comprehend, to store in long term memory and to recall the text.

Other research in the general field of reading (Bruce, 1980,1981, Rubin, 1980, Samuels, 1982, Meyer, 1981), cognition (Rumelhart, 1980) and artificial intelligence (Chase & Simon, 1973), have indicated that prior knowledge is vital to comprehension, recall and performance.

Since the mid 1970s schema theory research has provided evidence that background knowledge is an important factor in reading comprehension. As stated in the preceding chapter, schemata are previously established patterns existing in the minds of the reader which s/he uses to create meaning from text. That is, during the reading process selected *new* information from the text is related to *old* information

acquired from the reader's previous world knowledge (Kintsch and Van Dijk, 1978).

If one does not have the relevant background information, it may be difficult to detect the structural organization of the passage and utilize the context to aid comprehension. Pearson (1984) stated that the more information a person knows, the greater the likelihood that s/he will comprehend and remember– contact with existing knowledge determines how easily the material will be understood and remembered.

Although, we are becoming increasingly aware of the role of the reader's background knowledge, much less research has been done to investigate the role of prior knowledge in second language comprehension. (see 1.1)

The purpose of this Chapter is two fold. The first is to show how relevant schemata affect meaning and understanding at word, sentence and discourse level. The second is to present a few schemata studies undertaken by researchers in the area of L2 reading comprehension.

Thus, the Chapter has two sections: Relevant Schemata and Schemata Studies.

The presence of relevant schemata act as spring board towards understanding a given text. This assertion is demonstrated with several examples in the section to follow.

6.1 Relevant Schemata

With the advent of schema theory, it has become common knowledge that one's linguistic competence represents only one part of one's total background knowledge and hence comprehending words, sentences, and discourse involves much more than just relying on one's linguistic competence.

Kolers (1973) and Lipson (1983), confirmed that the skilled reader operates on logical relations in the text, even to the point of ignoring actual text material. That is, words are remembered preferentially in regard to their meaning. Prior knowledge

facilitates this effect because the reader with well elaborated schemata can more easily fit the material to the schema.

However, each word, each well-formed sentence and every satisfactory text passage has a meaning. The meaning of a communication depends in a fundamental way on a person's knowledge of the world and one's analysis of the context as well as the characteristic of the message. By meaning including sense, reference, truth value, illocutionary force, perlocutionary effect and significance. The scope of context ranges from local linguistic constraints to the physical and social milieu of an utterance (Anderson et.al. 1977).

On the other hand, a failure to comprehend a non-defective communication can, in principle, be traced to a language-specific deficit. It is, therefore, equally possible that difficulties in comprehension can be traced to failures such as the lack of skill-words in the reader's vocabulary, the misapplication of a rule of grammar or the improper coordination of anaphoric references etc. World and linguistic knowledge are, thus, interdependent. That is, one cannot be seen in isolation from the other.

The following sub-sections briefly illustrate the interaction of linguistic and world knowledge at word, sentence and discourse level.

6.1.1 At Word Level

The meaning of individual words in a sentence clearly depend upon the interaction of world knowledge and context. For instance, consider the sense of the word KICKED and the reference of the word BALL. (From Anderson & Ortony, 1977).

(i) The baby kicked the ball

(ii) The punter kicked the ball

(iii) The golfer kicked the ball

Obviously the ball is different in each of the case. The act of kicking also changes

like the uncoordinated or even accidental kick of the infant, the powerful kick of the punter and the angry golfer. We routinely make lots of inferences.

6.1.2 At Sentence Level

Carr, Dewitz and Patberg (1983) stated that new information is filtered through the framework of prior knowledge. Therefore, readers use their background knowledge to determine the number and type of inferences needed to comprehend. Unless there are existing schemata in memory the reader may not use the cues in the sentence to activate and modify his/her general knowledge structure. An example of a sentence that would be hard to comprehend and remember is: (iv) The house turned to water because the fire got too hot.
(Bransford & Johnson, 1973:422)

This sentence is grammatically correct, yet it conflicts with general knowledge of the subject. However, the knowledge that the house is an *igloo* has been found to increase comprehension and recall.

Again, the significance of the whole sentence is context-sensitive as illustrated in an example based on Austin (1962).

(vi) The bull is in the field.

Let us see this sentence against the following background.

(a) One is driving

(b) One is sitting in the field

(c) One has brought a cow to be inseminated

(d) One is simply visualizing

For instance, in (b) the statement may signify that one is in danger and had better run, whereas in (d) it does not matter whether there is a bull or not.

From this it becomes evident that, as stated earlier, that the comprehension of words, sentences, and discourse (see 6.1.3) could not be simply a matter of applying linguistic knowledge. Every act of comprehension involves one's knowledge of the world as well. Several experimenters show that extra linguistic knowledge is incorporated into the mental representations for sentences (cf.Anderson, & Ortony, 1975, Bransfield et.al. 1972).

6.1.3 At Discourse Level

The effect of knowledge on the meaning of text has been demonstrated by a growing volume of research. Bransford and Johnson (1973) have stated that if contact with prior knowlege is minimal, the text will be difficult to understand. Their studies (Bransford and Johnson, 1972, 1973) on prose comprehension and recall have become classics in reading research literature. In their experiment, they showed that relevant contextual knowledge was a pre-requisite for prose comprehension. Bransford and Johnson (1972) studied a group of texts which were written so as to be incomprehensible unless a title or a picture was presented. The title or picture helped relate the passage to information that could easily clarify the meaning of the text. In replicating this experiment, Bransford & Johnson (1973) presented the text as with or without pictures and with or without titles to determine if prior knowledge and the content in which it occurred affected understanding. To the readers, these passages appeared sensible and easy to recall when presented with a title to connect them to prior knowledge. Bransford and Johnson (1973) interpreted their result as verification that meaning is not in the text alone. If understanding involved relating context to general knowledge, the product will often include more information than was originally expressed.

It would be relevant to consider just one paragraph used in one of Bransford and Johnson's (1974:400) studies, where they studied the comprehension of texts for which

subjects could not provide the appropriate schemata, texts in which the schemata were potentially available but there were not sufficient clues to suggest the correct ones as well as texts in which subjects were led to choose a wrong interpretation.

> *' The procedure is actually simple. First you arrange things into different groups. Of course, one pile may be sufficient depending on how much there is to do. If you have to go somewhere else due to lack of facilities, that is the next step, otherwise you are pretty well set. It is important not to over do things. That is, it is better to do few things at once than too many. In the short run this may not seem important but complications can easily arise. A mistake can be expensive as well. At first the whole procedure will seem complicated. Soon, however, it will become just another facet of life. It is difficult to foresee any end to the necessity for this task in the immediate future, but then one can never tell. After the procedure is completed, one arranges the materials into different groups again. Then they can be put into their appropriate places. Eventually, they will be used once more and the whole cycle will then have to be repeated. However, that is part of life '*

One group of subjects heard the passage without being told what it was about (*No Topic Condition*) while a second group was told right after hearing it that the topic was *Washing Clothes* (*Topic After Condition*), and a third was told about the topic before hearing the passage (*Topic Before Condition.*) Comprehension and recall scores were very poor for the first group but improved for the second, and were still better in the case of the third.

These results indicate that comprehension does not simply follow from knowledge of the language. Rumelhart, (1980) claims that the bottom-up information is

inadequate to indicate the comprehension process appropriately but once the appropriate schemata are suggested, most people have no trouble in understanding the text.

The following section cites some of the findings of schemata theoretic studies in relation to ESL/EFL reading comprehension.

6.2 Schemata-Theoretic Studies

Schemata-theoretic studies are categorized into two areas. linguistic and the culture-bound studies. Some of the research findings based on the two areas of schemata theoretic studies are presented in the following sections.

The next section cites some of the linguistic-bound studies with regard to ESL/EFL schemata theoretic account of reading comprehension.

6.2.1 Linguistic-bound Studies

In second language studies, most research on prior knowledge and reading tend to be associated with linguistic knowledge of the target language and with transfer effects from the native language (see Coady, 1979, Yorio, 1971, Hatch,et.al., 1974, Cziko, 1978, 1980, Clarke, 1979, 1980).However, a number of researchers began to consider background knowledge into reading comprehension in ESL/EFL.

One of the major background knowledge studies in the area of L2 reading comprehension is that of Hudson. In a study with adults, Hudson (1982) examined whether the effects of pre-reading activities would compensate for the effects of lack of language ability in reading comprehension. He also explored whether these activities were equally effective across levels of second language ability. Ninety-three adult students of beginning intermediate and advanced levels were submitted to three reading treatments. One treatment involved discussing a set of visual aids based on the topic of the passage before reading it. In another treatment, vocabulary words from

the passage were discussed and defined before reading. In the last, the participants first read a passage for 15 minutes followed by a 10 minutes comprehension test. At the end of this time, the same passage was given for a second reading followed by the same comprehension test. The results of the study showed the facilitative effects on comprehension of induced content schemata through visual aids, especially at the beginning and intermediate levels as compared to other treatments. It seems that induced schemata facilitate access to comprehension, thus indicating that language competence is only one determinant of reading comprehension. *The fact that it can be overridden indicates that it is not a fixed or static proficiency, but it is relative proficiency* (Hudson, 1982:20). The study also showed that readers of different language proficiencies handled induced schemata differently. (see Chapter One)

In a project with Iranian students, Johnson (1981) studied the interactive effects of language complexity and cultural origin of a text on the participants' reading comprehension in English. The participants obtained better scores in the comprehension of the Iranian-based text because they seemed to rely on their familiarity with the characters and plot. No difference in scores was found between readers who had the syntactically adapted (simple) or unadapted (complex) passage based on English folklore. The researcher used two reading strategies: *Reader-based* strategies (activated by background schemata for familiar themes) and *Text-based* strategies (strategies resorted to for linguistic analysis because of lack of familiar schemata). The findings suggest that schemata and linguistic factors are two separate entities in their own right. However, it is doubtful, to assume that the background knowledge can be compensated by linguistic capacity. Previous research have shown that the case is the other way round. (see Hudson, 1982). Unless otherwise supported by further research this finding runs counter to the interdependence theory of background knowledge and linguistic competence.

Further, other research has shown that children are better able to process un-

familiar words if they are presented in a familiar story (Wittrocks, Marks and torow, 1975). In a subsequent study, Doctorow et.al (1978) examined the ef of paragraph headings on instruction sentences about passages. This connectir knowledge and text approximately doubled comprehension and recall in their ex iments. As Kintsch and Miller (1984) have aptly summarized, the ability to a pre-exisiting knowledge about the content of a text clearly increases readability comprehension. This is specially true for implied information (Pearson, Hanso Gordon, 1979).

Instead of providing readers with a title or perspective for an ambiguous pass Reynolds, Schallert & Goetz (1977) selected participants with particular experier background. Thirty physical education, and thirty music education college stud read two passages, each of which could be interpreted in two distincts ways. content of one passage could be interpreted either as a prison break or as a wrest match, the content of the other could be viwed either as a card playing sessior as a musical ensemble rehearsal. After reading each passage, participants comple both a free recall test and a multiple choice test consisting of ten questions. F choices were provided for each of the questions. Two of these choices were corr i.e. there was one correct answer consistent with each of the two text interpretatic The physical education students interpreted the first passage as a wrestling ma significantly more than the music education students. Similarly, the music edu tion students interpreted the second passage as a musical rehearsal significantly m than the physical education students. Most readers reported that during reading t interpreted each passage in only one way and did not consider alternative interp tations. The researchers concluded that schemata based on background knowle experience clearly influence readers' interpretation of textual information. Schem do, not only provide the context or *interpretive framework* necessary for compreh sion, but also cause readers to use this framework to interpret passage informatio

a particular way by excluding the possibility of other interpretations.

Some researchers extended background knowledge based on discipline-specific studies. Alderson & Urquhart (1988) in an experimental study, designed in support of ESP proficiency tests, asserted that students from a particular discipline would perform better on tests based on texts from their own subject discipline than would students from other disciplines. Alderson & Urquhart's findings suggest that students appear to be advantaged by taking a test on a text in a familiar content area.

Specifically focusing on three components of background knowledge, Carrell (1983) investigated their individual interactive effects on reading comprehension of both native and non-native adult students. One component was refered to as *Context* which involved including a title and a picture preceding a passage to be read. Another component *Transparency* was related to the presence of specific, concrete lexical items within text as opposed to abstact, general terms - *Opaqueness.* The last component, *Familiarity*, refered to a reader's prior knowledge of the content of the text. Each participant in the study read two passages, one familiar and another unfamiliar within one of the experimental conditions: *Context and Transparency, No Context and Opaqueness.* The findings of the study showed that all three components of background knowledge were utilized by the native speakers and not by the ESL readers.

The study suggested that the ESL participants tended to be linguistically bound to the text and did not make the necessary connections between the text and appropriate background information. This finding of Carrell (1983), needs to be re-examined. But as it stands now, it is open to doubt (see 1.1.4)

Even though, findings in ESL/EFL studies are not definitive in indicating the relationship between background information and Knowledge of the language, the studies mentioned above are thought to have a direct bearing on L2 reading compre-

hension.

Equally important in ESL/EFL reading comprehension is the significant role that cultural contexts play in text processing. This is discussed in the section to come.

6.2.2 Culture-bound Studies

Research has addressed the issue of cultural schemata to reading comprehension in three ways: first, it used textual materials within the the subject's cultural background to measure its effect on comprehension. Second, it used different structural forms (e.g. Folktales, Fairytales, Letters etc.)to measure comprehension. Lastly, it included linguistic forms (a form of language play) which showed that cultural schemata can influence textual interpretation.

Of particular interest is the study made by Steffensen, Joag-dev and Anderson (1979). They studied two groups of subjects from different cultural backgrounds, Asian Indians and Americans. Subjects were asked to read two letters with similar organizations. One described an Indian wedding and another an American wedding. Results indicated that subjects read the native passages more rapidly, recalled a greater amount of information from the native passage (as measured in idea units), produced more culturally appropriate elaborations of the native passage and produced more culturally biased distortions of the foreign passage. One section in the American passage which generated cultural differences described the bride's attire: *Did you know that Pam was going to wear her grandmother's wedding dress? That gave her something that was old and borrowed too.* This section appeared in the written recall of one Indian subject as : *She was looking alright execept the dress was too old and out of fashion.* In India the groom's family give the bride's family gifts which are in fact a dowry. This was misunderstood by American subjects who changed *the agreement about the gifts to be given*— to *the exchange of gifts*, erroneously implying

gifts flowing in two directions. Another American misidentified the dowry as the favours customarily given by the bride and groom to their attendants at an American wedding. Results indicated that both groups read the letter relevant to their own cultural background faster and recalled more of the culturally familiar text. It was concluded that the implicit background knowledge underlying a text profoundly influenced how well the text was understood and recalled.

This study by Steffensen et.al. (1979) offers the support for the hypothesis that prior knowledge in terms of familiarity with the cultural components of the text influences how the text is interpreted. However, it should be noted that the study was not specifically designed to examine aspects of second language reading.

The recognition of the importance of cultural background in reading comprehension dates as far back as the 1930s.

In his classic book *Remembering*, Barlett (1932), argued that cultural background affected comprehension. His prediction was supported in his study, He hypothesized that an individual who reads a story that presupposed the schemata of a foreign culture would comprehend it quite differently from a native. In his study he had Englishmen read and recall a North American Indian Folktale (War of the Ghosts). During recall Bartlett found that subjects modified, distorted or *conventionalized* parts of the text for which they did not have adequate background knowledge in favour of their own culturally-determined schemata.

It is worth noting that *'through membership in a culture, an individual has privileged information which is represented in a rich system of schemata'* (Steffensen & Colker, 1982:21). Further, Adams and Bruce (1982) on the same issue maintained that background knowledge has a pervasive effect on the ability of an individual to comprehend, remember and recall text. When there are differences in the cultural backgrounds of the author and of the reader of a text, problems can arise because

schemata are instantiated inappropriately by the reader.

A similar finding was reported by Steffensen and Colker (1982). In their study Australian Aboriginal women and American women heard two stories. The text described illness and medical treatment, one from a Western perspective and one from an Aboriginal perspective. Subjects were asked to recall each passage. The recalls were then parsed into idea units. Subjects remembered significantly more of the gist of the story related to their own culture and elaborated on it by supplying default values not included in the text. For instance, the American text stated only that the mother had taken her son to a doctor, but six American subjects recalled that she had first telephoned to make an appointment. Subjects tended not to remember much of the foreign story and what they did recall was often distorted. An example of distorted recall relates to mention in the Aboriginal story of a ritual in which tribesmen provided blood for the sick person by cutting their arms with a razor blade. The patients had then to drink the blood. Several Americans remembered this ritual as giving the patient a transfusion.

Furthermore, cultural influence on reading was examined by Johnson (1982) in a study with Seventy-two advanced students of ESL. She provided students with a reading passage about *Halloween.* One section of the passage dealt with information that was assumed to be familiar to the subjects, since they had participated in a city-wide *Halloween* celebrations two weeks earlier. Specifically it dealt with costumes and masks, trick-or-treat, the witch as a symbol of and a contrast between *Halloween* today and in the past. The other section of the passage dealt with information believed to be unfamiliar– the celebration of Halloween in the historical past and different degrees of witchcraft at that time. Subjects when asked to produce a written recall of the passage, remembered significantly more sentences, recalled significantly more relational and lexical propositions and made significantly more inferences compatible with the text for the familiar section.

Mandler, Scribner, Cole & De Frost (1980) carried out a cross cultural study that illuminates even more the cultural distinctions that seem to influence comprehension. These researchers presented five stories to Vai speaking subjects in Liberia. One of the five stories was a Vai Folktale, the other four were foreign. Each of the foreign tales was translated into Vai. Changes were made using selected culture-bound terms so that there would be consistency with Vai traditions, for example *dragons* became *water people, Princesses* became *chief's daughters.* Among the findings of this study there appeared to be few cultural differences in the recall of the five stories. The investigators concluded that the cultural content of a story was less important than its form in determining how much was remembered. However, how the boundary between content and form was drawn remains obscure.

Clearly, there is a vast body of literature on schemata theory vis-a-vis reading comprehension. The few examples cited in this chapter are those that have a direct bearing on ESL reading comprehension but certainly not comprehensive enough to warrant generalizations regarding ESL reading in its entirety.

However, these previous studies, though scant, show that ESL/EFL readers understand, read and recall better texts that deal with their own familiar culture than they do with texts that deal with a less familiar or unfamiliar culture.

In summary, linguistic competence and background knowledge are inseparable entities. That is, meaning in communication depends in a fundamental way on a person's knowledge of the world, but failure to comprehend a non-defective communication may be attributed to language specific-deficit.

Relevant schemata exist hierarchically at letter, word, sentence and discourse level. Cross-cultural studies offer a rich source of information on how readers comprehend text in relation to their background of cultural experience.

The present study emphasizes a prior knowledge approach to ESL/EFL reading

based on two culture-specific texts. The following Chapter on Methodology highlights the three cardinal approaches I employed in order to assess ESL/EFL reading comprehension, namely: Textual Organization, Comprehension Question Types and Prior Knowledge Test Constructions.

CHAPTER SEVEN

METHODOLOGY

7.0. The Study

As indicated in Chapter One, the purpose of the present study is to examine the role that schemata play in the reading comprehension of both native and non-native speakers of English. The study attempts to measure individual as well as group performances on reading comprehension of a familiar and unfamiliar culture-specific text. Specifically, the study examined the effects of three types of question-answer relations, namely, Textually explicit, Textually implicit and Schematically/Scriptally implicit, in order to determine:

(a) whether background knowledge facilitates the reading comprehension of non-native speakers of English. In addition, the study attempts to find out whether there is a relationship between prior knowledge in terms of cultural schemata and reading comprehension.

(b) whether there is a significant difference in comprehension test performance due to question type (Textually explicit, Textually implicit and Schematically implicit) as well as passage type (PE01 [passage for Ethiopians], PB02 [passage for British]). Furthermore, the study examines whether one question type is more (or less) significant in determining reading comprehension differences between native and non-native speakers of English in particular and comprehension *per se* in general.

(c) whether higher level of cognitive processing and skilled reading are manifested only by linguistic ability or prior knowledge or a combination of the two.

In this study a total of two hundred and fifty four postgraduate students participated, of whom one hundred were British, ninety four Ethiopians and sixty *Other Nations.* They were classified on the basis of sex, level of education and fields of study. They were male and postgraduates doing higher degrees in the Social Sciences at British Universities. They were drawn from Universities in London, Durham, Glasgow and Strathclyde.

The following table shows the breakdown of subjects into pilot studies (category I & II) and the main study (category III & IV)

Table 7.1 No. of Subjects in the Study

Category	Ethiopians	British	Other
I	20	20	-
II	20	20	-
III	54	60	-
IV	-	-	60

Although the present study is binary, the inclusion of the confirmatory group, henceforth referred to as *Other Nations* was deemed necessary in order to confirm/reaffirm or reject some of the conclusions, findings and insights gained from the binary study. These *Other Nations* were drawn from various countries, as many as sixteen where English is either a foreign or a second language (see table 7.2)

Table 7.2 Other Nations

Nationality	Algerians	Chinese	Jordanians	Iranian	Japanese
no. of subjects	2	8	1	3	1
Nationality	Kuwaiti	Lebanese	Malay	Moroccan	Namibian
no. of subjects	1	1	2	1	1
Nationality	Pakistani	Saudi	Somali	Sudanese	Syrian
no. of subjects	1	1	1	3	1
Nationality	Taiwanese				
no of subjects	2				

N = 30

During the process of selecting the ESL readers for the purpose of this investigation, the results the subjects obtained in the *English Language Testing Service (ELTS)* developed by the British Council and the University of Cambridge Local Examination Syndicate were considered as evidence of their English language proficiency. *ELTS* operates in most of the British Council's representations and regional offices all over the world. Its purpose is to find out if one's ability in English will meet the demands of a course of study or training in Britain or anywhere else where the teaching is in English. However, whether *ELT* devices measure one's language ability in absolute terms is open to doubt. (see Alderson & Urquhart, 1988, Alderson & Clapham, 1989).

The methods employed and the materials used to carry out the present investigation constitute the present Chapter. This Chapter has two main parts. The first deals with the preparation of the two culture-specific texts, comparability of the texts, comprehension test construction and pilot studies. The second part consists of other areas such as administration of the main study tests, which include theories of prior knowledge assessment, scoring techniques, description of items and standard item analysis.

The justifications for using culture-specific tests for reading comprehension and the main sources of the texts used for the present study are discussed in the next section.

7.1 Materials

One of the major reasons for this cross-cultural study is to determine empirically whether a knowledge of a given culturally familiar topic influences reading comprehension. This study investigates the effects on ESL readers as well as native speakers' reading comprehension of information associated with familiar and unfamiliar aspects of the two given customs.

The idea of using culture-specific passages for reading comprehension drew heavily on research findings by different reading specialists. According to them, reading materials that illustrate cultural behaviour are often of general interest to learners reading in English as a second language (Johnson, 1981, 1982, Anderson, 1984, Steffensen *et.al.* 1979, Hudson, 1982, Kintsch and Greene, 1978, Stevens, 1980, 1982, Rivers and Temperley, 1978, Carrell and Eisterhold, 1988). The effects of the language complexity and the culturally determined background of a text on reading comprehension have always been recognized as elements of concern in the selection of reading materials for foreign language learners and in the evaluation of their reading comprehension (Johnson, 1981).

Therefore, the investigator in the present study, seeking to determine specifically whether a knowledge of the language had a greater effect on reading comprehension than the cultural origin of the text, prepared two explicit and non fictional culture-specific passages on the topic of funeral and mourning customs of Ethiopians and British. While one passage was familiar to one group, the other was culturally unfamiliar to the other and vice versa. (see section 8.2.1 and table 8.3)

The main sources for the two culture-specific passages, namely, Passage for

Ethiopians and Passage for British, henceforth referred to as PE01 and PB02 respectively, are as follows.

For PE01, the investigator employed his own experiential background knowledge coupled with his personal judgement about the topic based on relevant materials obtained from London School of Oriental and African Studies (SOAS).

For PB02, Durham Cathedral and St. Nicholas church authorities (whose names appear in Appendix C1) were approached to authenticate the passage. Based on the suggestions put forth by the three church officials, some changes and amendments were made. Distortions and fuzzy descriptions were avoided and relevant and important ideas included. The next task was to evaluate the comparability of the two passages. The way it was carried out is explained in the section to follow.

7.2 Comparability of the Two Passages

In order to make the two passages relatively comparable, notions like simplification, difficulty, idea density, sentence length, idea units, syntactic and semantic complexity, readability and textual organization were taken into account bearing in mind that each of these notions has its own strengths and weaknesses.

However, it is important to note that any reading and comprehension oriented analysis of the communication process through the written text should see reading as an on-going cumulative process of interaction between the reader and the writer through the text and should be concerned with the characterization of the effect of different textual elements on this process.

Such an outlook on reading entails a discussion on how to facilitate the reader-text interaction and what factors textual or otherwise are involved in the better and more effective accomplishment of such a process. (see Chapter Four)

Although the task is complicated on the one hand and becomes relative on the

other, several measuring units were employed to make the two passages (PE01 and PB02) comparable as far as possible.

For a start, familiarity with each of the passages was determined by the investigator's judgement based on the knowledge of what is culturally familiar and what is culturally unfamiliar to each of the two groups involved in the study.

However, it was found necessary to select three native speakers of English as judges (raters or validators) who were working in the general field of linguistics and education at the University of Durham (whose names appear in Appendix C1) to see whether the two passages were comparable and thereby validate them. To this end, the judges were assigned by the investigator to do the following tasks in the sequence mentioned below.

1. To evaluate the familiarity and unfamiliarity of the two passages to the two culturally differing groups.

2. To see the passage in the light of:

   (a) the overall pattern of textual organization;

   (b) the rhetorical ordering of the passages;

   (c) any potentially difficult or ill-formed construction at clause and phrase level in simple, compound and complex sentences;

   (d) the overall readability [acceptability] of the passages;

   (e) any syntactic and semantic complexities.

3. To eliminate all unimportant ideas/concepts or words from both passages. All suggestions of the judges, particularly regarding the structural organization of the passages were taken into account. Therefore, the passages were rewritten on the basis of the comments and suggestions made by the judges. On the final

draft, they were given two additional tasks. They were:

4. To select as many concepts/words or phrases as possible which they strongly agree that they were indispensable (crucial) to the understanding of each passage. From a total of forty three words/concepts/phrases selected by the judges, the investigator finally chose twenty four words/concepts/phrases, i.e. twelve from PE01 and twelve from PB02, for a Prior Knowledge test which was administered before the execution of the main study. The justification for administering prior knowledge test and the results obtained by the two culturally differing groups are discussed. (see sections 7.7.1, 7.7.1.1, 7.7.1.2, 8.2.1 and table 8.3)

5. To parse the passages into idea units was the final and most important task of the judges.

Following Johnson (1973) and Brown & Simley (1977), the three raters were asked to parse the two passages into idea units or acceptable pausal units and then rate the importance of each unit in relation to the general (central) theme of each passage. The next minor task of the judges was to eliminate all idea units which they considered to be least important (irrelevant, non-essential or trivial) to the make up of the passage. The remaining idea units were taken as final. The systems of parsing the passages into idea units were similar to that of Urquhart (1984). Tables 7.3 & 7.4 show the number of idea units per passage per judge and average number of idea units per two judges.

Table 7.3 No. of Idea Units Per Passage Per Judge

Judge	PE01	PB02
1	109	104
2	103	99
3	108	101

Table 7.4 Average No. of Idea Units Per Two Judges

Passage	Judges 1/2	Judges 2/3	Judges 1/3
PE01	106	106	109
PB02	102	100	103

For the moment, all other factors remaining constant, one can safely conclude by just looking at tables 7.3 and 7.4 that the total number of idea units worked out by each judge for each passage are largely the same. It is also important to mention that the number of words and sentences used in the passages was more or less the same.

Based on these two culture-specific texts, fifty-four multiple-type of questions were set for reading comprehension. A brief over-view of objective tests is given below.

7.3 Objective tests

While we must acknowledge the shortcomings of tests, we must also overcome their deficiencies. Tests serve a variety of important functions in education. Despite their shortcomings, they are the best means we have for detecting characteristics in a reasonably objective fashion. They help us gain the kind of infomation about learners that we need to help students to learn.

Since teachers are concerned with shaping human behaviour, they must constantly make observations. They then evaluate the behaviour they are observing in terms of a set of criteria or standards in order to make the observation as reasonably precise as possible. Precision in observation refers to the accuracy with which we are able to capture a particular quality or component of the behaviour before us. (cf. Harrison, 1983, Hudson, 1973, Heaton, 1975).

To measure objectively, we need a measuring instrument that records behaviour from a neutral vantage point so that we can apply our own standards and values in evaluating it. Therefore, to find out what we want to know, we are aided by the test or measuring device. In education we test in order to improve instruction. Testing provides data about outcomes that can serve at least three important functions: (a) to determine readiness at the beginning of instruction; (b) to inform students about the quality of their performance and progress; and (c) to help teachers make instructional decisions by determining its effectiveness in order to facilitate learning. The latter is the purpose of the present study. Thus, measurement in education is a controlled and somewhat objective procedure by which the performance of which a person is capable may be sampled and evaluated against standards. It is this procedure that makes possible the availability of data for students feedback, the diagnosis of learning disabilities, of past failures, of present weaknesses, the detection of mastery, of competence, of the acquisition and possession of values, knowledge, creativity, the discovery of values, attitudes and interests etc. (cf. Oller, 1979, Mehrens, 1976, Valette, 1967, Hudson, 1973, Tuckman, 1975, Heaton, 1975, Harrison, 1983, Alderson, 1987)

However, the success of any measuring venture by teachers depends on how well the test is constructed and how reasonably it is interpreted.

> *'A Test, poor or good has positive or negative effect on teaching and learning and whether that effect or influence is benign, positive or negative, depends crucially on the nature and use of the test. '*
>
> (Alderson, 1986:104)

Further, Hughes (1986) maintains that the construction of language tests or testing systems can be seen as essentially a matter of problem-solving. The basic problem is to construct the test or testing system which is most appropriate for a particular purpose, in particular circumstances, bearing in mind the resources available.

In order to test/measure the reading comprehension of native and non-native speakers of English used in the present study, objective tests were designed. The term objective, as defined by Hudson (1973) refers to those tests which consist of a number of items, the correct responses to which are all precisely pre-determined, no matter what form it takes or what educational objectives it assesses.

Objective tests are frequently criticised on the ground that they are simpler to answer than subjective ones. Items in an objective test, however, can be made just as easy or as difficult as the test constructor wishes. Another criticism is that objective tests of the multiple-choice type encourage guessing. However, four or five alternatives for each item are sufficient to reduce the possibility of guessing. (see Heaton, 1975).

Questions of the multiple type were used for the present investigation, for they are unquestionably easier to score and easier to analyse in terms of incorrect responses (both of which features have undoubtedly reinforced their commercial use) than are other forms of objective items. In certain ways (Heaton, 1975:14), multiple-choice techniques are to testing, the same as perspective is to drawing: only through appreciation and mastery of these techniques is the would-be test constructor able to throw aside the limitations imposed by them and discover newer and improved techniques of testing.

Although, the multiple-choice techniques are now widely regarded as being one of the most useful of all objecive tests, they are , however, difficult items to construct, because (a) they demand plausible response options and (b) they usually require some preliminary testing, analysis and refinement in order to sharpen the contrast between the correct answer and the incorrect choices.

The most critical part of the construction of multiple-choice items is the selection of the response alternatives – the correct answer and the incorrect choices. The difference in difficulty between writing any other type of objective item and writing

multiple-choice item is the selection of incorrect responses. These wrong answers must be plausible to someone who does not know the answer, yet distinctly different from the correct answer. They should tap the kinds of errors that examinees are likely to make if they have incorrect knowledge or faulty comprehension. But it is sometimes difficult to construct an item having only one correct answer. (see Heaton, 1975).

Although the items designed for the present investigation suffer from some shortcomings of a theoretical nature (mainly lack of profound knowledge of testing theory on the part of the present researcher), mutatis-mutandis, the following considerations were taken into account during the preparation of the items.

(a) Incorrect answers were constructed in such a way that they are comparable in length, complexity and grammatical form to the correct answer.

(b) Extra clues to the correct answer within the item statement were avoided as much as possible.

(c) Attempts have been made to make the items and response alternatives as short, clear and simple (to understand) as possible.

(d) The location of the correct choice as well as question types were varied on as random a basis as possible.

For the fifty-four items produced based on the two culture-specific passages (PE01 and PB02), two rounds of pilot study were carried out in order to test the passage dependency of each item as described below.

7.4 Passage-dependency

Reading Comprehension apparently consists of a number of different skills which are to a substantial degree, independent of each other (Davis, 1968). Writing test items that ask questions about the specific reading passages has been the traditional approach to measuring most of these skills. In most standardized tests several multiple

choice items are written to measure comprehension of each passage.

The most crucial considerations in the construction of reading comprehension tests are the selection of appropriate passages and the relationships among the items within a given passage. Without careful attention to these two matters, an item writer is likely to produce comprehension items that can be answered correctly by an alert examinee who does not actually read and comprehend the passages associated with items (Pyrczak, 1972-73).

Davis (1968) suggested that tests used to check comprehension of the material to be read, while the rate was being measured, have often included items that could be answered by many examinees before they read the material. Furthermore, Weaver and Bickely (1967) found in an experiment that examinees who did not have access to the reading passages answered 67% as many items correctly on standardized reading tests as did the examinees who were provided with the passage.

An examinee may identify the keyed choice to a comprehension item without paying careful attention to the associated passage. There are at least two bases for this:

(a) The examinee may answer correctly on the basis of his general knowledge. Therefore, to minimise the possibility to the least degree, reading comprehension tests should be constructed in such a way that a previous knowledge of the content of the passages will not affect the performance of examinees taking these tests (Weisman, 1971). (b) The examinee may take advantage of the faults that are often present in multiple-choice items. This is mainly because several items are written about a particular passage. Hence, the possibility of using information in neighbouring items to guess the right answer is distinct, unless extreme care is taken to construct independent items on the passage. (c) Taking advantage of the interrelatedness of items increases the probability that one will mark the correct choices in multiple

choice tests is one aspect of test- wiseness that should be taken into consideration.

While the use of this principle of test-wiseness, undoubtedly, involves the use of certain reading comprehension skills, it may defeat the purpose of the test constructor by measuring comprehension skills other than those that the items were designed to measure (Pyrczak, 1972-73). Furthermore, superficial similarities between the keyed choices and stems on the presence of extra long keyed choices may aid examinees. Here special care must be taken by the constructor to avoid this fault.

Taking the considerations discussed above into account, it seems desirable to give extra attention to techniques or methods that determine the quality of multiple choice items designed to measure reading comprehension. The *conventional discrimination index* (Pyrczak, 1976) is helpful in this respect, because it indicates the relationship between marking or not marking the keyed choice in a given item and ability on some criterion measure of reading comprehension.

The desirability of using exercise items that are passage-dependent, from a logical point of view, should be obvious. It is important to note that passage dependence is especially important when pupils are to use items to check on their comprehension while they are attempting to increase their rate of reading. To see the importance of this principle, consider the extreme case in which all the items on a given passage are seriously lacking in passage- dependence. When responding to such items, most pupils will obtain high scores, no matter how fast they read the passage, since items that are not passage dependent can be answered correctly in the absence of the reading passage. There have been no studies of the passage-dependence of the reading comprehension exercise items (Pyrczak, 1976). There have, however, been many studies of the passage-dependence of reading comprehension test items (cf. Farr & Smith, 1970, Pyrczak, 1972, 1974, Tuinman, 1973, Weaver and Bickley, 1967).

In these studies, items were administered in the absence of the associated pas-

sage. The results indicate that a substantial number of items in standardized tests lack passage-dependence. Therefore, it seems reasonable (and highly desirable) to undertake large scale studies of the passage-dependence of exercise items. Until such studies can be undertaken (Pyrczak, 1975, 1976) reading teachers may find it interesting and helpful to undertake small scale studies as part of their regular instructional program and use extreme care to produce items that are passage-dependent. Unfortunately, despite the fairly large body of literature on comprehension items, most tests lack passage-dependence (Pyrczak, 1975).

Taking the foregoing discussion into consideration, a pilot study was carried out to evaluate the passage dependency of items designed to measure reading comprehension of subjects for the present study. This is further discussed below.

7.5 Pilot Study I

The purpose of conducting a pilot study, was to find out whether the items set by the investigator to measure reading comprehension for the present study were passage-dependent. The first round of pilot study was conducted in Durham for the British students, and in London for the Ethiopians. The subjects were simply asked to read the questions and encircle the letter of the correct answer from the four possible choices provided. The main purpose of the study was deliberately concealed from the subjects. Each subject was simply asked by the investigator if s/he had spare time and was willing to cooperate in doing the test as instructed.

The procedure was to administer only the questions to a group of students referred to in the context of this study as *Pilot Study 1* participants. The questions for both passages (PE01) and (PB02) were administered without the associated passages to forty participants, equally divided into Ethiopians and British. The total number of questions for both passages was fifty-four.

As stated earlier the desirability of using items that are passage- dependent is to

decrease, to a considerable degree, the likelihood that respondents answer correctly significant numbers of items without the associated passages. In this context, Bormuth (1967) argued that questions that most students answer correctly would not be passage-dependent and should be eliminated or rewritten. Tuinman (1972) also expressed strong reservation about comprehension test items which can be answered without prior reading of the passage(s). He maintained that when questions can be answered without prior reading, there may be doubts about the validity of these questions as indicators of how well the students have understood the passage. Similarly, Wesman (1971:126) says, '*When general reading comprehension tests are constructed it is important to eliminate in so far as possible the influence of special knowledge of subject matter of the passages.*'

Those who have expressed concern in their studies about the lack of passage dependency on several standardized reading tests at different times include Allington, et.al. (1977), Marr & Lyons, (1980), Pyrczak & Axelrod, (1976), Pyrczak, (1972, 1973, 1974, 1975).

The two comprehension passages (PE01 and PB02) used for the purpose of this study were followed by twenty-seven multiple choice questions for each passage. Nine questions were textually explicit, nine textually implicit and nine schematically implicit, (see 7.8.1 and 7.9), and are randomly written as shown in table 7.5.

Table 7.5 Question Classification

Question Type

Passage	TE	TI	SI
PE01	1 7 9 10 11	2 3 5 13 14	4 6 8 17 18
	12 15 23 24	16 19 20 26	21 22 25 27
PB02	7 8 9 10 12	2 3 6 11 15	1 4 5 14 19
	13 16 17 27	18 22 24 25	20 21 23 26

PE01 = Passage for Ethiopians

PB02 = Passage for British

TE = Textually Explicit

TI = Textually Implicit

SI = Schematically Implicit

Then the items for both passages (PE01 and PB02) were administered without the associated passages to the forty *pilot study 1* participants equally divided into Ethiopians and British as indicated earlier. The results of the first pilot study are given below.

7.5.1 Results of Pilot Study I

The results obtained are shown below in table 7.6. There was a total of 18 out of 54 items from the Ethiopian passage (PE01) answered correctly by more than 5 subjects by both groups (Ethiopians and British). Of these 11 and 7 items were answered correctly by Ethiopians and British respectively, on the Ethiopian passage.

From the British passage (PB02) 12 out of 54 items were answered correctly by more than 5 subjects by both groups. Of these 3 and 9 questions were answered correctly by the Ethiopians and British respectively on the British passage. The breakdown is given below by number of subjects in each group for each passage. Percentages are also provided for ease of understanding.

Table 7.6 No. of Subjects Answering Correctly the Test Items by Passage, Question type, Q.Nos., Nations and by Percentage (Pilot Study I)

PASSAGE = PE01

Q Type	Textually Explicit									Textually Implicit										Schematically Implicit									
Q Ns.	1	7	9	10	11	12	15	23	24	2	3	5	13	14	16	19	20	26		4	6	8	17	18	21	22	25	27	
Eth.	0	9	5	2	0	4	8	2	4	7	2	6	1	7	2	8	8	5		1	8	4	9	3	4	3	7	9	
%	-	90	50	20	-	40	80	20	40	70	20	60	10	70	20	80	80	50		10	80	40	90	30	40	30	70	90	
Br.	1	3	7	6	0	6	3	1	2	6	2	4	6	2	0	1	5	0		3	1	7	2	0	5	2	4	6	
%	10	30	70	60	-	60	30	10	20	60	20	40	60	20	-	10	50	-		30	10	70	20	-	50	20	40	60	

PASSAGE = PB02

Q Type	Textually Explicit									Textually Implicit										Schematically Implicit									
Q Ns.	7	8	9	10	12	13	16	17	27	2	3	6	11	15	18	22	24	25		1	4	5	14	19	20	21	23	26	
Eth.	3	0	7	9	3	1	5	1	1	3	2	1	0	0	0	1	2	1		0	1	1	4	5	6	3	1	3	
%	30	-	70	90	30	10	50	10	10	30	20	10	-	-	-	10	20	10		-	10	10	40	50	60	30	10	30	
Br.	2	0	2	7	2	8	9	2	0	2	0	5	4	4	6	2	0	1		4	1	9	7	4	4	7	8	7	
%	20	-	20	70	20	80	90	20	-	20	-	50	40	40	60	20	-	10		40	10	90	70	40	40	70	80	70	

After rewriting those items answered correctly by 6 or 7 subjects and eliminating those items answered correctly by more than 7 subjects, another round of pilot testing was done involving another group of subjects.

7.6 Pilot Study II

As in Pilot Study I, a total of forty subjects were involved in the second round of pilot testing. They were again equally divided into Ethiopians and British. Similar to the procedure adopted in the initial round of pilot testing, the items were administered without the associated passages. The instructions given to the first group of pilot study participants were exactly the same to the present group.

7.6.1 Results of Pilot Study II

In the second round of pilot testing, the results showed that there was a total of 5 questions answered correctly by more than 5 students on the Ethiopian Passage (PE01) and 6 on the British passage (PB02). Of these, 3 and 2 items were answered correctly by more than 5 students on the Ethiopian passage (PE01) by Ethiopians and British respectively. On the British passage (PB02) only 1 item was answered correctly by more than 5 Ethiopians and 5 items by the British. This breakdown is shown in table 7.7.

From the results of the second round of pilot testing, it can be clearly seen that the proportion of subjects who answered the items correctly is far lower. Even then, all items that have been answered correctly have been rewritten with some changes and amendments before they were administered for the main study.

In the second round of pilot testing, it can also be seen (see table 7.7) that there were 86 cases out of 108 (80%) in which the number of students providing correct answers were 4 or below as opposed to 71 cases (66%) in the first round of the pilot study. Therefore, it can now safely be concluded that the items set by the investigator are passage dependent, having fully met the criteria stated above. Table 7.8 and 7.9 show the number of subjects who answered items correctly in the two rounds of pilot testing.

Tables 7.8 & 7.9 Overall Percentage for Items Answered Correctly

(Pilot Study I & II)

Table 7.8 Pilot Study I

Passage	Eth.	%	Br.	%
PE01	11	41	7	26
PB02	3	11	9	33

Table 7.9 Pilot Study II

Passage	Eth.	%	Br.	%
PE01	3	11	2	7
PB02	1	4	5	19

Table 7.7 Pilot Study II - Breakdown of Items Answered Correctly

PASSAGE = PE01

Q Type	Textually Explicit									Textually Implicit									Schematically Implicit								
Q Ns.	1	7	9	10	11	12	15	23	24	2	3	5	13	14	16	19	20	26	4	6	8	17	18	21	22	25	27
Eth.	0	8	3	1	0	3	5	1	1	5	1	5	3	5	0	5	7	2	2	6	3	5	2	2	4	5	5
%	-	80	30	10	-	30	50	10	10	50	10	50	30	50	-	50	70	20	20	60	30	50	20	20	40	50	50
Br.	3	1	2	1	0	4	0	0	2	1	1	1	7	5	0	2	4	2	1	1	2	3	0	6	4	4	2
%	30	10	20	10	-	40	-	-	20	10	10	10	70	50	-	20	40	20	10	10	20	30	-	60	40	40	20

PASSAGE = PBO2

Q Type	Textually Explicit									Textually Implicit									Schematically Implicit								
Q Ns.	7	8	9	10	12	13	16	17	27	2	3	6	11	15	18	22	24	25	1	4	5	14	19	20	21	23	26
Br.	2	2	1	9	1	1	9	0	3	2	4	1	6	3	5	0	0	1	4	0	1	6	4	8	1	0	1
%	20	20	10	90	10	10	90	-	30	20	40	10	60	30	50	-	-	10	40	-	10	60	40	80	10	-	10
Eth.	2	1	5	6	2	2	3	2	2	4	3	1	1	0	2	0	1	2	1	0	0	3	4	4	2	1	1
%	20	10	50	60	20	20	30	20	20	40	30	10	10	-	20	-	10	20	10	-	-	30	40	40	20	10	10

The second and most important issue that should be raised, at this juncture, is whether the results of the pilot study indicate anything worthwhile to the main investigation in question. In the first as well as in the second round of pilot study, more Ethiopians were found to answer correctly, items derived from PE01 as compared to British. Conversely the number of subjects correctly answering items based on the PB02 was higher for the British compared to the Ethiopians. This can be deduced from the fact (see tables 7.8 and 7.9) that the Ethiopians answered correctly 41% and 11% (for the first and second round of pilot testing respectively) of the questions from PE01 as opposed to 26% and 7% for the British. The same trend can be observed on PB02, where Ethiopians answered 11% and 4% (for the two studies respectively) of the questions correctly as opposed to 33% and 19% of the British.

Table 7.10 Percentage of Subjects Answering Correctly By Question Type (Pilot Study I)

Q Type and Total	Passage: PE01 (Eth.)	PE01 (Br.)	Passage PB02 (Eth.)	PB02 (Br.)
TE	37.7	32.2	33.3	35.5
TI	51.1	28.8	11.1	26.6
SI	53.3	33.3	26.6	56.6
TOTAL	47.3	31.4	23.6	39.5

N=10

Table 7.11 Percentage of Subjects Answering Correctly By Question Type (Pilot Study II)

Q Type and Total	Passage: PE01 (Eth.)	PE01 (Br.)	Passage PB02 (Eth.)	PBO2 (Br.)
TE	24.4	14.4	25.5	31.1
TI	36.6	25.5	15.5	24.4
SI	37.7	25.5	17.7	27.7
TOTAL	32.9	21.8	19.5	27.7

N=10

Figures 7.1 & 7.2 which are derivations of tables 7.10 and 7.11, illustrate the interaction between the performance of Ethiopians and British on two separate sets of items without the associated passages. The overall proportions of subjects answering correctly test items without the benefit of prior reading of the passages as indicated in table 7.6 and 7.7, is 25 % in the second round, as opposed to 35 % in the first round of pilot testing. Hence, this indicates that the items were coming close to being more passage dependent in the second round than in the first round of pilot testing. Figures 7.1 & 7.2 show the percentage of subjects answering correctly the first and second round test items by passage type respectively.

The differences between the two cultural groups in the response pattern were

Fig. 7.1 Percentage of Subjects Answering First Round Test Item Correctly

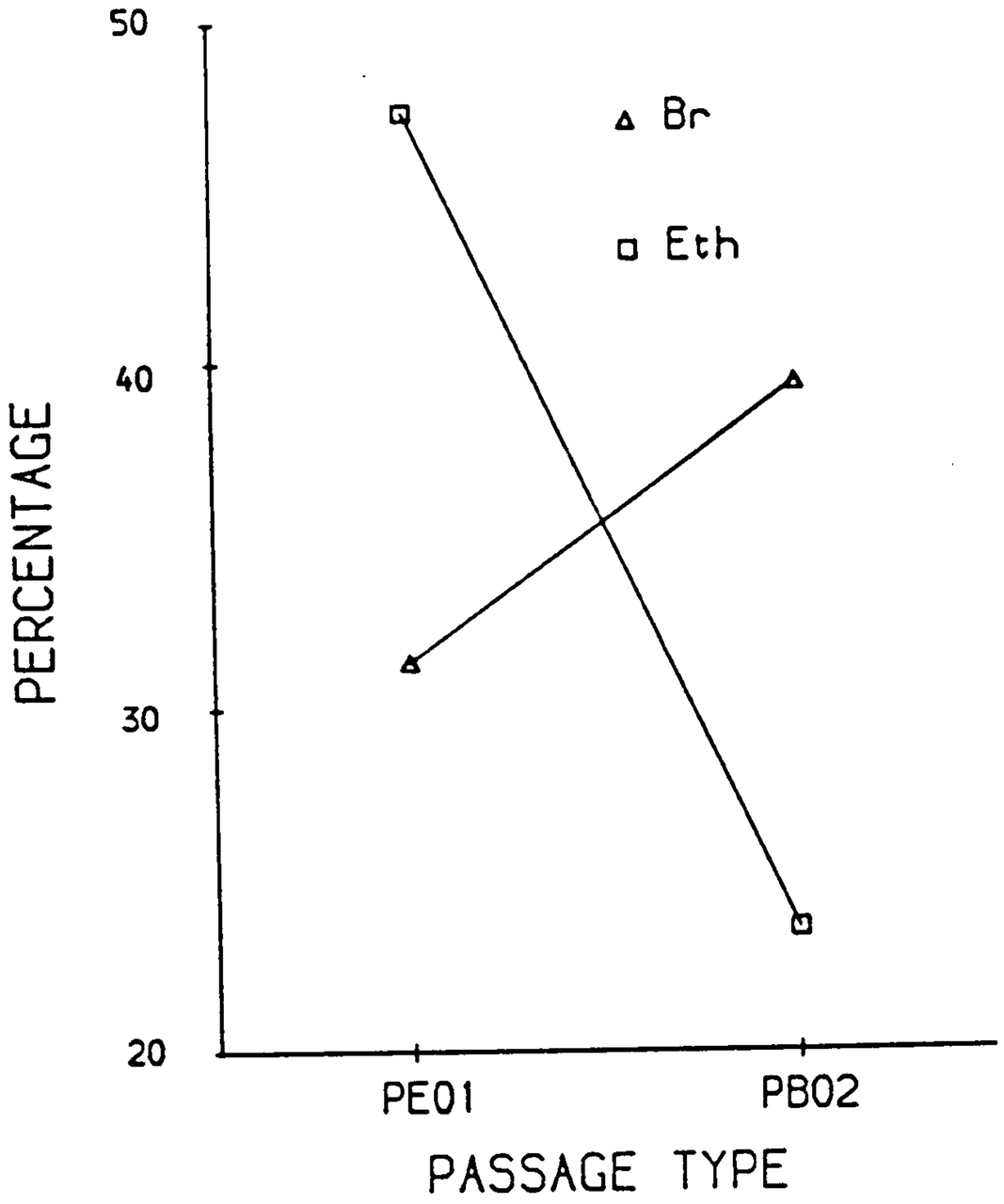


Fig. 7.2 Percentage of Subjects Answering Second Round Test Items Correctly

not significant. The difference between the two groups for PE01 was 11% and 8% for PB02. However, the difference becomes distinct to a certain degree if the response pattern is seen by question type. For instance, schematically implicit questions obviously require the subjects to use their relevant background knowledge on the topic.(see Chapter Nine)

The following tables (7.12 and 7.13) show the actual differences in percentage for each passage by question type in the two rounds of pilot testing.

Table 7.12 Differences in Percentage By Question Type (Pilot Study I)

Q Type	Passage: PE01 (Eth.)	PE01 (Br.)	PE01 (Diffs.)
TE	37.7	32.2	5.5
TI	51.1	28.8	22.3
SI	53.3	33.3	20.0
Q Type	Passage: PB02 (Eth.)	PB02 (Br.)	PB02 (Diffs.)
TE	33.3	35.5	2.2
TI	11.1	26.6	15.5
SI	26.6	56.6	30.0

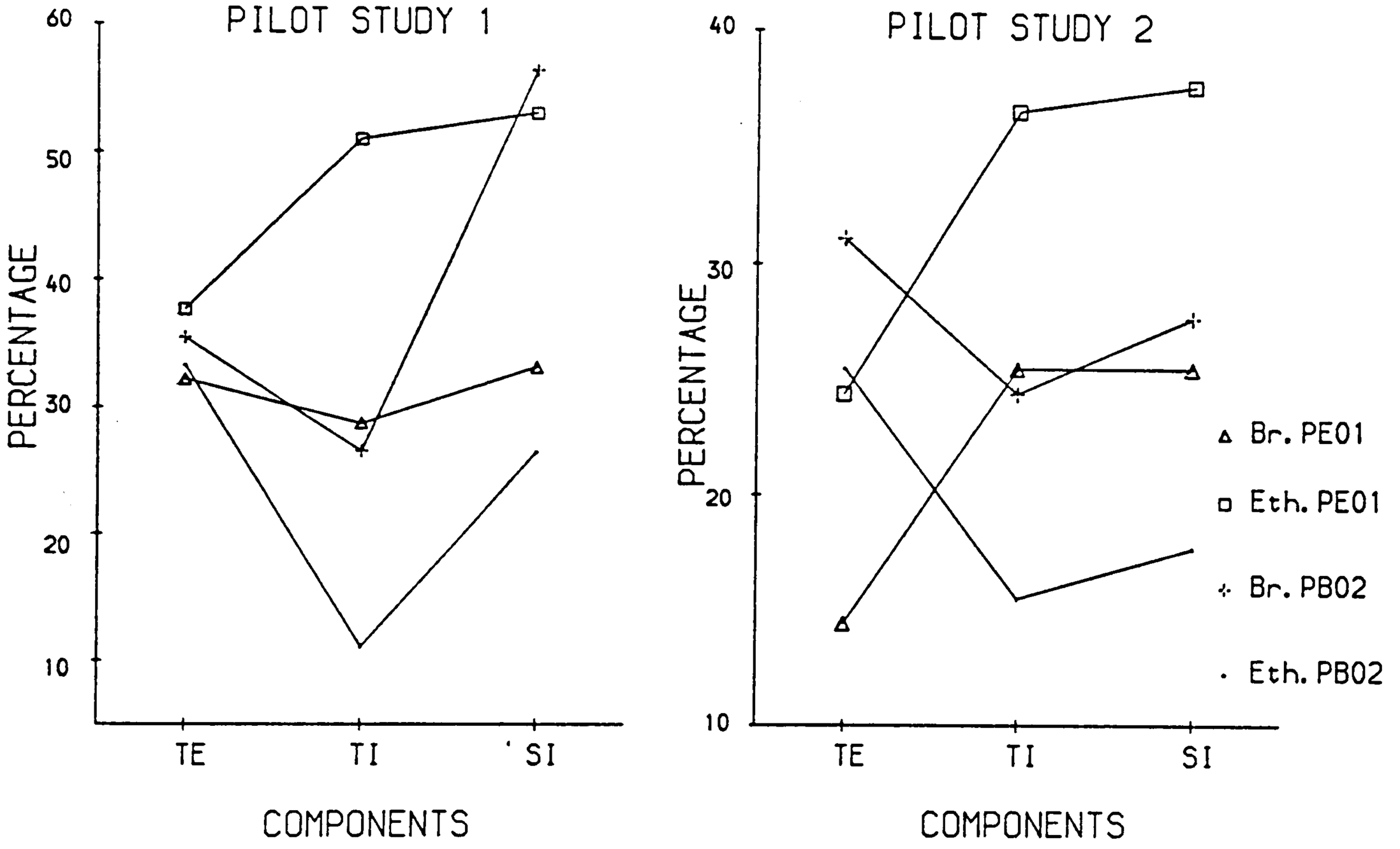
Table 7.13 Differences in Percentage By Question Type (Pilot Study II)

Q Type	Passage: PE01 (Eth.)	PEO1 (Br.)	PEO1 (Diffs.)
TE	24.4	14.4	20.0
TI	36.6	25.5	11.1
SI	37.7	25.5	12.2
Q Type	Passage:PBO2 (Eth.)	PBO2 (Br.)	PBO2 (Diffs.)
TE	25.5	31.1	5.6
TI	15.5	24.4	8.9
SI	17.7	27.7	10.0

Fig. 7.3 shows differences between the first and second round of pilot testing

with regard to the subjects' overall performance on test items without the associated passages, emphasis being on differences by question type.

Fig. 7.3 Differences of Scores Obtained by the Two Groups on Each Question Type and on Each Round of Pilot Study



As can be seen from fig.7.3 there are differences between the items answered in the first and second round of pilot testing. The differences are apparent on question type. For instance differences are significant on TI and SI items between the two groups on each passage. Each group tends to score more on the passage which is culturally familiar and slightly less on the unfamiliar passage, although this is not of utmost importance at this stage. The purpose of these pilot studies, as indicated earlier in this chapter, is not to gauge the amount of prior knowledge subjects possessed on the topic of the passages. Rather, it is to ensure that the items set by the investigator to measure culture-specific reading comprehension are passage dependent or not. Accordingly, from the results given above, the passage dependency of the items set to measure reading comprehension is confirmed.

The next task was to administer these comprehension items associated with the relevant passages to the main study group.

7.7 Administration of the Main Study

The main test was administered in Glasgow, London and Durham to a total of one hundred and seventy-four post graduate students. Of these, sixty were British, sixty Other Nations and fifty-four Ethiopians.

The test was administered in three sessions in each city. This arrangement was necessitated by the fact that it was not possible to get one appropriate time that suited all subjects involved in the study. Therefore, the investigator made prior arrangements with each subject in order to assign him to the session which is held during his spare time. However, six selected subjects for the main study failed to show up at the time when they were supposed to have sat for the test.

Then, it was explained to the subjects that the purpose of the study was to examine the effects of background knowledge with reference to the theory of culture-specific schemata on the reading comprehension of cross-cultural texts by ESL readers as well as native speakers. This was followed by a number of instructions (dos and don'ts), such as : (a) Read the passage for comprehension and be prepared to answer questions that follow each passage. (b) The test is not a speed test. However, how long it takes you to read each passage is of interest to the investigator. (c) Once you have turned a page, do not go back to that page etc. (see Appendix C2)

They were then provided with a booklet that contained: (i) Instructions, (ii) Passage for British (PB02), (iii) Reading Comprehension Items, (iv) Passage for Ethiopians (PE01), (v) Reading Comprehension Items, and (vi) A questionnaire.

However, before administering the reading comprehension test intended to measure the subject's comprehension of cross-cultural texts, it was necessary to examine

the amount of prior knowledge the main study subjects possessed on each of the two culture-specific passages. The justifications for using prior knowledge test and methods used to assess prior knowledge are succinctly put in the following sections.

7.7.1 Assessment of Prior Knowledge

Prior knowledge influences what is understood from the text (e.g. Bartlett, 1932, Reynolds, 1981, Taylor, 1980, Steffensen, 1980, Anderson et.al., 1983, and many others). Several studies have suggested that prior knowledge is an integral part of the comprehending process (e.g. Bransford and Johnson, 1972, Johnston, 1981). This implies that two individuals with equivalent reading comprehension ability but differing in prior knowledge would, in all likelihood, exhibit different levels of comprehension of the same text. Such differences are likely to show up in assessment of reading comprehension ability. (cf. Johnston, 1983-84)

There is no way of knowing what part of an individual's score is due to reading comprehension ability and what to prior knowledge. Thus, attempts to compare several individuals in terms of their reading comprehension ability are confounded by the differences in their prior knowledge. Findings are then subject to misinterpretation. One student may do very poorly because of a lack of prior knowledge whereas another student, with perfectly adequate prior knowledge, may do poorly because of inadequate reading comprehension skills. How do we go about this problem then? It seems important to distinguish between these sources of failure since each requires an entirely different treatment.

One possibility is to try to construct tests which are less dependent on prior knowledge. An alternative possibility is to try to obtain an indication of that part of the comprehension score which is more closely related with reading comprehension ability than with prior knowledge, and hence provides a more valid index of raw comprehension ability. The present investigation intends to provide a methodology

which may allow a distinction between individuals who fail to comprehend because of prior knowledge mismatches or because of inadequate skill development.

The question then becomes how to estimate an individual's prior knowledge? The measure of text specific background knowledge may be useful for teachers in assessing the difficulty of a reading assignment and for researchers in controlling for differences in prior knowledge or in examining the relationship between background knowledge and various aspects of learning (Langer, 1983-84).

Researchers from diverse fields have underlined that comprehension is always to some extent idiosyncratic (Langer, 1978) building on individual's responses to the pragmatics of the particular reading situation as well as their understanding of the *content* of the text (Anderson, Pichert and Shirley, 1979, Goodman & Goodman, 1978, Gumperz, Simons & Cook-Gumperz, 1982, Heath, 1983, Steffensen et.al., 1981, Tannen, 1979).

One set of factors which influences how an individual will interpret a particular passage stems from the nature and extent of previous knowledge about the topic (Langer, 1983). The notion that relevant background knowledge is directly related to comprehension and recall should come as no surprise. What is surprising is: Can passage-specific background knowledge be reliably estimated prior to reading? If so, Can this information be used in making decisions about appropriate instructional techniques surrounding a given reading experience?

Langer (1980), Langer & Nicolich (1981), developed a system for categorizing the quality of knowledge that a reader possesses about key concepts in a text. Passages were selected from texts read by students in grade three through graduate school. Key words or phrases were then selected as representing the major concepts in each passage. Students were asked to free associate in response to each concept selected from the passage to jot down anything that came to mind when they heard that par-

ticular word or phrase. Following the procedure, some 3,000 responses were gathered for content analysis. Then students' responses were categorized: namely, *uncategorizable responses* (showing no apparent link to pre-existing knowledge) at the lowest level of organization. Secondly, responses reflecting *diffusely organized knowledge* (see Langer, 1980, Langer and Nicolich, 1981) at the next level and finally responses reflecting *highly organized knowledge* at the highest level (Langer, 1980).

Langer et.al.'s (1981) level of passage-specific knowledge are related to the categories of conceptual development described by Vygotsky and Bruner (1956, 1962). Vygotsky (1962) identified three phases of conceptual complexity ranging from the more subjective and diffuse to the more objective and organized. At the lowest level, Vygotsky claimed that knowledge is organized around *poorly articulated images and objects* related only by the immediate perception of the observer. At the next level, *concrete relationships* are formed around more objectively recognizable bonds and at the highest level, *abstract symbolic relationships* are recognized.

Bruner *et.al.* (1956), identified three groups of conceptual categories : *formal, functional, and affective. Formal concepts* are constructed by specifying properties or attributes that are intrinsic to the entire class. They develop concurrently with their symbolic representation. *Functional concepts* focus on a specific function, they are concrete and objective. *Affective concepts* are personally based and not amenable to ready description (Langer, 1980).

Although developed at different times for different purposes, Vygotsky's stages of concept development, Bruner's bases for concept categorization, and Langer's topic specific knowledge differentiation are strikingly parallel. In each case, there is a progression from (a) a diffuse, personal response to (b) a concrete, functional response to (c) an incorporation of abstract, super-ordinate principles.

Langer (1980) examined the relationship between these levels of text related

knowledge and the recall of information from text. Two passages from Meyer's (1975) work on the organization of prose and the structure of recall were used. Three major content words central to each specific passage were selected for use as free association stimuli. High school seniors were given each content word and were told to write anything that came to mind when they heard that word. After having read the passage silently they wrote all they could remember about the passage. The free association responses were assigned to one of the three background knowledge categories, as described above, and were weighed from 3 [highly organized] to 1 [diffusely organized]. The recall protocols were scored using Meyer's categories for hierarchical structure of passage content. Correlation analysis indicated that Langer's measure of background knowledge was highly related to the readers recall (Langer, 1980).

A follow up study by Langer & Nicolich (1982), more fully examined the relationship between background knowledge and the organization of recall. Findings indicate that the passage specific knowledge measure is highly related to passage comprehension. The results, coupled with its ease of administration and scoring, make the measure a promising research tool for the control of background knowledge as well as for examining the effects of topic specific knowledge on particular kinds of learning in particular contexts.

The relationship between passage comprehension and the knowledge measure also suggests that the measure can be used as an individual or small group diagnostic device to help teachers determine when a particular text book selection is appropriate either for individual or class assignment. It could also assist teachers in determining whether and for whom direct concept and vocabulary instructions are available.

Studies of prior knowledge have generally used *familiar* versus *unfamiliar* texts as estimates of prior knowledge (e.g. Freebody,1981). Two other approaches have also been used. Hagerup-Neilsen (1977) and Raphael (1981) have had subjects rate

familiarity of passages or topics. Unfortunately, aside from the incomparability of different individual's ratings, this procedure requires metacognitive awareness.

On the other hand, Pearson, Hansen and Gordon (1979) asked prior knowledge questions before the children read the passages. This seems to be a more powerful approach but the questions tend to over direct reading. Furthermore, when the questions are highly related to the text, any related improvement could be attributed to greater passage independence of the items. Nonetheless, this more direct approach to the measurement of prior knowledge was used in the present study with modifications which minimize the above problems. Regarding problems related to prior knowledge tests, Johnson says,

> *' It is possible that what is required is a complete theory of the structure of knowledge so that one could generate for any subset of knowledge, appropriate indicators of prior knowledge. However, such a theoretical development presently is unavailable '*
>
> (Johnson, 1983-84:222)

The methods of measuring prior knowledge and the techniques of scoring prior knowledge test responses are adaptations of the works of Pearson et.al. (1979) and Langer et.al. (1980, 1981) respectively. These are dicussed below.

7.7.1.1 Prior Knowledge Test

The prior knowledge of subjects selected for the main study was measured by testing specific content related conceptual knowledge. From a total of 43 words selected as appropriate for a prior knowledge test by the judges, the investigator approved 24 words/concepts to be included for the prior knowledge test, equally divided into PE01 and PB02. As indicated, the main justification for administering a prior knowledge test is to know the amount of prior knowledge the subjects had on each

culture-specific passage that they were going to read about.

During administration, subjects were given adequate instructions, like *write down everything you know about each vocabulary or concept on the spaces provided* . The subjects did the tests under unspeeded conditions. (cf. Prior Knowledge Tests, Appendix C3). They worked at their own rates and consequently there was some variation in completion time. The techniques of scoring the responses that the subjects wrote on/about each phrase/concept are given below.

7.7.1.2 Scoring of Prior Knowledge Test

Each free association response was categorized to indicate the level of prior knowledge it reflected, that is, responses were scored from 3 [much prior knowledge], 1 [little prior knowledge], to 0 [no prior knowledge]. The criteria for scoring responses were based on categories such as the following:

MUCH = [3]

(i) superordinate concepts

(ii) definitions

(iii) analogies

(iv) linking

SOME = [2]

(i) examples

(ii) attributes

(iii) defining characteristics

LITTLE = [1]

(i) associations

(ii) rootwords

(iii) peripheral responses

It may be useful to cite one example from the data to show how the responses were scored based on the above concept categorizations. *Crying Melodiously* was one of the concepts/phrases given for prior knowledge test. The following responses are collated from the answer sheets.

CRYING MELODIOUSLY

I. For Superordinate Concepts = [3]

a. cry formed by a clearly recognizable tune in a larger arrangement of notes.

b. a way of crying at a funeral, where crying is expressed in a well defined lyrics and melody, wailing.

c. in some cultures it is customary to hire professional weepers who could cry after someone's death.

d. lamenting someone's death in the form of song.

e. wailing and shedding tears in a melodic tune.

II. For Attributes = [2]

a. a synchronized rhythm of grief.

b. attempt to win other's sympathy.

c. tuneful appreciation of sorrow.

d. crying in a musical and fascinating sound.

e. wailing at varying pitches of noise.

f. appreciation of sorrow which is tuneful.

g. crying in a ritualized and musical way.

h. a public sign of grief.

i. mourning the dead in a singing sort of way.

j. loud wailing.

k. weeping in a songful manner.

III. For Associations = [1]

a. crying nicely and beautifully.

b. close friends weeping in a song like tune.

c. trying to sing.

d. noises made in a musical manner.

e. ritualized celebration.

f. a tuneful call.

g. rhythmic weeping.

h. loss of valuable friend.

i. shouting musically or tunefully.

j. melancholic.

k. strange way of crying.

l. crying that resembles some sort of melody.

The scores in the key vocabulary/concepts tests directly related to the content of the passages can be taken as a fairly reliable estimate of existing cultural schemata.

The purpose of this test, as indicated earlier, is to measure the amount of prior knowledge in terms of cultural schemata which subjects possessed and thereby verify whether the two culture specific passages were either familiar or unfamiliar to the respective cultural groups chosen for the investigation. The results are shown in section 8.2.1. In the following sections the items used for the present study are evaluated, described and analysed.

7.8 Evaluating the Items

> *'No one person can write a test by himself, even if he puts aside for a few days and comes back to revise it later. If he does this he will certainly find all kinds of errors and inconsistencies which he had not noticed as he worked the test out in detail, but this is no substitute for the comments of others, who will see the test material from a different view point and will point out ambiguities and possibilities for errors which the test writer cannot see '*
>
> (Harrison, 1983:134-5)

Furthermore, Hughes (1986:33) maintains that the tester ought to be able to demonstrate that he is testing directly the skills that are necessary for the purpose in question. Where versions of the test are to be written by non-professional test writers, the clearer the test's rationale and the better it is understood, the better these versions are likely to be.

Bearing the above considerations in mind, the tests used for the present investigation were distributed to six lecturers at Durham University so that each item is evaluated in terms of its content validity and most importantly to find out what they think that particular item is a test of (i.e. Is the item a test of factual recall or implicit knowledge or background knowledge?) in order to produce a corroborative evidence (Hill, personal communication) that the items serve the purpose that they

are intended for. These native speakers (whose names appear in Appendix C1) agreed to look at the content validity of the fifty-four items. They were provided with the test items and with the discussion by the researcher, of the strengths and weaknesses of each item. An interview was arranged with each of the six lecturers from English and Education departments in Durham to discuss their responses in detail with the researcher.

The first general question related to the suitability of the test items irrespective of which category they were placed in. They were asked to note which items were difficult to unerstand or had no apparent correct answer. The items that were noted as weak on this counts by two or more native speakers were 4, 10, and 17 on PB02.

Then they discussed whether any of the items were wrongly categorized. They had already read through and considered carefully the nature of the description of the three types of questions. It was particularly pointed out that schematically implicit questions needed to draw on background knowledge and knowledge of the text. Those questions that were felt to be clearly categorized wrongly by two or more of the native speakers were 18 and 15 on PB02, and items 2 and 20 on PE01.

Finally, these lecturers were asked, whether in their view, the tests were generally satisfactory. While agreeing with the researcher that there were some weaknesses which could be put right if there were to be a re-test at any stage, they felt that in general the tests were doing what they were supposed to do.

Conventional testing theory prescribes two types of criterion by which a test may be judged. First is validity: the test of whether a test actually measures what it sets out to measure or achieve what it sets out to achieve, and secondly, inextricably linked with the first, is reliability. The reliability of a test is a matter of how consistently it produces similar results on different occasions under similar circumstances (cf. Oller, 1979, Morrow, 1986, Harrison, 1983 among others).

Reliability is a necessary characteristic of any good test: for it to be valid at all, a test must first be reliable as a measuring instrument. An appreciation of the various factors affecting reliability is important for the teacher at the very outset, since many tend to regard tests as infallible measuring instruments and fail to realize that even the best test is indeed an imprecise instrument with which to measure language skills. (cf. Heaton, 1975:155).

Among the many factors that affect reliability of a test (e.g. administration, instruction, personal factors, scoring etc.) is the extent of the sample of material selected for testing. Whereas validity is concerned chiefly with the content of the sample, reliability is concerned with size. The larger the sample, the greater the probability that the test as a whole is reliable. (ibid).

Even though the size of the sample used for the present study is small, we would want a reasonable level of reliability. As Alderson (1981:65) puts it: *'If one concentrates on validity to the exclusion of reliability, one needs to ask whether one is measuring anything, since measurement is quantification, and with quantification comes the need for reliability'.*

What is a reasonable level of reliability? The answer to this question depends almost entirely on the purpose to which the measure is to be put. If important decisions about individuals rest on a measurement, then it should have very high reliability. For the investigation of group differences, however, lower reliabilities are usually sufficient, say, teacher-built tests are usually considered adequate with reliabilities of .60 (Tuckman, 1975:257, Fitz-Gibbon and Morris, 1987:115). *Inevitably, tests are about and for groups of people not individuals* (Alderson, 1981:65).

The internal consistencies of the tests used for the present investigation were measured by a statistic known as KR20 formula (Kuder-Richardson Formula 20), which is a widely used measure of internal consistency. It indicates how the test

might be expected to correlate with other selection of similar items and its value is higher the stronger the inter-correlation among items of the test.

The internal consistency of the tests on PB02 and PE01 as indicated by KR20 were 0.66 and 0.68 respectively. (see Appendix D17)

> *'Validity is inevitably tied up with reliability, an unreliable test cannot be valid, although an invalid test can be reliable. One way of improving both validity and reliability of tests is to specify more closely both content and the criteria for assessment. '*
>
> (Alderson, 1981:65)

Every test should be as valid as the constructor can make it. The test should aim to provide a measure of the particular skill which it is intended to measure or as Davies (1986) succinctly put it: *'Just what is it that this test does measure?'* This is a question of the content validity of the tests. Content-validity is the extent to which the selection of tasks one observes in a test-taking situation is representative of the target set (universe) of tasks of which the test is assumed to be a sample or put in another way, content validity is the systematic examination of the test content to determine whether it covers a representative sample of the behaviour domain to be measured (Palmer and Bachman, 1981:136, Anastasi, 1961 as in Davies, 1986:55).

The process of investigating content validity requires a fairly complete description of the types of competence being tested.

The following sections deal with comprehension question-relations in general and description of items used for the present investigation in particular.

7.8.1 Comprehension Question-Relation

The outcome measures from reading comprehension tests generally provides a quantitative measure of how much the reader has comprehended. There are, however,

possible qualitative differences between readers. For example, the total score may be the same for two different readers, but if one succeeds on all literal items but none of the inferential items, while the other performed equally well on both types, presumably, there is a qualitative difference in their comprehension of the text. (see Johnson, 1983-84).

Perhaps prior knowledge differentially influences performance on different question types (Pearson and Gordon, 1979). But what constitutes a different type of question? It might be helpful for the purpose of the present investigation to construct a simple taxonomy of questions. Tuckman (1975) asserts that a taxonomy is a device for classifying things in terms of certain of their characteristics, thus, it identifies the relationship of one thing to another in terms of these characteristics.

In addition, Bloom (1956) suggets taxonomies will help teachers (a) to understand and evaluate information (b) to identify goals in the teaching-learning process (c) to identify directions to extend instructional activities and (d) to plan and prepare measuring devices.

Therefore, it was felt necessary for the purpose of achieving the objectives of the present investigation, to divide question-answer relations into three categories based on the works of Pearson & Johnson (1978) and Lucas & McConkie (1980). As the researchers themselves (Pearson & Johnson, 1978, Lucas & McConkie, 1980) readily admit, this question taxonomy with only three categories, as discussed below, can hardly qualify as a taxonomy. However, like the researchers, the present investigator found the taxonomy intuitively appealing in its ability to capture the relationship between information presented in a text and information that has to come from a reader's store of prior knowledge (scripts/schemata).

Three kinds of question-answer relations, namely Textually Explicit, Textually Implicit and Schematically Implicit were explored to assess the reading comprehension

of native and non-native speakers of English. The following section deals with the description of question-answer relations and analysis of items used for the present study.

7.9 Description of Items

The items administered for the present investigation were equally divided into three types of question-answer relations. For both passages (PB02 and PE01) there were 18 textually explicit, 18 textually implicit and 18 schematically or scriptally implicit items as described and demonstrated below.

7.9.1 Textually Explicit Items

Textually explicit items, as the name implies, have obvious answers from the page of print. They are referred to as factual, literal recognition or recall questions. Literal comprehension requires the recognition or recall of ideas, information and happenings that are directly stated in the materials read. In other words, a question-answer relation is classified as textually explicit if both question and answer are derivable from the text and if the relation between question and answer was explicitly cued by the language of the text. This type of comprehension is thought of as reading the lines.

7.9.1.1 Analysis of TE items on PB02

Items 7, 8, 9, 10, 12, 13, 16, 17 and 27 are TE items set for comprehension on the British culture-specific passage (PB02). Each TE item is discussed below.

Item 7. Which one of the following is not true of cremation?

a. It is done out of sight of relatives

b. It is necessarily done immediately after the service is over

c. It is not done while the relatives are present to pay their last respects.

d. It may take place some time after the service is over

The answer to this item is stated in idea units 60 and 65 which read: ... *(60) A cremation is held at a special crematorium. (62) A service will be held in a church (63) before the body is removed for burning. (64) This burning is done out of sight of the relatives (65) and not necessarily after the service.*

Item 7 requires the testees to eliminate the three distractors which are true of cremation based on the information given in the text. Therefore, the correct answer to this item is essentially (b).

Item 8: Which of the following is not true of the ashes after cremation has taken place?

a. collected and buried in the ground

b. scattered in the ground of the crematorium.

c. collected and stored in a container

d. can be taken home

The Text reads: *(66) After burning, (67) the ashes are collected (68) and either scattered in the ground of the crematorium or buried in the ground . (69) They can be taken home, if required.* Information a, b, and d are clearly stated, but not c, which should be the right answer.

Item 9: Which of the following is the appropriate place for cremation to take place?

a. at any vacant place

b. at the chapel of rest

c. at a special place

d. at a cemetery

The information is stated in idea Units 60 and 61. ... *(60) A cremation is held*

at a special crematorium. (61) This is a chapel with facilities for burning the body.

The answer to this item is (c).

Item 10: In the case of one of the following, a church service for the deceased cannot be held. Indicate which.

a. first degree murder

b. accidental death

c. premature death

d. none of the above

Idea units 55 and 56 state that *a church service is not obligatory and will not in any case be held in case of a suicide.* Therefore, the answer would obviously be suicide. However, since it is not mentioned in the given options, the correct choice is (d). It is important to note that the validators pointed out that the question includes *One* and because the correct answer (d) has the wording *none of the above* rather than *suicide*, it is confusing to the testee. As has previously been noted, there is a special difficulty with negatives in this type of test.

Item 12: Paschal candles, according to custom, are appropriately placed. Which one of the following is the right position for the candles to be placed?

a. on the top of the coffin

b. at the side of the coffin

c. in front of the coffin

d. behind the coffin

The answer to this item is derived from the passage: ...*(41) In church, the coffin is placed at the front of the nave (42) and at the side will be placed (43) the paschal*

candles. The answer is clearly (b).

Item 13: Too evident sorrow, as an outward manifestation of mourning, is considered a

a. sign of mental instability.

b. sign of emotional attachment.

c. sign of sympathy and love.

d. sign to inspire pity.

The correct answer (a) is derived from the text ... *(86) Too evident sorrow (87) does not inspire pity. (88) It is a sign of mental instability (89) or of bad manners.*

Item 16: One of the following is closely associated with an inquest.

a. The district coroner

b. The district judge

c. The city council

d. The chief of the constabulary

The information is stated in idea units 14–16. ... *(14) If the cause of death is uncertain, the fact must be reported to the district coroner (15) for further investigation (16) in the form of post-mortem and inquest.* Therefore, the correct answer to this item is (a).

Item 17: When someone dies it is reported to the registrar's office for the purpose of obtaining

a. birth certificate.

b. medical certificate.

c. death certificate.

d. disposal certificate.

In the passage the following information is given: *(1) When someone dies (2) the death and its cause must be certified by a doctor and reported to the registrar ... (5) A Disposal certificate (6) allowing the body to be buried or cremated (7) will be issued by the registrar ... (12) a death certificate will also be issued ... (14) to claim life insurance benefits.* It seems that both c and d can be possible answers. This item is not asking about the duties and responsibilities of the registrar i.e. issuing death as well as disposal certificates. It asks the testees which of the two certificates comes first as a matter of priority and urgency. Common sense tells us that the dead should be respected and disposed of appropriately. After all, a death certificate is mainly needed to claim life insurance benefits, which can be processed any time after burial. In addition, the statement 'a death certificate will also be issued ... ' implies that a death certificate, although essential, is not as an absolute necessity as is a disposal certificate. In fact the status of death certificate, as implied by 'will also ' in the passage, is secondary to disposal certificate. Therefore the answer to this item is (d). However, the validators considered that, because (c) and (d) were possible answers even though (d) was the better answer, the question at the head of item 17 should be *When someone dies the most important certificate to be obtained from the registrar's office is....*

Item 27: What is a death certificate needed for?

a. census purposes

b. disposing of the corpse

c. claiming life insurance

d. remembrance

Idea units 12–14 read: *A death certificate will also be issued and is needed for*

example, to claim insurance benefits. The answer is (c).

Now let us look at textually explicit items of the Ethiopian culture-specific passage (PE01).

7.9.1.2 Analysis of TE items on PE01

TE items of this passage are 1, 7, 9, 10, 11, 12, 15, 23 and 24.

Item 1: This item is drawn from the following statement in the text. ... *(79) The head mourners stay in full mourning (80) for one year.* The question reads: The mourners, according to tradition, should be in full mourning for one of the following periods.

a. 40 days b. 8 days c. 6 months d. One year

The answer to this question is obviously (d).

Item 7: On which day is a large reception given to close relatives and guests in remembrance of the deceased?

a. Third day b. Twelfth day c. Fortieth day d. Eighth day

In order to answer this question correctly, one simply has to read idea units 73 and 74: *A large reception is given to close relatives and guests on the 40^{th} day.* The answer would then be (c).

Item 9: What is the most conspicuous practice of mourners?

a. participating in the general weeping

b. choosing the right church and cemetery

c. arranging ceremonial details

d. consoling the bereaved

It is mentioned in the passage that: *(39) Weeping is the most conspicuous practice of the mourners.* The correct answer to this staightforward item is (a).

Item 10: It asks whether the eastern gate of the church is for

a. patriots b. unbaptized infants c. priests d. women

This is indicated in the text. *(24) The corpse is deposited on the ground by the northern gate if the deceased is a man (28) by the southern, if a woman, (29) and if a member of the clergy by the eastern gate (30) or inside the church.* Therefore, the answer to this question is (c).

Item 11: This item is based on the text used for item 10. (see idea unit 24). The question reads: The corpse of one of the following is deposited on the ground by the northern gate if the deceased is a —

a. woman b. man c. child d. member of the clergy

The answer to this item is (b).

Item 12: How many times is the corpse taken around the temple at the Church?

a. once b. twice c. three times d. five times

The answer to this item can be derived from the passage. *(23) At the church, (24) the corpse is taken around the temple from right to left once.* The correct answer, therefore, is (a).

Item 15: At the church the corpse is taken around the temple in one of the following directions.

a. right to left b. left to right c. left to right and then right to left d. right to left and then left to right

This item is constructed based on the text given under item 12. See idea unit

24. The correct answer is (a).

Item 23: Mourners engage in intensive lamentations during one of the following times.

a. The first three days

b. The first nine days

c. The first twelve days

d. The first forty days

The answer can be derived from the following statements in the passage. *(62) After intensive weeping on the third day (64) at church (65) the head mourners move to a modest room (66) where they remain for another nine days (67) lamenting and weeping.* Therefore the answer should be (a).

Item 24: The provision referred to as inba-adirk will normally go to one of the following.

a. The clergy concerned

b. The head and ordinary mourners

c. The grave diggers

d. The poor

This item is constructed based on the information given in the passage that reads: *(19) At the rear of the procession (20) are those who carry pots of drinks and food (21) which is referred to as inba-adirk (22) which goes at the end of the funeral to a group of the clergy concerned.* Clearly the correct answer is (a).

In the following section textually implicit items are described and demonstrated.

7.9.2 Textually Implicit Items

These types of questions have the question information and response information

in different sentences in the text, requiring the testee to combine the separate pieces of information in order to produce or recognize the answer. Textually implicit items do have answers that are on the page, and the answers may not be so obvious as textually explicit items. A question-answer is classified as textually implicit, if both question and answer are derivable from the text but there may be no logical or grammatical cue tieing the question to the answer and the answer given is plausible in the light of the question. This type of comprehension is thought of as reading between the lines.

This question type is a multi-member set which requires both factual recall and inferencing. Some implicit questions rely on careful analysis of supporting details. More commonly, the inferences are based on cause-effect relationships. More common still in the questions attached to the two passages being considered are inferences based on sequencing. However, the most common are the result of comparing idea units or the four possible distractors to see which of them is the correct one, the most likely, or indeed the only one not blatantly incorrect.

A brief analysis of the nine textually implicit items attached to each passage follows.

7.9.2.1 Analysis of TI items on PB02

Items 2, 3, 6, 11, 15, 18, 22, 24, and 25 are TI items set for comprehension on PB02.

Item 2: Why has cremation become the dominant manner of burial?

a. for purely scientific reasons

b. for projected fear of space

c. for reasons of forgetting the dead

d. for saving time, money and energy by avoiding pilgrimage to the graveside

The item is constructed based on the information given in the passage. *(57) Although burials are still common, (58) there are a far greater number of cremations. (59) Land for burials is rapidly running out (60) and it is expected that within twenty five years burials will be a thing of the past.* It can be seen here that while both question and answer were textually derived, the relation was implicit rather than explicit. This is demonstrated by the fact that the connective *and* actually implies *so* semantically, so that the implicit connection is one of result. Therefore, the correct answer (b) is dependent on seeing a cause-effect relationship between idea units 59 and 60 even though the connective word *and* does not apparently signal such a relationship.

Item 3: The funeral rites have been modified and reduced to a decent minimum, but which one of the following customs seems to remain intact to date?

a. wearing dark clothes

b. operations to dispose of the body

c. too evident sorrow

d. being too emotional

Let us have a look at idea units starting at 76 and ending at 93 in the passage. *The funeral rites have been modified by reducing to a decent minimum the inevitable operations to dispose of the body. The outward manifestation of mourning are repugned and disappearing. Emotions are avoided ... . Dark clothes are no longer worn. Too evident sorrow does not inspire pity. Within the family circle, one hesitates to let oneself go for fear of upsetting the children. One can have the right to cry, if no one else can see or hear.*

The testee has to comprehend the above paragraph in full to see how funeral rites have been modified with the passage of time and even reduced to a decent minimum. The question asks 'What are these decent minimums?' Obviously certain operations

to dispose of the body as they are indicated from idea unit 1 to idea unit 52. The correct answer (b), is the result of comparing the changes made to signs of obvious mourning (the three distractors) with the changes made to the operations to dispose of the body.

Item 6: Which one of the following is not necessarily the work of the undertaker?

a. arranging embalming

b. arranging the funeral party

c. collecting the corpse from the chapel of rest

d. arranging transport to the church or crematorium

The works of the undertaker are explicitly stated in the passage. The testee is expected to combine the separate pieces of information in order to get the correct answer. The duties of the undertaker as stated in the text are compared with the one duty (embalming) not mentioned and the latter is, therefore, chosen to match the question set. This is a stronger comparison than in item 3 above where different proportions were compared.

The following sentences help the examinee to choose the correct answer. *(19) The undertaker or the funeral director, (21) will make funeral arrangements. (23) The undertaker arranges ceremonial details, (24) an appropriate church, (25) certificates, hearse and bearers (30) and collects the body (31) for transport to the church or crematorium.*

It is nowhere stated in the text that the undertaker arranges embalming. Therefore, the correct answer to this item should be (a).

Item 11: The duration of the service at the church before going to the cemetery or crematorium is

a. very short and untiring

b. very long and boring

c. very long but interesting

d. short and or long depending on the cause of death

This implicit item is set based on the information given in the passage. ... *(46) After the service (47)which usually lasts twenty minutes is over, (48) the relatives will make their way to the cemetery or crematorium.*

This is another case of having to use a comparison of choices. The testee has to choose between a and d. (20 minutes is short in any culture - a longer time-scale could have been culturally dependent and therefore more likely to be schematically implicit). In the absence of idea unit 47, d could have been seen to be the correct answer. The answer to this item is (a).

Item 15: Which of the following applies to the statement: If the relatives of the deceased cannot afford to pay for the services of the undertaker, they can always arrange the burial themselves.

a. This is a rare incident.

b. This does happen most of the time.

c. It can be both a and b depending on the circumstances.

d. Many agree that it never happens.

In the text it is given that ... *(27) The cost of the undertaker, (20) a registered and licensed business man, varies from two-hundred and fifty pounds excluding burial*

fee (28) which is payable to the cemetery or church.

This item is set against this background, i.e., Is it possible within the British society, for the relatives of the deceased to carry out the burial by themselves if they are unable to pay for the services of the undertaker?

This is implicit cultural knowledge presupposed by the text and the reader's own cultural background knowledge. The leading statement, 'What if relatives cannot afford to pay for the services of the undertaker?' is creating a hypothetical situation for testees to use their imagination based on the cost of the undertaker and burial fees stated in the passage.

Any society has its own norms. The norms of British society are that the undertaker is the only right person to carry out funeral arrangements. It is not a matter for debate that relatives of the deceased however 'poor' they are, cannot carry out burial services by themselves. If the worst comes to the worst the city council or the appropriate institution of the state takes care of funeral expenses. The church authorities (see appendix C1) also agree that this state of affairs never happens, which makes (d) the correct answer. While finding the correct answer requires reading through the text carefully and comparing one part with another and so is textually implicit, because of its partial dependence on knowledge of British culture, the validators were of the opinion that if the test were to be re-applied this should be characterized as a schematically implicit item.

Item 18: The church service includes readings from the Bible read by the clergy, followed by an address. The address is given by one of the following.

a. the clergy

b. the relatives

c. the funeral director

d. an intimate friend

Based on the following text the above item was set. ... *(44) The service includes readings from the Bible (45) read by the clergy or relative or friend, followed by prayers and an address by the clergy.* Once again the comparison is between item 44 (the readings) and 45 (the address). The correct answer is (a). However, the validators agreed that this was at the explicit end of the scale and thought that if the test were to be re-administered it should be considered an explicit item.

Item 22: If death resulted from an accident or if violence occurred in suspicious circumstances the fact must be reported to one of the following.

a. The nearest hospital or health centre

b. The district coroner

c. The district police

d. The district council

The statement in the passage: ... *(15) If the cause of death is uncertain, the fact must reported to the district coroner (16) for further investigation in the form of post-mortem and inquest ...* will enable the testee to find the correct answer which is (b).

The item and the statement in the passage are worded slightly differently. The words used in the passage that read *If the cause of death is uncertain* is transformed into *If death resulted from accident or if violence occurred in suspicious circumstances* in the item.

In addition, the item does not state why the cause of death should be reported and how it should be examined or investigated. The testee will have to make a slight inference from the text to answer b.

1	2	3
MEDICAL CERTIFICATE	DEATH CERTIFICATE	DISPOSAL CERTIFICATE

Item 24: These certificates are put in boxes with a number on them. Indicate which one of the following is the right sequence of obtaining them in terms of priority.

a. 1–2–3 b. 2–1–3 c. 1–3–2 d. 3–2–1

Here the testees are required to show the right order of certificates exactly as stated in the passage. *When someone dies (2) the death and its cause must be certified by a doctor and (3) reported to the registrar. (5) A disposal certificate allowing the body to be buried or cremated (7) will be issued by the registrar. (8) The certificate will not be issued without a medical certificate. (12) A death certificate will also be issued (13) and is needed, for example, (14) to claim life-insurance benefits.*

Most of the previous items in this section with the notable exception of item 2 involve some sort of comparison. This item, however, is related to inferring sequence. Examinees are required to have read the passage carefully. According to the text the right sequence of obtaining certificates starts with medical followed by disposal and lastly by death certificates. Therefore, the correct answer to this item is (c).

Item 25: Which one of the following offices is responsible for issuing a disposal certificate?

a. The office of the coroner

b. The office of the funeral director

c. The office of the parish church

d. The office of the registrar

The item is based on the statement ... *(5) A disposal certificate (6) allowing the body to be buried or cremated (7) will be issued by the registrar.* The reason why it is labeled as implicit is simply because the distractors as well as the correct answer

refer to offices rather than individual positions of authority as indicated in the text above. The correct answer is (d).

The following textually implicit items 2, 3, 5, 13, 14, 16, 19, 20, and 26 are derived from PE01 and analysed as follows.

7.9.2.2 Analysis of TI items on PE01

Item 2: The church service and the general weeping are mostly carried out in one of the following patterns.

a. semi-circular b. triangular c. circular d. rectangular

The correct answer, which is c, can be derived from the following statements in the passage. *(1) When someone dies, a group of priests and deacons (2) are summoned to the house of the deceased (2) during the morning of the funeral day. (3) The group forms a circle around the bed on which the corpse lies (4) and starts the service (5) which is composed of readings and chanting hymns.*

Although idea units 1, 2, 4 and 5 contribute to an understanding of the item, idea unit 3 is the basis on which the item is framed. This is another item dependent on comparison. However. the validators thought that it was so clearly stated (*the group forms a circle round the bed*) that the item should be categorized as textually explicit on any re-application of the test.

Item 3: When is the last general weeping carried out?

a. on the seventh year

b. on the eightieth day

c. on the fortieth day

d. on the first anniversary

The answer to this item is based on the information in the passage. It reads: ... *(85) In the period between the 40^{th} day and 7^{th} year, (86) there are receptions (87) on the 80^{th} day and on the 6^{th} month after the 1^{st} year. (89) On the 7^{th} anniversary, (90) however, most of the relatives gather (91) and indulge in general weeping.*

It can be easily inferred and/or assumed from the above text that the last period of mourning is on the 7^{th} year as no further date is mentioned. The process involved is once again comparison and elimination of responses. Therefore, the correct answer to the item is (a)

Item 5: Which one of the following statements is true of the nettela during the funeral day and sometime afterwards?

a. The nettela is worn in the usual way.

b. The coloured patch of the nettela lies below and the whole nettela turned inside-out.

c. The narrow ends of the nettela are tied around the neck and the opposite end lies over the shoulder.

d. One of the narrow ends of the nettela is tied around the waist and the opposite end brought over the shoulder from the back.

The item is set based on the following: ... *(100) The women wear their nettela in a different way. (101) They tie one of the narrow ends around their waste and bring the opposite end (102) over their shoulder from the back. (103) This makes the coloured patch lie above, and the whole nettela turned inside-out.*

The item requires the testee to combine these pieces of information carefully in order to get the correct answer. Although *nettela* is a non-English word, it poses no problem or confusion for the British or Other Nations as it can easily be inferred from the context in which it is used, that it is a piece of cloth of one kind or another. This

once again involves comparison and elimination of distractors. The answer to this item is (d).

Item 13: Which one of the following is the right order for the funeral procession?

a. clergy—corpse carriers—head mourners—inba-adirk

b. head mourners—clergy—corpse carriers—inba-adirk

c. corpse carriers—clergy—head mourners—inba-adirk

d. inba-adirk—head mourners—clergy—corpse carriers

The item is constructed on the basis of the following information given in the passage. ... *(16) In the funeral procession, the clergy leads the way, (17) followed by men who carry the corpse (18) and then by head-mourners. (19) At the rear of the procession (20) are those who carry pots of drink and food (21) which is referred to as inba-adirk.*

Like item 24 on the Brirish passage this item is related to inferring sequence and the correct answer to it is (a).

Item 14: Which of the following is true of the gibate-meret? It is said

a. after the grave is closed

b. before the grave is closed

c. at the church

d. at the house of the deceased

The text in the passage reads: ... *(31) After the corpse is put into the grave (32) priests say the last prayers gibate-meret. (33) Then the grave diggers start to close the grave.*

This item like the previous one relies on correct sequencing but the idea units

need to be read very carefully and related to each other to see which actions come before the gibate-meret and which after. The correct answer is (b).

Item 16: The funeral rite is made at the house of the deceased once and how many of the remaining rites are carried out on the way to the church?

a. 5 b. 6 c. 3 d. 2

The information given in the text is ... *(6) The funeral rites are divided into seven parts. (7) The first carried out in the house of the deceased (8) and the remainder takes place on the way to the church.* It involves comparing idea units 6, 7, and 8 and subtracting one number from the other. The correct answer is (b).

Item 19: One of the following may be allowed during the period of full mourning.

a. pleasurable recreation

b. eating too much

c. some dancing when the situation demands

d. at times, singing and listening to the radio

The passage reads: ... *(70) The head-mourners stay in full mourning (80) for one year. (81) During this period (82) no songs or any such diversions are allowed in the residence of the bereaved (83) nor may the bereaved indulge in any pleasurable recreations elsewhere (84) till the term of the full mourning has elapsed.*

Since the question is about what is and what is not allowed during the period of full mourning, the testee is expected to depend heavily on the information provided and single out the correct answer by eliminating the rest of the distractors. This process can then be thought of either as eliminating the distractors and selecting what is left, or, looked at another way, comparing the details in the passage to see which is the most likely answer or in certain circumstances the only answer which is

not impossible. The correct answer is (b).

Item 20: On the way back home from the funeral, one of the following is common practice.

a. The alkash sings in a mournful voice.

b. The mourners have to keep silent.

c. The head mourners keep on crying loudly and beat their chests.

d. There is a sigh of relief and a general relaxation.

The answer can be inferred from the sentence given in the passage. ... *(36) On the way back home (37) no weeping occurs.* The answer to this item is (b) and the process involved is the same as for item 19. However, the validators were of the opinion that this particular item was textually explicit and should be categorized as such on any re-application of the test.

Item 26: As a rule, the bereaved, relatives and friends weep and cry loudly and melodiously. One of the following is the right term for it.

a. Individual weeping

b. Group weeping

c. Chorus

d. Choir

This item is based on the following sentences in the passage. *(40) There is individual weeping. (45) The lamenter-poet sings in a peculiar and mournful tune (46) praising the departed (47) by bringing to the memory of the mourners his/her past deeds (48) upon which the female mourners gathered around her (49) beat their chests and cry.*

The testees are required to concentrate on idea units 48 and 49 in order to answer

the item correctly. The correct answer is (b).

7.9.3 Schematically Implicit Questions

This question-answer relation occurs whenever a plausible non-textual response is given to a question derivable from the text. It is thought of as reading beyond the lines. On the question of how scriptal comprehension occurs, Pearson and Johnson (1978:162) say:

> *' Scriptal comprehension occurs when a reader gives an answer that had to come from prior knowledge (it is not there in the text) to a question that is at least related to the text (i.e. there would be no reason to ask the question if the text were not there). It is similar to textually implicit comprehension in that an inference is involved, however, it is different in that the data base for the inference is in the reader's head, not on the page. '*

The main purpose of setting such type of question is to capture, as much as possible, the relationship between information presented in a text and information that has to come from a reader's store of prior knowledge (scripts /schemata).

For the most part, understanding is an automatic non-conscious process. Somehow, when an adult reads a simple story or some event in the world or engages in some social interaction, the superstructure of inferences which support interpretation go unnoticed (Sanford,1985). While this degree of automation is very convenient from an everyday viewpoint, it makes it difficult for investigators to unravel just what is the full range of inferences being made, and just what sort of knowledge is being used at any particular time.

One problem is obviously how to discover the range of knowledge required for the comprehension of various situations. In many ways studies such as those of Schank

and Abelson (1977), Abelson (1975), Rumelhart, (1975),Sanford and Garrod (1981) are the natural history of explorations of inferential mechanisms and of ranges and types of inference. *Natural History* can be distinguished from *Biology* in that while biology is based on a sound theoretical superstructure, natural history consists more of observation and taxonomizing (Sanford, 1985).

From the discussion in chapter five, we have seen that many and varied types of knowledge are drawn upon for understanding. These types of knowledge can be retrieved very rapidly and automatically. This assertion leads to the question of how a processor accesses the right knowledge at the right time with speed and facility.

One solution to the problem is to have knowledge organized into useful packets (schemata), so that the main task becomes one of finding the right packet for the situation at hand. Once the packet is found, most of the work will have been done. Schemata exemplify such knowledge packets. By retrieving an appropriate script many useful inferences are already made and relevant props, characters and relationships between things are readily available.

Background knowledge is not only used in the comprehension of texts. In fact, bringing in the right knowledge is equally important for visual perception and for thinking and problem solving (see chapter five). Therefore, people use their knowledge to make certain assumptions and interpretations during the time of initial learning. This is called the *constructive hypothesis* (Bransford, Barclay, Franks, 1972). From this perspective comprehension involves the construction of meanings and inferences that may differ from the original message.

In contrast, the *reconstructive hypothesis* or *rationalization* (Bartlett, 1932) assumes that remembering is not simply the retrieval of previously stored constructions. People remember only the general idea of what was presented and then reconstruct the details according to their expectations of what must have been true. Various gaps

should be filled in by the comprehender. Gaps are of course greatest when the writer assumes the reader has the same schemata.

Taking the foregoing discussion into account eighteen schematically implicit items, equally divided into PE01 and PB02 were set for the present investigation. It should be noted, at this point, that inferential comprehension may be manifested by textually implicit as well as by schematically implicit question-answer relations. As such, it becomes difficult, if not impossible, to draw a watertight distinction between the two. For instance, what is implicit knowledge for one reader might be background knowledge for another. As it stands this complex phenomenon should await further research (Hill, Sanford, personal communication).

However, for the present investigation an attempt has been made to categorize the question types in such a way as to avoid as much as possible any overlap of one type upon another.

Schematically implicit items are demonstrated by the examinee when s/he uses a synthesis of the literal content of a selection, his/her personal knowledge, intuition and imagination as a basis for conjectures or hypotheses. (cf. Barrett, 1976)

Conjectures or hypotheses can be either convergent or divergent depending on the task and the reading materials involved. For example, (cf. Pearson and Johnson, 1978) inferential tasks related to narrative selections may permit more divergent or creative conjectures because of the open-ended possibilities provided by such writing. On the other hand, expository selections, because of their content, call for convergent hypotheses more often than not. These types of items, then, are elicited by purposes for reading and by teacher's questions which demand existing knowledge coupled with thinking and imagination which are stimulated by, but go beyond, the printed page.

A few example of the characteristics of schematically implicit items which are mainly applicable for the present study are stated below.

a. Relating Stereotyped Knowledge with Text

The examinee is required to make the best use of clues provided in the text and relate them to his knowledge of the subject in question.

b. Gap-filling Task or Retrieval of Knowledge

Here the examinee is required to answer questions by default.

c. Finding the Main idea and Predicting Outcomes

Here the examinee is required to provide the main idea, general significance, theme, or moral which is not stated in the passage and also to conjecture about the outcome of the selection on the basis of his understanding the selection.

d. Evaluation or Making Judgements

This is demonstrated when the examinee makes judgements about the content of the passage by comparing it with external criteria (e.g. authorities on the subject,or written sources on the subject) or with internal criteria (e.g. the reader's experiences, knowledge or values related to the subject under consideration).

e. Inferring Figurative Language

The examinee is required to infer literal meanings from the examiner's figurative use of language.

In general, this type of item explores the examinee's ability to analyse a written passage from several perspectives as indicated above, including the ability to recognize both explicitly stated elements or arguments in the passage as well as the implications of those statements or arguments if any.

In schematically implicit items the problem of passage-dependency is apparent. There is every reason to believe that some SI items may be answered without reference to the passage. Related research has indicated that quite a few items can be answered

on reading comprehension tests without access to the passage on which the questions are based (cf. Christensen and Stordahl, 1955, Eurich, 1931, Tuinman, 1970, 1972, Farr and Smith, 1970).

Since SI items are basically prior knowledge questions, their passage dependency in this study has been established in the following way.

In two rounds of pilot study the items were administered without the associated passage (*Passage-out Condition*) to a control group and with the passage to the experimental or main group (*Passage-in Condition*) (see 7.5, 7.5.1, 7.6, and 7.6.1)

It may be pointed out that the term passage-dependency refers to the probability that an item is correctly answered when no passage is available. This proportion correct is a negative index. The higher it is, the less getting the item right depends on reading the passage. The phrase highly passage-dependent, therefore, indicates a low proportion of correct answers under the *Passage-out Condition.*

A Post-hoc comparison between the testees under passage-out and passage-in conditions was made. It was found that the testees in the passage-in condition performed better than those in the passage-out condition on most of the SI items. Thus, reading the passage has enhanced comprehension (Sanford, personal communication). (see Appendix D18)

It should also be stressed that it is extremely difficult to construct highly passage-dependent items (items which cannot be answered without reading the passages) even if the passages contain highly imaginary materials (Tuinman, 1970).

However, Pearson and Johnson (1978:211) say:

' We would never want to see where the items were not dependent to some degree on prior knowedge. In fact, our view of comprehension as a process of building bridges between the new and the

known commits us to value test items that require such integration. In short, for us, literal comprehension of the passage is not enough. Just because an item requires that the reader integrates textual information with prior knowledge, does not mean that it is not dependent. '

Everything else being equal, the test with the most items with the highest degree of passage dependency offers the largest guarantee against invalidity due to responding to items without prior reading of the passage on which the item is based. Nevertheless, a caution (Tuinman, 1972-73) is necessary: Passage dependency may be purchased at the price of other benefits. For instance, Weaver, Bickley and Ford (1969) demonstrated that inference items were more passage dependent than literal, factual items. Passage-independence may be more a function of prior factual knowledge than of our ability to generate inferences from the text to our prior knowledge base (our schemata/scripts).

In addition to considering passage-dependency, the content validity of the items under consideration is of paramount importance. Hence, the following section deals with analysis of SI items used for the present study.

7.9.3.1 Analysis of SI Items on PB02

Items 1, 4, 5, 14, 19, 20, 21, 23, and 26 are SI items set for comprehension on the British culture-specific passage (PB02).

Item 1 In this modern age, the masters of death, of the moment and of the circumstances of death are:

a. doctors and the hospital team

b. cigarettes and alcohol

c. church and the clergy

d. scientists and researchers

One's own views or opinions may sometimes conflict with the view expressed or with the information provided in the passage. This item requires one to select between alternative possible interpretations of the incoming data based on the general significance of the passage.

The clues provided in the passage (idea units 75-102) accompanied by stereotyped situations like the importance of the medical certificate and the death certificate, the modification of funeral rites, the avoidance of an outward manifestation of death, the little recognition paid by friends, neighbours and children to the fact that death has occurred etc., contribute to an understanding of the statement at the head of the question. Needless to say, the passage includes so many references to medical matters and so little to the spiritual and emotional support that are available in the British context at the time of death. The item is one of inferring the main idea by predicting outcomes based on the information given in the passage. The correct answer to this item is (a).

Item 4 Which one of the following reasons is most plausible for the statement, *Nowadays one no longer dies in the bosom of one's family.*

a. job opportunities across nations

b. the dominance of science and technology

c. abundance of hospitals

d. the inconvenience death causes at home

This item refers to an understanding of less stereotyped situations which lends itself to routine problem-solving application of some pre-formed set of events, procedures or values (Sanford, 1985). An application of script/schema to aid interpretation is a routine problem-solving method, in that many of the problems of interpreting

events or values can be solved by selecting the right script: in this instance obviously 'a death script'.

The item also refers to Barrett's (1976) notion of 'Judgement of Appropriateness', where a task of this type requires the examinee to determine whether certain selections or parts of selections are relevant and contribute to resolving an issue or a problem. Tasks of this nature call for opinions based on the values the examinee has acquired through personal experience also. Carrell (1984) calls this type of task 'Making Correct Prediction 'based on background knowledge.

The clues scattered in the two paragraphs starting at 79 and ending at 103, indicate that the family tries to avoid being involved in the pain and emotional disturbance of death. It is part of the background knowledge of many British readers that most death occur in hospitals but that the hospitals themselves very often find it difficult to cope with the terminally ill and so distractor c (seemingly a plausible answer) can be eliminated. a and b are not connected in any way to the situation given in the item nor can they be implied from the text.

There is often a fine balance between the part played by prior knowledge and the part played by clues in the text. Nevertheless, sufficient recourse has to be made by the reader to his/her prior knowledge to include it in the set of valid SI items. Thus, the correct answer to this item is (d). However, when the question was submitted to the validators, they pointed out that it was not clear whether the quotation which forms part of the question was lifted from the passage or not and also had difficulty in understanding what was meant by distractor (a) and distractor (c) could be considered as a possible alternative answer.

Item 5. Depending upon the circumstances of death, normally the funeral takes place within one of the following days

a. 1-3 days b. 2-5 days c. 3-7 days d. 4-9 days

Here, it should be noted that many stereotyped episodes have boundaries of time and space (Anderson, Garrod and Sanford, 1981).

The examinee is required to point out the normal (as indicated in the item) stereotyped time range for a funeral to be carried out. Distractors a-d can all be plausible answers. However, since a piece of temporal information about a funeral to take place is given in the passage, a recourse to the passage is essential. Idea units 1-5 read: ... *the death and its cause must be reported to the registrar within 5 days.*

The clue *within five days* acts as a characteristic feature (Sanford, 1985) of the situation and as a representative feature of the normal time period over which the funeral can be expected to run. Hence, *within five days* sets a time limit (maximum five days) for obtaining the necessary certificates in order to carry out the funeral service. The correct response to this item is (b).

Item 14 Which one of the following is not true of embalming?

a. It is an indispensable part of funeral ceremony.

b. It can be carried out any time before the procession starts.

c. It can be carried out at the end of the funeral procession.

d. It is essentially done for cosmetic purposes.

This item rests on a situation-specific (Sanford and Garrod, 1981) memory structure. Here the examinee is required to answer the question by default based on the statement given in the passage.

... *(15) If the cause of death is uncertain, the fact must be reported to the coroner*

for further investigation (17) in the form of post-mortem (autopsy) and inquest.

A stereotyped memory structure for post-mortem triggers the use of chemicals for preserving the body. Preservation of the body from decaying again triggers the notion of embalming.

The examinee is required to use his script for 'embalming'. Readers often use an appropriate script whenever they confront text (or any other linguistic or sensory stimulus) containing concepts (or associates of concepts) which are part of that script.

The item is designed to test the examinee's knowledge of what is and what is not true of embalming. In order to answer this item the examinee ought to have general as well as specific information about embalming (an appropriate schema anticipated by the item-writer).

Embalming, as is commonly known, can be carried out either before and or after funeral procession. It is carried out essentially on the choice of the relatives of the deceased. Therefore, if embalming is a matter of choice, its indispensability as part of the funeral ceremony is out of the question. The best answer is (a) though some native speakers have suggested that c is a possible alternative as embalming at this stage is rare.

Item 19 Which one of the following is true of funeral services. They are

a. held at any time of the day.

b. usually held in the mornings.

c. held at a particular/specific time.

d. preferably held on Sundays.

Prior knowledge is only a partial guide to this item as some members of the culture will have experienced a, b, or c in their limited experience of funeral services.

It requires confirmation of one of these possible choices in slightly different wording to establish the correct answer which is (a).

Item 20 Despite the efforts of cemetery offices,

a. people rarely visit the urns today.

b. people are not grateful to cemetery offices.

c. people want to abolish cemetery offices.

d. people want to avoid visiting gravesides.

This item is related to inferring comparison based on an integration of scriptal data and an inference from textual data (Barrett, 1976). Analogies and comparison help build bridges between what the reader knows about two associated concepts (cemetery and crematorium in this instance) to understand a text (Carrell, 1984).

It is also related to one of Barrett's background knowledge question types– Evaluation. Here, evaluation is demonstrated by the examinee when he makes judgements about the content of a reading selection by comparing it with external criteria (e.g. information provided by the writer on the subject, authorities on the subject etc) or with internal criteria (e.g. the reader's experience, knowledge or values related to the subject under consideration).

This item can be answered by reading the following statements mentioned in the text as well as using one's own background knowledge of the topic in question:

... (57) Although burials are still common (58) there are a far greater number of cremations. (59) Land for burial is rapidly running out (60) and it is expected within twenty five years burial will be a thing of the past. (99) Cremation has become the dominant manner of burial. (100) The deep motivation (101) is that it is the most radical means of getting rid of the body (102) or forgetting it and nullifying it. (103)

Cremation excludes a pilgrimage to the graveside.

It can be seen from the above statements that cremation is preferred to burial. It is nowhere stated (implied or direct) in the passage that people are either ungrateful to cemetery offices or want to abolish them as shown in distractors b and c. Distractor a does not happen as urns are not to be visited but may be kept in the house. Thus, the correct answer to this item is (d).

Item 21 Which one of the following statements is false.

a. Embalming is not carried out until the registrar's certificate has been issued.

b. The executor or relative arranging funeral should tell the undertaker if they specifically object to embalming.

c. Embalming obscures the cause of death.

d. A body can be preserved essentially for cosmetic purposes.

This item about embalming is set with the intention of activating the background knowledge of the examinee. Although embalming is not mentioned in the passage, preserving the body from decay or smelling is a cultural background knowledge within the British context. As mentioned in the passage, the cause of death should be reported to the appropriate authority. Different certificates should be obtained before the body is disposed of etc. This situation-specific knowledge calls for a retrieval of different knowledge to fill-in the gap that is missing. In this instance, the gap is filled in by a knowledge of embalming (preservation of the body from decay).

The item requires the examinee to have had a complete knowledge (cultural) as to when embalming is carried out, who is involved/concerned in carrying it out, what it does to the body etc. Statements in a, b and c are true statements regarding the practice of embalming except d which is not necessarily true of embalming. Therefore, the answer should be (d).

Item 23 While the corpse is lowered to the ground, one of the following sprinkles earth on it.

a. the undertaker b. the priest c. the immediate relative

d. the grave diggers or bearers

The item requires the examinee to relate textual input to previous knowledge. The textual input is given in the passage. *(49) A simple service of prayers (50) about five minutes, (51) will be held at the graveside (52) before the coffin is lowered into it. (53) The grave will not be filled in until the relatives are on their way home.*

It can be predicted from the statements above that it is only the priest (b) and not others (a, c and d) who is in charge of the burial. One of his duties is to give a lead to the grave diggers to fill the ground by sprinkling earth on to it.

Item 26 One of the following is associated with cassock, surplice and stole.

a. the church b. the chapel of rest c. the cemetery

d. the crematorium

This is an item whose correct answer can only be retrieved by reading the passage. This is referred to as a gap-filling task. Under the passage-out condition 10% of the British answered this item correctly. However, 76% of the main/experimental group answered the item correctly under passage-in condition. (see Appendix D18) From this it can be concluded that where the examinees did not have that knowledge because there are gaps, the gaps will be filled in more easily when they read the passage.

Cassock, surplice and stole are formal attire put on by priests while carrying out church or funeral services. Thus, the answer is (a).

7.9.3.2 Analysis of SI Items on PE01

The SI items used for comprehension on the Ethiopian passage were 4, 6, 8, 17, 18 21, 22, 25, and 27 and are described below.

Item 4 As custom has it, how many receptions are held in memory of the deceased?

a. Five b. Seven c. Three d. Nine

The exact number of receptions held in memory of the deceased is unstated but implied. Here, the examinee is required to proceed by mapping the things mentioned in the passage into a complete understanding.

Reception (Teskar) is mentioned in two different paragraphs (Para 15 and 17). Paragraph 15 reads ... *(73) A large reception is given to close relatives and guests on the fortieth day.* Paragraph 17 further reiterates ... *(85) In the period between the fortieth day and the seventh year, there are receptions (87) on the eightieth day, (88) on the sixth month and after the first year. (89) On the seventh anniversary, however, most of the relatives gather (91) and indulge in general weeping.*

Prior notion of teskar (reception) helps the reader to understand that a reception is also held on the seventh anniversary which is not stated in the text. It might also help the reader to disregard the size of the reception whether it is large or small. The reader with the appropriate script for teskar would include the large reception held on the fortieth day along with other normal receptions held on the 80^{th} day, 6^{th} month, 1^{st} year and the 7^{th} year. The correct answer to this item is (a).

Item 6 One of the following is not a common practice of mourners.

a. sleeping on the floor

b. brushing cheeks with a coarse material

c. beating the uncovered chests

d. putting aside shoes and earrings

All of the above statements (a-d) are practices of mourners. They are stated in different paragraphs of the passage starting from idea unit 56 to 61 where it is discussed that beating chests and brushing cheeks with coarse material are manifestations of outward mourning. In addition, the practices of sleeping on the floor, going without shoes, putting aside earrings, cutting the hair short or shaving it etc. are mentioned starting from idea unit 92 through 99.

The examinee is required to be sensitive to clues that will help him answer the one that most accurately and most completely answers the question being posed, all other things being equal.

Here the words, *in extreme cases*, stated in idea unit 59 will help the examinee identify which of the practices of mourners is least common or perhaps even undesirable. The words *in extreme cases* describe the practice of brushing cheeks with a coarse material, thereby making it stand out to be at odds with the rest of the practices. Therefore, the most correct answer to this item is (b).

Item 8 The head mourner(s) may not be one of the following

a. the son(s) and/or daughter(s) of the deceased

b. the husband and/or wife of the deceased

c. the brother(s) and/or sister(s) of the deceased

d. the father or mother of the deceased

Cultural and linguistic knowledge are essential to answer this item correctly. Here, it should be noted that understanding relies on mapping data such as sensory information, the perception of events, fragments of discourse etc. on the appropriate information in memory. The appropriate information acts as an interpreter of the

input. The schema solution to this question is to have the right data structures (a or b or c or d) which depend upon how the appropriate information (the head-mourners(s)) is normally used (Sanford, 1985).

Head mourner(s) could be the son(s), or the daughter(s), or the brother(s), or the sister(s) or the husband or the wife or the father or the mother of the deceased.

Let us be more specific. For instance, if the deceased is the father then the head-mourners are his child(ren), his wife, his brother(s) and sister(s),and his parents.

Since the item is put in a hypothetical situation any of those mentioned from a to c can be correct answers. However, d does not stand in agreement with the rest of the choices. This is simply because the deceased is not specifically mentioned in the question. As it stands, d is an 'either or' question, which necessarily implies that the head mourner is always either the mother or the father and the deceased is the son or the daughter and nobody else in the family. Therefore, the correct answer to this item should be (d).

Item 17 One of the following is a usual practice as far as custom is concerned.

a. Teskar is carried out on three occasions: the fortieth day, first anniversary and the seventh year.

b. Teskar is carried out on four occasions: on the third day, on the seventh day, on the twelfth day and the thirtieth day.

c. Teskar is carried out on two important occasions: on the fortieth and eightieth days.

d. Teskar is carried out only once: on the fortieth day.

The examinee is required to make his own judgement in order to select the most plausible response to the item by comparing each alternative response with external

criteria (e.g. referring to sources mentioned in the passage) or with external criteria (e.g. background knowledge).

It should be noted that an application of the script to aid interpretation is a routine problem-solving method, in that many of the problems of interpreting events can be solved simply by selecting the right script. However, for the interpretation of events or descriptions for which there is no script, or similar schema structure, other methods or ways would have to be employed. For instance, the British and Other Nations do not have a 'script' or any other substantial knowledge structure for 'Teskar', and yet understanding occurs. The word 'reception' can be triggered based on the temporal information provided in the alternative responses of the item.

In order to answer this item correctly, recourse should be made to the passage in order to find out the total number of receptions held in memory of the deceased and the appropriate timings on which they are held.

The information given in the responses (a-d) is incomplete. However, in relative terms, one response is more complete than others. The testee is expected to select the response which is most nearly complete.

It can be inferred from the passage or retrieved from memory that there are five receptions. Based on this true statement, b can be eliminated on the ground that the dates on which receptions are held fail to comply with the stated facts in the text. c and d should also be eliminated since (a) carries most of the information which qualifies it as the most plausible answer to this item.

Item 18 On the third day, friends and neighbours make intensive weeping. This is, as it is believed, because of one of the following reasons.

a. The eyes of the deceased disintegrate on the third day.

b. It is on the third day that a place is allocated to the deceased in heaven.

c. The soul of the deceased appears before the angels on the third day.

d. It is on the third day that one comes to know one's right place: hell or heaven.

In idea units 62-65 it is mentioned that on the third day mourners make intensive weeping before they move to a modest room for another nine days. These statements being highly culture-specific, the examinee is required to fill-in the gap from his/her memory the main reason why mourners make intensive weeping particularly on the third day.

It is assumed that a problem-solving schema in the form of culture-specific questions about the goal would enable the readers to apply their knowledge of problem-solving to the content of the text based on whetever resources they have in store (even in long term memory) in the process of making sense of the text (Sanford, 1985).

Although distractors b, c and d have close relationships with the problem posed by the item (i.e. the conventional knowledge that people have about hell and heaven ...) they can be eliminated on the ground that each statement is no cause for intensive weeping. That is, allocation of places in heaven, appearing before the angels or knowing one's right place (either in heaven or hell) cannot, by any stretch of imagination, cause any distinct grief to mourners. Of course, the justifiable causes for mourning are themselves somewhat culture-specific. The answer, therefore, to the item is (a).

Item 21 The grave is usually dug in —

a. a north-east direction

b. a south-west direction

c. an east-west direction

d. a south-east direction

Statements about grave-specification have been given in the passage ... *(25) the*

corpse is deposited on the ground by the northern gate if the deceased is a man, (28) by the southern gate if a woman (29) and if a member of the clergy by the eastern gate.

Based on this information, it is anticipated that the reader will retrieve a schema from memory which can then be used to fill out the details that are missing in order to answer the item correctly. After all, understanding of something (grave-digging or grave-specification in this instance) may mean being able to draw out all of the details or implications of that something (Sanford, 1985). The correct answer to this question is (c).

Item 22 When the mourners just reach the home of the bereaved from church, they

a. break afresh into weeping.

b. are served with nifro.

c. are met by someone with water to wash their hands.

d. are given seats and served with coffee.

The examinee is required to make use of textual cues in one part of the text to distinguish the most appropriate from slightly less appropriate multiple-choice possibilities in another part of the text. This requirement is met by appropriate background knowledge.

Responses b, c, and d can all be answers to the question posed, because all of them happen when the mourners reach the home of the bereaved from church. However, the most conspicuous practice is serving the mourners with nifro. Therefore, the answer is (b).

Item 25 One of the following is what the bereaved do on the day of the funeral. They tie threads around their necks which are coloured

a. black. b. white. c. yellow. d. blue.

It is stated in the passage that there are lots of formal practices exercised by mourners right from the funeral day to the end of the mourning period. For instance, *(58) beating chests (41) crying loud, (73) giving receptions, (92) sleeping on the floor, (94) putting away earrings, (100) wearing the nettela in a different way* etc., will enable the examinee to fill-in what is not directly expressed. This is so because schemata enable events to be inferred which may have been omitted from a text.

One essential practice that is omitted from being mentioned in the passage is the usual practice of mourners to wear white threads around their necks, which makes (b) the correct answer.

Item 27 The alkash is paid according to how well she has done her job 'Well' refers to one of the following.

a. how far she makes mourners weep more

b. how far she swings in the funeral dance

c. how far she praises the departed

d. how far her poems and the tune are coherent and mournful respectively

The examinee, in this instance, is asked to infer a literal meaning from the item-writer's figurative use of language. Recognizing the literal meaning of a figurative statement is an inferential skill.

Here, the interpretation of 'job well done' depends upon the role themes (Schank and Abelson, 1972) associated with alkash (a lamenter-poet). Schank and Abelson (1977) argue that scripts are organized by even higher level structures, which they term themes: namely, role themes, interpersonal themes, and life themes. For the present question at issue, only role themes will be considered. Role themes are con-

strued as bundles of knowledge associated with a role name, the knowledge consists of representations enabling recognition that the role is to be played, and scripts which enable the role to be played. (cf. Sanford, 1985).

One makes the strong inference that the alkash acts in order to make the mourners weep profusely, as it is indicated in the passage in a round about way, is consistent with interpretation of the action with the expectations of an alkash's normal modus operandi.

Given this, the role theme is defined in terms of goals. Here the goal is to make mourners weep more than might be normally expected – a service she renders the bereaved in return for the money she is paid. The correct answer to this item is (a).

Summary

Although the interpretation of individual specification is often open to doubt (Criper and Davies, 1988), the comprehension skills identified for each question type are shown below.

1. Understanding explicitly stated information.

PB02TE = 7, 8, 9, 10, 12, 13, 16, 17, and 27.

PE01TE = 1, 7, 9, 10, 11, 12, 15, 23, and 24.

2. Understanding information in the text, not explicitly stated.

a. Understanding relations within sentences

PB02TI = 2

b. Comparing stated with unstated information (elimination of alternatives)

PB02TI = 3, 6, 11, 15, 18

PE01TI = 2, 3, 5, 16, 19, 20

c. Understanding transformed statements/distractors

PB02TI = 22, 25

PE01TI = 26

d. Inferring sequence

PB02TI = 24

PE01TI = 13, 14

3. Interpreting text by going outside it.

a. Inferring main idea and predicting outcomes

PB02SI = 1, 4

b. Gap-filling task (Retrieval of knowledge)

PB02SI = 14, 21, 26

PE01SI = 18, 21, 25

c. Making Judgements (Evaluation)

PB02SI = 20

PE01SI = 17

d. Relating stereotyped knowledge with text

PB02SI = 5, 19, 23

PE01SI = 4, 6, 8, 22

D. Inferring figurative language

PE01SI = 27

As stated in Chapters One and Nine, one ought to be aware of the fact that there

is a considerable debate as to whether SI questions exist and if so what proportion of the answers are to be found entirely in the passage and what proportion related to background knowledge. Even the authorities in the field take slightly different positions on this issue. In the light of this debate, it is necessary to be cautious when interpreting the present results.

Nonetheless, it is possible to draw some tentative conclusions about this area, conclusions which may, of course, be questioned if the theoretical issues are resolved in one direction rather than another.

Furthermore, it should be noted that the native speakers found that few items have been wrongly categorized (see 7.8). However, if this investigation were ever to be replicated the items will be moved further from such danger of overlap.

Lastly, some items were couched in negative rather than positive terms. This procedure made these items unnecessarily complex for the testees and care will be taken if there is any replication of this research in the future to frame all such questions in positive terms.

Careful considerations must be taken in the construction of a test (see section 7.3). What is required now is a knowledge of how far those objectives have been achieved by a particular test. The results obtained from objective tests can be used to provide valuable information concerning:

(a) the performance of the testees as a group

(b) the performance of each of the items comprising the test.

This information is gained through the use of item analysis as explained and demonstrated below.

7.10 Item Analysis

A standard item analysis was carried out of the 54 test items used for the present investigation, giving facility values and discrimination indices for each item, for the whole population, and for each of the three sub-groups (British, Ethiopians and Other Nations) separately.

All items should be examined from the point of view of (1) their difficulty level and (2) their level of discrimination (Heaton, 1975:172). It is essential, at this juncture, to give a brief description about item analysis in general and the two basic statistics for an item in particular.

Item analysis is the procedure by which individual item performance by a group of testees is compared to their performance on the total test (Tuckman, 1975:271). It is used for item selection decisions and for revising items which lack appropriate discrimination power. Item analysis is an important and necessary step in the preparation of good multiple choice tests. (cf. Mehrens, 1976, Oller, 1979, Heaton, 1975). In this case, there was no time to apply item analysis as a procedure before administering the tests but rather it was used as a check afterwards.

Sensible item analysis involves the careful subjective interpretation of some objective facts about the way examinees perform on multiple choice items. In so far as all tests involve determinate and quantifiable choices (i.e. correct and incorrect responses, or subjectively determined better and worse responses), item analysis at base is a very general procedure (Oller, 1979:245).

There are two basic statistics for an item: Facility Value and Discrimination Index. The facility value (F) gives an indication of the ease or difficulty of an item and is most simply expressed as the proportion of the candidates who selected the correct responses to the item. Values of F range from 0% (extremely difficult) to 100% (extremely easy). The procedure of expressing F is shown below.

F= the number of testees who answered the item correctly divided by the total number of testees.

i.e. $F.V = \frac{R}{N}$ where $R = n^o$ of correct answers and $N = n^o$ of testees.

How is F interpreted? An item that is too easy (e.g. an item that every student answers correctly) or too difficult (e.g. an item that every student answers incorrectly) can tell us nothing about the differences in ability within the test population. (Oller, 1979:246, Hudson, 1973:151). Therefore, it may be of no avail to include test items that every testee answers correctly or that every testee answers incorrectly.

Based on the formula shown above, the facility values have to fall between zero and one or between 0% and 100%. As Oller (1979:247) puts it:

> *'It is not possible for more than 100% of the examinees to answer an item correctly nor for less than 0% to fail to answer the item correctly. The worst any group can do on an item is for all of them to answer it incorrectly (F=.00=0%). The best they can do is for all of them to answer it correctly (F=1.00=100%). '*

Since an item that every one answers correctly or incorrectly tells us nothing about the variance among the testees on whatever the test measures, items falling somewhere between 0.15 and 0.85 are usually preferred (Oller, 1979:247). Heaton (1975:173) says that many test constructions may be prepared in practice to accept items with facility values between 0.30 and 0.70. On the same issue, Vallette (1967) asserts that teacher made tests should range from 30%–90%.

It should be noted that the most desirable F values are those falling towards the middle of the range of possible values. For instance, items with F values of 50% permit the highest discrimination indices to be obtained, since it is theoretically possible for all in the high group to respond correctly whilst all in the low group

respond incorrectly (Hudson, 1973:152).

On the other hand, Heaton (1975:173) maintains that an easy item will discriminate amongst a group of below average students, i.e., one student with a low standard may show himself to be better than another student with a low standard by being given the opportunity to show his performance on an easy item. By the same token, a very difficult item, though failing to discriminate among most students will certainly separate the good student from the very good student.

Heaton argues further:

> *'A further argument for including items covering a range of difficulty levels is that provided by motivation. While the inclusion of difficult items may be necessary in order to motivate the good student, the inclusion of easy items will encourage and motivate the poor student. In any case, a few easy items can provide a "lead-in" for the student - a device which may be necessary if the test is at all new or unfamiliar or if there are certain tensions surrounding the test situation '* (1973:173).

For item evaluation, another statistic is also required: Discrimination Index. The discrimination index (D) of an item indicates the effectiveness of the item in distinguishing between the more and the less able examinees.

Oller (1979:247) says:

> *'The fundamental issue in all testing and measurement is to discriminate between larger and smaller quantities of something, better and worse performances, success and failure, more or less of whatever one wants to test or measure. What is required is an index of the validity of each item in relation to some measure of*

whatever the item is supposed to be a measure of. The index of discrimination (D) tells us whether those examinees who performed well on the whole test tended to do well or badly on each item in the test. '

Now let us consider how an item discrimination index could be computed. Item discriminability is computed using the following procedure. (see Heaton, 1975:174, Oller 1979:250-252, Hudson 1973:154)

1. Arrange the scripts in rank order of total score and take 27.5% from the top (high scorers) and 27.5% from the bottom (low scorers).

2. Count the number of those testees in the upper group answering the item correctly; then count the number of the lower group testees answering the item correctly.

3. Subtract the number of correct answers in the lower group from the number of correct answers in the upper group.

4. Divide the difference by the total number of testees in one group.

Thus, D= the number of high scorers who answered the item correctly minus the number of low scorers who answered the item correctly, divided by 27.5% of the total number of the testees.

By logic, it is assumed that high scorers should tend to get an item right more often than those who are not. However, it would be a disturbing state of affair if we found an item that high scorers tended to miss more frequently than low scorers. Thus, for each item we count the number of testees in the high scorer group who answered it correctly and compare this with the number of persons in the low scorer group who answered it correctly. What is required here is an index of the degree to which each item tends to differentiate high and low scorers the same as the total score

does, i.e. an estimate of the correlation between the item scores and the total score (Oller, 1979:251, Heaton, 1975, Hudson, 1973, Valette, 1967 among others).

Flanagan (as in Oller 1979) showed that this method provides an optimum estimate of the correlation between the item in question and the total test.

D can vary from +1 to -1. That is, if all those in the high ability group correctly answer a particular item whilst all in the low group select an incorrect response, then that item is highly discriminating and is said to have a D value of +1. Conversely, if all the testees in the low ability group select the correct answer, while all in the high group select an incorrect response, then the item is said to have a D value of -1. If an equal proportion of testees in each group answers the item correctly, then the item is not discriminating at all and its D value is zero.

From the foregoing discussion, it should be noted that high positive D values are desirable, whereas low or negative values are undesirable. In other words, the higher the D value of an item, the more effective it will be in a test in differentiating between the better and the less able testees. It should be pointed out, however, that very high D values can be troublesome (Hill, personal communication).

Oller (1979:254) maintains that the item on a test should be correlated with the test as a whole. The stronger the correlation, the more reliable the test, and to the extent that the test as a whole is valid, the stronger the correlation of items with total, the more valid the item must be.

In general, values of D of 0.2 (Hudson, 1973:151) or of 0.25 (Oller, 1979:252) or 0.10–0.15 (Valette, 1967:43) are normally acceptable. Heaton (1975:177) states that items with D value of less than 0.30 will not contribute effectively to the discrimination of the test as whole and are of doubtful use.

However, item analysis data should not be interpreted solely in terms of rigidly

stated statistical criteria and sound educational reasons may override statistical considerations in certain circumstances (Hudson, 1973, Tuckman, 1975, Carroll, 1985). To this effect, Hudson (1973:151) confirms that to ensure the validity of a particular test it may be necessary to include a small number of items which assess the abilities differing substantially from those assessed by the majority of items in the test. In such a situation these few items would be likely to have lower D values than the majority, since the D value normally reflects the degree to which each item measures what the test as a whole measures. To omit these items simply on account of their lower D values would impair the validity of the test. Hudson further states that no matter how an item analysis has been worked out, it needs to be interpreted with caution. It must be recognized that the data relating to a particular item depends on other factors as well as on the quality of that item.

For the present investigation, a total of 54 items were set and 90 subjects (30 British, 30 Ethiopians and 30 Other Nations) were tested. The selection of candidates for inclusion in the high and low ability groups for purposes of item analysis is usually made by considering their performance on the tests as a whole. Then the testees were placed in rank order (see Appendix D16) and the top 27.5% (25 for 90 cases, and 8 for 30 cases) were taken as high-ability group and the bottom 27.5% as the low ability group.

Based on this classification, a standard item analysis was carried out showing Facility Values and Discrimination Indices for each item, for each of the three sub-groups (British, Ethiopians and Other Nations) separately and for the whole population as shown in Appendix D8, D9 and D10 and the summary of item analysis (see Appendix D11 and D12) is reported in Chapter Eight.

CHAPTER EIGHT

ANALYSIS OF DATA

8.0 Introduction

The methodology employed in this research has been discussed in the previous chapter. The interpretations and the findings of the study are given in the next chapter. This chapter has two sections. The first section is concerned with the treatment of the data and data analysis procedure, preceded by the purpose of the study. The second presents the subjects under investigation, the results of the familiarity test, the summary of the item and distractor analysis, the reliability of the tests, the results of the main test followed by extraneous variables and the relationship of prior knowledge tests to reading comprehension.

8.1 The Purpose of the Study

The purpose of the study as discussed in the preceding chapter, is to examine the effects of prior knowledge in the form of cultural schemata on the comprehension of culture-specific texts by second language readers as well as native speakers of English. The study being binary, tries to find out differences in comprehension between two cultural groups, namely, Ethiopians and British on two culture-specific passages, deliberately designed for the two groups involved in the study. However, it was felt necessary to include a third group, equal in number, drawn from various countries, where English is either a foreign or a second language for the purpose of reinforcing and/or reconfirming the results which will be obtained from the study in question.

The treatment of the data for the present study and the data analysis procedures followed are discussed in the following two consecutive sub-sections.

8.1.1 Treatment of the Data

Measurement is a universally accepted process of description assigning quantitative values to the properties of objects and events, the ultimate purpose being to develop generalizations that may be used to explain phenomena and to predict future occurrences.

However, the distinction between different scales of measurement is important since particular statistical techniques can only be applied to data measured on a particular scale. For example, measurement on a ratio scale consists of allocating a number to an individual to indicate its precise position along a continuous scale with a true zero. (cf. Erickson & Nosanchuk, 1985).

Since the data for this research are interval scale data, the use of parametric tests (General Linear Models) is possible. Secondly, parametric tests assume that the population from which the sample is drawn is normally distributed or that the sample distribution is normally distributed because the sample size is large enough for the law of large numbers to apply. In this case the sample size is not large. So the sample data was tested for normalcy. The two criteria used to find out whether the data are normally distributed are skewness and Kurtosis. A normal distribution has a skewness and a corrected Kurtosis of 0. (Best, 1982)

For the present data which consist of 90 cases (Eth=30, Br = 30, Oth = 30), the observed values (at .05 significant level) are < 0.409 amd < 0.77 for skewness and Kurtosis respectively. Since both values for skewness and Kurtosis are not significantly greater than 0, it can be considered that the data do not differ significantly from a normal distribution.

The following table shows the observed values for skewness and Kurtosis based on the mean and variance of the following main explanatory variables used in this study.

Table 8.1 Observed Values for Skewness and Kurtosis

Variable	Mean	Variance	Skewness	Kurtosis
PB02	12.98	13.39	0.369	0.115
PB02TE	5.97	2.98	0.364	0.448
PB02TI	4.08	2.86	0.510	0.545
PB02SI	2.93	1.88	0.096	0.456
PE01	13.20	14.45	0.116	0.943
PE01TE	5.37	3.22	0.201	0.483
PE01TI	5.14	3.23	0.103	0.449
PE01SI	2.69	2.78	0.510	0.290

Key to Abbreviations

PB02 = Passage for British # 2

PB02TE = Textually Explicit items

PB02TI = Textually Implicit items

PB02SI = Schematically Implicit items

PE01 = Passage for Ethiopians # 1

PE01TE = Textually explicit items

PE01TI = Textually implicit items

PE01SI = Schematically Implicit items

Further, since the data treatment is parametric, appropriate tests like the t-test, one-way and two-way analysis of variance (ANOVA) were used. Non-parametric tests are also used, for example, the Mann-Whitney U-test, to check the consistency of the results shown in the t-test. As has been stated earlier in this section, certain assumptions underlie the use of parametric tests for making comparisons between sets of observational data:

1 The observations must be independent.

2 The observations must be drawn from normally distributed populations.

3 These populations must have the same variance.

4 The variables involved must have been measured on at least an interval scale.

Both the t-test and ANOVA are fairly robust, and are therefore, suitable even for data which deviate somewhat from the above assumptions. The t-test is used to determine how great the difference between two means must be in order to be judged significant. By the same token, the ANOVA procedure is used to determine whether the differences among two or more means are greater than could be expected by chance alone (i.e. a measure of significance). This test is extremely powerful, since it yields a known error probability, and it is more likely to reject a null hypothesis if it is false, than in the case of alternative test procedures. Therefore, much of the analysis carried out in this research relies upon parametric techniques. It was also found appropriate to use non-parametric tests like the Mann-Whitney U-test to check for disparity or inconsistency of results obtained in parametric tests. Because this test allows for a relaxation of the stringent requirements (e.g. normalcy of population) which apply with the t-test, the Mann-Whitney U-test is less efficient, i.e. significance will only be observed for a given sample size with a large difference in mean scales. The Mann-Whitney tests allow us to establish (or not establish) significance without stringent assumptions being met.

8.1.2 Data Analysis Procedure

The data collected for the study were analyzed following a system known as *Statistical Package for Social Sciences (SPSS-X)*. This is a powerful general statistical package capable of manipulating a wide range of data.

SPSS-X was fed with the appropriate data needed for the study to calculate the

following:

1. The total number and percentage of scores obtained by each subject (Eth., Br.. and Oth.) on each passage (PE01 and PB02) and on each question type (TE, TI, and SI).

2. The total percentage of scores obtained by subjects on the basis of nationality, passage type and question type.

3. t-test the for variables (taking into account the means, standard deviations, F and t-values and probability).

4. A one-way analysis of variance by nations and by components.

5. A two-way analysis of variance by nations, by passage type and by components.

6. Pearson and Spearman Correlation Coefficients

7. t-test for the extraneous variables like age, reading time, interest and attendance by nation and by passage type.

8. Mann-Whitney U-test for all the variables.

The next as well as the subsequent sub-sections deal with the number of subjects involved both in the two rounds of pilot study and the main reading comprehension tests.

8.2 Subjects Under Study

The statistical analysis employed in this experiment is not descriptive but inferential. Since inferential statistical analysis involves the process of sampling, and the selection of a small group that is assumed to be related to a larger group from which it is drawn (the sample and the population respectively), a total of two-hundred and fifty four subjects participated in both the pilot study and the main study. Out of

this total, a sample of one hundred and thirty subjects was considered sufficient for the main study.

The process of sampling makes it possible to draw valid inferences or generalizations on the basis of careful observation of variables within a relatively small proportion of the population.

Although common knowledge, it is important to note that the choice of sampling method should be made so as to avoid as far as possible any kind of bias. Nonetheless, the choice of sampling method depends both on the nature of the situation and on the purpose for which the sample is required. For inferential analysis, such as this study, simple random sampling was deemed necessary.

For the two rounds of the pilot study, the procedures and results as discussed in chapter seven, a total of forty British and forty Ethiopian post graduate students participated. Twenty British and twenty Ethiopians were identified for the first pilot study and an equal number of British and Ethiopians were taken for the second round. For both rounds of pilot study, a sample of twenty subjects (equally divided between British and Ethiopians) were selected from a population of forty (see chapter Seven)

The main study group comprised fifty-four Ethiopians, sixty British and sixty *Others*, *Other Nations* are drawn from various countries, as many as sixteen, where English is a second and/or a foreign language. Together with a consultant in statistics at the University of Durham, the decision was taken to sample categories 3 and 4 by considering only the returns which had odd numbers. This gave a set of 30 Ethiopians, 30 British, and 30 Other Nations.

The breakdown of the number of subjects is shown below.

Table 8.2. No. of Participants in the Study

Participants	Ethiopians	British	*Other*
Group 1	20	20	-
Group 2	20	20	-
Group 3	60	54	-
Group 4	-	-	60

In order to examine the amount of prior knowledge the subjects had on each culture-specific text, it was necessary to use a familiarity test based on content-vocabulary questions before administering the main reading comprehension tests. This is briefly discussed in the next section.

8.2.1 Familiarity Test

It was relevant to the study to find out whether the two culture-specific passages prepared for the present investigation were familiar or unfamiliar to the subjects before administering the tests.

The main justification for administering a prior knowledge test, or familiarity test, is to examine the amount of prior knowledge subjects had on each culture-specific passage before they read the two culture-specific passages and thereby establish to what extent the two passages were either familiar or unfamiliar to the cultural groups.

Therefore, a prior knowledge test using content-vocabulary/concepts based on a familiarity-unfamiliarity framework was administered. Each subject was asked by the investigator to write anything that came to mind about the word or concept given in the PKT working papers provided. (see Appendix C3)

The techniques of scoring the responses that the subjects wrote on/about each word/concept or phrase were adapted from the study undertaken by Langer & Nicolich (1981). Each free association response was categorized to indicate the amount of

prior knowledge that each subject possessed. Responses were scored from 3 (much prior knowledge) to 0 (no prior knowledge). (see 7.7.1.2)

The results of PKT showed that the total mean scores obtained by the British on content-vocabulary concepts (free associations) extracted from PB02 was greater (mean = 29.1) than the mean scores of the Ethiopians (mean=6.6) and the difference is statistically highly significant ($P < 0.001$). Table 8.3 shows the means and standard deviations of the scores obtained by both groups.

Table 8.3 PKT Scores by Passage by Nation

Variable	Nation	Mean	Std.D	F	t	df	sig
PB02	Br.	29.1	5.3	1.5	14.8	58	0.000
PB02	Eth.	6.6	6.5	-	-	-	-
PE01	Br.	10.7	4.0	1.48	-12.6	58	0.000
PB02	Eth.	24.8	4.9	-	-	-	-

N=30 (Br) N=30 (Eth)

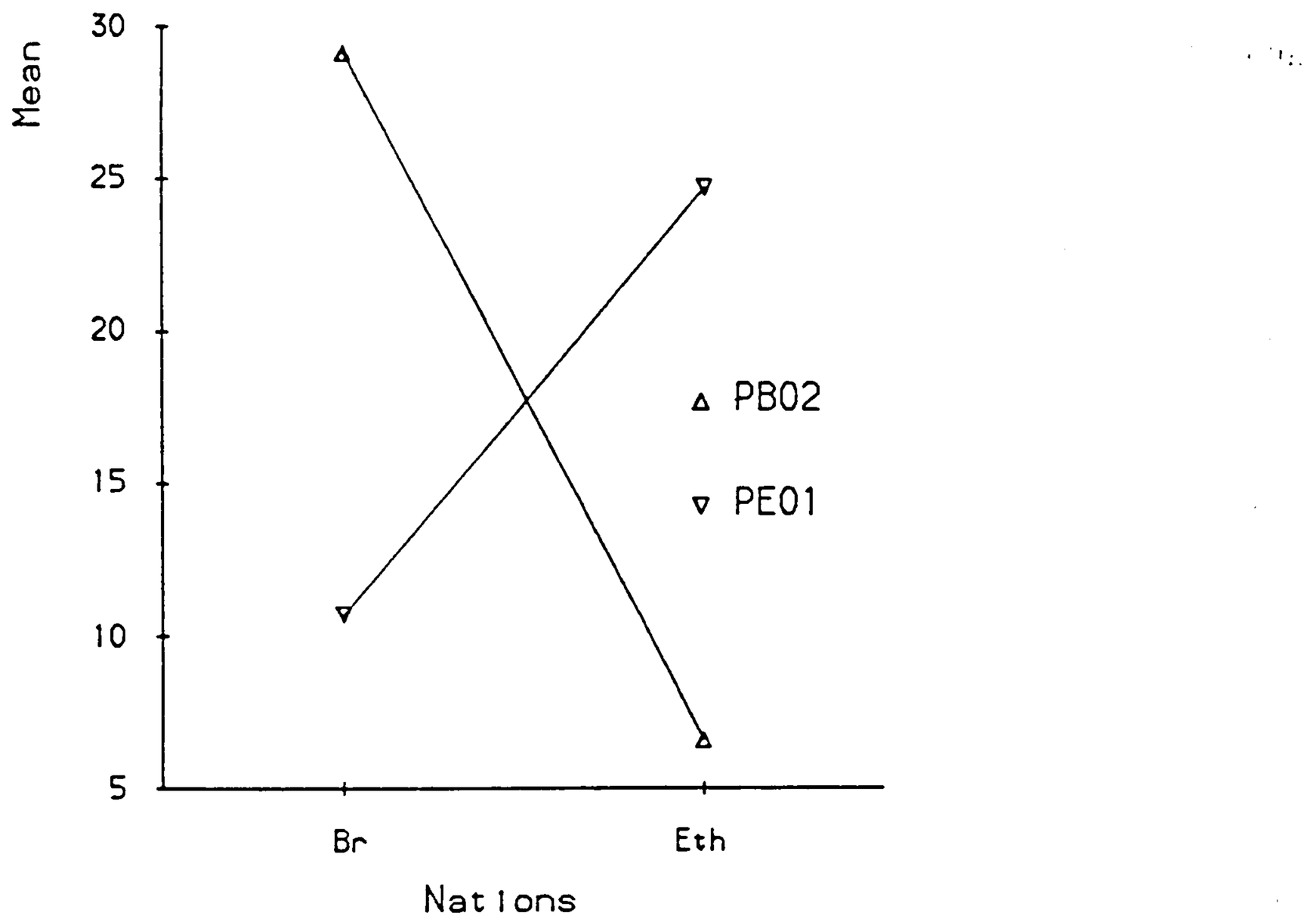
By the same token, the total mean score of the Ethiopians on PE01 was greater (mean = 24.8) than the British (mean = 10.7) and the difference is statistically significant ($P < 0.001$). For ease of understanding the derivation of table 8.3 is shown in figure 8.1 in percentage.

Hence, the results of the PKT on a familiarity-unfamiliarity continuum show that each cultural group is familiar with materials associated with the home culture and not the other way round. The results of the main study tests can be taken as a fairly reliable source of information needed in this investigation. The correlation of familiarity test with reading comprehension is shown in section 8.2.5.2

8.2.2 The Main Tests

The treatment of the data for the main study involved the use of t-tests, ANOVA

Fig. 8.1 Familiarity Test (PKT) by Passage by Nation.



and the Mann-Whitney U-tests. The t-test was done using *SPSS-X* based on raw (see Appendix D15) scores of each subject (Br., Eth., & Oth.) on each passage (PB02 & PE01) and by each question type (TE,TI and SI). The Mann-Whitney U-tests were used to confirm the consistency of the results obtained in the t-test. The results obtained from these tests are binary all through, showing a comparison of all three possible pairs [Br. (British) and Eth. (Ethiopians) followed by Oth.(*Other Nations*) and Eth. and lastly by Oth. and Br.]

8.2.2.1 Summary of Item Analysis

Owing to the limited availability of respondents and the short time scale available for the administration of the test, it was not possible to do a simple preliminary item analysis to remove any test item which acted untypically in relation to the test as a whole. However, as has been demonstrated in Chapter Seven, two rounds of pilot study have been conducted in an effort to change as many as possible of the test items that relied too heavily on prior knowledge alone.

In much of the testing literature, it is assumed that the test is being used to grade the learner and so the typical item analysis makes use of the rank position of the examinees based on their performance in the test. (see 7.10)

When interpreting F and especially the D values of an item used for the present investigation, given the nature of the tests, two considerations have to be taken into account.

1. An item which has a lower D value for one group may have a relatively sufficient value for another. (see Appendix D11 and D12)

2. The crucial factor in this study is the comprehension ability of the British, Ethiopians and Other Nations over against each other on the two passages as a group and not the abilities of individuals within a group.

For the present investigation, a D of 0.25 is reckoned to be satisfactory. Based on this criterion, it can be seen from the summary table that seven items (12, 14, 15, 16, 21, 26 and 27) at 0.25 level; three items (4, 17 and 23) at 0.38 level; nine items (1, 7, 8, 9, 10, 11, 13, 18 and 20) at 0.50 level; four items (19, 22, 24 and 25) at 0.63 and three items (3, 5 and 6) at 0.75 level, have performed as expected for PB02.

It should be remembered that an item is retained for use if it has a D value of not less 0.25 for any/or all of the groups. However, item 2 performed unexpectedly showing a D of 0.13 for Other Nations and < 0.13 for the British and Ethiopians. However, it is retained for use on the ground that all of the distractors in the item worked quite well, (with the exception of distractor a.) for all groups. (see Appendix D15).

Similarly, for PE01 the following items performed sufficiently.

1. Items with D value of 0.25 were 2, 7, 14, 17 and 25.

2. Items with D value of 0.38 were 1, 8, 10, 20, 23 and 27.

3. Items with D value of 0.50 were 6, 9, 11, 19, 21, 24 and 26.

4. Items with D value of 0.63 were 3, 13, 16 and 18.

5. Items with D value of 0.75 were 4, 5 and 12.

6. The Item with D value of 0.86 was 15.

Since of all the above items performed satisfactorily either for the whole group or at least for one of the groups, there is enough ground for their retention (Hill, personal communication).

Item 22 of PE01 has been found to have a D value of 0.13 for British and -0.13 and -0.38 for Ethiopians and Other Nations respectively. It would have been extremely difficult to eliminate this item after the full administration of the test owing to the non-availability of the testees for a re-test. However, there are also other grounds for its retention especially the fact that the facility value and discrimination index for the total population answering this item were 0.64 and 0.28 respectively.

8.2.2.2 Distractors Analysis

It is important to scrutinise items in detail, particularly in those cases where items have not performed as expected.

It should, however, be noted that an item is said to have performed unexpectedly, in the present investigation, if it has a D value of < 0.13 for all the three cultural groups (British, Ethiopians and Other Nations). Based on this criterion, items 2 and 21 of PB02 have performed unexpectedly.

If we look at item 2 of PB02, distractor (a) has been found to be ineffective for all nations. It pulled only 4.4% of the testees. Distractors (c) and (d) were tricky and pulled 43% and 22% of the testees respectively. However, the correct answer, which is (b), pulled only 30% of the testees. This item failed to discriminate between

high-scorers and low-scorers for all groups. The reason for its retention is simply because it is a valid item with a facility value of 0.30 for the total population. (see Appendix D8).

Similarly, item 21 of PB02 has a D value of 0.00 for the whole population. It can be seen below that the level of difficulty of ditractors a, b, c and d are reasonably acceptable for the whole population.

a=22%	b=17.7%	c=30%	d=30%

If we treat the item by each nation we find that for the British, only distractor (d) is ineffective. Similarly, only distractors (a) and (b) are ineffective for the Ethiopians as well as Other Nations. From this, it should be noted that some distractors which appear to be ineffective for one group are sufficiently effective for another. Although the discrimination power of this item is zero for the whole population, it has a discrimination value of 0.25 for Other Nations and hence retained for use.

Further, the item which posed problem on PE01 was item 22. As can be seen in Appendix D15, for the British distractors c and d, for Ethiopians distractor a and for Other Nations distractors c and d were ineffective. This item is retained on the ground that it had a D value of 0.28 for the whole population.

8.2.2.3 Reliability

The internal consistency of the tests on PB02 and PE01 as indicated by KR20 (Kuder-Richardson Formula 20) was 0.66 and 0.68 respectively (see 7.8 and Appendix D17).

8.2.3 Results of the Main Tests

Table 8.4 t-test for Scores on PB02 by Component by Nation

Component	Mean (Br.)	Std.D. (Br.)	Mean (Eth.)	Std.D. (Eth.)	t	df	sig
PB02	16.6	2.6	12.3	3.3	5.5	58	0.000
PB02TE	7.0	1.3	5.8	1.5	3.2	58	0.002
PB02TI	5.2	1.2	3.4	1.5	5.6	58	0.000
PB02SI	4.4	1.3	3.1	1.1	3.9	58	0.000

N=30 (Br) N=30 (Eth)

PB02 = Passage for British # 2

TE = Textually Explicit

TI = Textually Implicit

SI = Schematically Implicit

Br =British Eth.=Ethiopian Oth.= *Others*

Overall, on PBO2, the total mean score obtained by the British was significantly greater (mean = 16.6) than the Ethiopian mean score (mean = 12.3).

It can also be seen that the comprehension scores of the British on all question type, namely PB02TE, PB02TI and PB02SI were higher than the Ethiopians. The standard deviation for British was comparable to those for Ethiopians.

On each question type, the differences between the means of the two groups were statistically significant ($P < 0.002, P < 0.001$ and $P < 0.001$) for PB02TE, PB02TI and PB02SI respectively.

The above results were envisaged. However, it is worth noticing that the British mean was found to be lowest on background knowledge questions (Schematically Implicit Items [mean = 4.4]) as compared with Textually Explicit items (mean =

7.0) and Textually Implicit items (mean = 5.2). This subject will be taken up later on in Chapter Nine.

Table 8.5 t-test for Scores on PE01 by Component by Nation

Component	Mean (Br.)	Std.D. (Br.)	Mean (Eth.)	Std.D. (Eth.)	t	df	sig
PE01	15.6	3.9	16.2	3.3	-0.61	58	0.546
PE01TE	6.4	1.8	5.6	1.7	1.78	58	0.081
PE01TI	6.2	1.9	6.2	1.5	0.00	56	1.000
PE01SI	3.1	1.3	4.4	1.2	-4.27	57	0.000

N=30 (Br) N=30 (Eth)

On PE01, overall, the Ethiopian mean was higher (mean = 16.2) than the British (mean = 15.6) but the difference was not statistically significant (P = 0.546). This is interesting to note because it was assumed that the Ethiopians would do significantly better than the British on a familiar culture-specific passage. But the results showed a different trend in that we cannot say that native speakers cannot answer as many comprehension items correctly as non-natives on an unfamiliar passage as long as the answers were derivable from the given passage explicitly or implicitly. The following figures (8.2 & 8.3) which show mean scores are derivations of tables 8.4 & 8.5

Fig. 8.2 Mean Scores on PB02 by Nation by Component.

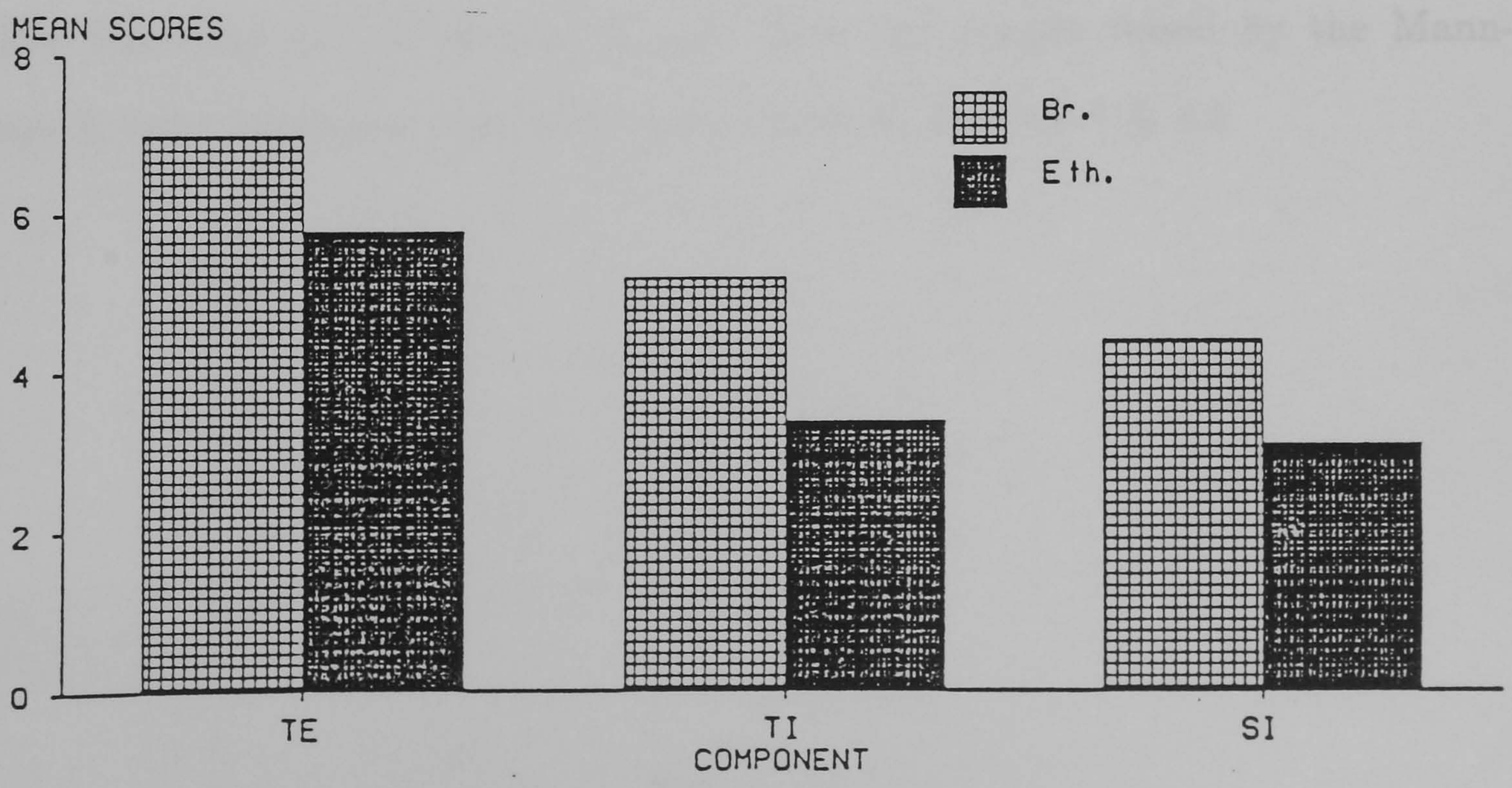
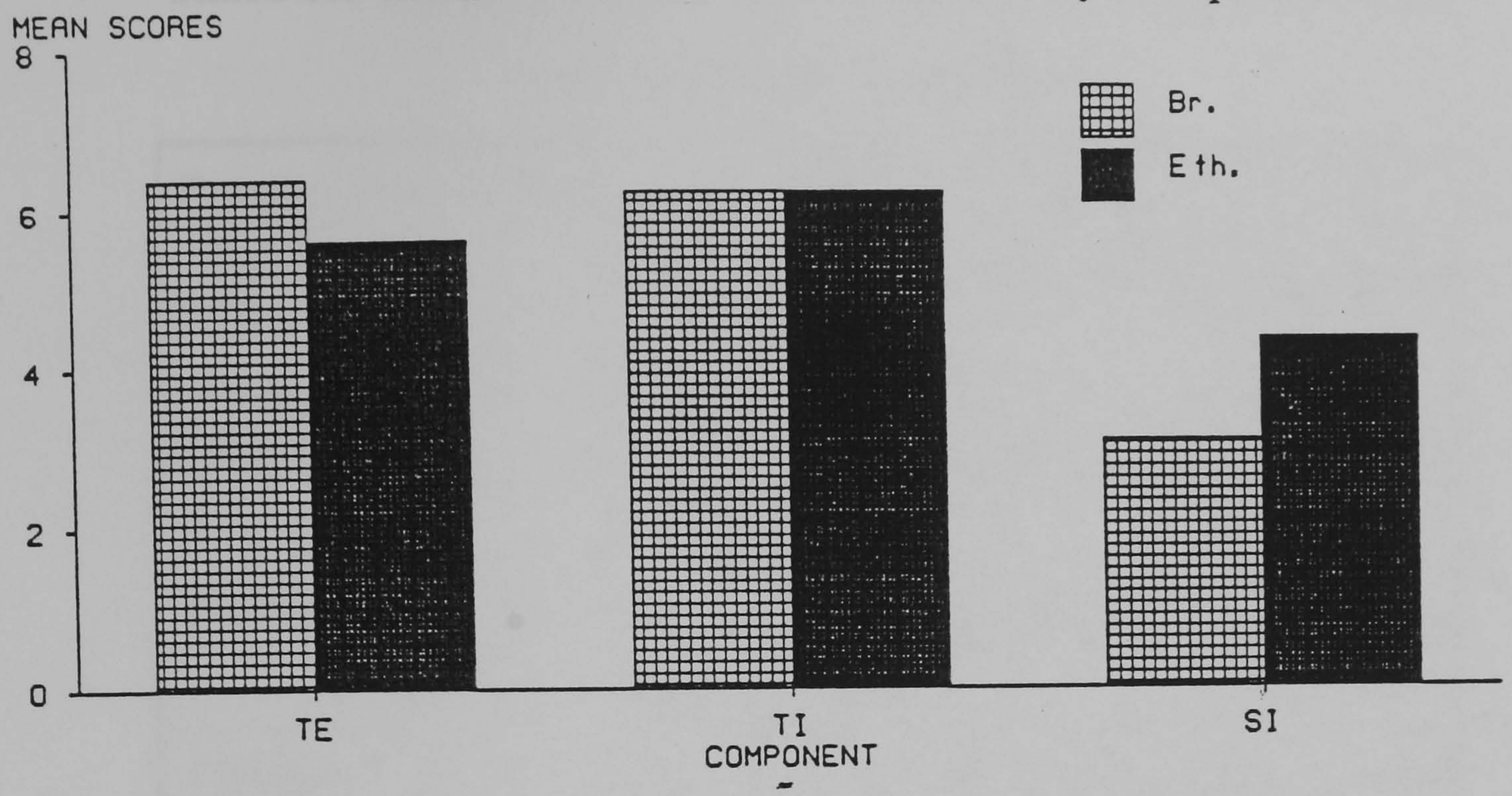


Fig. 8.3 Mean Scores on PE01 by Nation by Component.



Therefore, the British, equipped with the necessary linguistic competence (English in this case) had the advantage over the Ethiopians and scored higher (mean = 6.4) than the Ethiopians (mean = 5.6) on textually explicit items. There was no difference observed between the British and the Ethiopians on textually implicit items of PEO1. However, it is interesting to note that on schematically implicit items, items which are solely related to background knowledge, the Ethiopian mean score (mean = 4.4) was significantly greater than the British (mean = 3.1).

It is essential to observe the consistency of the results of the Ethiopians and British on PE01 and PB02 in the t-test by using the Mann-Whitney U-test.

The following two tables (8.6 & 8.7) show the results tested by the Mann-Whitney U were consistent with the t-tests shown in tables 8.4 & 8.5

Table 8.6 Mann-Whitney U-test for Scores between British and Ethiopians on PB02.

Passage	Nation	Mean Rank	Case	U	W	Z	P
PB02	Br	40.38	30	153.5	1211.5	-4.4126	< 0.0000
	Eth	20.62	30				
PB02TE	Br	37.13	30	251.0	1114.0	-2.9978	0.0027
	Eth	23.87	30				
PB02TI	Br	40.18	30	159.5	1205.5	-4.4157	< 0.0001
	Eth	20.82	30				
PB02SI	Br	38.23	30	218.0	1147.0	-3.5160	0.0004
	Eth	22.77	30				

TABLE 8.7 Mann-Whitney U-test for Scores between British and Ethiopians on PE01.

Passage	Nation	Mean Rank	Case	U	W	Z	P
PE01	Br	29.70	30	426.0	891.0	-0.3675	0.7207
	Eth	31.30	30				
PE01TE	Br	34.75	30	322.5	1042.5	-1.9180	0.0551
	Eth	26.25	30				
PE01TI	Br	30.80	30	441.0	924.0	-0.1355	0.8922
	Eth	30.20	30				
PE01SI	Br	21.97	30	194.0	659.0	-3.8712	0.0001
	Eth	39.03	30				

As indicated in Chapter Seven, the primary purpose of the inclusion of the third group *Other Nations* was to see if prior knowledge in the form of schemata had a pervasive effect on the reading comprehension of unfamiliar material. This [third] group, is drawn from sixteen countries where English is a second and or a foreign

language. The results of the comprehension tests based on the two culture-specific passages, namely, PE01 and PB02 comparing the Ethiopians and the British, have been given earlier. Now, we will see the performance of the third group, *Others* on the same comprehension items of the two passages. Comprehension scores of *Others* will be treated in two ways. The total scores of *Others* versus the total scores of Ethiopians on the one hand and the total scores of *Others* versus the total scores of British on the other.

The following tables (8.8, 8.9, 8.10 & 8.11) show the results of a series of t-tests which compared the mean overall scores and separate component scores for each national group, i.e. *Others* versus British and *Others* versus Ethiopians on both passages.

The critical significance level was 0.05, being adequate for the rejection of Ho and the consequent acceptance of H1 (that the samples are drawn from different populations).

The pattern of results is interesting. For scores on PB02 (see table 8.8) the mean score obtained by *Others* was almost similar (mean = 11.7) to that of the Ethiopians (mean 12.3) with a significance of P = 0.485, which is not significant at the critical level.

Table 8.8 t-test for Scores between Ethiopians and Others on PB02

Passage	Mean (Eth.)	Std.D. (Eth.)	Mean (*Others*)	Std.D. (Others.)	t	df	sig
PB02	12.3	3.4	11.7	3.6	-0.7	58	0.485
PB02TE	5.8	1.5	5.1	1.8	1.6	58	0.110
PB02TI	3.4	1.5	3.7	1.8	-0.7	58	0.484
PB02SI	3.1	1.2	2.9	1.5	-0.7	58	0.507

N=30 (*Oth*) N=30 (Eth)

However, on PE01 (see table 8.9) the mean scores of the Ethiopians (mean = 16.2) was greater than the mean scores of *Others* (mean = 12.5) at a significance level of $P < 0.05 \quad (P < 0.001)$. On each question type of PE01 the Ethiopians performed significantly better in relation to PE01TI and PE01SI.

Table 8.9 t-test for Scores between Ethiopians and Others on PE01

Passage	Mean (Eth.)	Std.D. (Eth.)	Mean (*Others*)	Std.D. (*Others*)	t	df	sig
PE01	16.2	3.3	12.5	3.9	-4.0	58	0.000
PE01TE	5.6	1.7	5.1	1.9	-1.1	58	0.281
PE01TI	6.2	1.5	4.7	1.9	-3.4	58	0.001
PE01SI	4.4	1.2	2.7	1.6	-4.8	58	0.000

N=30 (*Oth*) N=30 (Eth)

There was no significant difference observed between the total mean scores of Ethiopians (mean = 5.6) and *Others* (mean = 5.1) on the Textually Explicit items of PE01.

On PB02, the scores of the British were significantly greater (mean = 16.6) than *Others* (mean = 11.7). It can be observed (see table 8.10) that the British performed significantly better than *Others* on all question types, namely, PB02TE, PB02TI and PB02SI respectively. The significance level as far as the differences in performance are concerned can be seen in table 8.10. The mean score obtained by *Others* on PB02 is more or less the same as that of the Ethiopians. This is interesting and will be explained in Chapter Nine.

Table 8.10 t-test for Scores between British and Others on PB02

Passage	Mean (Br.)	Std.D. (Br.)	Mean (*Others*)	Std.D. (*Others*)	t	df	sig
PB02	16.6	2.6	11.7	3.6	6.0	58	0.000
PB02TE	7.0	1.3	5.1	1.8	4.7	58	0.000
PB02TI	5.2	1.2	3.7	1.8	4.0	58	0.000
PB02SI	4.4	1.3	2.9	1.5	4.0	58	0.0000

N=30 (Br) N=30 (*Oth*)

Overall, the British performed significantly better (mean = 15.6) than *Others* (mean = 12.5) on PE01 (see table 8.11) not to mention the significantly better performance on PB02 as shown in table 8.10. Interestingly, however, while the differences are apparent on PE01TE and PE01TI with a significance level of $P =>$ 0.008 and $P =<$ 0.004 respectively, there was no significant difference between the British and *Others* on PE01SI question type. The implications of this result will be explained later in Chapter Nine.

Table 8.11 t-test for Scores between British and Others on PE01

Passage	Mean (Br.)	Std.D. (Br.)	Mean (*Others*)	Std.D. (*Others*)	t	df	sig
PE01	15.6	3.9	12.5	3.9	3.1	58	0.003
PE01TE	6.4	1.8	5.1	1.9	2.7	58	0.008
PE01TI	6.2	1.9	4.7	1.9	3.0	58	0.004
PE01SI	3.1	1.3	2.7	1.6	0.9	58	0.324

N=30 (Br) N=30 (*Othe*)

Figures 8.4 & 8.5 show mean comprehension scores of the three cultural groups on both passages.

Fig. 8.4 Overall Mean Scores by Nation by Passage Type.

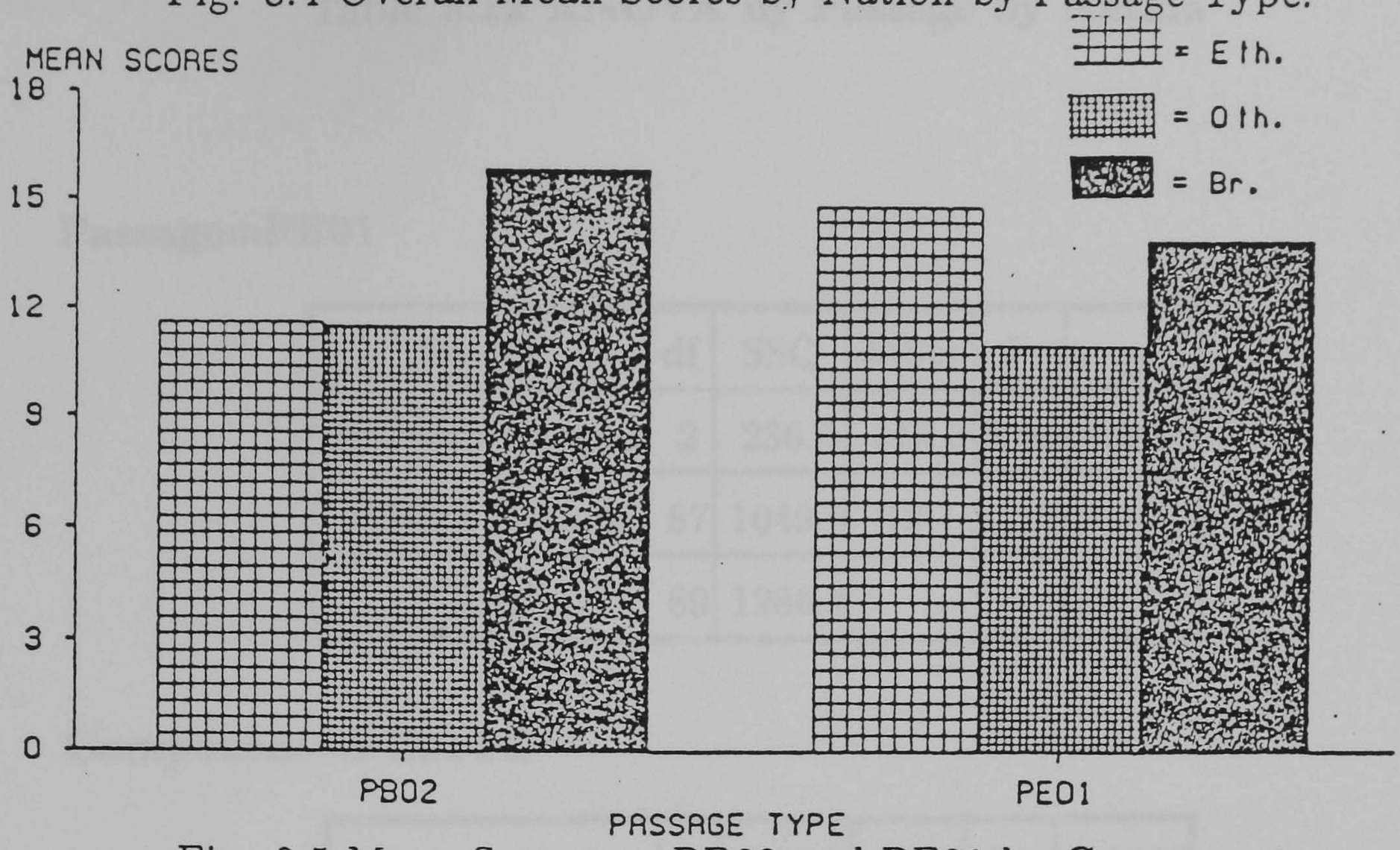
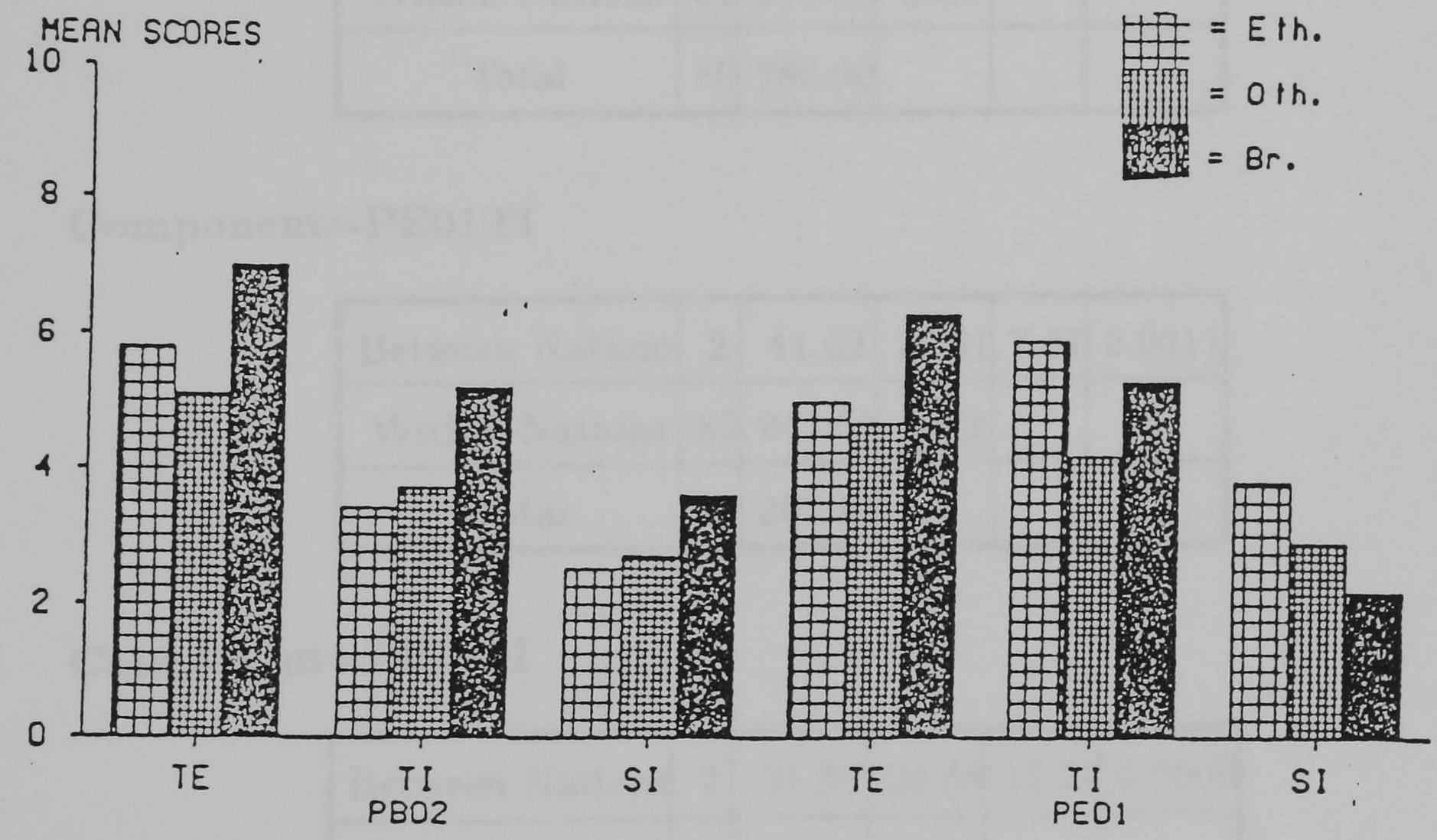


Fig. 8.5 Mean Scores on PB02 and PE01 by Component.



8.2.4 A One-Way ANOVA

It was necessary to do a One-Way Analysis of Variance by Passages (PE01 & PB02) and by Nation since ANOVA is most appropriate when there are more than two categories.

Table 8.12 ANOVA by Passage by Nation

Passage=PE01

Source	df	SSQ	MSQ	F	p
Between Nations	2	236.6	118.3	9.80	0.0001
Within Nations	87	1049.8	12.1		
Total	89	1286.4			

Component=PE01TE

Between Nations	2	44.07	22.03	7.89	0.0007
Within Nations	87	242.83	2.80		
Total	89	286.90			

Component=PE01TI

Between Nations	2	41.62	20.81	7.37	0.0011
Within Nations	87	245.50	2.82		
Total	89	287.12			

Component=PE01SI

Between Nations	2	59.35	29.68	13.74	0.0000
Within Nations	87	187.93	2.16		
Total	89	247.29			

Table 8.13 ANOVA by Passage by Nation

PASSAGE=PB02

Source	df	SSQ	MSQ	F	p
Between Nations	2	367.36	183.68	19.38	0.0001
Within Nations	87	824.6	9.48		
Total	89	1191.96			

Component=PB02TE

Between Nations	2	55.40	27.20	11.50	0.0000
Within Nations	87	209.50	2.41		
Total	89	264.90			

Component=PB02TI

Between Nations	2	58.02	29.01	12.85	0.0000
Within Nations	87	196.43	2.26		
Total	89	254.46			

Component=PB02SI

Between Nations	2	22.87	11.43	6.88	0.0017
Within Nations	87	144.73	1.66		
Total	89	167.60			

It can be seen from tables 8.12 & 8.13 that the three different groups do not have the same mean in ANOVA and *Nation* makes a significant difference for total score and component.

8.2.5 A Two Way ANOVA

In the treatment of a two-way ANOVA the between subject factors are nations (British, Ethiopians and *Others*) and the within subject factors are passages (PE01

& PB02) and components (TE, TI and SI).

Table 8.14 ANOVA Summary Table by Nation by Passage and by Component

Source	SSQ	df	MSQ	F	p
Nation	164.36	2	82.18	14.39	0.001
S-Within Nations	496.04	87	3.71		
Passage	22.0	1	22.0	9.35	0.003
Nation x Passage	60.69	2	30.34	12.89	0.001
Passage x S-Within	204.80	87	2.35		
Component	515.07	2	257.53	161.67	0.001
Nation x Component	20.86	4	5.22	3.27	0.013
Component x S-Within	277.18	174	1.593		
Passage x Component	95.36	2	47.68	27.27	0.001
Nation x Passage x Comp	27.47	4	6.89	3.93	0.004
Passage x Comp x S-Within	304.18	174	1.74		

It can be seen that the difference between the components is significant , that is TE being the highest followed by TI, and SI being the lowest. Therefore, we have a main effect of component. What is more interesting is, the effect of component depends on nation. If we take both passages the effect of component is different for the different nations, and their differences are significant.

Generally speaking, TE is higher than TI and TI is higher than SI in both passages. If we also look at the passages separately, we see differences in the effect of the component. The effect of component depends on the passage type. The interaction can be seen in figs. 8.6, 8.7, 8.8, & 8.9.

The mean tables (8.15, 8.16, 8.17, & 8.18) will show the effects of passage type and components by nation.

Table 8.15 shows the overall means obtained by the three nations on both passages. It can be seen that the British mean is greater than the Ethiopian and *Other Nations.* The difference between the British and *Other Nations* is significant. The Ethiopian mean is greater than *Other Nations.*

Table 8.15 Overall Means for PB02 and PE01 by Nation

Nation	Mean
British	5.38
Ethiopian	4.75
Others	4.03

Table 8.16 and Figures 8.6 & 8.7 show the mean comprehension scores of each nation on each passage and on each question type.

Table 8.16 Means for Each Passage by Each Nation

Nation	Passage Type	
	PB02	PE01
British	5.53	5.23
Ethiopian	4.10	5.40
Others	3.90	4.16

Overall, the British mean on PB02 is significantly greater than the Ethiopians and *Other Nations*, whereas the Ethiopian mean on PE01, is only slightly greater than the British. However, the Ethiopian mean on PE01 is significantly greater than *Other Nations.* The means of Ethiopians and *Other Nation* on PB02 is more or less the same (mean = 4.1 and 3.9 respectively). This will be explained at length in the following chapter. The major aim of this study is to arrive at a conclusion based on the results of comprehension scores the subjects obtained on each question type (TE, TI and SI) of the two culture-specific passages. Therefore, the following tables (8.17 & 8.18) and figures (8.6, 8.7, 8.8 & 8.9) are given below in order to highlight the

the differences as well as the interactions between question type and passage type by the three culturally different groups.

Fig.8.6 Means for each Passage by Nation.

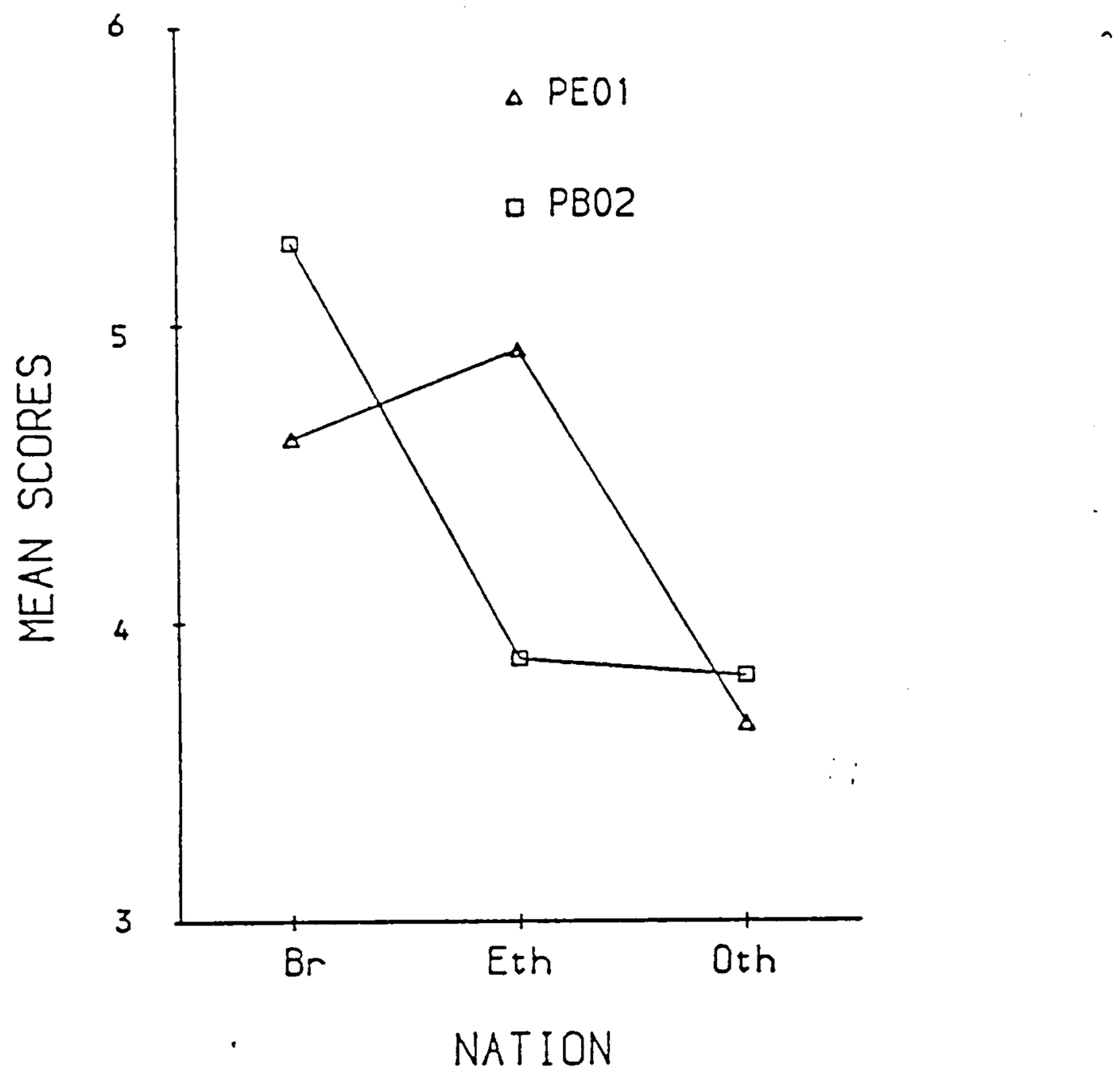


Table 8.17 Mean Comprehension Scores on PB02 by Nation by Component

Nation	Passage	TE	TI	SI
British	PB02	7.0	5.2	3.6
Ethiopian	PB02	5.8	3.4	2.5
Others	PB02	5.1	3.7	2.7

Figure 8.8 easily demonstrates table 8.17.

Fig. 8.7 Overall Mean Scores by Nation by Component for PE01 & PB02.

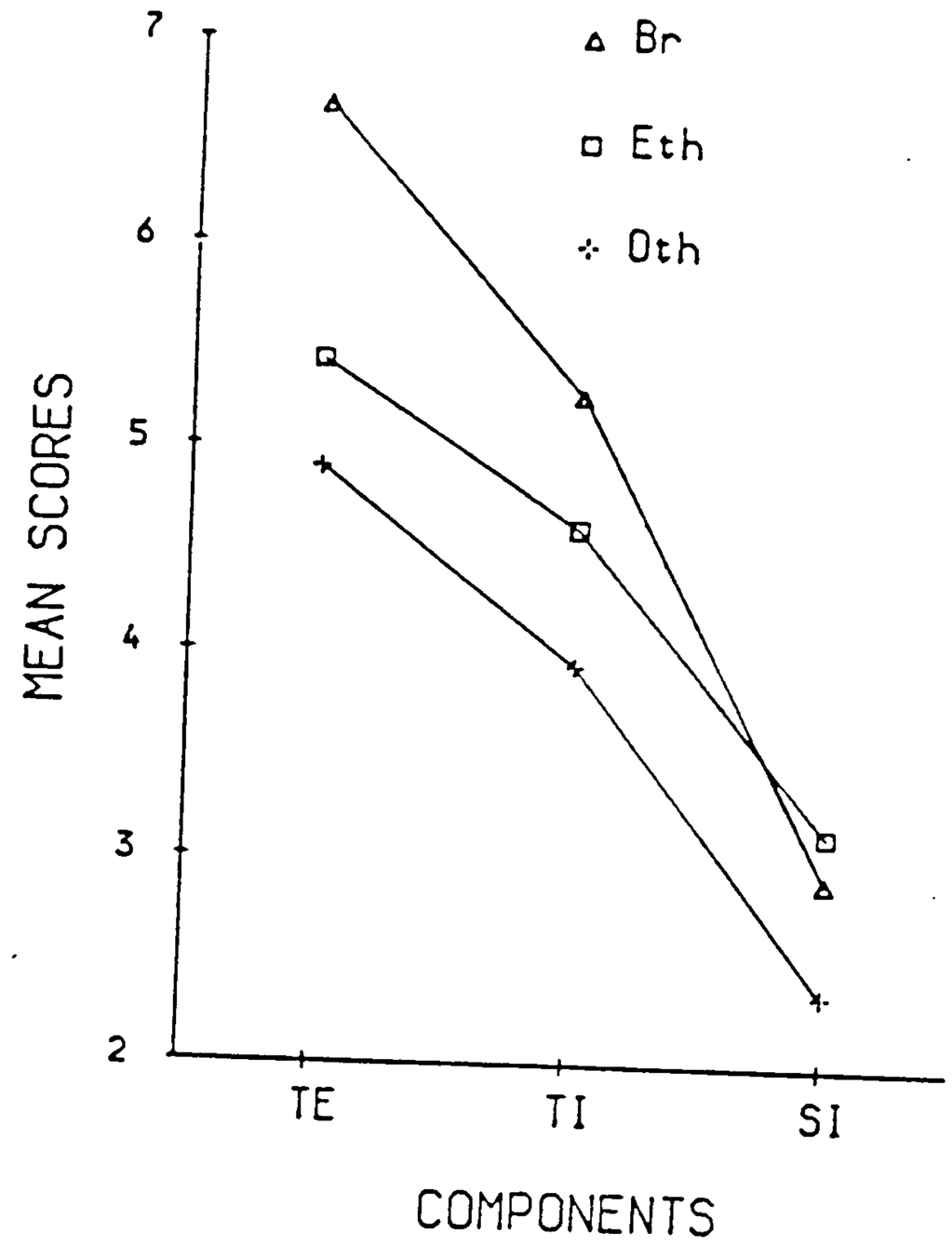


Table 8.18 Mean Comprenension Scores on PE01 by Nation by Component

Nation	Passage	TE	TI	SI
British	PE01	6.4	6.2	3.1
Ethiopian	PE01	5.6	6.2	4.4
Others	PE01	5.1	4.7	2.7

This again can be shown in figure 8.9 .

Fig.8.8 Mean Scores on PB02 by Nation by Component Interaction.

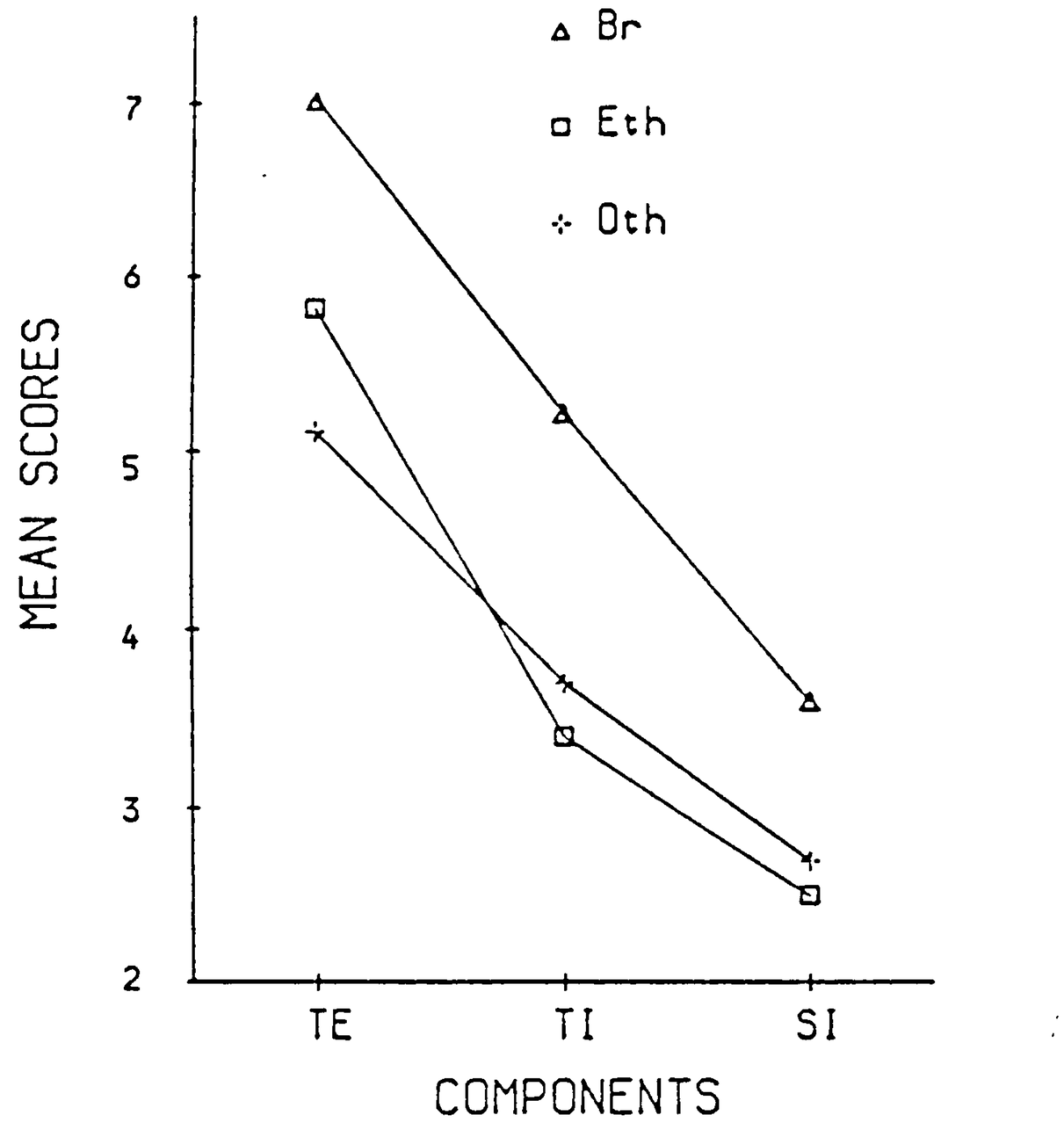
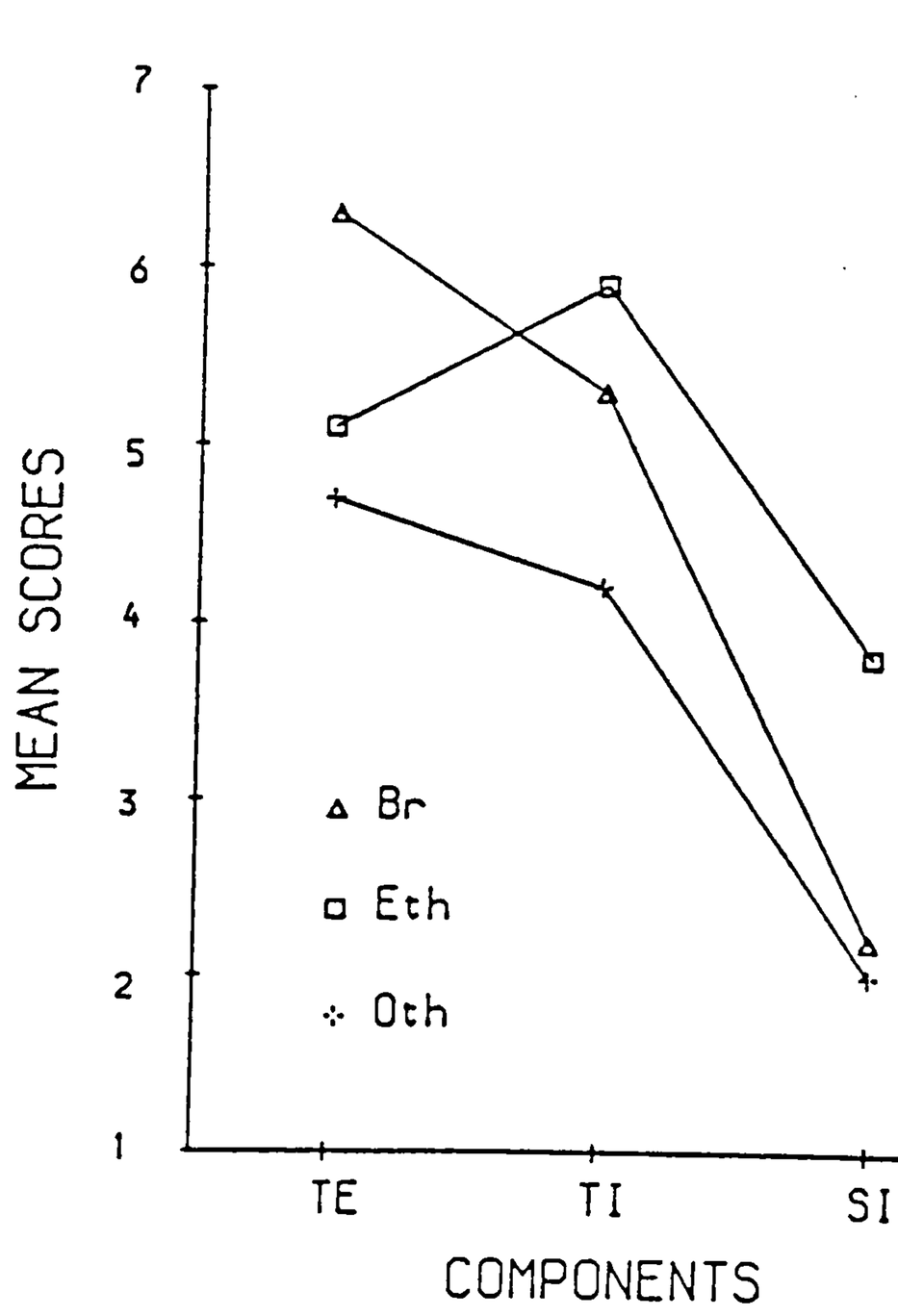


Fig. 8.9 Mean Scores on PE01 by Nation by Component Interaction.



As can be seen in figs. 8.6, 8.7, 8.8 & 8.9 the effect of Passage type (PE01 & PB02) is different for the different cultural groups. The British do best on all question types of the British Passage, and they do better on Textually Explicit question type of the Ethiopian passage than the Ethiopians. As expected the Ethiopians performed better on Schematically Implicit question types of the Ethiopian passage than the British and *Other Nations*. However *Other Nations* performed less than the Ethiopians and the British on both passages. It is important to note that the Ethiopians performed significantly better than *Other Nations* on textually and schematically implicit items drawn from PE01.

It is also important to note that, for all three groups the best overall performance is obtained for Textually Explicit component and the worst overall performance is on the schematically Implicit component.

The effect of interest on reading comprehension and the relationship between prior knowledge tests and comprehension are discussed in the following sections.

8.2.5.1 Extraneous Variables

Extraneous variables like reading time, age, attendance at a funeral, and interest were assessed in the present investigation. Nonetheless, it was found necessary to consider only interest to see if it can affect the reading comprehension of native and non-native speakers of English on familiar and unfamiliar texts. Subjects were asked to indicate the passage in which they were more interested after reading for comprehension. The interest of each cultural group on the two passages (PE01 and PB02) is shown in the following tables.

Table 8.19 The British on PB02

Interest	Cases	Mean	Std. D	df.	F	P
None	3	15.0	3.5	2, 27	0.67	0.522
PB02	4	16.5	1.3			
PE01	23	16.9	2.7			
Both	–	–	–			

N=30

Table 8.20 The British on PE01

Interest	Cases	Mean	Std. D	df.	F	P
None	3	10.0	6.1	2, 27	4.8	0.16
PB02	4	17.6	4.3			
PE01	23	16.0	2.9			
Both	–	–	–			

N=30

Table 8.21 The Ethiopians on PB02

Interest	Cases	Mean	Std. D	df.	F	P
None	3	15.3	2.1	3, 26	1.77	0.177
PB02	10	13.2	4.1			
PE01	12	11.0	2.7			
Both	5	12.0	2.6			

N=30

Table 8.22 The Ethiopians on PE01

Interest	Cases	Mean	Std. D	df.	F	P
None	3	14.7	3.8	3, 26	0.52	0.670
PB02	10	17.1	3.3			
PE01	12	15.8	3.4			
Both	5	16.4	3.3			

N=30

Table 8.23 Other Nations on PB02

Interest	Cases	Mean	Std. D	df.	F	P
None	10	11.0	3.5	3, 26	0.81	0.499
PB02	9	13.3	4.5			
PE01	9	12.0	1.9			
Both	2	10.0	2.1			

N=30

Table 8.24 Other Nations on PE01

Interest	Cases	Mean	Std. D	df.	F	P
None	10	12.8	4.1	3, 26	0.146	0.932
PB02	9	13.0	4.9			
PE01	9	12.1	3.2			
Both	2	14.0	2.8			

N=30

It can be seen from tables 8.19 that interest has no effect on the reading comprehension of the British on the British passage (F=0.67, df=2, 27, P> .552). It is, however, interesting to note that the British who were not interested in the Ethiopian passage had a significantly lower score (mean= 10.0) than those who were interested (mean=16.0) (see table 8.20). But the mean score of those who were interested (13%)

in the British passage was 17.6. ANOVA reveals that there is no significant difference between the groups due to interest.

By the same token, there was no difference observed between the Ethiopians who were interested in the British passage as well as in the Ethiopian passage (PB02: F=1.77, df=3, 26, P> 1.7, PE01: F=0.52, df=3, 26, P>0.670).

Interest has been found to have no effect on the reading comprehension of Other Nations also for the two passages. (PB02: F=0.81, df=3, 26, P>0.499, PE01: F=0.146, df=3, 26, P>0.932).

8.2.5.2 The Relation of PKT with Reading Comprehension

In order to examine the relationship between prior knowledge test (PKT) scores and scores of reading comprehension for the two passages by each group (British, N=30 and Ethiopians, N=30), a Pearson Moment Correlation Coefficient was used. A Spearman Correlation Coefficient was used for the total population (N=60) for reasons described later on in this section.

Tables 8.25 and 8.26 show correlation coefficients and their significance between the scores of the British on the British prior knowledge test (henceforth referred to as PKTB) and their scores on the British passage (PB02), Ethiopian passage (PE01) and the Ethiopian prior knowledge test (PKTE). The same procedure applies to the Ethiopians.

Table 8.25 The British PKTB with PB02 and PE01

	PKTE	PB02	PB02TE	PB02TI	PB02SI
PKTB	0.57	0.56	0.40	0.23	0.33
Significance	0.000	0.005	0.015	0.112	0.038
	PKTE	PE01	PE01TE	PE01TI	PE01SI
PKTB	0.57	0.27	0.21	0.33	0.04
Significance	0.000	0.070	0.129	0.037	0.410

The British PKTE with PB02 and PE01

	PKTB	PE01	PE01TE	PE01TI	PE01SI
PKTE	0.57	0.20	0.05	0.27	0.13
Significance	0.000	0.144	0.397	0.070	0.250
	PKTB	PB02	PB02TE	PB02TI	PB02SI
PKTE	0.57	0.25	0.30	0.13	0.20
Significance	0.000	0.088	0.054	0.472	0.147

Table 8.26 The Ethiopians PKTE with PE01 and PB02

	PKTB	PE01	PE01TE	PE01TI	PE01SI
PKTE	0.07	0.03	0.12	0.28	0.26
Significance	0.36	0.45	0.26	0.05	0.08
	PKTB	PB02	PB02TE	PB02TI	PB02SI
PKTE	0.07	0.13	-0.01	0.18	0.16
Significance	0.36	0.25	0.47	0.18	0.21

The Ethiopians PKTB with PB02 and PE01

	PKTE	PB02	PB02TE	PB02TI	PB02SI
PKTB	0.07	0.32	0.32	0.25	0.19
Significance	0.36	0.04	0.04	0.09	0.15
	PKTE	PE01	PE01TE	PE01TI	PE01SI
PKTB	0.07	0.06	-0.02	0.18	-0.05
Significance	0.36	0.38	0.47	0.17	0.40

From table 8.25 we can see that the British PKTB is highly significantly correlated with textually explicit (r=0.40, P=0.015) and significantly correlated with their scores on schematically implicit component (r=0.33, P=0.04). However, there was no significant correlation between PKTB and textually implicit component of the British passage.

The scores of the British on PKTE was not correlated with any of the components of the Ethiopian passage, although we see a positive correlation with the textually implicit component of the passage (PE01TI: r=0.27, P=0.07)

It should, however, be noted that the British PKTB score is significantly correlated with their score on PKTE (r=0.57, P=0.001).

From table 8.26 we see that the Ethiopian PKTE was insignificantly correlated with their score on PKTB (r=0.07, P=0.36). The Ethiopian PKTE was significantly correlated with the textually implicit (r=0.28, P=0.05) and positively correlated with the schematically implicit (r=0.26, P=0.08) components of the Ethiopian passage.

The Ethiopian PKTE was not significantly correlated with their score on either the British passage as a whole or with any of its components. However, while the Ethiopian score on PKTB was significantly correlated with textually explicit (r=0.32, P=0.04) and positively correlated with the textually implicit (r=0.25, P=0.09) com-

ponents of the British passage, it was not correlated with the Ethiopian passage. In fact, it was negatively and insignificantly correlated with the textually explicit (r=-0.017, P=0.47) and schematically implicit (r=-0.05, P=0.40) components of the passage.

The Spearman Rank Correlation measure rather than the Pearson Moment Correlation Coefficient was used for the total population, because the latter measure is only accepted in the case of normally distributed variables. While the distribution of most quantities within either the Ethiopian or British group might well be approximated as normal, normality is not a reasonable assumption when considering the two groups together.

For all cases (N=60) the Spearman Correlation Coefficient was used to examine the relationship between the PKTE and PKTB scores of two groups and their aggregate scores on the two reading comprehension passages.

Tables 8.27 shows correlation coefficients and their significance levels between PKTB and PKTE and between PKTB and PB02 including its components. Table 8.28 shows correlation coefficients and their significance level between PKTB and PE01 and its components.

Table 8.27 Spearman Correlation Coefficients of PKTB with PKTE and PB02

	PKTE	PB02	PB02TE	PB02TI	PB02SI
PKTB	-0.69	0.60	0.47	0.57	0.48
Significance	0.000	0.000	0.000	0.000	0.000

Table 8.28 Spearman Correlation Coefficients of PKTB with PE01

	PKTE	PE01	PE01TE	PE01TI	PE01SI
PKTB	0.69	0.00	0.26	0.09	-0.48
Significance	0.000	0.49	0.02	0.25	0.000

From tables 8.27 and 8.28 we are able to see that there is a strong negative correlation (r=-0.69, P=0.001) between the prior knowledge scores of the British (PKTB) and the Ethiopians (PKTE).

PKTB is significantly and highly correlated with all the components. The strongest correlation was found to be with textually implicit (r=0.57, P=0.001) followed by schematically implicit (r=0.48, P=0.001). However, it should be noted that there is only a marginal difference between textually explicit (r=0.47) and schematically implicit (r=0.48) components of PB02. PKTB is correlated more negatively strongly with PE01SI (r=-0.48, P=0.001) than PE01TE (r=0.26) and PE01TI (r=0.09, P=0.25). The correlation between PKTB and PE01TE is significant (P=0.02). There was no significant correlation between PKTB and PE01TI (P=0.25).

Tables 8.29 and 8.30 show the correlation coefficients and their significance level between PKTE, PB02 and PE01 including their components.

Table 8.29 Spearman Correlation Coefficients of PKTE with PB02

	PB02	PB02TE	PB02TI	PB02SI
PKTE	-0.43	-0.27	-0.45	-0.33
Significance	0.000	0.019	0.000	0.005

Table 8.30 Spearman Correlation Coefficients of PKTE with PE01

	PE01	PE01TE	PE01TI	PE01SI
PKTE	0.09	-0.17	-0.04	0.50
Significance	0.25	0.09	0.39	0.00

PKTE is significantly negatively correlated with all component scores of the British passage. PKTE is more strongly and negatively correlated with textually implicit (r=-0.45, P=0.001) followed by schematically implicit (r=-0.33, P=0.005)

and lastly by textually explicit (r=-0.27, P=0.019) components of PB02.

From table 8.30, we can see that PKTE shows a contrasting pattern when correlated against component scores for the Ethiopian passage with weak and insignificant negative correlations for textually explicit (r=-0.17, P=0.09) and implicit scores (r=-0.04, P=0.39) and a strong and significant correlation with schematically implicit score (r=0.50, P=0.001).

We move on to a detailed discussion of the findings and their significance in the following Chapter.

CHAPTER NINE

DISCUSSION OF THE FINDINGS OF THE STUDY

9.0 Introduction

Current reading comprehension research tends to support the view that readers use their prior knowledge (cultural, academic or otherwise) along with information in the text to read with understanding (Anderson, 1988, Steffensen et.al., 1979, Spiro, 1981, Alderson & Urquhart, 1988).

Most research studies have concerned native speakers of English and the area of prior knowledge, particularly in terms of cultural knowledge, has been neglected in ESL reading comprehension research. (see 1.1.2, 1.1.3, 1.1.4 & 1.1.5). However, the research studies on ESL reading done by Hudson (1982), Carrell (1983a), Johnson (1981) and Alderson & Urquhart (1988) are of significant importance in the area of ESL/EFL reading comprehension.

As indicated in Chapter One, the main purpose of this study is to gain a better understanding, in a specified way, of the role that prior knowledge plays in the comprehension performance of non-native speakers of English. In addition, the study tries to show how one comprehension question type is different from the other and in what way. That is the reason why comprehension questions were categorized into three types (TE, TI & SI), each one being treated as a separate entity in its own right. This categorization of question types is of immense importance in second language reading in general and material preparation in particular.

Though this study recognizes the difficulty of categorizing all questions unequivocally into these three types (TE, TI & SI), it seeks to find out which question-type

has the greatest tendency to distinguish between native and non-native speakers of English . The study also takes into account the relationship between prior knowledge and reading comprehension of native and non-native speakers of English. Although not of particular importance the effect of the interestingness of a passage on reading comprehension was taken into account, and was subsequently investigated.

This Chapter has four parts. The first is concerned with the research questions that the present study attempts to specify, identify and then answer. The second is a discussion of the results as they were classified according to the three comprehension question types and the interactional aspects of the variables used in the study. The third deals with specific findings on the question of skilled and unskilled reading, emphasizing knowledge of vocabulary. Lastly, the summary of the results are briefly presented.

The hypotheses formulated to carry out this research are given in the following section.

9.1 Hypotheses

The hypotheses of the present study are categorized in two parts. The hypotheses that have to do with reading *per se* fall under the heading *Reading Ability* and those related to background knowledge are put under *Existing Knowledge* as shown below.

9.1.1 Reading Ability - Hypotheses A

In connection with the reading abilities of native as well as non-native speakers of English the following hypotheses were investigated:

1. There is a significant difference in comprehension test performance between native and non-native speakers of English due to Question type (TE, TI & SI) and Passage type (PE01 & PB02).

2. Comprehension performance of L2 readers is directly related to linguistic com-

petence in the target language.

3. Higher level of cognitive processing is manifested by linguistic ability.

4. One comprehension question type (TE or TI or SI) is more (or less) significant in determining reading comprehension differences between native and non-native speakers of English in particular and reading comprehension *per se* in general.

5. Skilled reading is a direct result of linguistic competence.

9.1.2 Existing Knowledge - Hypotheses B

Regarding background knowledge of the subjects involved in the study, the following hypotheses were investigated:

1. There is a difference in comprehension test performance due to differences in cultural schemata.

2. The interestingness of a culture-specific passage has an effect on reading comprehension.

3. Background knowledge in terms of cultural schemata facilitates/enhances the ability of non-native speakers of English to process information from a given text.

4. There is a relationship between prior knowledge in terms of cultural schemata and reading comprehension.

5. There is a significant difference in comprehension test performance due to the effect of interaction of background knowledge, passage type, and question type.

We take for granted that, on the whole and according to the previous literature, that the Ethiopian passage will be comparatively easier for the Ethiopian readers to understand and the British passage will be comparatively easier for the British readers to understand, though, as we will see later on in this Chapter, the greater

reading skills of the British readers and certain other factors will not make this quite as simple a duality as it might appear at first.

The analysis and findings of the study based on the different comprehension question types and interactional effects of passages, nations and components are discussed in the following sections.

9.2 Discussion of Results

Before discussing the results in detail, it is worth pointing out that this research, as has been mentioned previously, serves to indicate possible conclusions that can be drawn about the reading comprehension of non-native speakers of English. As in any such study there are both practical and theoretical limitations which must be acknowledged in any scholarly work. The theoretical limitations are in the area of the disputes among experts about the nature of schemata and the ability of schematically implicit questions to reflect unambiguously the relationship between individual readers' schemata and comprehension of particular passages.

The practical limitations are inherent in a one-off experiment of the kind conducted. Classroom research allows for constant refinement of the test instrument and even then it is notoriously difficult to get experts to agree absolutely on the suitability of all distractors, the completely unambiguous nature of each question, and the absolute categorization of test items into three categories. Test items, therefore, are on most occasions a slightly blunt instrument which give very strong indications rather than final answers.

Furthermore, it was felt essential that this particular study should tap a cultural background familiar to the researcher. This also served to provide face validity. However, the practicalities of conducting this research among Ethiopian graduates in Britain rather than in Ethiopia imposed practical problems of organization and timing. This meant, for instance, that it was impossible to get the reactions of the 6

validators of the question categorization before the experiment was conducted. However, it was decided to approach the validators to determine whether the experiment provided certain evidence to support the main hypotheses or was more in the nature of a very strong indicator.

The responses of the validators have been reported on elsewhere in the study. Four clear errors of categorization have been acknowledged in the test, as have some measure of opaqueness and ambiguity in three or four more questions. However, it is felt that this level of miscategorization means that the general indications demonstrated in the experiment are still valid, though the researcher would agree that further work in this area would be needed to establish all the findings beyond dispute. This is, however, probably true of most instruments administered on a one-off basis. One attempt to widen the validity of the research was the administration of the test to a group of Other Nations to see how they fared on the British and Ethiopian passages.

With these caveats in mind, the results will be discussed in more detail, the conclusions reached being tempered with some caution.

As expected, purest results to support schema theory would be if each of the two cultural groups perform better on the comprehension item derived from the home culture. But interestingly, this did not distinctly happen, as can be seen from the results of the data below.

Overall, the results of the main test showed that all subjects performed better on comprehension items derived from a familiar culture-specific passage. The detailed statistical results of this empirical testing for purposes of empirical verification have been given in the previous chapter (see tables 8.4 & 8.5).

Briefly, the results showed that, overall, the British performed significantly better (mean = 16.6) than the Ethiopians (mean = 12.3) on the British passage and the difference was statistically significant ($P < 0.001$).

On the other hand, although the performance of the Ethiopians (mean = 16.2) on the Ethiopian passage was slightly better than the British (mean = 15.6), the difference was not found to be statistically significant.

From the overall results cited above, it can be concluded that the Ethiopians did not perform outstandingly better on comprehension questions of the Ethiopian passage than the British.

The effect of interest on the reading comprehension of native and non-native speakers of English on familiar and unfamiliar texts was taken into consideration in the present investigation. (see 8.2.5.1)

ANOVA was used to see the differences between those who were interested in PB02, PE01, both passages and none of the passages. It was found that interest did not have any effect for the British on the British passage (F= 0.67, df= 2, 27 P= 0.552). Although the British who were not interested in the Ethiopian passage had had a lower score than those who were interested, a significant difference between the groups due to interest was not observed (F= 4.8, df= 2, 27 P= 0.16).

Similarly, there was no difference observed between the Ethiopians who were interested in the British passage (F= 1.77, df= 3, 29 P= 1.7) as well as in the Ethiopian passage (F= 0.52, df= 3, 26 P= 0.670). Furthermore, interest has been found to have no effect on the reading comprehension of Other Nations for the two passages (PB02: F= 0.81, df= 3, 26, P= 0.499; PE01: F= 0.146, df= 3,26, P= 0.932). Therefore, hypothesis B2, *The interestingness of a culture-specific passage has an effect on reading comprehension,* is not accepted.

There is a fundamental question that should be raised for the sake of clarifying the objective of the study. The question is: *What question type measures, examines, and determines prior knowledge of a subject?* or to put it in a slightly different way: *Is it the textually explicit or the textually implicit or the schematically implicit*

question type that is capable of determining with reasonable accuracy, the amount of background knowledge one possesses on a familiar or unfamiliar topic? This question is not only of major importance in the assessment as well as understanding of what schemata are all about but also the cornerstone of this study.

Therefore, it is of paramount importance to treat each question type on its own merit and evaluate the outcomes derived from it. The results obtained from textually explicit, textually implicit & schematically implicit comprehension questions are shown in the following three consecutive sub-sections.

9.2.1 Textually Explicit Questions

As the name implies, textually explicit questions have both the question information and the answer information stated in a single sentence in the text. (see 7.9.1)

As expected, on the Ethiopian passage, the Ethiopians should obviously have an advantage and be able to perform better than the British and *Other Nations.* Surprisingly, however, the Ethiopians did not perform better than the British and *Other Nations* on textually explicit comprehension questions. On textually explicit questions of the Ethiopian passage the mean scores of the Ethiopians, British and *Other Nations* were 5.6, 6.4 and 5.1 respectively (see tables 8.5 and 8.11). From these results we see that, although the material/content of the Ethiopian passage is unfamiliar to the British, they performed better than the Ethiopians and significantly better than Other Nations (P= 0.008), not to mention their significant performance on TE items of the British passage. Therefore, hypothesis A1, *There is significant difference in comprehension test performance between native and non-native speakers of English due to question type (TE) and passage type (PE01 and PB02),* is accepted.

It should be noted that the major requirement to process textually explicit questions is linguistic competence. The nature of textually explicit questions is such that, question-answer relations can be processed right from the text without any higher

order of processing of information involved. Textually explicit questions were found to be the easiest to score. (see tables 8.4 & 8.5) This is simply because the answers are easily processed on the page of print. However, it is important to note that textually explicit items without the associated passage are difficult to score, because they are passage-dependent. This is confirmed in the pilot study (see Chapter Seven). Now we move on to textually implicit items.

9.2.2 Textually Implicit Questions

As stated in section 7.9.2, textually implicit items have the question information in different sentences in the text, requiring the reader to combine the separate pieces of information in order to produce or recognize an answer.

Although textually implicit question types are less easy to score than textually explicit comprehension questions, interestingly they have been found to be easily accessible by native speakers irrespective of familiarity with the topic. This can be proved by just looking at the mean scores of the British on textually implicit items of the Ethiopian passage. The British had a mean score of 6.2 which was the same as that of the Ethiopians (mean = 6.2).

The findings suggest that textually implicit questions, unlike textually explicit questions, are indicative of higher order processing of information - a direct reflection of the application of both linguistic and prior knowledge. This assertion comes from the evidence that the British performed significantly better than the Ethiopians and *Other Nations* on textually implicit items derived from the British passage. The mean score of the British on textually implicit items was 5.2 as opposed to 3.4 of the Ethiopians. The difference between the scores is statistically significant ($P > 0.001$).

It is interesting to note, at this point, regarding textually implicit items of the British passage, the mean scores of the Ethiopians (mean = 3.4) and *Other Nations* (mean = 3.7) were not significantly different ($P > 0.484$). It can be observed that

the mean scores of both the Ethiopians and *Other Nations* on textually implicit items of the British passage were significantly lower than the British (see tables 8.4, 8.5, 8.10). This is because these ESL readers were obviously disadvantaged both by lack of background knowledge and linguistic ability.

Interestingly in the same way, the mean scores of the non-natives or ESL readers, namely, the Ethiopians (mean = 6.2) and *Other Nations* (mean = 4.7) on textually implicit questions of the Ethiopian passage were significantly different ($P < 0.001$). (see table 8.9) It should also be noted that unlike textually explicit questions, the Ethiopians performed equally as well as the British on the textually implicit questions of the Ethiopian passage. The main reason for this is that the Ethiopians were advantaged on implicit questions of a familiar topic which required a bit of prior knowledge. Here, hypothesis B3, *Background knowledge in terms of cultural schemata facilitates/enhances the ability of non-native speakers of English to process information from a given text,* is accepted.

Suffice it to note, the fact that the Ethiopians performed better than *Other Nations* (though both groups are ESL readers) on textually implicit questions from the Ethiopian passage is a clear evidence for the assertion that prior knowledge aids as well as facilitates reading comprehension.

As the name implies, a question-answer relation is classified as textually implicit, if both questions and answers are derivable from the text but there is no logical or grammatical cue tying the question to the answer and the answer given is plausible in the light of the question. Therefore, like textually explicit questions of a familiar or unfamiliar topic, native speakers are advantaged to process textually implicit comprehension questions without an arduous struggle. However, non-native speakers require the support of prior knowledge to fill the missing link that was created due to lack of knowledge of the language.

A particular problem is that the classification of the questions into explicit and implicit is inevitably arbitrary. The questions naturally distribute themselves along a continuum and there is bound to be some overlap or lack of sharp distinction between the types of question in the middle of the continuum. Nonetheless, it was felt that the classification of questions into explicit and implicit was justified on the ground of convenience.

The findings based on both textually explicit and implicit items are only relative and obviously need the support of future research.

9.2.3 Schematically Implicit Questions

The third type of questions are termed Schematically implicit items: items that required prior knowledge of the subject in question. It should, however, be noted that there is a considerable debate as to whether SI questions exist and if so what proportion of the answers are to be found entirely in the passage and what proportion related to background knowledge. Even the top researchers in the field take slightly different positions on this issue. In the light of this debate, it is necessary to be cautious when interpreting the present results.

Nevertheless, it is possible to draw some tentative conclusions about this area, conclusions which may, of course, be questioned if the theoretical issues are resolved in one direction rather than another.

The analysis of the data for the present study revealed that the British and *Other Nations* performed significantly less on the schematically designed reading comprehension items of the Ethiopian passage than the Ethiopians. The mean scores of the British, *Other Nations* and Ethiopians were 3.1, 2.7 and 4.4 respectively and the difference between the mean scores of the two cultural groups and Ethiopians was found to be statistically significant ($P < 0.001$). Likewise, the British performed significantly better than the Ethiopians and Other Nations on the British passage

($P < 0.001$).

It is also important to see how prior knowledge is related to reading comprehension. The Pearson and Spearman Correlation Coefficients were used to find out the relationship between prior knowledge test (PKT) and reading comprehension performance of the subjects.

First, let us see the correlations of PKT with each of the passages (PE01 and PB02) and by each Nation (Ethiopians and British) as indicated in tables 8.25 & 8.26. The score of the British on the British prior knowledge test (PKTB) was highly significantly correlated with textually explicit (r= 0.40, P=0.015) and schematically implicit (r= 0.33, P= 0.04) questions of PB02. Their score on the Ethiopian prior knowledge test (PKTE) was not correlated with any of the components of PE01. (see table 8.25)

By the same token, the scores of the Ethiopians on PKTE was significantly correlated with textually implicit (r= 0.28, P= 0.005) and positively correlated with schematically implicit (r= 0.26, P= 0.08) questions of PE01.

Secondly, for all cases (N= 60) the Spearman Correlation Coefficient showed that the correlation between PKTB and PE01TE was significant (P= 0.02). However, PKTB was negatively strongly correlated with PE01SI (P=- 0.001). On the other hand, PKTE was significantly negatively correlated with all the components of PB02. (see table 8.29)

The British prior knowledge test is highly significantly correlated with textually implicit (r= 0. 57, P= 0.001) followed by schematically implicit questions of PB02. Whereas the Ethiopian prior knowledge test (PKTE) was correlated significantly with only schematically implicit component of PE01 (P= 0.001).

From these results we see that both prior knowledge tests, PKTB & PKTE,

were found to have a relationship with the reading comprehension of the British on PB02 and the Ethiopians on PE01 respectively. Therefore, hypothesis B4, *There is a relationship between prior knowledge in terms of cultural schemata and reading comprehension,* is accepted.

We have also seen in the previous chapter that the British performed significantly better than the Ethiopians and Other Nations on the British passage. The Ethiopians performed significantly better than the Other Nations and the British on all question types and SI items of the Ethiopan passage respectively. In addition, the Spearman Moment Correlation Coefficients showed that there was a strong negative correlation (r= -0.69, P= 0.001) between the prior knowledge score of the British (PKTB) and the prior knowledge score of the Ethiopians (PKTE). Hence, hypothesis B1, *There is a difference in comprehension test performance due to differences in background knowledge,* is accepted.

On the basis of the findings of this study, it is interesting to note that knowledge of the language alone is not sufficient in the process of reading comprehension. This can be aptly demonstrated not to be so by the mere fact that the scores obtained by the British (Native Speakers) and *Other Nations* (Non-native speakers) on background knowledge questions of the Ethiopian passage were less than the scores of the Ethiopians. In addition, the Ethiopians performed signifgicantly better than Other Nations on textually implicit questions of the Ethiopian passage. Therefore, hypothesis A2, *Comprehension performance of L2 readers is directly related to linguistic competence in the target language,* may not be fully accepted.

It is important to note, that schematically framed comprehension questions require the reader to use some information from the given text and some from a fund of previous experience. Although, as stated earlier, the existence of SI questions is in doubt by some authorities in the field, the investigator of the present study drew

heavily on the works of Pearson and Johnson (1978:162) who assert that:

Scriptual comprehension, then, occurs when a reader gives an answer that had to come from prior knowledge (it is not there in the text) to a question that is at least related to the text (ie. there would be no reason to ask the question if the text were not there). It is similar to textually implicit comprehension in that an inference is involved: however, it is different in that the data base for the inference is in the reader's head, not on the page.

At least on the basis of the present study, schematically framed comprehension questions were found to be indicative of how much information and linguistic capacity a reader, native or non-native, possesses on a familiar or unfamiliar topic. As indicated earlier in this section, on schematically designed reading comprehension questions, however small the scores were, the Ethiopians performed significantly better than the British on the Ethiopian passage. Conversely, the British performed significantly better than the Ethiopians on the British passage. *Other Nations*, who were disadvantaged by virtue of being culturally unfamiliar with both culture-specific passages scored significantly lower than the Ethiopians and the British.

An equally interesting result obtained from this study is that regardless of linguistic ability in the target language, schematically implicit comprehension questions were found to require higher order processing of information than that which resides in a given text. This is because the reader answers questions by going out side the given text using his/her imagination and general understanding of what is being discussed in the text. Therefore, deficiency or efficiency in the target language may not significantly affect reading comprehension. The overall mean scores of the British on schematically framed comprehension questions provide evidence for this, since they were significantly less on both passages than textually explicit and implicit questions. This holds true for Ethiopians and *Other Nations* (see tables 8.4, 8.5, 8.10 & 8.11).

On the basis of the findings of the current study, it is highly unlikely that hypothesis A3, *Higher level of cognitive processing is manifested by linguistic ability,* is correct.

The findings of the present study suggest that schematically implicit questions tap a deeper level of comprehension than the other two types and can be distinguished from them by the different relative capabilities of the three groups in answering them. The foregoing discussion can not be complete without analyzing the effects of each independent variable used in this study. Therefore the effects of passage, components, nations and passages are discussed in the section to come.

9.2.4 Interactional Effects

The overall results appeared to have shown that some of the main effects were in predicted directions. With respect to the independent variables: Nation, Passage type and Component, it was found on two way ANOVA, that there were significant interactions.

First of all, the difference between the component is found to be significant ($P < 0.001$). The main effect of component is observed by taking total comprehension scores for both passages. The highest scores were on textually explicit questions and the lowest on schematically implicit questions.

What is more interesting is that the effect of component is significantly different for different nations ($P < 0.001$).

Tables 8.13 & 8.14 indicate significant main effects for Nation ($F[2,89] = 19.38$, $P < 0.001$) and for passage ($F[1,87] = 9.35$, $P < 0.003$).

However, it should be noted that the effects of passage depend on which group one is looking at. That is to say, that the passage by Nation interaction was mainly due to the presence of the culture-specific contents in the two passages selected for this study, i.e. the British passage was culture-specific in favour of the British and the

Ethiopian passage was culture-specific in favour of the Ethiopians. Consequently the British readers performed significantly better than the Ethiopians on the British passage, while the Ethiopians performed slightly better than the British on the Ethiopian passage. Nonetheless, this result is based on the aggregate scores of TE, TI and SI items on each passage.

Therefore, it was necessary to see whether the cultural group by question type interaction was found present in the separate analysis of both passages. Statistical tests for the interaction effects between nation and question type revealed that the contrast between British and Ethiopians were greatest in the case of schematically implicit questions compared with other question types. It is also worth noting that the contrasts between the two nations appeared to be larger for the British passage than for the Ethiopian passage.

The differences between the components, as indicated earlier is also significant ($P < 0.001$). The mean score for TE is significantly greater than TI and similarly, TI is significantly greater than SI. Therefore, a main effect of component is observed. Therefore, hypothesis A4, *One comprehension question type (TE, TI, or SI) is more (or less) significant in determining reading comprehension differences between native and non-native speakers of English in particular and reading comprehension per se in general,* is accepted. This distinct difference will clear the ground to give the sort of conclusions that have been given under each question type. (see 9.2.1, 9.2.2, & 9.2.3)

As far as the two-way interaction (i.e. Nation by passage by component) is concerned, the interaction between component and passage depends on nation. That is, for both passages, the overall British mean score for TE and SI (see fig. 8.5 & 8.7 and tables 8.17 & 8.18) was greater than the Ethiopian and *Other Nations.* But the overall mean, for the two passages of the Ethiopians on SI component types were significantly greater than the British and *Other Nations.*

The interactional effect of component on Nation needs further elaboration by treating the two passages separately. If we look at the passages separately (see table 8.14) we see differences (F [2,304] = 27.27,$P < 0.001$) in the effect of the component. On the British passage, there was no interaction between component and Nation. This means that the British mean scores were significantly different on all question types (see fig. 8.8), whereas on the Ethiopian passage, the interaction between component and nation is apparent. That is, the British performed better on TE question type than the Ethiopians and conversely, the Ethiopians performed better on SI question types of the Ethiopian passage. (see fig. 8.9)

Therefore, whereas there was an interaction between component and Nation and passage type on the Ethiopian passage, there was none on the British passage. With a two way interaction, on the British passage the effect of passage is different for the different nations. This is because of the linguistic ability coupled with background knowledge the British had on a familiar topic. Hypothesis B5, *There is a significant difference in comprehension test performance between native and non-native speakers of English, due to the effect of interaction of background knowledge, passage type, and question type,* is accepted.

9.3 Specific Findings: Skilled and Unskilled Reading

Going from the results of the study to a significant area, let us look at vocabulary and reading and how the study relates to it.

Research findings have shown that reading in a language other than one's first (L1) is a source of difficulty (cf. Macnamara, 1970, Oller et al. 1973). Subjects tend to read in a second language with less understanding and at a slower rate. Alderson (1984) in his critical summary of this research expressed the view that a growing body of research failed to demonstrate a strong relationship between reading ability in the first language and reading ability in a second language. In an extensive review

of the literature on reading in L2, Alderson found out that researchers have explained difficulty with L2 reading according to two competing hypotheses. That is, poor reading in L2 is due to difficulties with reading skills or poor reading in L2 is due to difficulties with the language. However, the importance of background knowledge in reading comprehension has not been taken into consideration.

If the ESL reader does not have the relevant background knowledge (i.e. old information acquired from previous world knowledge which will be related/assimilated to the new), it may be most difficult to detect the structural organization of the passage and utilize the context to aid comprehension as s/he is seriously handicapped by knowledge of the language. (see Chapter Five and Six)

Another area that should be taken into serious consideration is the role of vocabulary in the process of reading comprehension. Vocabulary has been considered as an important predictor of reading success (Fry & Lagomarsino, 1982). The findings of this study support the view that vocabulary is a good predictor of the background knowledge a reader may have on a given area. The results obtained from vocabulary tests, administered to all subjects of this study before they were allowed to read the passages for comprehension, were found to have a relationship with reading comprehension. Hence, it should be noted that culture-specific vocabulary tests are indicative of existing prior knowledge of culture-specific comprehension questions (see 7.7.1.1).

Koler (1973) emphasizes that the skilled reader operates on logical relations in the text even to the point of ignoring actual text material. Words are read and remembered preferentially with regard to their meaning. Prior knowledge facilitates this effect because the reader with well elaborated schemata can more easily fit the material to the schema or *instantiate* (Lipson, 1983). According to this what may separate skilled from unskilled readers is how much can be read at a single glance

(Holmes, 1973). This refers to the non-visual information or knowledge which expands on what is presented and not to the actual visual information present. For instance, it has been proposed that a ratio of one part of visual information to three parts non-visual or existing knowledge is optimal processing (Holmes, 1973).

However, as far as ESL reading is concerned, the question of skilled and unskilled readership seems to be quite a dubious area at present and, therefore, should await further research.

Sole reliance on linguistic items only in order to activate schema (ta) is a potentially dangerous course of action for L2 readers, since there is always the possibility that the wrong schema might be activated and a bias towards the whole text and the whole effort to the reading process unconditionally thwarted.

On the other hand, it is naive to suggest that it is adequate enough to have only background knowledge for comprehension to occur in a foreign language. Prior knowledge of a situation does not guarantee its usefulness for comprehension. In order for prior knowledge to aid comprehension it must become an activated semantic context (Bransford & Johnson, 1972) via knowledge of vocabulary.

The approach to ESL reading via background knowledge primarily and linguistic knowledge secondarily is one of emphasis rather than of kind. If the L2 reader has little or no background knowledge about the content area of the text and has limited lexical and syntactic knowledge, obviously one is seriously handicapped by being engaged in a substantial decoding to come to an understanding of what the text is all about.

It is not much of a debate that decoding unfamiliar content domains is difficult enough for linguistically competent native speakers as well. This is re-affirmed by Sandford & Garrod (1981) that the chances of accommodation of new input depend on how detailed a scenario is. On the same notion, Schallert (1976) reiterates that

the level of sophistication of existing knowledge structures is regarded as determining the acquisition of new information.

Therefore, there is every reason to believe that if understanding unfamiliar content domains is difficult for native speakers, it can as well pose a formidable problem for non-natives.

There is evidence (cf Hamp-Lyons, 1985) that *L2 readers tend to employ word-level reading strategies: Local Reading.* as opposed to *Global Reading,* (such as guessing the meanings of words from the context). It seems, however, that the distinction between local reading and global reading is a false one as they are independent from each other on the one hand and inextricably linked together on the other. Word-level reading strategies should not be stigmatized as inappropriate, because the utilization of content words to construct meaningful propositions is a well-documented strategy of native speakers (cf. Clark & Clark, 1977).

Some authorities in the field of reading have had us believe that L2 readers anchor themselves to lexical items rather than sentence structures or discoursal frameworks implying that usage of lexical items is more *local* than the utilization of sentence structure or discourse items.

Regarding word identification, it is important to mention the two opposing views. The *componential* view tends to regard words as being composed of minimal units of content labelled as semantic components, semantic primitives and semantic markers. Such a view is in support of the notion that meaning is composed of fixed and necessary attributes. Here, language processing is regarded as essentially context-free. However, many researchers including Givon (1982) who are interested in an empirically viable epistemology of natural language, reject outright the idea of a componential view of lexical items because of its failure to take context into account.

On the other hand, the *encyclopaedic* view regards word identification as wholly

context-bound. The componential view takes for granted that natural language is close-ended and/or context free. Words, however, have no fixed meanings as they are understood and comprehended differently by different people depending upon the particular knowledge of the world involved.

I would like to cite only one example from the data of the present study in order to illustrate whether it is the exclusive duty of ESL/EFL learners always to anchor themselves to lexical items during the process of reading comprehension. Question No. 27 of the Ethiopian Passage reads: (cf. Appendix C7)

The lamenter poet is paid according to how well she has done her job. "Well "refers to : 1. how far she makes mourners weep more

2. how far she swings in the funeral dance

3. how far she praises the departed

4. how far her poems are coherent and mournful

17% of the British as opposed to 57% of the Ethiopian subjects answered the above question correctly. This finding throws some light on the idea that lexical items processing should not always and necessarily be relegated to local reading or bottom-up processing of information. Therefore, it seems to me at this stage and, of course, needs further investigation, that the belief that L2 readers anchor themselves to lexical items is an erroneous assumption and it must be borne in mind that it is not local reading *per se* which is the cause of mis-comprehension, but a combination of various factors including lack of background knowledge.

It is imperative to mention the fact that the activation of background knowledge can give rise to both appropriate elaboration and inappropriate modifications (Carrell, 1983a) of textual meaning.

The example taken from the data of this study *good job* is an example that served to show both appropriate elaboration and inappropriate modifications made

by the two cultural groups - Ethiopians and British. The Ethiopians have activated *bad job* schema based on background knowledge while the British have activated a *good job* schema as it is stereotypically understood, which resulted in an inappropriate understanding (in fact quite the opposite) of what the text is supposed to convey. Thus, hypothesis A5, *Skilled reading is a direct result of linguistic competence,* is not accepted.

There is substantial evidence that *poor comprehenders* do indeed tend to *encode individual word concepts*, binding themselves to the exact wording and limiting their ability to paraphrase and retain the gist as individual words are forgotten (Merrit, 1969). This notion is not totally objectionable, because it is possible to remedy the situation by drawing attention to the inefficiency of encoding individual words and concepts which are detrimental to more global, inferential, and constructive processes. What is actually objectionable is the setting up of a dichotomy between reading for word identification and reading for meaning by relegating the former in the process of achieving the latter. But, is it not true that native speakers resort to a strategy of identifying lexical items when they find themselves in a situation where the content of the message is unfamiliar?

However, getting the right meaning of words with particular reference to the appropriate context in a given cultural milieu is not necessarily the task exclusively expected of skilled readers. Therefore, drawing a dichotomy between skilled and unskilled comprehenders on the basis of *who gets the right meaning* may not seem appropriate.

The results of this study suggest, as indicated earlier in this section, that background knowledge serves both natives and non-natives squarely, irrespective of the influence of linguistic capacity. Had it not been for background knowledge, cultural in this case, the Ethiopians would not have scored better than the British and *Other*

Nations on many of the culture-specific comprehension questions, one of which is given as an example to demonstrate the case in point.

Whereas it is true that skilled readers utilize content effectively to decide which micro-propositions are relevant or irrelevant; this, by no means, should imply that decoding is the exclusive property of unskilled comprehenders. Further, the idea of equating unskilled reading with decoding is all the more refuted by Lesgold and Perfetti (1981). To the dismay of the supporters of global reading, Lesgold and Perfetti found out that word decoding is in fact the property of skilled readers. They say: ... *efficient (fast and automatic) decoding is a feature of skilled reading. Word decoding is particularly well refined in skilled readers. Expert readers are especially characterized by highly refined lower-level procedures for handling words.*

(Lesgold & Perfetti, 1981;405)

Moreover, Stanovich (1980) claims that reliance upon sentence context to facilitate word recognition is characteristic of *less skilled readers* , even though skilled readers are better at utilizing such context.

A reasonable argument worth a mention here is the finding of Barron (1981). Barron suggests that the fact that less skilled readers appear to be more dependent on context for word recognition may be due to their inability to utilize efficiently a phonographic strategy. Such a strategy involves the rapid activation of phonological information and the utilization of such information for access to syntactic and semantic information, that is, a rapidly activated phonological code may provide access to more precise information about the semantic and syntactic identity of a word than is provided by context.

Nonetheless, in order to utilize the context for reducing the range of possible meanings of unknown words, the reader must first and foremost activate a context on the basis of his prior knowledge. To ensure the provisional hypothesis about

the intended textual meaning is reasonably accurate, presupposes that the context activated must be appropriate and relevant. To effect such a facilitating context, the reader, native or non-native, needs to start either from top to bottom or the other way round. And this processing of information in either way can be done by both *skilled* or *unskilled* readers depending upon the familiarity of the given topic. All factors remaining constant, it needs the support of further research, to draw a neat boundary between skilled and unskilled readers and/or comprehenders, be it in L1 or L2 taking into account all the extra-linguistic factors involved in reading comprehension.

9.4 Summary of Results

The summary of results are discussed relative to the findings of this study. They must, of course, be viewed from the limitations of the investigation in hand. The conclusions that have been drawn are relative and therefore need the support of future research.

The purpose of the study was to gain a better understanding, in a specified way, of the role of prior knowledge in terms of cultural schemata in comprehension performance of students reading English as a second language. The study involved question type and passage type as major factors in determining the ability of native and non-native speakers drawn from contrasted cultural groups.

In addition, the study tried to show how one question type is different from the other and in what way. This is the reason why comprehension questions were categorized into three types each being treated as a separate entity so that the results produced are also separate in their own right. This categorization of question types is of immense importance in second language reading in general and material preparation in particular.

A major finding of this study is concerned with the relationship between schematically framed questions and background knowledge. The processing of information

on schematically implied versions of the text by ESL readers is found to be considerably enhanced by relevant existing schemata. The evidence comes from the fact that on schematically implicit questions drawn from the Ethiopian passage, the Ethiopians performed better than the British and Other Nations. Likewise, with regard to schematically framed questions of the British passage, the British scored higher than the Ethiopians and Other Nations. In both cases, the difference between the mean of the two groups is found to be statistically significant.

The findings of this study seem similar as well as different from existing studies in some ways. The methodology carried out to compose questions to measure comprehension is one aspect which deserves a mention here. A pilot study was carried out to see whether one question was either passage dependent or passage independent, the idea being that all question types were related directly or indirectly to the associated passage(s). The classification of the questions into different types helped to dilineate the comprehension performance of subjects, so that the conclusions arrived at were treated separately on their own merit.

As predicted, this study showed that knowledge of the target language has a significant effect on textually explicit comprehension questions. As stated earlier, a question-answer relation is classified as textually explicit if both questions and answers were derivable from the text and if the relation between question and answer was explicitly cued by the language of the text: *reading the lines.*

Therefore, the natives, equipped with the necessary linguistic capacity performed significantly better than the non-natives on textually explicit questions of the Ethiopian passage as well as the British passage. The reason for this is not a complex one. As asserted by Clarke (1979) and Cziko (1978), it is highly likely that the limited language proficiency places a ceiling on one's L2 reading ability. Both Clarke and Cziko, ESL reading specialists, strongly argue in favour of their findings

that reading in L2 is dependent on language proficiency. But the sad thing is that they don't give us a detailed account of the specific area of deficiencies or shortcomings that ESL learners are mostly bound to suffer from. Are the shortcomings apparent as they seem to be, due to lack of adequate prior knowledge primarily or lack of linguistic capability in the target language secondarily (or vice-versa) or is it a combination of the two, no matter in which order? Therefore, one is bound to note that Clarke and associates have confounded linguistic and prior knowledge factors in the area of ESL reading comprehension problems.

Another finding from this study regarding textually explicit comprehension question-answer relations, irrespective of passage type, is that the scores obtained by all the three cultural groups on textually explicit questions were found to be the highest followed by textually implicit ones. The lowest scores for all groups were on schematically implied comprehension questions. This finding questions the postulates put forward by Dooling and Lachman (1971), and by Sulin and Dooling (1984), that comprehension is seriously impeded when the reader has to function within the frameworks of unfamiliar topics. Though convincing as it appears, it is worth asking oneself what is meant by an unfamiliar topic. *Is it an unfamiliar topic in an unfamiliar language or an unfamiliar topic but in a familiar language?*

The results of this study indicate that the British performed better than their counterparts on the textually explicit and equally well on the implicit comprehension questions on an unfamiliar culture-specific text, i.e. the Ethiopian passage. Conversely, the mean scores of the Ethiopians on textually explicit questions of the British passage were higher (better) than textually implicit or schematically implied questions. The same thing applies exactly to the third group - *Other Nations.*

The findings of this study suggest that textually-explicit questions cannot adequately distinguish between one's familiarity or unfamiliarity with a topic in the

reading process. This takes us to the contention that, since textually explicit comprehension questions are text-dependent, the question-answer relations can be easily or laboriously processed from the page of the print. Unless otherwise refuted by further studies, textually explicit comprehension question types are not valid enough to measure familiarity or unfamiliarity with a topic.

A case in point is, on the Ethiopian passage, the Ethiopians should have an advantage and be able to perform better than the British and *Other Nations.* However, on textually explicit questions, the Ethiopians, as has been mentioned earlier in this chapter, did not perform better than the British and *Other Nations.* This is because, although the material/content is unfamiliar to the British and *Other Nations*, the nature of textually explicit questions is such that the question-answer relations can be processed right from the text without any higher order of processing being involved. Based on the findings of this study, textually explicit questions may not be taken as fairly reliable indicators of comprehension, no matter whether the text is familiar or unfamiliar.

In the same way, it has been found that textually implicit questions are easily accessible by native speakers irrespective of much familiarity with the topic. On the other hand, the findings suggest that textually implicit questions, unlike textually explicit questions, are indicative of a higher order processing of information : a direct reflection of both linguistic and prior knowledge. This is why the British performed significantly better than the Ethiopians and *Other Nations* on textually implicit questions derived from the British passage. By the same token, interestingly the mean scores of the non-natives or ESL readers, namely Ethiopians and *Other Nations,* on textually implicit questions of the Ethiopian passage were significantly different. This is because the Ethiopians were advantaged on these questions which partly required background knowledge. Therefore, the findings of this study suggest that like textually explicit questions of a familiar or unfamiliar topic, native speakers

are advantaged to process textually implicit comprehension questions without much effort. Whereas, non-natives require the support of prior knowledge to fill the missing link that was created due to the lack of linguistic knowledge. Therefore, the reason why the Ethiopians performed better than *Other Nations*, though they are both ESL readers, on textually implicit questions from the Ethiopian passage is a clear evidence for the assertion that prior knowledge aids as well as facilitates reading comprehension.

The results of the present study indicated that schematically framed questions may generate differences in any reading comprehension undertaken by natives as well as non-natives leaving aside for the moment the important element of linguistic capability. Therefore, the results of this study seem to indicate that the reader, whether native or non-native, with better developed schemata comprehends better because relevant schemata for any given task serve as an interpretative framework necessary for comprehension. The findings of this study also suggest that background knowledge compensates for certain syntactic or semantic deficiencies of non-native speakers of English.

Schematically implied comprehension questions require higher order processing of information than that which resides in a given text. Hence, deficiency or efficiency in the target language does not significantly affect reading comprehension based on background knowledge. In addition, it was also noted that schematically framed questions could be indicative of how much information and linguistic capacity a reader, native or non-native, possesses on a familiar and/or an unfamiliar topic.

It is important to note that the overall results appeared to have shown that the main interactional effects of passage, question type and cultural groups were in predicted directions.

The passage by Nation interaction was mainly due to the presence of culture-

specific contents in the two passages selected for this study, i.e. the British passage which was culture-specific in favour of the British and the Ethiopian passage which was culture-specific in favour of the Ethiopians. Consequently, the British readers performed significantly better than the Ethiopians on the British passage, while the Ethiopians performed slightly better than the British on the Ethiopian passage.

These results are based on the aggregate scores of TE, TI and SI reading comprehension questions. However, the aggregate results are not sufficient enough to warrant comprehension performance based on background knowlege.

Therefore, statistical tests for the interaction effects between Nation and Question type revealed that the contrasts between British and Ethiopian readers were greatest for schematically implicit questions compared with other question types. In addition, across all question types the contrasts between the two nations appeared to be larger for PB02 than for PE01.

In sum, the results confirmed that cultural schemata were important determinants for the comprehension of culture-specific passage(s).

Based on such findings the notion of schema theoretic view of second language reading comprehension is supported. This essentially means that similar to reading in the native language, second language reading is seen as an interactive process dependent not only on textual input but also on relevant prior knowledge. Further, from the findings of this study, it can be concluded that readers reading in English as a second language may have difficulties in comprehension not only because of inadequate grasp of the language or linguistic shortcomings but also because of the lack of prior-knowledge, specifically in terms of cultural schemata. Firm support is thus provided for the findings that prior knowledge is an important factor influencing ESL readers' comprehension (Hudson, 1982, Johnson, 1981, 1982). But the findings of the studies undertaken by Carrell (1983a) and Carrell and Wallace (1983) who

argued that there are no significant effects of prior knowledge in ESL subjects' reading comprehension are open to doubt because their assertion is based on Bransford et.al.'s *Washing Clothes and Balloon Serenade:* texts which are difficult to understand even by native speakers of English.

The findings of this study, although different in emphasis, methodology and experimental design, seem similar to the few previous studies which have been suggested in Chapter Six, to indicate and thereby give support to the notion that the reader with better developed schemata comprehends better, simply because one had more relevant schemata to serve as interpretative frameworks necessary for comprehension.

For ESL readers, reading comprehension is easier if the reader is familiar with the concepts presented and if the topic is drawn from contextually/culturally familiar subject matter as it considerably improves the reading comprehension process.

The following Chapter presents the summary, conclusion and pedagogical implications of the present study.

CHAPTER TEN

SUMMARY, CONCLUSION AND IMPLICATIONS OF THE STUDY

10.0 Introduction

This chapter presents the summary, conclusion, implication, recommendations and limitations of the study based upon the review of the related literature and the data collected and analyzed for the present research.

The first section is concerned with the summary of the review of the literature and findings of the study along with the conclusions arrived at, while the second discusses the pedagogical implications drawn from the study. The third deals with recommendations and limitations of the present study showing some directions for improved ESL/EFL schemata and research undertakings respectively.

The summary and the conclusion of the present study are presented concurrently in the following section.

10.1 Summary and Conclusion

The purpose of the study, as indicated in the preceding chapters, is to examine the effect of prior knowledge in the form of cultural schemata on the comprehension of culture-specific texts by second language readers as well as native speakers of English.

The study was necessitated by five problem areas, namely, English as a language of wider communication, minimal attention to ESL/EFL reading process and research, conflicting L2 research findings, inadequate background knowledge studies, and inadequate prior knowledge assessments in the area of second language reading.

The review of the related literature started with reading theories along with the historical development of reading comprehension (Chapters Two and Three) and moved to the relatively new area in reading research, namely, reading within the framework of discourse (Chapter Four). This was then followed by schema theory (Chapters Five and Six).

The remaining chapters dealt with the actual investigation undertaken in the light of the theoretical issues discussed in Chapters 2-6. Chapter Seven covered the methodology employed and Chapters Eight and Nine gave the analysis and findings of the results respectively.

All chapters are sequentially summarized in the following manner.

The most successful reading instruction is likely to be that which is based on a solid understanding of the reading process, and which promotes rather than thwarts the acquisition of good reading strategies.

It can be recalled from the discussion in Chapter Two, that the major categories of reading theories are bottom-up, top-down and interaction, which have obviously generated three major types of methods of reading.

For the bottom-up theorists, reading means pronouncing words, or producing the phonemes of the language when one sees the written marks which represent these phonemes. The approaches involved here are the phonics approach, the sight-word approach and the linguistic approach.

The bottom-up theory emphasizes the learning of letter sound correspondences and ability to sound out words. Here, the assumption is that reading means learning to pronounce words. The meaning of text is accessible only and automatically through the sounds, and the blending of the sounds of letters in words occurs properly as sounds of letters are sequentially pronounced.

Further, bottom-up emphasizes learning and internalizing regular patterns of spelling-sound correspondence through the reading of sets of words like *Nan, Dan, Fan, Can.* The assumptions for this are:

(i) The early reader can infer these regular patterns;

(ii) Language is conformable to such regular patterns and;

(iii) Once words are pronouced according to the patterns, the meaning takes care of itself.

The bottom-up theories suffer from some severe shortcomings (Chapter Two). For instance, pattern recognition may be a part of reading, but pattern recognition alone is hardly an adequate account of the process in totality. Furthermore, new words are often taught in isolation from meaningful context with a heavy emphasis on word-form recognition rather that on meaning. Meaning is therefore, conceived of as basically a word-level phenomenon.

However, whether or not the emphasis on meaningless segments of language (phonemes/graphemes) is an advantage or disadvantage depends on the overall context of teaching. (see 2.1.1)

Many researchers in the area of reading have adapted the top-down approach to second language reading (see Eskey, 1973, Clarke and Silberstein, 1977, Coady, 1979, Carrell, 1983 among others) and have tried to relate it to the practical problems of curriculum design and teaching methods and materials.

Proponents of each theory have argued that the former or the latter is the true starting point and the controlling factor in the reading process.

For the top-downers, the essential aspect of reading is the bringing of meaning to the text. Reading, according to this approach, is a matter, first of all, of predicting meaning and secondly, a matter of sampling and selecting the point in order to confirm

or disconfirm the projected prediction.

The top-down theory of reading gains its strength from psycholinguistics. The psycholinguistic approach emphasizes the use of non-visual information and visual cues to get to meaning.

Rather than teaching skills, specifically word pronunciation and/or identification skills, the psycholinguistic approach helps readers develop strategies, specifically predicting, sampling and confirming/correcting strategies. The methods for teaching these strategies are worked out as well as those of any other method.

While other approaches recommend the sequence *Memory-Word analysis skills-context* for identifying words, the psycholinguistic approach recommends the sequence *Context-Word-Context*, where the first 'Context ' in this list includes the entire store of knowledge and experience plus the preceding [textual] 'context ' (Weaver,1980) and the second 'context ' is that which follows the word.

The contribution of the psycholinguistic approach is valuable, even though, minimizing the importance of the bottom-up decoding procedures remains to be its major weakness. (Chapters Two and Three)

The differences between reading theorists are usually a matter of emphasis on either bottom-up or top-down processes, rather than an outright and total exclusion from the concept of reading of something another theorist has identified as significant. For instance, bottom-up theories have typically focused on the phonological system of language, teaching grapheme by phoneme correspondences and have given inadequate attention to syntax and semantics. Both of these latter systems of language, however, cannot be excluded from the reading process.

Therefore, a fair approach to the teaching of reading should necessarily be one that takes the strengths of the two theories (bottom-up and top-down) in a coherent

framework.

It should, however, be borne in mind that no particular approach stands out as being superior to the other. But the fact of the matter is in second language reading, proceeding from whole to part rather than the other way round is found to be not only easier and more practical but also enhances comprehension skills. This holistic framework is labelled as the Interactive Theory of Reading.

The interactive theorists of reading attempt to take into account the weaknesses as well as the strengths of bottom-up and top-down theories. An interactive model of reading assumes that skills at all levels are interactively available to process and interpret the text by subsuming both top-down and bottom-up strategies. Therefore, the model incorporates the implications of reading as an interactive process consisting of background knowledge, expectations, context and linguistic features. The characteristics of this model are:

(i) A top-down model of reading is essentially a model of the fluent reader (Weber,1984). Hence, it will not account for all the needs of ESL students who are acquiring reading skills. But an interactive model of reading can more sufficiently account for the role of certain bottom-up skills that are important for successful reading aquisition.

(ii) An interactive model would suggest that reading requires a relatively high degree of grammatical control over structures that appear in whatever readings are given to ESL students (Eskey & Grabe,1988).

(iii) An interactive model of reading recognizes the importance of vocabulary, whereas a top-down model assumes that poor readers are word-bound (see 9.3) Much evidence in support of an interactive model suggest that poor readers simply have not acquired automatic decoding skills (Stanovich,1980, Mitchell,1982).

For second language readers, both top-down and bottom-up skills and strategies must be developed, since both contribute directly to the successful comprehension of text. That is, some time must be devoted in reading classes for rapid and accurate identification of lexical and grammatical forms (bottom-up). On the other hand, some time must also be devoted to reading for global meaning, to developing educated guesses in the absence of absolute certainty, to developing appropriate and adequate schemata for proper interpretation of texts (top-down).

Reading comprehension, as a complex cognitive process, is a reflection of the inner workings of the human mind involving language, motivation, perception, concept development, the whole experience itself.

Therefore, it is not surprising to learn that experts think of reading comprehension as similar to other kinds of human behaviour (thinking, reasoning and problem solving). As far back as 1908, (in Pearson & Johnson 1978) Edmund Burke believed that if we could understand reading we would understand the mysteries of the human mind. And recently, reading comprehension is viewed as a process subject to the same constraints as human memory and problem solving by cognitive psychology and artificial intelligence.

Therefore, whatever it is that influences thinking or problem solving ability also influences reading comprehension.(cf. Pearson & Johnson,1978).

A brief mention has been made in Chapter Three, that comprehension seems so elusive that it defies accurate description, because of conflicting terminology and sequence charts.

For instance, one comprehension series may start by suggesting that teachers ask questions from literal recall of factual details to critical thinking items. The other series may use only literal recall questions reserving higher-order questions for subsequent years. Still another may direct the teacher not to worry about comprehension

at all.

In the face of all these confusions, one is bound to conclude that different terminologies are used to describe the same underlying process. So the first source of confusion (See Pearson and Johnson,1978) in reading comprehension stems from the fact that a given skill may exist under a variety of labels from one source to another.

A second source of problem can be found with a single account of comprehension skills rather than between one account and another. Suffice it to mention Gray's (1960) and McCanne's (1963) lists of comprehension skills. Both of them listed each of the following skills as separate entities in its own right (see 3.3.1, 3.3.2, 3.3.3.)

GRAY	McCANNE
1. Word Perception	1. Classifying things
2. Comprehension	2. Classifying things and ideas
3. Reaction to what is read	3. Recognizing wholes and parts
5. Fusion of new ideas and old.	4. Finding details to support main ideas
	5. Recalling information for objectives
	6. Suggesting a title for a story
	7. Deciding on subtitles
	8. Finding the main idea of a paragraph
	9. Finding the main idea of a story
	10. Finding major thought units

It can be seen that Gray moves from the specific to the general. In Gray's lists, it is debatable whether comprehension occurs before the fusion of new ideas with old (known). In McCanne's lists, a common denominator for all of them is 'relating general concepts to specific concepts' and in addition, skills 6-10 are more or less the same.

Making a long list of comprehension skills is, therefore, a source of confusion since a list leaves the impression that each skill has a separate and equal identity when, in fact, they are highly interrelated or different names for the same thing.

The third difficulty arises from mismatching. For instance, some skills that get classified as a comprehension skill in one system are labelled as word identification skills in another. It is essential to raise a relevant question here: i.e. where should one, for example, include structural analysis and contextual analysis? Are they part of word identification or comprehension? To achieve the right pronunciation as well as to decide upon the meaning of a word a reader must have knowledge of morphemes. On the other hand, for word identification process, a reader uses knowledge of context. However, this does not necessarily mean that utilizing contextual information is only a comprehension and not a word identification skill. It is difficult to demarcate one skill from the other.

The fourth problem, discussed in Chapter Three, is related to the notion of whether reading comprehension is teachable or not. With regard to this controversy, there are several schools of thought. There are those who claim that in teaching reading only word identification should be taught and after that it is up to the readers themselves. Others argue that while it may not be able to teach comprehension *per se*, instructional and practice conditions can be arranged in such a way as to increase the likelihood that children will understand what they read. The third group contends that the comprehension process can be modelled for students by providing cues, discussions, questions, feedback, practice and guidance. Hence, comprehension is teachable but also it is best learned through the guidance of a well informed and sensitive teacher (Pearson and Johnson,1978).

The last source of confusion in the comprehension literature centres on the distinction between comprehension as a product and comprehension as a process. The

process refers to what happens to readers as they proceed reading and to what keeps them going when they read. Whereas, the product refers to measuring the net result of the process in however small a way. Since processes are either totally or mostly inaccessible, products remain the only means of evaluating the quality and quantity of student's comprehension processes.

The major inconsistency between factor analytic studies which have failed to uncover significant independent reading sub-skills and the scope and the sequence of charts for the teaching reading that assume such skills still persist. However, one can learn without the compedium of comprehension skills and sequence charts.

Reading occurs in a social context. We are beginning to understand how social interactions affect the course of reading development, since research studies have started coming from philosophers, ethnomethodologists and cognitive psychologists to show how reading comprehension fits in a social setting.

The relationship between thinking *per se* and reading comprehension, techniques for analogical reasoning, inferencing, creativity, problem solving etc. were considered distant from issues of reading comprehension. Nevertheless, as we moved to understand how prior knowledge is used in reading, how the reading task affects comprehension, and how readers can control their own reading process, we touch more and more on general thinking skills. We may well find that the major breakthrough will involve the integration of the reading domain with more general studies of learning and thinking skills.

Writing in its relation to reading is touched upon to show the fundamental use of both reading and writing. This opens an arena whereby learners learn to use language more effectively (reading, writing, speaking, listening) because they need it to accomplish tasks which are of importance to them. (Chapter Four)

Furthermore, Chapter Four highlighted the importance of the transaction that

occurs between reader, text, and writer, providing a more integrated way to analyze reading. Drawing insights from philosophers (e.g. speech acts, the cooperative principle) proves the case that all reading involves interpretation as well as literal comprehension. The process of interpretation, seen as integral to understanding, attempts to resolve the competing claims of writers, texts and readers.

Reading from the point of view of discourse (reading as a discoursal framework) is one of the major aspects of the reading comprehension which should be reckoned with in ESL/EFL situations.

Research on natural language understanding has often focused on the problem of analyzing the structure and meaning of isolated sentences. However, to understand the whole text, these sentences must be seen as elements whose significance resides in the contribution they make to the larger whole. Therefore, each sentence should be interpreted with respect to both the linguistic context established by preceding sentence(s) and the real-world setting. An attempt has been made to examine the structure of discourse understanding and interpretation. (Chapter Four)

Understanding discourse involves understanding semantic relations between constituents of the text that are not stated explicitly, but that may be plausibly assumed. By invoking schemata a text can be understood by default assumptions about *normal* situations and *actual* courses of events.. A very important aspect in the process of reading.

Discourse understanding is based on the cooperative behaviour of the reader and the writer via the text. This entails assessing the intentions and purposes behind an utterance. Methods to achieve this are usuallly based on the theory of speech acts, which are associated with various types of utterance, such as assertions, questions, commands and requests. Understanding utterance at a deeper level is then viewed as establishing what goal the speaker or the writer wants to achieve by performing the

speech acts and what role the speech act plays in achieving that goal. This is true with oral communication or with written text.

Therefore, in order to understand text, one must understand the relations between its parts. Individual sentences are joined together to form larger units. Discource understanding must be based on some characterization of the way in which a discourse is built up out of constituent units.

It has been a common practice in ESL/EFL reading syllabi to attempt to *simplify* the text. However, it has been found in a number of studies that simplification may actually make passages harder rather than easier to understand (Chapter Four). The common practices held by text-simplifiers are (a) reducing sentence length by destroying inter-causality explicit connectives, (b) selecting simpler but less descriptive vocabulary, (c) altering the flow of topic and comment relation in paragraphs, (d) eliminating qualifying statements that specify the conditions under which generalizations are thought to hold. All these make the text more complicated than it seems to be.

Although, not in ESL/EFL classroom situations (but relevant), Armburster and Anderson (1987, 1976) examined a number of dimensions of student text materials and found that context area texts often (a) fail to structure the information within a predictable and recurrent frame (like a schema for text), (b) use sub-headings that do not reveal the macrostructure of the topic, (c) avoid using visual displays of information, particularly to summarize information presented textually, (d) use obscure pronoun references and, (e) fail to use obvious connectives, such as *because, since, before,* and *after,* even when these connectives clearly fit.

What makes a text difficult? The answer to this important question is that current reading research is guided by principles very different from long sentences and hard words (Chapter Four).

In the last few years our thinking about reading comprehension has changed dramatically. The schema theory tradition has provided us with an alternative world view about comprehension processing, emphasizing the effect of existing knowledge on comprehension (Chapters Five and Six).

There is sufficient evidence now that people believe that through instruction one can develop or improve a person's reading comprehension abilities as opposed to the former belief that reading comprehension was something that could only be fostered through nurturing.

The major influences or changes in our views stem from schema theory. These new views have forced us to rethink the act of reading. For a long time it was thought that reading was the reproduction of the ideas on the page, the goal was to have the reader reproduce a *prototype* of the page. Schema theory has moved us away from a reproductive view to a constructive view.

In that view, the reader, rather than the text, moves to the centre of the construction process. The reader, like an architect, or a builder, uses the text as a blue print as s/he creates meaning. In the reading situation, the reader approaches the text with certain expectations of what he is about to read.

Schema theory emphasizes reader-based comprehension, in that the text that is being constructed is not on the page, but in the reader's head, a very important point for teachers to realize when they interact with their students.

It is a common practice that teachers often spend too much time stuck in the text on the page (which is, of course, a major resource used to construct the text in the head), rather than probing and exploring and encouraging the students to construct a text of their own. This notion does not dismiss the use of text. It just means that teachers need to shift their focus from the page to their student minds'. The text, instead of being a thing to be learned, is a resource used to construct meaning. And

comprehension, instead of being a measure of the degree to which one can recall the message on the page, is the reader's attempt to build a model of meaning within his/her own head. It is the text that every reader builds within his/her own head that is the basis upon which we say a reader has understood.

In short, we have seen in the review of literature (Chapter Five) that schemata provide ideational scaffolding for assimilating text information and facilitate the selective allocation of attention. Further, schemata enable inferential elaboration since no text is ever fully explicit. Any schema possesses its own criteria for what is important and these can be used to create summaries of text that focus on important information. Finally, schemata allow for orderly searches of memory.

Prior knowledge (in the form of schemata) influences our comprehension to a much greater degree than what earlier research has suggested. In an effort to examine further what constitutes difficulty in reading comprehension of texts written in English by non-native speakers of the language, the present study examined the role of prior knowledge in terms of cultural schemata.

Schema theory suggests that since meaning is not inherently embedded in a text, the reader with a greater amount of prior knowledge should be more able to fill in whatever gaps there exist, by consulting the appropriate schema in memory. Since shemata are based, in part, upon cultural knowledge, it would logically follow that readers will comprehend better passages that are based on their own culture than if the passages are not.

With respect to the use of relevant schemata, there is little reason to suppose that second language reading will be any different from first language reading. In fact, it is likely that cultural schemata would aid second language readers even more than if they were reading in their native language.

Hudson (1982) maintained that without good control of the rules of English,

non-native speakers would be less successful in obtaining cues from the written text. It would then be necessary for them to make use of additional or extralinguistic cues that they may have to help them in comprehension.

While most research studies involved native speakers of English, the area of prior knowledge, particularly in terms of cultural knowledge, has been neglected in ESL/EFL reading comprehension research (see Rationale of the Study in Chapter One). The previous ESL/EFL research studies are general in nature. Therefore, the present study attempted to examine the role of prior knowledge in the comprehension performance of both native and non-native speakers of English. The subjects under study were British, Ethiopians and *Other Nations.*

To carry out the present study, the following methods were employed. (Chapter Seven)

(a) Two comparable culture-specific texts were prepared;

(b) Based on the two passages, three types of comprehension questions were designed;

(c) The passage dependency of the items designed to measure comprehension of native and non-native speakers of English was examined in two rounds of pilot study;

(d) In order to find out the amount of prior knowledge which the subjects possessed on the two culture-specific texts, a familiarity test was administered;

(e) Finally, for the main test, fifty four items were equally divided into textually explicit, textually implicit and schematically implicit question types were administered for reading comprehension;

(f) The results were then anayzed (Chapter Eight) following a system known as SPSS-X. The treatment of the data involved the use of t-tests, ANOVA and the

Mann-Whitney U-tests;

(g) Discussions of the findings of the study are presented in Chapter Nine.

The major findings of the study suggest that:

(a) background knowledge in terms of cultural schemata facilitates/enhances the ability of non-native speakers of English to process information from a given text.

(b) there is a significant difference in the comprehension performance of native and non-native speakers of English due to the effects of interaction of background knowledge, passages and questions.

The following section deals with the implications of the current study. The two major factors that affect ESL/EFL reading comprehension, namely, the linguistic and background knowledge factors are discussed. Ancillary factors such as motivation, interest and the reading environment are also discussed.

10.2 Pedagogical Implications

It should be borne in mind that the second language reader is a developing reader with gaps and limitations in both knowledge systems and skills. Therefore, the teacher's task is to facilitate learning and not mechanically control it. As Eskey and Grabe (1988:228) put it: *Classroom work can point the way but cannot substitute for the act itself: People learn to read by reading, not by doing exercises.*

How does an ESL reading teacher handle such a process? Is it by taking up Krashen's and Terrell's (1983) *Total Non-Intervention Policy*, whereby one just mixes students and books and gets out of the way? Or is it by using highly structured, carefully selected, sequenced and controlled text books?

Depending upon the circumstances the answer varies according to the type of

programme available in relation to the proficiency of the learners, educational needs, interest, time and age factors (Eskey & Grabe, 1988). However, it is worth mentioning, at this juncture, three important programmes. Namely:

(i) Quantity Reading (enough reading to increase skills and knowledge significantly),

(ii) Appropriate Materials (relevant to needs and interests) and

(iii) Teacher Judgement (creating a world of reading, stimulating interest, create/edit/ choose appropriate materials).

Krashen (1982) has argued that the subject matter of second language classes should be both interesting and relevant. There are only two ways (Eskey & Grabe, 1988:230) to do this: One is the *Reading Lab Approach* whereby the learners make their own choices of reading material from a wide selection of appropriate texts in order to allow a very high degree of individualization.

The second is the *Content-Centered Approach* which is geared to special needs of non-natives, such as English for Specific Purposes for particular academic and occupational groups, or adjunct or sheltered courses, or even for following up special interests of the group as a whole.

The two approaches could be amalgamated and used interactively. The main disadvantage of these approaches is the difficulty of finding a subject that every one is interested in. However, it can be argued circularly that a fundamental part of any teacher's job is making the subject matter interesting. Therefore, the individualized and content-centered approaches combined with a single programme could bring about good results if implemented properly (see Carrell, 1987).

The theories of reading, however perfect in and of themselves, cannot be complete without taking into account the part played by factors that directly or indirectly affect the reading comprehension process.

It is of paramount importance for teachers to be fully cognizant of all factors that influence/affect reading comprehension.

Grabe(1986) asserts that successful second language reading depends upon the possession of a *Critical Mass of Knowledge* like linguistic knowledge, and background knowledge assumptions. These are the major factors that affect reading comprehension not to mention the ancillary factors like interest, motivation, reading ability and the reading environment. Each of these factors is briefly treated in the following sections.

10.2.1 Linguistic Factors

A number of studies (Chapman,1979, Cohen et.al.,1979, Mackay,1979, Cowan,1976, Williams,1983, Chapman,1983, Carrell,1982,1986, Conor,1984) have shown that second language readers typically experience difficulty with conjunctive vocabulary and hence often fail to successfully comprehend L2 tests. Therefore, mastery of textual features like relations (anaphoric, causal and time) cohesive devices (substitution, elipsis, lexical cohesion etc.) are central factors in reading comprehension. This has led to the contention that there is a threshold of linguistic competence necessary for successful L2 reading, coupled with the reader's ability to activate appropriate schemata.

Speaking of linguistic threshold, Alderson points out that *threshold* cannot be understood as an absolute term as it varies from reader to reader and from task to task.

Alderson (1984) raises some pertinent questions regarding linguistic threshold:

... to what extent is it [the linguistic threshold] syntactic, semantic, conceptual, discoursal? Does the level of the threshold vary for different learners and for different tasks? Is it conceivable that good first language readers will require a lower threshold before being in a position to utilize their good strategies? Will the attain-

ment of a higher level of competence compensate for a poor first language reader?

(Alderson as in Devine, 1988:267)

These questions undoubtedly need definite and precise answers. However, the fact of the matter is that, several studies into the relationship between language competence and L2 reading raise more questions than they give answers. But to be concise for the moment (details will come subsequently in the following sections) Alderson's questions might be partially answered by Grabe's (1986:36) assertion that *on achievement of a critical mass a reader stops learning to read and only reads to learn.*

The idea that second language readers must reach a level of general language competence in order to read/comprehend successfully in the target language is not a matter for debate unless otherwise disputed by further research. But the problem is how to bring about the desired linguistic competence to the *right level* where ESL readers will comprehend successfully? The following aspects, although suggestive, should be taken into account by the teacher:

(i) Providing a rich linguistic environment

(ii) Improving grammatical skills

(iii) Using appropriate skills

(iv) Increasing reading skills

(v) Making the instruction holistic/integrative

(vi) Developing flexibility of reading strategies

(vii) Providing relevant background information.

Linguistic factors comprise two major areas of knowledge, namely, syntactic and semantic. A brief account of each knowledge is given in the following sub-sections.

10.2.1.1 Syntactic Knowledge

A *syntactic system* refers to the orderly arrangement among words in sentences. Syntactic knowledge operates meaningfully when the learner recognizes grammatically acceptable sentences.

However, it is syntax that is at work, when one is able to read the following sentence and answer questions that follow it.

Sentence: - The makle tilinked the gorbenchy in the tarmenant since the gorbenchy tinacled the makle.

Questions:- Who tilinked the gorbenchy?
Why did the makle tilinked the gorbenchy?
What did the gorbenchy do to the makle?

Although there is no real meaning in the above sentence, one is able to answer the questions given based on syntactic knowledge and the ability to recognize the syntactic similarities between the sentence and the rest of the questions.

It should be noted, nonetheless, that it is not possible to paraphrase the sentence simply because it is difficult to integrate those meaningless nonsense words with background knowledge.

10.2.1.2 Semantic Knowledge

Semantic knowledge does not only refer to our knowledge of word meanings but also includes our knowledge of relationships among words. It is semantic knowledge that accounts for the fact that the following array of words in (i) are ordered as in (ii). It is not possible to order (i) like (ii) by using syntactic knowledge.

(i) dairy the ran milkman the to farm

(ii) The milkman ran to the dairy farm

(iii) The dairy farm ran to the milkman

Syntactic knowledge, however, allows (iii) to be quite acceptable but semantic knowledge does not.

Semantic knowledge entails factors like vocabulary development and concept development which would be treated succinctly below.

10.2.1.2.1 Vocabulary Development

Unlike the traditional view of vocabulary, schema theory has shed new light on the complex nature of the interrelationships of schemata, context and vocabulary knowledge. That is, a given word does not have a fixed meaning but a variety of meanings around a prototypical core interacting with context and background knowledge (see Chapter Four).

The example from Anderson et al. (1977:368) will underpin the discussion in question.

- The punter kicked the ball.
- The baby kicked the ball.
- The golfer kicked the ball.

The key words in the above sentences are *ball* and *kick*. Readers will construct different images for these two words. For instance, different kinds of balls are visualized. By the same token, the act of kicking is different in each of the sentence. Comprehension of these lexical items will be affected if background experience associated with types of kicking and things that can be kicked is missing. The angry golfer? The strong punter? The uncoordinated kick of the infant?

Teaching vocabulary, as ascertained by reading specialists, means teaching a new concept, new knowledge. Carrell (1988:243) says, *Knowledge of vocabulary entails*

knowledge of the schemata in which a concept participates, knowledge of the networks in which that word participates, as well as any associated words and concepts

There are conflicting practices with regard to the teaching of vocabulary according to Carrell (1988) and Hudson (1982) and Pearson (1982).

Carrell (1988) is of the opinion that teaching vocabulary is highly desirable in order to increase learning from text. However, the words to be taught should be the 'Key Words' in the target passage(s) and should be taught in semantically and topically related sets so that meanings and background knowledge improve concurrently. *Attempts to teach word meanings without determining that they are key to the target passage(s), without teaching word meanings and background knowledge concurrently are probably doomed to failure* (Carrell,1988:243)

On the other hand, Hudson(1982) maintains that merely presenting a list of new or unfamiliar vocabulary items to be encountered in a text, does not guarantee the learning of the word of the concept behind the word, or of improved reading comprehension on the text or passage.

Further, in a study, Pearson(1982) concludes that three different types of vocabulary instruction before reading the target passage failed to produce any significant facilitating effects on the reading when compared to the absence of any vocabulary instruction.

Reading researchers strongly recommend that the second language curriculum should have a general program of parallel concept/background knowledge development and vocabulary development. Therefore, instead of pre-teaching vocabulary for single reading passages (undeniably, this has got its own merit depending upon the given circumstances), teachers should pre-teach vocabulary and background knowledge concurrently for sets of passages to be read at some later stage.

10.2.1.2.2 Concept Development

As indicated in the previous chapters, reading research appears to have shifted away from an emphasis on decoding and methods of teaching reading toward an emphasis on understanding how readers comprehend and how teachers can help students comprehend better.

The assertion that comprehension is building bridges between the new and the known has a wide and full support of all studies in the field. Nonetheless, it should be noted that the assertion is based on a complex set of implications about the process itself and about the process of teaching comprehension because of the following essential factors:

(i) Comprehension is active, not passive, i.e. the reader interprets and then alters what he reads in accordance with prior knowledge about the topic in question (see Chapter Four)..

(ii) Comprehension involves a great deal of inference making, as inferences are inevitable parts of the comprehension process (see Chapter Five)

(iii) Comprehension is a dialogue between writer and reader. That is, what is the writer trying to do? inform? persuade? direct? etc. (see Chapter Four)

If that is what comprehension is all about, how do people organize their minds to relate old and new concepts that arise in their words? Concepts are schematically rather than randomly organized. Each association represents a predictable type of relation to the stimulus (Pearson and Johnson,1978). For instance, property relations refer to properties and attributes whereas class relations imply that the stimulus concept belongs to the class of things denoted by the associative response. Our

conception of classes and properties will help us learn to distinguish between one object or thing and another. In the classroom situation, these classes and properties can be illustrated in a semantic map. Therefore, semantic maps would give a quick, informal diagnostic picture of what students already know and need to know about a set of concepts we might want to teach.

The knowledge represented by the semantic map could possibly include concepts which are new. Hence, the teachers task is to help students assimilate/accommodate the new information into their pre-existing body of meaning. How does the process occur? The process starts when the learner does one of the following:

(i) When the learner chooses to ignore the information provided and keeps the existing schema intact;

(ii) When the learner chooses to modify previous schema to include a related schema;

(iii) When the learner keeps the original schema intact and postulates a second meaning/concept for the previous schema.

In the first situation the learner has assimilated by ignoring the teacher's information. Accommodation has occurred in both second and third situations. In the second instance, the learner alters the properties that he assigns to the given concept. In the third, the learner keeps his original schema intact and adds a new schema for the same concept.

Semantic maps are a useful construct for illustrating certain basic relations among concepts. Several researchers have developed constructs that capture perceptions about how events and episodes get related to one another (see Fillmore,1968, Frederksen,1975, Lindsay and Norman,1972, Schank,1973).

Lindsay and Norman (1972) have utilized Fillmore's(1968) case grammar to expand the number and kind of relations that can exist in a semantic network.

In a case grammar analysis of an event, the first step is to identify the basic action and secondly the actors [agent-object]. It is the action that is the focal point around which all other concepts in the event revolve. Let us see an example from Pearson & Johnson (1978:38), *'Delilah bewitched Samson. He cut his hair and lost his strength '* (see Appendix E).

We see that there are three basic actions - *bewitch cut* and *lose*, which are linked by causal relations i.e. the bewitching caused the cutting which caused the loss of strength. It should also be noted that Samson is the object of one of the actions but the agent of the other two.

Therefore, each of the verbs *bewitch, cut, lose* plus the associated agents and objects is a proposition. A proposition can be thought of as a unitary statement or clause (dependent or independent) about the world (see 3.2) .

Kintsch(1974) and Meyer(1977) have provided evidence to support the conclusion that propositions are basic units of thought. Therefore, understanding relations among propositions is critical to good comprehension.

It is equally important to note as teachers, that the relations among propositions (cause, purpose, condition, time etc) carry the thread of a story or a passage in a text.

It is not a matter for debate that comprehension involves processing the text information, matching it against the proto-typic schema for events and integrating textual and schematic information, thus producing a complete knowledge structure for the event described in the text.

Comprehension being a complex process, is best understood by invoking the new to known principles as understanding involves what is new in the context of what is already known.

Semantic maps can be expanded to represent our knowledge about events as well as concepts. By adding new links, we can represent the relations within a proposition (agent, object, recipient, time, location, negation etc.) as well as relations between propositions.

Pearson and Johnson(1978) assert that, while understanding relations among concepts is an important aspect of comprehension, understanding relations among propositions is a more central aspect of comprehension. Therefore, causal, anaphoric and time relations are briefly discussed below.

10.2.1.2.2.1 Causal Relations

Because the world is preoccupied with a search for causes, no aspect of comprehension could be more important than helping learners to understand relations of causality.

Signal words like *because, since, as, for, hence, so, therefore, as a result* etc. provide explicit cues that the connected propositions are causally related. Teachers should always bear in mind that it is not simple to handle causal relations in second language classes, because it is quite common for causality-related propositions to be connected by a simple conjunction *and* and many causal relations can be disguised as time relations *after, when.* In addition, there are often multiple causes for a single event. The events can be ordered in a causal chain. Each event can be a prerequisite to the next being a partial cause, a partial explanation of the final effect. It is also important to note that writers do not include all possible details when they develop a logical argument. Therefore, a reader by reference to his/her own knowledge store can bring omitted details into light (see Chapter Four).

The other two important comprehension tasks under the rubric of causal relations are drawing conclusions and predicting outcomes. They appear when the cause-effect relation is not explicitly stated. Therefore, the reader, from his/her conditional

relation schema would make a different set of inferencing either forward or backward inferencing depending upon the circumstances.

But the true basis of one's inferences would be a set of *suspended causality* (Pearson and Johnson, 1978) rules, a set of propositions specifying what kinds of events typically lead to other events. Predicting outcomes, then, is a type of future causality based upon stored knowledge about what kind of effect the explicitly stated cause usually elicits *forward inferencing.*

Drawing conclusions also involve *backward inferencing.* This happens when there are no clear cut physical causes. That is, instead of going forward from a cause to plausible effect, one is forced to move backward from a cause to plausible effect to a cause.

The only difference between forward and backward inferencing is in the data-base that the reader uses. When the relation is explicit in the text, the reader can use that information to answer the question. When there is no explicit cause-effect statement, the reader is forced to use whatever data (suspended causality rules) that are stored in mental scripts (see Pearson and Johnson, 1978).

It is important for teachers to give some instructional guidelines and activities since causal relations lend themselves to a variety of exercise formats. The teaching [emphasis] of time relations is equally important as causal relations in second language reading.

10.2.1.2.2.2 Time Relations

It has been found out in ESL reading studies that time markers, just like cohesive devices, do pose great difficulties to learners. No skill seems as difficult as placing a list of events from a story in the sequence in which they occurred. For instance, Pearson(1974/5) found that students have much more difficulty placing events in

order or answering *what-when-where* type questions when the two events presented as a pair were reversible rather than irreversible. A reversible pair of events can logically occur in either order as in:

George played the guitar before he ate dinner. But an irreversible pair can under normal circumstances occur in only one order as in:

George opened the box. Then he put his books in it.

Therefore, we see that the reversibility of events is the greatest source of difficulty in comprehending time relations. Teachers should be very careful in selecting and creating time-relation instructional activities for students. One good tip for teachers would be to begin time relations activities using only irreversible sets of events, gradually introducing predictably ordered sets of events and then insert set of events, the order of which is reversible, arbitrary and particular to a text segment.

At longer discourse level, anaphoric relations have been found to cause more difficulty for ESL/EFL students.

10.2.1.2.2.3 Anaphoric Relations

Anaphoric relations are encountered more than any other relation discussed so far. (Pearson & Johnson, 1978:122) Anaphora includes all the basic personal and demonstrative pronouns.

It is important that ESL teachers should pay considerable attention to helping students relate each anaphoric term to its appropriate referent in the sentence, paragraph or passage context in which it occurs.

Some findings (Bormuth, 1969, Lesgold,1974) suggest that systematic instruction in anaphoric structures is necessary and it is also important to note that some structures require more attention than others.

Instructional activities on antecedent matching and anaphora substitution are important anaphoric relations that should merit the attention of the teacher.

For example, with regard to antecedent matching, a paragraph or a list of sentences can be constructed with numbers placed over or in front of various anaphora. The learners could be instructed to write the same number over or in front of the antecedent for each anaphora. The reverse of this activity, anaphoric substitution, can also be used by instructing learners to find words to substitute for the numbered words or phrases. The sentences can be constructed by the learners themselves.

Anaphoric relations as basic units of discourse lend themselves to higher propositional level tasks like paraphrasing, association, comparison etc. At the level of longer discourse retelling or summarizing is an extension of paraphrase. Asking a student to retell or summarize (Durell,1955, Goodman and Burke,1972) a selection in his/her own words is a reasonable practice activity. Retelling provides an overt measure of what a student has done with the information presented in a selection, indicating what has or has not been assimilated into existing schemata.

Association activities can be practised at the level of longer discourse. Learners can be asked to identify a sentence or a paragraph that does not fit in with the rest of the text. It is also helpful if the sentences or paragraphs are composed by the learners themselves.

Comparison tasks at longer discourse level are also of particular importance. Learners should be helped to research for commonalities and differences between text segments or between a text segment and information already a part of their schemata.

The relations mentioned so far overlap one another. For instance, causal and time relations. However, despite this inevitable overlap, teachers are encouraged to deal with each of the relations as separate instructional components, taking into account, of course, their inherent interdependence.

The above instructional guidelines are suggestive and not by any means prescriptive. The suggestions can be adjusted according to the content of the material to match the students' background knowledge and reading ability, as discussed in the section to come.

10.2.2 Background Knowledge Factors

Research in schema theory confirms that the greater background knowledge a reader has of a text's context area, the better the reader will comprehend that text (Pearson et.al. 1979, Taylor, 1979, Stevens, 1980) whether the text is culture-specific (Steffenson et.al., 1979, Johnson, 1981, Carrell, 1981) or discipline-specific (Alderson and Urquhart, 1988).

Several methods and approaches for facilitating reading through the activation of background knowledge have been proposed in a wide variety of reading studies.

The following methods and approaches are employed to help/train the reader to activate appropriate background knowledge before reading. They are summarized as follows. (see Carrell, 1988).

1. LEA [Language Experience Approach] Creating the text.
2. ECOLA [Extending Concepts through Language Activities] Setting a communication purpose for reading.
3. DRTA [Directed-Reading-Thinking Activity] Predicting what a text will be about.
4. ETR [Experience-Text-Relationship method[Sharing prior experience on the topic.
5. PReP [Pre Reading Plan] Free association on the topic.
6. SQ3R [Survey-Question-Read-Recite-Review method] Surveying the text.

This prior activation of background knowledge also gives the reader a purpose

for reading (Carrell, 1988). In addition, all of these methods help the reader do something after reading in order to synthesize the new information gained from the text with prior knowledge. For example, Carrell (1988) puts it succintly as follows:

(i) Discussing the text [LEA, SQ3R]

(ii) Writing interpretation [ECOLA, SQ3R]

(iii) Confirming hypotheses [DRTA]

(iv) Relating text to prior knowledge [ETR]

(v) Reformulating knowledge [PReP]

This is a welcome aspect of developing background knowledge in reading. *'Every act of comprehension involves one's knowledge of the world as well'* (Anderson, 1977:369).

In the last few years, schema theory research has changed our thinking about reading comprehension dramatically. It has shown the importance of background knowledge in the study of first as well as second language comprehension (see Adams & Collins,1979, Alderson and Urquhart, 1988, Anderson,1977, Bartlett,1932, Coady,1979, Hudson,1982, Johnson,1981,1982, Rumelhart and Ortony,1977, Rumelhart,1980, Steffensen et.al.1979)

Traditionally, in the study of second language comprehension the emphasis has been almost exclusively on the language to be comprehended and not on the comprehender. During the past decade the act of reading has moved away from a reproductive (the view that reading comprehension was something that could only be fostered through nurturing) to a constructive view. This makes the reader the centre of the construction process rather than the text.

Speaking of text, the reader based comprehension does not altogether relegate

the text. But the emphasis is that the text that is being constructed is not on the page but in the reader's head.

The teacher's duty should be to probe, explore and encourage the learners to construct a text of their own rather than spending too much time in the text on the page. However, this does not dismiss the idea that the text is a resource used to construct the text in the head. Hence, teachers ought to shift their focus from the page to the minds of their students, which is where comprehension takes place.

Every text has many potential meanings and this is why one of the major tasks of the teacher is to help learners realize those potential meanings. To achieve these ends, teachers should endeavour to accomplish three important pedagogical aspects before reading. These are: building background knowledge, vocabulary instruction and setting purposes for reading.

Teaching background knowledge of a topic to readers can improve, to a considerable degree, their reading comprehension on materials concerning that topic. Background knowledge can be taught directly and therefore teachers are urged to spend more time developing background knowledge prior to reading (see Stevens,1982). It is not a difficult task to provide students with an ideational scaffold that enables them to better understand information concerning a given topic.

One important aspect is to build bridges between a student's existing knowledge and new knowledge needed for text comprehension. One way of doing this is to employ organized pre-reading approaches to facilitate reading through activation of background knowledge. Another way might be to adapt the experience-text-relationship (ETR) method (Au, 1979) whereby students express their own experience of knowledge about a given topic prior to reading. This not only helps the students to draw relationships between personal experiences and materials discussed in the text, but also provides an opportunity for each student to make comparisons and contrasts into

their pre-existing schemata so that these schemata become redefined and extended (cf. Floyd & Carrell, 1986) in an act of self-discovery and integration.

Langer's Pre-Reading Plan (PReP) is another possibility to be reckoned with in building background knowledge. The method uses a discussion-based activity to assess the amount of information a student has about a particular topic and how this information is organized. The pre-reading plan begins with the teacher introducing a key word, concept or picture to stimulate a discussion. By having the students say anything that initially comes to mind and having that information recorded on the blackboard, participants are able to see which associations already exist between the key concepts and their prior knowledge. In such a milieu, interaction with others (accepting, rejecting or altering explanations), integration and reformulation of knowledge of the target concept would take place.

Equally important are the previewing techniques (Swaffar, 1981) of contextual clues such as titles, headings, pictures, text genre etc which encourage students to draw inferences prior to reading. Lastly, since students have rich and complex networks of schemata based on their own cultures and languages, ESL students need to be exposed to other activities outside the classroom that aid in the development of culturally appropriate schema. A teacher of reading might be viewed as a teacher of relevant information as well as a teacher of reading skills. Practical research into the best methods of imparting background knowledge to ESL/EFL readers becomes all the more essential. (see Stevens,1982)

The clear implication of schema theory is that it is inappropriate to deal with vocabulary as a list of separate items. For instance, definitional approaches and even conceptual approaches to learning vocabulary do not take the learner far. Rather, a conceptual approach in introducing vocabulary items should be used. That is, learners should be helped to see how any particular vocabulary item is similar to

and/or is different from other concepts already known.

According to schema theory the wrong question to ask is *What is it that the learner doesn't know and how can I get it into his/her head?* Instead, the right question to ask is, *What is it that the learner does know and how could it be possible to use that existing knowledge as a foundation to help the learner grapple with new concepts encountered?* (see Tierney and Pearson,1986, Brookes and Grundy,1988). This is what captures the flavour of schema theory in the reading process.

One of the key implications (Tierney and Pearson,1986) and emphasis of schema theory is the need to respect the learner's interpretation, for it gives us a real sense of the need to respect more clearly the reader's role in the creation of meaning.

Tierney and Pearson(1986:18) confirm that what schema theory ought to do for teachers is to make them realize that their role is not to be the source of wisdom and truth, imparting knowledge to learners. Instead, the teacher's role is more like that of a tour guide, who is responsible to help learners develop strategies for discovering truth and wisdom on their own.

The third factor affecting reading comprehension is labelled *Other factors* and is treated below.

10.2.3 Other Factors

Motivation (instrumental and/or integrative) and reading ability play a significant role in reading comprehension. Given the fact that motivation plays an important part in reading, there are ways of improving comprehension. One way is by generating activities by a wide variety of means - films, trips, related books, community resource persons etc. The other way to capitalize on motivation is to allow students to read selections of high interest.

Any good instructional model of reading must include motivational factors, like

incentives, reinforcers, feed back. It has also been found that fear and anxiety can influence comprehension test scores quite dramatically. Other things being equal, changing a student's motivational state will alter comprehension. Factors in the reading environment (the home, the school, the teacher, the peers) have their effects on comprehension both positively and negatively.

Psychologists in their attempt to explain the human memory, have largely contributed to our understanding of the comprehension process. Therefore, knowledge about the reading process can make a difference to how we teach. For example, if the teacher thinks that motivation can change one's comprehension, that could be one instructional decision to be taken up. Or, if prior knowledge with a certain topic improves reading comprehension, then the teacher might offer experience with the topic prior to reading. It is left to the discretion of the teacher to make judicious selection of reading materials for particular students. This is precisely the main reason why these guidelines for teachers of reading are suggestive rather than prescriptive.

The following section gives some recommendations to improve reading standards especially where English is the medium of instruction at institutions of higher learning.

10.3 Recommendation

Reading in a second language can be one of the major causes of inadequate standards at all levels of education. A more constructive approach, in such a milieu, might be to prioritize plans to accelerate improvements in reading standards.

Learners of all levels and capabilities want the skills that they have aquired to be identified and then consolidated and guided by planned programmes of direct teaching as well as supervised and guided practice. Admittedly, most of the burden may fall on the shoulder of language teachers. However, other content-area teachers should be cognizant of the indisputable fact that every teacher is a teacher of reading in one sense, if not in another. Therefore, reading should be regarded by all those concerned

(the parents, the school, education planners, curriculum developers, syllabus designers) as a developmental process that extends from childhood to adulthood. The basis of all skills at school or university are one way or the other related to the process and product of reading, no matter in which order. Skills such as organization, selection, and collection of information from primary or secondary sources, are all the more requisites for academic success.

In order to bring about a better change in the standard of reading, especially in countries like Ethiopia where English is the medium of instruction from secondary school up to University level, a few or all of the following courses of action, depending upon the availability of human and material resources, need to be considered in order to produce long term effects:

1. Opening a department or a centre for the study of reading, both at secondary and university levels is necessary. At higher level, courses for the improvement of students' reading techniques must be offered. Offering advanced courses at diploma and at higher levels would increase the supply of qualified personnel who could in turn teach reading, lecture on courses of in-service training and act as advisers, consultants, remedial teachers and heads of reading centres or departments.

2. Teachers in training should study the subject of reading and have practical experience in teaching it. Therefore, it should be compulsory for every student-teacher to take substantial amount of training in teaching reading.

3. Provide students with suitable background material for a broadly-based course on the teaching of reading in teacher training or in-service training as well as for other interested teachers.

4. A greater proportion of available research funds should be devoted to aspects of reading research which would have practical implications for teachers. The

money made available for books should be greatly increased. Along with this, the production of adequate diagnostic tests of reading skills at every level is particularly important, since successful teaching can only be planned on the basis of knowledge of what children have or have not mastered.

5. Reading standards should be the concern of all departments at institutions of higher learning.

6. A professional association which might be termed *The Ethiopian Reading Teachers Association* [ERTA] would be a great source of basic and applied research.

It might not be possible to implement all the above recommendations at once or immediately due to some constraints that have to do with human and material resources. However, it is certainly possible to implement one aspect of the recommendations at one point in time and another at a different time. But it should be borne in mind that all institutions of learning should place reading at the top of all their educational priorities.

This study has attempted to evaluate critically many of the current concepts of reading. In some ways the exploration and evaluation are unsatisfying, because so much remains to be learned about what reading is and how the process functions. Much of what we need to know must await further developments in basic and applied research.

The limitations of the present study (see 1.5) can act as a spring-board to future reading research undertakings. The area of ESL/EFL research is still in its infant stage. However, one research area which is of immediate importance in ESL/EFL reading comprehension, would be to measure the comprehension performance of L2 learners on identical texts written in the first as well as in the target language. The results might clear the way to a deeper understanding of the complex processes involved in L1 and L2 reading comprehension, particularly in relation to background

knowledge. In the meantime, if the pedagogical implications and recommendations provided in this thesis are implemented, the teaching-learning processes of English as a second and/or foreign language will be enhanced.

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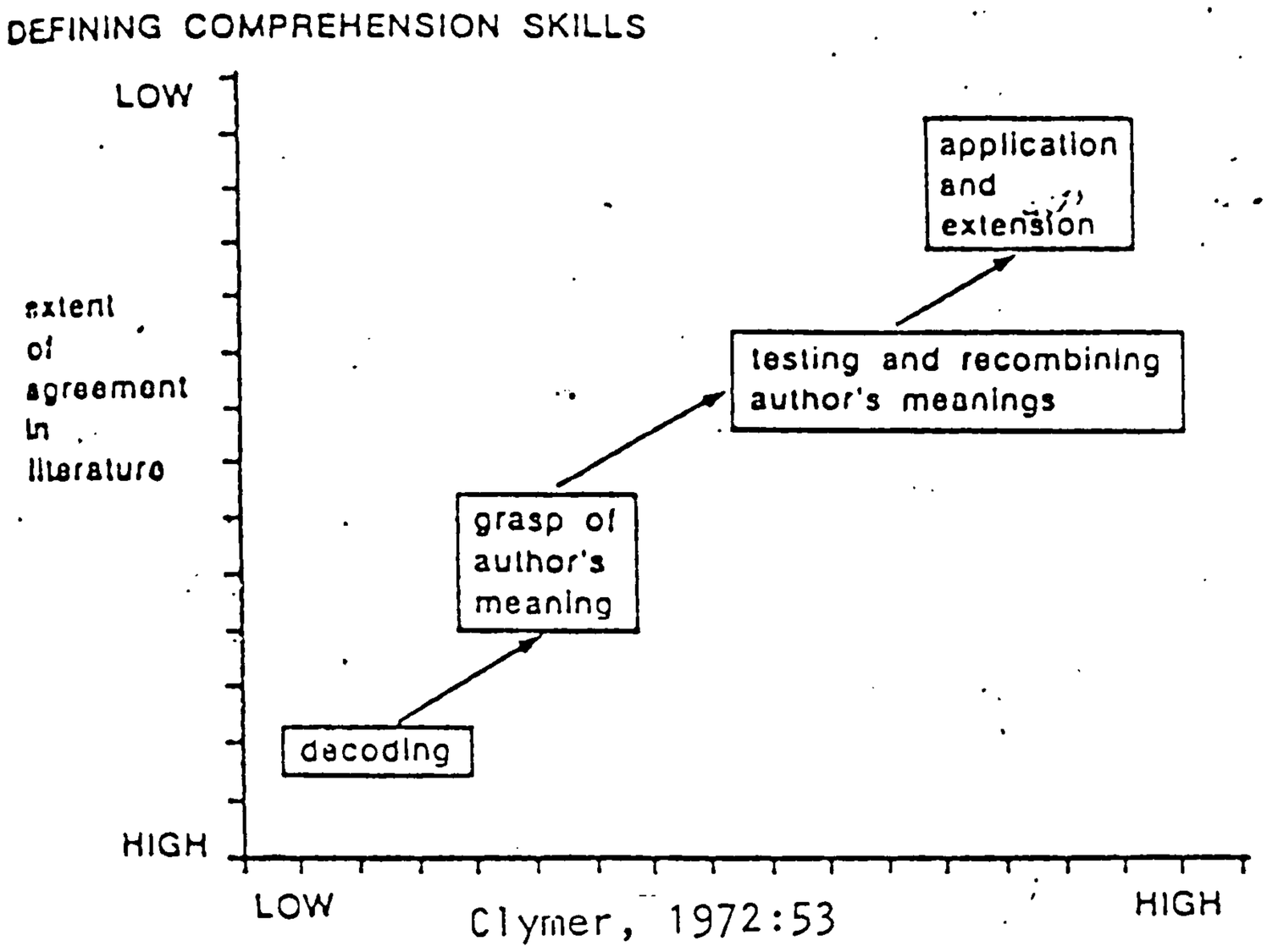
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APPENDIX A

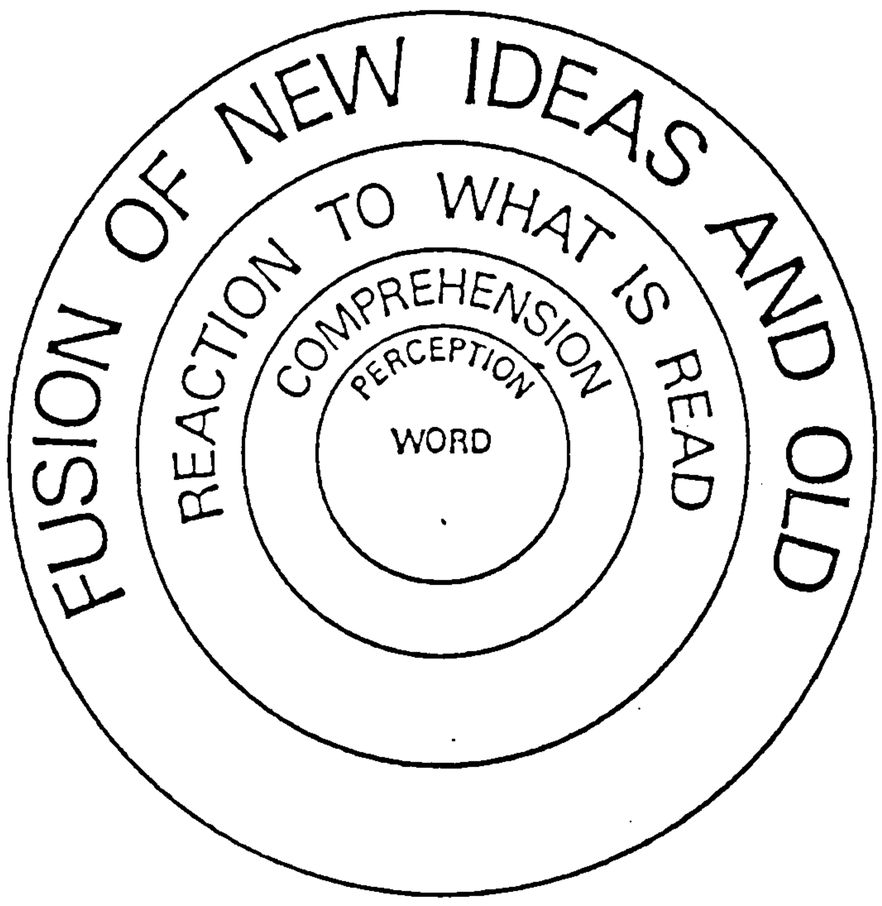
Complexity of Reading Outcome



Clymer, 1972:53

APPENDIX B

Major Components of Reading



Gray, 1960:61

APPENDIX C

Research Test

C1: Consultants

C2: Instructions

C3: Prior Knowledge Test

C4: PB02

C5: Comprehension Items for PB02

C6: PE01

C7: Comprehension Items for PE01

C8: Questionnaire

C1: Consultants

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C2: INSTRUCTIONS

The purpose of this study was explained and instructions were given in the following manner.

INSTRUCTIONS

This booklet contains a prior knowledge test followed by two passages, fifty-four comprehension questions and a questionnaire.

1. Start with Familiarity Test, which are open-ended. Write anything you know about each concept on the spaces provided.

2. After Familiarity Test, you will find passages PE01 and PB02, each followed by twenty seven multiple choice questions.

IMPORTANT

a. Please read the passage for comprehension and be prepared to answer the questions that follow each passage.

b. This is not a speed test. However, how long it takes you to read different materials is of interest to the investigator.

c. Four options are given to each item of which one stands out more plausible than others. Encircle only the letter of the answer you think is most plausible.

When the investigator asks you to start please turn the page and begin work.

ONCE YOU HAVE TURNED A PAGE, DO NOT GO BACK TO THAT PAGE!!

Are there any questions?

Do not turn this page until you are told to do so.

Thank you very much indeed for your cooperation.

C3: PRIOR KNOWLEDGE TEST

Instructions:

The following is a prior knowledge test about a topic which you will read for comprehension later on.

You are now required to write down everything you know about each vocabulary or concept on the spaces provided.

DO YOU HAVE ANY QUESTIONS?

Please start now.

1. Lamenter Poet

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. . . . . .

. . . . . .

2. Coroner

. . . . . .

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3. Inba-adirk

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4. Paschal Candles

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5. Gibate-meret

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6. Crematorium

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7. Crying Melodiously

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8. Undertaker

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9. Head Mourners

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10. Funeral Party

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11. Funeral Rites

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12. Hearse and Bearers

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13. Circling Temple

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14. Embalming

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15. Cheek Brushing

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16. A Certified Death

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17. Funeral Dance

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18. Chapel of Rest

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19. Grave Specification

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20. Post-mortem and Inquest

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21. Disposal Certificate

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22. Confessor

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23. Too Evident Sorrow

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24. Chest Beating

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C4: PB02

(1) When someone dies, (2) the death and its cause must be certified by a doctor (3) and reported to the Registrar of birth, death and marriage (4) within five days (5) . A disposal certificate (6) allowing the body to be buried or cremated (7) will be issued by the registrar. (8) The certificate will not be issued (9) without a medical certificate. (10) Without a certificate (11) an undertaker cannot legally carry out a funeral. (12) A death certificate will also be issued (13) and is needed, for example, to (14) claim life-insurance benefits.

(15) If the cause of death is uncertain, the fact must be reported to the district Coroner (16) for further investigation (17) in the form of post mortem and inquest.

(18) Once the disposal certificate has been issued, (19) the undertaker or funeral director, (20) a registered and licensed businessman, (21) will make the funeral arrangements (22) on behalf of the relatives. (23) The undertaker arranges ceremonial details, (24) an appropriate church, (25) the necessary certificate, (26) coffin, hearse and bearers. (27) The cost varies from two-hundred and fifty pounds excluding burial fee (28) which is payable to the cemetery or church.

(29) On the day of the funeral, (30) the undertaker will collect the body (31) or bring it from the undertaker's chapel of rest (32) in a hearse for transport to the church or crematorium.

(33) On arrival at the church, (34) the main funeral party will be met (35) by the clergy, (36) who will lead a simple procession into the church. (37) The undertaker's bearers will usually carry the coffin.

(38) The service may be held at any time of the day (39) to suit the church, (40) the relatives and travelling friends.

(41) In church, the coffin is placed at the front of the nave (42) and at the side will be placed (43) the paschal candles. (44) The service includes readings from the Bible (45) read by the clergy or relative or friend, followed by prayers and an address by the clergy.

(46) After the service, (47) which usually lasts twenty minutes, (48) is over, the relatives will make their way to the cemetery or crematorium. (49) The cemetery may be attached or belong to the church or the local council.

(50) A simple service of prayers, (51) about five minutes, (52) will be held at the graveside (53) before the coffin is lowered into it. (54) The grave will not be filled in until the relatives are on their way home.

(55) A church service is not obligatory (56) and will not in any case be held in case of a suicide.

(57) Although burials are still very common, (58) there are a far greater number of cremations. (59) Land for burials is rapidly running out (60) and it is expected that within twenty five years burial will be a thing of the past.

(61) A cremation is held at a special crematorium. (62) This is a chapel with facilities for burning the body. (63) A service will be held in a church (64) before the body is removed for burning. (65) This burning is done out of sight of the relatives (66) and not necessarily immediately after the service. (67) After burning, (68) the ashes are collected (69) and either scattered in the grounds of the crematorium or buried in the ground. (70) They can be taken home, if required.

(71) After burial or cremation is over, (72) many of the friends and relatives may be invited back to someone's home for refreshments (73) or this is something the undertaker can arrange. (74) Refreshment may be anything from a sandwich and a pint of beer (75) to a traditional ham salad.

(76) The funeral rites have been modified (77) by reducing to a decent minimum (78) the inevitable operations necessary to dispose of the body.

(79) The outward manifestations of mourning are repugned (80) and disappearing. (81) Emotions are avoided. (82) One does not have the right to become emotional other than in private. (83) Dark clothes are no longer worn. (84) One no longer dresses differently (85) from the way one does on any other day. (86) Too evident sorrow (87) does not inspire pity. (88) It is a sign of mental instability (89) or of bad manners. (90) Within the family circle (91) one also hesitates to let oneself go for fear of upsetting the children. (92) One can only have the right to cry, (93) if no one else can see or hear.

(94) It is above all essential that society, (95) neighbours, friends and children (96) notice to the least possible degree (97) that death has occurred. (98) For instance, (99) cremation has become the dominant manner of burial. (100) The deep motivation (101) is that it is the most radical means of getting rid of the body, (102) or forgetting it and nullifying it. (103) Cremation excludes a pilgrmage to the graveside.

C5: COMPREHENSION ITEMS FOR PB02

Encircle the letter of the most plausible answer

1. In this modern age, the masters of death, of the moment and of the circumstances of death are:

1. doctors and the hospital team
2. cigarettes and alcohol
3. the Church and the Clergy
4. scientists and researchers

2. Why has cremation become the dominant manner of burial?

1. for purely scientific reasons
2. for projected fear of space
3. for reasons of forgetting and nullifying the dead
4. for saving time, money, energy, by avoiding pilgrimage to the graveside

3. The funeral rites have been modified and reduced to a decent minimum, but which one of the following seems to remain intact to date?

1. wearing dark clothes
2. operations to dispose of the body
3. too evident sorrow
4. being too emotional

4. Which one of the following reasons is most plausible for the statement, "Nowadays one no longer dies in the bosom of one's family."

1. job opportunities across nations
2. the dominance of science and technology
3. the abundance of hospitals
4. the inconvenience death causes at home

5. Depending upon the nature and circumstances of death, normally, the funeral takes place within one of the following days.

1. 1-3 days
2. 2-5 days
3. 3-7 days
4. 4-9 days

6. Which one of the following is not necessarily the work of the undertaker?

1. arranging embalming
2. arranging the funeral party
3. collecting the corpse from the chapel of rest
4. arranging transport to the church or crematorium

7. Which one of the following is not true of cremation?

1. it is done out of sight of relatives
2. it is necessarily done immediately after the service is over
3. it is not done while relatives are present to pay their last respects
4. it may take place some time after the service is over

8. Which of the following is not true of the ashes after cremation has taken place?

1. collected and buried in the ground
2. scattered in the grounds of the crematorium
3. collected and stored in a container
4. can be taken home

9. Which one of the following is the appropriate place for cremation to take place?

1. any vacant place in the outskirts
2. at the chapel of rest
3. at a special place
4. at a cemetery

10. In the case of one of the following, a church service for the deceased cannot be held. Indicate which.

1. first degree murder
2. accidental death
3. premature death
4. none of the above

11. The duration of service at the church before going to the cemetery or cremation is .....

1. very short, and untiring
2. very long and boring
3. very long but interesting
4. short and/or long depending on the cause of death

12. Paschal candles, according to custom, are appropriately placed. Which one of the following is the right position for the candles to be placed?

1. on the top of the coffin
2. at the side of the coffin
3. in front of the coffin
4. behind the coffin

13. Too evident sorrow, as an outward manifestation of mourning is considered a

1. sign of mental instability
2. sign of emotional attachement
3. sign of sympathy and love
4. sign to inspire pity

14. which one of the following is not true of embalming?

1. it is an indispensable part of funeral ceremony
2. it can be carried out any time before the funeral procession starts
3. it can be carried out towards the end of funeral procession
4. it is essentially done for cosmetic purposes

15. Which one of the following applies to the statement, "If the relatives of the deceased cannot afford to pay for the services of the undertaker, they can always arrange the burial themselves."

1. this is a rare incident
2. this does happen most of the time
3. it can be both A and B depending on the circumstances
4. many agree that it never happens

16. One of the following is closely associated with an inquest.

1. The district Coroner
2. The district Judge
3. The City Council
4. The chief of the Constabulary

17. When someone dies it is reported to the registrar's office for the purpose of obtaining

1. birth certificate
2. medical certificate
3. death certificate
4. disposal certificate

18. The church service includes readings from the Bible read by the clergy, followed by an address. The address is given by one of the following

1. the clergy
2. the relatives of the decesead
3. the funeral director
4. an intimate friend

19. Which one of the following is true of funeral services: They are

1. held at any time of the day
2. usually held in the mornings
3. held at particular/specified time
4. preferably held on Sundays

20. Despite the efforts of cemetery offices :

1. people rarely visit the urns today
2. people are not grateful to cemetery offices
3. people want to abolish cemetery offices
4. people want to avoid visiting gravesides

21. Which one of the following statements is false

1. embalming is not carried out until the Registrar's certificate has been issued
2. the executor or relative arranging funeral should tell the undertaker if they specifically object to embalming
3. embalming obscures the cause of death
4. a body can be preserved, essentially for cosmetic purposes

22. If death resulted from an accident or if violence occurred in suspicious circumstances, the fact must be reported to one of the following

1. the nearest hospital or health centre
2. the district coroner
3. the district police
4. the district council

23. While the corpse is lowered to the ground, one of the following sprinkles earth on it.

1. the undertaker
2. the priest
3. the immediate relative
4. the grave diggers or bearers

1	2	3
MEDICAL CERTIFICATE	DEATH CERTIFICATE	DISPOSAL CERTIFICATE

24. These certificates are put in boxes with numbers on them. Indicate which one of the following is the right sequence of obtaining them in terms of priority.

1. $1 \rightarrow 2 \rightarrow 3$
2. $2 \rightarrow 1 \rightarrow 3$
3. $1 \rightarrow 3 \rightarrow 2$
4. $3 \rightarrow 2 \rightarrow 1$

25. Which one of the following is responsible for issuing disposal certificate?

1. the office of the Coroner
2. the office of the funeral director
3. the office of the parish church
4. the office of the registrar

26. One of the following is associated with Cassock, Surplice, and Stole during the funeral :

1. The church
2. The cemetery
3. The chapel of rest
4. The crematorium

27. What is death certificate needed for?

1. census purposes
2. disposing of the corpse
3. claiming insurance benefits
4. remembrance

C6: PE01

(1) When someone dies, a group of priests and deacons are summoned to the house of the deceased (2) during the morning of the funeral day. (3) The group forms a circle around the bed on which the corpse (4) lies and starts the service (5) which is composed of readings and chanting hymns.

(6) The funeral ritual is divided into seven parts. (7) The first is carried out in the house of the deceased (8) and the remainder takes place on the way to the church.

(9) No service is said for a person (10) who has suffered death by drowning, (11) by falling from a cliff, (12) by being eaten by wild beasts, (13) or by committing suicide. (14) This also holds true (15) for those who failed to have a confessor.

(16) In the procession, the clergy leads the way, (17) followed by men who carry the corpse (18) and then by head mourners. (19) At the rear of the procession (20) are those who carry pots of drinks and food (21) which is referred to as inba-adirk (22) which goes at the end of the funeral to a group of clergy concerned.

(23) At the church, (24) the corpse is taken around the temple from right to left once (25) and deposited on the ground (26) by the northern gate, (27) if the deceased is a man, (28) by the southern, if a woman, (29) and if a member of the clergy, by the eastern gate (30) or inside the church.

(31) After the corpse is put in the grave, (32) priests say the last prayers gibate-meret. (33) Then the grave diggers start to close the grave (34) while the tears of the bystanders start to flow, (35) and the air is filled by the strange cries of the bereaved.

(36) On the way back home, (37) no weeping occurs (38) and on entering the house or das, every body is served with nifro.

(39) Weeping is the most conspicuous practice of the mourner. (40) There is individual weeping as well as group weeping. (41) The weeping is done by crying loudly and melodiously.

(42) The group weeping is conducted by a woman, (43) a lamenter-poet (44) known as alkash. (45) This woman sings in a peculiar and mournful tune (46) praising the departed (47) by bringing to the memory of the mourners his/her past deeds (48) upon which the female mourners gathered around her, (49) slap their chests and cry. (50) Group mourning is practised throughout the first three days, (51) usually twice or three times a day.

(52) As each newcomer arrives (53) from a distant region (54) and enters the mourning place crying, (55) those inside break afresh into weeping.

(56) Women, who are close relatives slap their chests with both hands. (57) So hard do these women slap their uncovered chests, (58) that by the second day they become swollen and red. (59) In extreme cases the mourners' grief becomes so intense (60) that they brush their cheeks with coarse material (61) so that the outer skin is scaled off.

(62) After intensive weeping (63) on the third day (64) at the church, (65) the head mourners move to a modest room, (66) where they remain for another nine days (67) lamenting and weeping.

(68) On the twelfth day, (69) the family of the deceased carry out a general weeping (70) after having sent food and drinks (71) to the priests and the poor. (72) Then the general parting takes place.

(73) A large reception is given to close relatives and guests (74) on the fortieth day. (75) The alkash is also present. (76) Of course, she is paid according to how well she has done her job. (77) Then every body starts enjoying the food and

drink prepared (78) in remembrance of the deceased.

(79) The head mourners stay in full mourning (80) for one year. (81) During this period (82) no songs or any such diversions are allowed in the residence of the bereaved, (83) nor may the bereaved indulge in any pleasurable recreations elsewhere (84) till the term of the full mourning has elapsed.

(85) In the period between the fortieth day and the seventh year, (86) there are receptions (87) on the eightieth day, (88) on the sixth month and after the first year. (89) On the seventh anniversary, (90) however, most of the relatives gather (91) and indulge in general weeping.

(92) It is a common practice for the bereaved to sleep on the floor, at least (93) for the first forty days.

(94) The women go without shoes for, at least, (95) the first twelve days and rings and earrings are put aside (96) until the fortieth day. (97) The hair is shaved off or cut very short for one year (98) and dressing such as butter is not applied to it. (99) Men do not shave until the fortieth day.

(100) The women wear their nettela in a different way. (101) They tie one of the narrow ends around their waist and bring the opposite end (102) over their shoulder from the back. (103) This makes the coloured patch lie above, and the whole nettela turned inside out.

C7: COMPREHENSION ITEMS FOR PE01

Encircle the letter of the most plausible answer.

1. The mourners, according to tradition, should be in full mourning for one of the following times

1. forty days
2. eighty days
3. six months
4. one year

2. The church service and the general weeping are mostly carried out in one of the following patterns

1. semicircular
2. triangular
3. circular
4. rectangular

3. When is the last general weeping carried out?

1. on the seventh year
2. on the eightieth day
3. on the fortieth day
4. on the first anniversary

4. As custom has it, how many receptions are held in memory of the deceased?

1. five
2. seven
3. three
4. nine

5. Which one of the following statements is true of the nettela during the funeral day and some time afterwards?

1. The nettela is worn in the usual way
2. The coloured patch of the nettela lies below and the whole nettela turned inside-out
3. The narrow ends of the nettela are tied around the neck and the opposite end lies over the shoulder
4. One of the narrow ends of the nettela is tied around the waist and the opposite end brought over the shoulder from the back

6. One of the following is not a common practice of mourners.

1. sleeping on the floor
2. brushing cheeks with a coarse material
3. beating the uncovered chests
4. putting aside shoes and earrings

7. On which day is a large reception given to close relatives and guests in remembrance of the deceased?

1. third day
2. twelfth day
3. fortieth day
4. eighth day

8. The head mourner(s) may not be one of the following

1. the son(s) and/or daughter(s) of the deceased
2. the husband and/or wife of the deceased
3. the brother(s) and/or sister(s) of the deceased
4. the father or mother of the deceased

9. What is the most conspicuous practice of the mourner?

1. participating in the general weeping
2. choosing the right church and cemetery
3. arranging ceremonial details
4. consoling the bereaved

10. The eastern gate of the church is meant for one of the following

1. patriots
2. unbaptized infants
3. priests
4. women

11. The corpse of one of the following is deposited on the ground by the northern gate if the deceased is a .....

1. woman
2. man
3. child
4. member of the clergy

12. How many times is the corpse taken around the temple at the church?

1. once
2. twice
3. three times
4. five times

13. Which one of the following is the right order of the funeral procession?

1. clergy→corpse carriers→head mourners→inba-adirk carriers
2. head mourners→clergy→corpse bearers→inba-adirk carriers
3. corpse carriers→clergy→head mourners→inba-adirk carriers
4. inba-adirk carriers→head mourners→clergy→corpse carriers

14. Which of the following is true of the 'gibate-meret.'It is said

1. after the grave is closed
2. before the grave is closed
3. in the church
4. at the house of the decesead

15. At the church the corpse is taken around the temple in one of the following directions.

1. right to left
2. left to right
3. left to right and then right to left
4. right to left and then left to right

16. The funeral rite is made at the house of the deceased once and how many of the remaining rites are carried on the way to the church?

1. five
2. six
3. three
4. two

17. One of the following is a usual practice as far as custom is concerned

1. Teskar is carried out on the fortieth day, the first year anniversary, and the seventh year
2. Teskar is carried out on the third day, on the seventh day, on the twelfth day, and on the thirtieth day
3. Teskar is carried out on two important occasions, i.e., on the fortieth and eightieth days after burial
4. Teskar is carried out only on the fortieth day

18. On the third day, relatives, friends and neighbours make intensive weeping. This is, as it is believed, because of one of the following reasons.

1. the eyes of the departed disintegrate on the third day
2. it is on the third day that a place is allocated to the deceased in heaven
3. the soul of the deceased appears before the angels on the third day
4. it is on the third day that one comes to know one's right place, i.e. hell or heaven

19. One of the following may be allowed during the period of full mourning

1. pleasurable recreations
2. eating too much
3. some dancing when the situation demands
4. at times singing and listening to the radio

20. On the way back home from funeral, one of the following is a common practice

1. the alkash sings in a mournful tune
2. the mourners usually keep silent
3. the head mourners keep on crying loudly and beat their bodies and throw themselves on the ground
4. a sigh of relief and a general relaxation

21. The grave is usuallly dug in

1. a north-east direction
2. a south-west direction
3. an east-west direction
4. a south-east direction

22. When the mourners just reach the home of the bereaved from church, they .....

1. break afresh into weeping
2. are served with nifro
3. are met by someone with water to wash their hands
4. are given seats and served with coffee

23. Mourners engage in intensive lamentations during one of the following times

1. the first three days
2. the first nine days
3. the first twelve days
4. the first forty days

24. The provisions referred to as inba-adirk will normally go to one of the following

1. the clergy concerned
2. the head and ordinary mourners
3. the grave diggers
4. the poor at the gate of the church

25. One of the following is what the bereaved do on the day of the funeral. They tie threads around their necks which are coloured

1. black
2. white
3. yellow
4. blue

26. As a rule, the bereaved, relatives and friends weep and cry loudly and melodiously. One of the following is the right term for it.

1. individual weeping
2. group weeping
3. chorus
4. choir

27. The Alkash is paid according to how well she has done her job. 'Well' refers to one of the following

1. how far she makes mourners weep more
2. how far she swings in the funeral dance
3. how far she praises the departed
4. how far her poems and the tune are coherent and mournful respectively

C8: QUESTIONNAIRE

The following questions are equally imporatant in determining the purpose of the study. Your cooperation to answer them is highly solicited.

1. Age . . . .

   Sex . . . .

   Nationality . . . . . .

   Field of study . . . . . .

2. Which of the two passages (PE01/PB02) were you interested in and why?

   . . . . . .

   . . . . . .

   . . . . . .

   . . . . . .

3. As you know some ideas stick out more than others, hence, what ideas strike you most in either of the passages or in both?

   . . . . . .

   . . . . . .

   . . . . . .

. . . . . .

4. Have you ever attended

1. An Ethiopian funeral ceremony? . . . (Y/N)

2. A British funeral ceremony? . . . . . (Y/N)

APPENDIX D

Results of the Test

D1: Question Classification

D2: Answers of British

D3: Answers of Ethiopians

D4: Answers of Other Nations

D5: Raw Scores by Question Type

D6: Percentage of Correctly Answered Questions

D7: Percentage of Correctly Answered Questions by Component

D8: Item Analysis on PB02

D9: Item Analysis on PE01

D10: Discrimination Indices for the whole Population on PB02 and PE01

D11: Summary of Item Analysis on PE01 by Cultural Groups

D12: Summary of Item Analysis on PB02 by Cultural Groups

D13: Distractors Analysis for PB02

D14: Distractors Analysis for PE01

D15: Response Frequency Distribution for Items 2, 21 and 22

D16: Rank Orders in Order of Merit

D17: Kuder-Richardson Formula 20

D18: Post-hoc Comparison between pre and post-test SI items

D1: Question Classification

Passage	TE					TI					SI				
PE01	1	7	9	10	11	2	3	5	13	14	4	6	8	17	18
	12	15	23	24		16	19	20	26		21	22	25	27	
PB02	7	8	9	10	12	2	3	6	11	15	1	4	5	14	19
	13	16	17	27		18	22	24	25		20	21	23	26	

PE01 = Passage for Ethiopians

TE = Textually Explicit

TI = Textually Implicit

SI = Schematically Implicit

PB02 = Passage for British

D2: Answers of British

N°	Age	Int	Att	Br Passage PB02			Eth Passage PE01		
	e	t	t	TE	TI	SI	TE	TI	SI
01	23	2	1	233422123	222134234	144311231	141323211	313222312	221131232
02	24	2	1	413421143	122111314	133312321	431322422	314313212	324432234
03	29	2	1	233421134	322141214	113314231	431321111	314122222	122442243
04	31	2	0	232421143	322141314	232311131	121321111	312112222	321232231
05	31	0	0	233421143	322131324	132311331	132413332	323143331	323313334
06	31	1	1	223421143	312141234	123311221	421321211	314122212	124123214
07	23	2	0	224423142	223111324	232311322	441321142	332222422	342133213
08	26	2	1	233421143	222112234	132111131	131323131	312121212	121431214
09	27	2	1	213422141	222141324	144112331	244323231	314122222	312123113
10	22	2	0	223421133	222131214	133131131	431223111	132123222	321424114
11	23	2	0	223421143	342111234	112314221	421321131	314124411	223323124
12	23	2	1	213422142	222114214	112314121	431321131	314122222	221233214
13	22	0	1	444431133	224141312	113423223	121323331	413232414	311323112
14	24	2	0	223421131	412112321	221234323	141322111	114132332	224341213
15	22	2	1	211421143	222131324	232132231	441321141	412343212	222132233
16	21	1	1	232124133	322144214	143312423	231321134	314142412	314333113
17	21	2	1	233421133	222441314	144412431	121323131	312143242	124431213
18	23	2	1	233421142	322141214	142314321	431321234	312142222	112333224
19	38	2	1	233421143	322121231	142311421	131321111	314142222	322421231
20	23	2	0	233321143	322133134	144314331	431321131	212122222	124132214
21	23	2	0	224421143	322141214	113114323	421321141	314122232	123133111
22	22	1	1	223421143	411141314	133312211	131321211	314122222	124423223
23	22	0	0	232421143	422134234	111314323	131321112	312114222	122433111
24	22	2	1	234424133	221141314	443314221	131322144	312121222	221441214
25	22	1	1	322441143	322141234	114314121	431321112	314223312	211421213
26	23	2	1	213421133	322141211	422114431	431321111	314122212	122132111
27	27	2	1	222421133	222144311	132233121	421322222	324121132	211121214
28	23	2	1	223424143	212144214	133321121	431321211	314111212	222341233
29	23	2	0	213421143	422141234	442314123	431321131	334122212	122441213
30	24	2	1	233322142	212131214	132314321	131321111	214132322	342123133

Int: Interest Att: Attendance. N= 30

D3: Answers of Ethiopians

N°	Age	Int	Att	Br Passage PB02			Eth Passage PE01		
				TE	TI	SI	TE	TI	SI
31	29	2	2	233411131	222433312	322424342	234323232	314131321	212433214
32	30	2	2	112423243	244111213	131232322	433423214	344214213	421131211
33	30	1	2	233422133	232423311	231211223	431323114	314422222	113123211
34	40	2	2	223422343	342123314	111432424	131321112	334114222	323313221
35	35	1	2	233424133	321134224	242311221	144321111	314122222	121413311
36	29	2	2	444423244	434332314	221211443	231433114	334222224	423111322
37	32	3	0	223423333	421234314	232312141	131323111	314121322	123433211
38	30	3	2	331421333	234114212	332332313	134323442	314421212	332441211
39	28	0	2	213421132	321131312	122114323	131423211	334321421	244433214
40	25	2	2	231134143	231431111	342323431	434321112	314322222	232133321
41	50	2	2	343323141	334131311	331411434	134321212	333123233	144133314
42	46	1	2	233421143	221114212	132332422	431233232	313121221	123131221
43	26	1	2	234313142	323332224	131411232	134433211	334122322	123143214
44	43	1	2	234434133	211111314	242213232	121323312	344121223	211111211
45	31	2	2	232421133	324112334	131412322	131321132	332122244	123113214
46	40	2	2	232431133	221133211	212114442	433321111	314114221	221111223
47	42	1	2	233422143	433133314	221312424	131323111	314314322	223411223
48	43	1	2	233421142	121143314	342414432	411321111	314122223	223113221
49	38	3	2	432421143	322231234	342212222	133321141	314122221	113431224
50	42	2	2	233422133	322144244	143323222	134321132	312222323	241343221
51	26	1	2	224413141	332431211	133411434	133323211	433322221	321114224
52	29	3	2	231434143	422142114	132224112	131323234	314422222	323431221
53	33	0	2	231421133	222112333	232312332	133323214	234123222	222222211
54	33	2	2	444422132	412132114	131412423	432221111	334122422	423413224
55	35	1	2	444121133	311432112	341434434	133321134	334423223	332413224
56	33	2	2	233433133	212133321	213211331	131334211	333112242	223111211
57	35	1	2	213424141	321131224	123414441	131321111	314122222	133131214
58	28	0	2	234421143	441141214	112212132	433321111	314122143	321143321
59	40	2	2	223422343	342123314	111432424	131321112	334114222	323313221
60	32	3	0	223423333	421234314	232312141	131323111	314121322	123433211

Int: Interest Att: Attendance. N= 30

D4: Answers of Other Nations

N°	Age	Int	Att	Br Passage PB02			Eth Passage PE01		
				TE	TI	SI	TE	TI	SI
61	24	0	0	143214114	144134333	312322432	431321134	323121141	114231223
62	24	0	0	233421133	321131414	132214313	421321131	334111223	214423224
63	34	1	0	234423333	321111324	141211421	131421114	314133212	324113112
64	30	2	0	211434132	441131214	131414443	131323114	244141412	211423113
65	28	3	0	214431141	422432214	111234121	131321114	314112411	121433213
66	29	1	0	231123133	121111233	231212442	421311224	344243212	213422311
67	25	1	0	213421133	322312224	233212322	131321212	114123213	421121211
68	28	2	0	233221243	222212113	231322332	134321221	314122212	322121114
69	27	2	0	234422142	311141112	132231432	432321143	333114212	314124114
70	30	2	0	234121132	421111244	121414444	131321132	314144222	112313213
71	27	0	0	234421143	333142314	133442334	421323211	434143332	224113224
72	24	1	0	232421143	322141214	142434441	431321143	313122222	113213114
73	30	0	0	224112233	412432313	241322122	112322112	344213122	221122214
74	34	2	0	232121133	322134211	143322233	431321412	324242112	241111112
75	35	2	0	233412142	222221224	131324322	132423114	133143214	241421112
76	28	1	0	134211133	321131322	142114143	121314143	314113222	211413113
77	48	1	0	222424133	421121244	441312121	431321111	314122221	332123214
78	25	0	0	112121143	332421141	141322433	221343224	332142422	212221114
79	37	3	0	413423133	332111124	221213132	122323331	414142213	324323213
80	25	0	0	231122331	321233132	143223114	214421214	313212211	112342214
81	45	1	0	232421133	314432314	143222332	441321114	434342212	324324114
82	31	2	0	214421133	321444314	123231131	131322312	214113323	314321231
83	28	0	0	231421132	324233134	331212332	131322212	133213211	211121114
84	30	2	0	223432432	412131314	143434323	121321211	314133212	313123113
85	24	1	0	232421343	221122414	141411433	121143232	322143132	231123323
86	30	0	0	232431344	321132334	232213313	441423124	314222212	322311211
87	34	2	0	211434132	441131214	131414443	131323114	244141412	211423113
88	30	0	0	434231143	221421214	141413142	114321111	314123212	221411211
89	32	1	0	324443131	433433313	331234241	212312213	332222431	212323313
90	25	0	0	234121431	312131314	143311342	131424243	342231112	211133411

Int: Interest Att: Attendance. N=30

D5: Raw Scores by Question Type

BRITISH									ETHIOPIANS								
N°	PB02	TE	TI	SI	PE01	TE	TI	SI	N°	PB02	TE	TI	SI	PE01	TE	TI	SI
1	17	7	6	4	13	5	5	3	31	10	6	2	2	10	3	5	2
2	15	7	4	4	13	5	5	3	32	10	4	4	2	11	4	3	4
3	17	7	6	4	21	9	9	3	33	10	7	1	2	20	7	8	5
4	16	8	5	3	17	7	7	3	34	11	6	2	3	19	7	6	6
5	17	9	4	4	6	1	2	3	35	17	7	5	5	20	6	9	5
6	18	8	6	4	21	7	8	6	36	6	3	1	2	14	4	6	4
7	13	5	5	3	14	6	5	3	37	11	5	3	3	19	7	7	5
8	20	9	6	5	15	6	6	3	38	9	5	3	1	11	3	6	2
9	17	6	6	5	14	3	9	2	39	16	6	4	6	12	5	4	3
10	16	7	6	3	13	7	5	1	40	12	5	3	4	19	7	8	4
11	19	8	5	6	15	7	5	3	41	8	4	2	2	13	5	4	4
12	17	6	5	6	20	8	9	3	42	18	9	5	4	15	3	6	6
13	11	4	5	2	7	4	2	1	43	9	4	3	2	15	3	7	5
14	9	6	1	2	14	6	5	3	44	13	5	5	3	14	4	6	4
15	15	7	5	3	13	7	3	3	45	14	7	4	3	17	6	5	6
16	15	5	5	5	14	6	6	2	46	16	6	5	5	19	8	6	5
17	18	8	5	5	14	5	5	4	47	13	8	2	3	16	7	5	4
18	21	8	6	7	17	6	7	4	48	18	8	5	5	23	8	8	7
19	21	9	5	7	19	8	8	3	49	16	7	5	4	17	6	8	3
20	17	8	4	5	20	8	7	5	50	15	7	5	3	14	5	5	4
21	18	7	6	5	20	7	8	5	51	9	4	2	3	14	5	4	5
22	16	8	5	3	22	7	9	6	52	13	6	4	3	16	4	8	4
23	17	8	5	4	17	7	6	4	53	13	7	4	2	13	4	6	3
24	18	6	7	5	14	5	7	2	54	9	3	2	4	19	7	7	5
25	17	5	7	5	14	8	5	1	55	8	4	1	3	14	5	5	4
26	18	7	5	6	21	9	8	4	56	10	6	2	2	15	5	5	5
27	14	6	4	4	11	4	5	2	57	17	6	6	5	20	8	9	3
28	15	7	5	3	16	8	6	2	58	17	8	6	3	19	8	6	5
29	20	8	7	5	18	8	7	3	59	11	6	2	3	19	7	6	6
30	17	6	5	6	16	8	6	2	60	11	5	3	3	19	7	7	5

OTHER NATIONS								
N°	PB02	TE	TI	SI	PE01	TE	TI	SI
61	6	2	2	2	14	7	3	4
62	17	8	5	4	16	7	5	4
63	16	5	5	6	17	6	6	5
64	12	3	5	4	10	6	3	1
65	12	5	3	4	16	7	5	4
66	13	5	6	2	9	4	4	1
67	12	7	3	2	15	6	5	4
68	9	7	2	0	15	5	8	2
69	13	6	4	3	12	6	4	2
70	15	5	6	4	17	6	7	4
71	12	8	3	1	16	6	3	7
72	20	8	6	6	18	7	8	3
73	4	2	0	2	11	4	4	3
74	11	6	3	2	13	7	4	2
75	14	6	5	3	6	4	2	0
76	14	4	4	6	12	3	7	2
77	15	5	6	4	20	9	8	3
78	9	5	1	3	7	2	5	0
79	9	5	3	1	12	3	5	4
80	8	3	3	2	9	3	4	2
81	10	7	1	2	13	7	4	2
82	12	6	4	2	12	5	4	3
83	10	6	3	1	7	5	1	1
84	10	3	3	4	14	6	6	2
85	16	7	5	4	7	1	3	3
86	12	5	5	2	15	4	7	4
87	12	3	5	4	10	6	3	1
88	14	5	6	3	17	6	7	4
89	4	2	0	2	6	2	3	1
90	10	4	3	3	8	3	2	3

D6: Percentage of Correctly Answered Questions

BRITISH								
N°	PB02	TE	TI	SI	PE01	TE	TI	SI
1	62.96	25.93	22.22	14.81	48.15	18.52	18.52	11.11
2	55.56	25.93	14.81	14.81	48.15	18.52	18.52	11.11
3	62.96	25.93	22.22	14.81	77.78	33.33	33.33	11.11
4	59.26	29.63	18.52	11.11	62.96	25.93	25.93	11.11
5	62.96	33.33	14.81	14.81	22.22	3.70	7.41	11.11
6	66.67	29.63	22.22	14.81	77.78	25.93	29.63	22.22
7	48.15	18.52	18.52	11.11	51.85	22.22	18.52	11.11
8	74.07	33.33	22.22	18.52	55.56	22.22	22.22	11.11
9	62.96	22.22	22.22	18.52	51.85	11.11	33.33	7.41
10	59.26	25.93	22.22	11.11	48.15	25.93	18.52	3.70
11	70.37	29.63	18.52	22.22	55.56	25.93	18.52	11.11
12	62.96	22.22	18.52	22.22	74.07	29.63	33.33	11.11
13	40.74	14.81	18.52	7.41	25.93	14.81	7.41	3.70
14	33.33	22.22	3.70	7.41	51.85	22.22	18.52	11.11
15	55.56	25.93	18.52	11.11	48.15	25.93	11.11	11.11
16	55.56	18.52	18.52	18.52	51.85	22.22	22.22	7.41
17	66.67	29.63	18.52	18.52	51.85	18.52	18.52	14.81
18	77.78	29.63	22.22	25.93	62.96	22.22	25.93	14.81
19	77.78	33.33	18.52	25.93	70.37	29.63	29.63	11.11
20	62.96	29.63	14.81	18.52	74.07	29.63	25.93	18.52
21	66.67	25.93	22.22	18.52	74.07	25.93	29.63	18.52
22	59.26	29.63	18.52	11.11	81.48	25.93	33.33	22.22
23	62.96	29.63	18.52	14.81	62.96	25.93	22.22	14.81
24	66.67	22.22	25.93	18.52	51.85	18.52	25.93	7.41
25	62.96	18.52	25.93	18.52	51.85	29.63	18.52	3.70
26	66.67	25.93	18.52	22.22	77.78	33.33	29.63	14.81
27	51.85	22.22	14.81	14.81	40.74	14.81	18.52	7.41
28	55.56	25.93	18.52	11.11	59.26	29.63	22.22	7.41
29	74.07	29.63	25.93	18.52	66.67	29.63	25.93	11.11
30	62.96	22.22	18.52	22.22	59.26	29.63	22.22	7.41

ETHIOPIANS								
N°	PB02	TE	TI	SI	PE01	TE	TI	SI
31	37.04	22.22	7.41	7.41	37.04	11.11	18.52	7.41
32	37.04	14.81	14.81	7.41	40.74	14.81	11.11	14.81
33	37.04	25.93	3.70	7.41	74.07	25.93	29.63	18.52
34	40.74	22.22	7.41	11.11	70.37	25.93	22.22	22.22
35	62.96	25.93	18.52	18.52	74.07	22.22	33.33	18.52
36	22.22	11.11	3.70	7.41	51.85	14.81	22.22	14.81
37	40.74	18.52	11.11	11.11	70.37	25.93	25.93	18.52
38	33.33	18.52	11.11	3.70	40.74	11.11	22.22	7.41
39	59.26	22.22	14.81	22.22	44.44	18.52	14.81	11.11
40	44.44	18.52	11.11	14.81	70.37	25.93	29.63	14.81
41	29.63	14.81	7.41	7.41	48.15	18.52	14.81	14.81
42	66.67	33.33	18.52	14.81	55.56	11.11	22.22	22.22
43	33.33	14.81	11.11	7.41	55.56	11.11	25.93	18.52
44	48.15	18.52	18.52	11.11	51.85	14.81	22.22	14.81
45	51.85	25.93	14.81	11.11	62.96	22.22	18.52	22.22
46	59.26	22.22	18.52	18.52	70.37	29.63	22.22	18.52
47	48.15	29.63	7.41	11.11	59.26	25.93	18.52	14.81
48	66.67	29.63	18.52	18.52	85.19	29.63	29.63	25.93
49	59.26	25.93	18.52	14.81	62.96	22.22	29.63	11.11
50	55.56	25.93	18.52	11.11	51.85	18.52	18.52	14.81
51	33.33	14.81	7.41	11.11	51.85	18.52	14.81	18.52
52	48.15	22.22	14.81	11.11	59.26	14.81	29.63	14.81
53	48.15	25.93	14.81	7.41	48.15	14.81	22.22	11.11
54	33.33	11.11	7.41	14.81	70.37	25.93	25.93	18.52
55	29.63	14.81	3.70	11.11	51.85	18.52	18.52	14.81
56	37.04	22.22	7.41	7.41	55.56	18.52	18.52	18.52
57	62.96	22.22	22.22	18.52	74.07	29.63	33.33	11.11
58	62.96	29.63	22.22	11.11	70.37	29.63	22.22	18.52
59	40.74	22.22	7.41	11.11	70.37	25.93	22.22	22.22
60	40.74	18.52	11.11	11.11	70.37	25.93	25.93	18.52

OTHER NATIONS								
N°	PB02	TE	TI	SI	PE01	TE	TI	SI
61	22.22	7.41	7.41	7.41	51.85	25.93	11.11	14.81
62	62.96	29.63	18.52	14.81	59.26	25.93	18.52	14.81
63	59.26	18.52	18.52	22.22	62.96	22.22	22.22	18.52
64	44.44	11.11	18.52	14.81	37.04	22.22	11.11	3.70
65	44.44	18.52	11.11	14.81	59.26	25.93	18.52	14.81
66	48.15	18.52	22.22	7.41	33.33	14.81	14.81	3.70
67	44.44	25.93	11.11	7.41	55.56	22.22	18.52	14.81
68	33.33	25.93	7.41	0.00	55.56	18.52	29.63	7.41
69	48.15	22.22	14.81	11.11	44.44	22.22	14.81	7.41
70	55.56	18.52	22.22	14.81	62.96	22.22	25.93	14.81
71	44.44	29.63	11.11	3.70	59.26	22.22	11.11	25.93
72	74.07	29.63	22.22	22.22	66.67	25.93	29.63	11.11
73	14.81	7.41	0.00	7.41	40.74	14.81	14.81	11.11
74	40.74	22.22	11.11	7.41	48.15	25.93	14.81	7.41
75	51.85	22.22	18.52	11.11	22.22	14.81	7.41	0.00
76	51.85	14.81	14.81	22.22	44.44	11.11	25.93	7.41
77	55.56	18.52	22.22	14.81	74.07	33.33	29.63	11.11
78	33.33	18.52	3.70	11.11	25.93	7.41	18.52	0.00
79	33.33	18.52	11.11	3.70	44.44	11.11	18.52	14.81
80	29.63	11.11	11.11	7.41	33.33	11.11	14.81	7.41
81	37.04	25.93	3.70	7.41	48.15	25.93	14.81	7.41
82	44.44	22.22	14.81	7.41	44.44	18.52	14.81	11.11
83	37.04	22.22	11.11	3.70	25.93	18.52	3.70	3.70
84	37.04	11.11	11.11	14.81	51.85	22.22	22.22	7.41
85	59.26	25.93	18.52	14.81	25.93	3.70	11.11	11.11
86	44.44	18.52	18.52	7.41	55.56	14.81	25.93	14.81
87	44.44	11.11	18.52	14.81	37.04	22.22	11.11	3.70
88	51.85	18.52	22.22	11.11	62.96	22.22	25.93	14.81
89	14.81	7.41	0.00	7.41	22.22	7.41	11.11	3.70
90	37.04	14.81	11.11	11.11	29.63	11.11	7.41	11.11

D7: Percentage of Correctly Answered Questions by Components

BRITISH								
Nº	PB02	TE	TI	SI	PE01	TE	TI	SI
1	62.96	77.78	66.67	44.44	48.15	55.56	55.56	11.11
2	55.56	77.78	44.44	44.44	48.15	55.56	55.56	11.11
3	62.96	77.78	66.67	44.44	77.78	100.00	100.00	11.11
4	59.26	88.89	55.56	33.33	62.96	77.78	77.78	11.11
5	62.96	100.00	44.44	44.44	22.22	11.11	22.22	11.11
6	66.67	88.89	66.67	44.44	77.78	77.78	88.89	22.22
7	48.15	55.56	55.56	33.33	51.85	66.67	55.56	11.11
8	74.07	100.00	66.67	55.56	55.56	66.67	66.67	11.11
9	62.96	66.67	66.67	55.56	51.85	33.33	100.00	7.41
10	59.26	77.78	66.67	33.33	48.15	77.78	55.56	3.70
11	70.37	88.89	55.56	66.67	55.56	77.78	55.56	11.11
12	62.96	66.67	55.56	66.67	74.07	88.89	100.00	11.11
13	40.74	44.44	55.56	22.22	25.93	44.44	22.22	3.70
14	33.33	66.67	11.11	22.22	51.85	66.67	55.56	11.11
15	55.56	77.78	55.56	33.33	48.15	77.78	33.33	11.11
16	55.56	55.56	55.56	55.56	51.85	66.67	66.67	7.41
17	66.67	88.89	55.56	55.56	51.85	55.56	55.56	14.81
18	77.78	88.89	66.67	77.78	62.96	66.67	77.78	14.81
19	77.78	100.00	55.56	77.78	70.37	88.89	88.89	11.11
20	62.96	88.89	44.44	55.56	74.07	88.89	77.78	18.52
21	66.67	77.78	66.67	55.56	74.07	77.78	88.89	18.52
22	59.26	88.89	55.56	33.33	81.48	77.78	100.00	22.22
23	62.96	88.89	55.56	44.44	62.96	77.78	66.67	14.81
24	66.67	66.67	77.78	55.56	51.85	55.56	77.78	7.41
25	62.96	55.56	77.78	55.56	51.85	88.89	55.56	3.70
26	66.67	77.78	55.56	66.67	77.78	100.00	88.89	14.81
27	51.85	66.67	44.44	44.44	40.74	44.44	55.56	7.41
28	55.56	77.78	55.56	33.33	59.26	88.89	66.67	7.41
29	74.07	88.89	77.78	55.56	66.67	88.89	77.78	11.11
30	62.96	66.67	55.56	66.67	59.26	88.89	66.67	7.41

ETHIOPIANS								
N°	PB02	TE	TI	SI	PE01	TE	TI	SI
31	37.04	66.67	22.22	22.22	37.04	33.33	55.56	7.41
32	37.04	44.44	44.44	22.22	40.74	44.44	33.33	14.81
33	37.04	77.78	11.11	22.22	74.07	77.78	88.89	18.52
34	40.74	66.67	22.22	33.33	70.37	77.78	66.67	22.22
35	62.96	77.78	55.56	55.56	74.07	66.67	100.00	18.52
36	22.22	33.33	11.11	22.22	51.85	44.44	66.67	14.81
37	40.74	55.56	33.33	33.33	70.37	77.78	77.78	18.52
38	33.33	55.56	33.33	11.11	40.74	33.33	66.67	7.41
39	59.26	66.67	44.44	66.67	44.44	55.56	44.44	11.11
40	44.44	55.56	33.33	44.44	70.37	77.78	88.89	14.81
41	29.63	44.44	22.22	22.22	48.15	55.56	44.44	14.81
42	66.67	100.00	55.56	44.44	55.56	33.33	66.67	22.22
43	33.33	44.44	33.33	22.22	55.56	33.33	77.78	18.52
44	48.15	55.56	55.56	33.33	51.85	44.44	66.67	14.81
45	51.85	77.78	44.44	33.33	62.96	66.67	55.56	22.22
46	59.26	66.67	55.56	55.56	70.37	88.89	66.67	18.52
47	48.15	88.89	22.22	33.33	59.26	77.78	55.56	14.81
48	66.67	88.89	55.56	55.56	85.19	88.89	88.89	25.93
49	59.26	77.78	55.56	44.44	62.96	66.67	88.89	11.11
50	55.56	77.78	55.56	33.33	51.85	55.56	55.56	14.81
51	33.33	44.44	22.22	33.33	51.85	55.56	44.44	18.52
52	48.15	66.67	44.44	33.33	59.26	44.44	88.89	14.81
53	48.15	77.78	44.44	22.22	48.15	44.44	66.67	11.11
54	33.33	33.33	22.22	44.44	70.37	77.78	77.78	18.52
55	29.63	44.44	11.11	33.33	51.85	55.56	55.56	14.81
56	37.04	66.67	22.22	22.22	55.56	55.56	55.56	18.52
57	62.96	66.67	66.67	55.56	74.07	88.89	100.00	11.11
58	62.96	88.89	66.67	33.33	70.37	88.89	66.67	18.52
59	40.74	66.67	22.22	33.33	70.37	77.78	66.67	22.22
60	40.74	55.56	33.33	33.33	70.37	77.78	77.78	18.52

OTHER NATIONS								
N°	PB02	TE	TI	SI	PE01	TE	TI	SI
61	22.22	22.22	22.22	22.22	51.85	77.78	33.33	14.81
62	62.96	88.89	55.56	44.44	59.26	77.78	55.56	14.81
63	59.26	55.56	55.56	66.67	62.96	66.67	66.67	18.52
64	44.44	33.33	55.56	44.44	37.04	66.67	33.33	3.70
65	44.44	55.56	33.33	44.44	59.26	77.78	55.56	14.81
66	48.15	55.56	66.67	22.22	33.33	44.44	44.44	3.70
67	44.44	77.78	33.33	22.22	55.56	66.67	55.56	14.81
68	33.33	77.78	22.22	0.00	55.56	55.56	88.89	7.41
69	48.15	66.67	44.44	33.33	44.44	66.67	44.44	7.41
70	55.56	55.56	66.67	44.44	62.96	66.67	77.78	14.81
71	44.44	88.89	33.33	11.11	59.26	66.67	33.33	25.93
72	74.07	88.89	66.67	66.67	66.67	77.78	88.89	11.11
73	14.81	22.22	0.00	22.22	40.74	44.44	44.44	11.11
74	40.74	66.67	33.33	22.22	48.15	77.78	44.44	7.41
75	51.85	66.67	55.56	33.33	22.22	44.44	22.22	0.00
76	51.85	44.44	44.44	66.67	44.44	33.33	77.78	7.41
77	55.56	55.56	66.67	44.44	74.07	100.00	88.89	11.11
78	33.33	55.56	11.11	33.33	25.93	22.22	55.56	0.00
79	33.33	55.56	33.33	11.11	44.44	33.33	55.56	14.81
80	29.63	33.33	33.33	22.22	33.33	33.33	44.44	7.41
81	37.04	77.78	11.11	22.22	48.15	77.78	44.44	7.41
82	44.44	66.67	44.44	22.22	44.44	55.56	44.44	11.11
83	37.04	66.67	33.33	11.11	25.93	55.56	11.11	3.70
84	37.04	33.33	33.33	44.44	51.85	66.67	66.67	7.41
85	59.26	77.78	55.56	44.44	25.93	11.11	33.33	11.11
86	44.44	55.56	55.56	22.22	55.56	44.44	77.78	14.81
87	44.44	33.33	55.56	44.44	37.04	66.67	33.33	3.70
88	51.85	55.56	66.67	33.33	62.96	66.67	77.78	14.81
89	14.81	22.22	0.00	22.22	22.22	22.22	33.33	3.70
90	37.04	44.44	33.33	33.33	29.63	33.33	22.22	11.11

D8: Item Analysis for Each Sub-Group and for the Total Population on PB02

	BRITISH			ETHIOPIANS			OTHERS			TOTAL		
Item	Score	FV	D	Score	FV	D	Score	FV	D	Score	FV	D
1	23	0.76	0.25	13	0.43	0.13	20	0.67	0.50	56	0.62	0.40
2	13	0.43	-.38	10	0.33	0.00	4	0.13	0.13	27	0.30	0.00
3	24	0.80	0.00	15	0.50	0.75	18	0.60	0.75	57	0.63	0.60
4	9	0.30	0.38	7	0.23	0.25	13	0.43	0.13	29	0.32	0.16
5	13	0.43	0.25	15	0.50	0.75	6	0.20	0.25	34	0.38	0.40
6	2	0.06	0.13	12	0.40	0.75	14	0.47	0.63	28	0.31	0.16
7	27	0.90	0.25	23	0.76	0.50	24	0.80	0.38	74	0.82	0.44
8	13	0.43	0.50	18	0.60	0.38	18	0.60	0.50	49	0.54	0.28
9	20	0.67	0.50	15	0.50	0.38	7	0.23	-.13	42	0.47	0.40
10	27	0.90	0.13	26	0.86	0.38	19	0.63	0.50	72	0.80	0.36
11	29	0.96	-0.13	20	0.66	0.38	18	0.60	0.50	67	0.74	0.52
12	28	0.93	0.13	22	0.73	0.25	19	0.63	0.13	69	0.76	0.36
13	22	0.73	0.38	11	0.37	0.50	17	0.57	0.25	50	0.56	0.36
14	6	0.20	0.13	2	0.06	0.25	1	0.03	0.13	9	0.10	0.16
15	16	0.53	0.13	4	0.13	0.25	4	0.13	0.13	24	0.26	0.48
16	30	1.00	0.00	23	0.76	0.25	22	0.73	0.25	75	0.83	0.40
17	20	0.66	0.38	15	0.50	0.13	10	0.33	0.13	45	0.50	0.44
18	21	0.70	0.38	9	0.30	0.25	16	0.53	0.50	46	0.51	0.36
19	24	0.80	0.63	20	0.67	0.13	15	0.50	0.50	59	80.66	0.48
20	13	0.43	0.38	7	0.23	0.38	10	0.33	0.50	30	0.33	0.40
21	4	0.13	0.13	13	0.43	-.13	10	0.33	0.25	27	0.30	0.00
22	17	0.56	0.63	11	0.36	0.38	11	0.37	0.50	39	0.43	0.56
23	18	0.60	0.13	12	0.40	0.38	7	0.23	0.25	37	0.41	0.20
24	9	0.30	0.63	3	0.10	0.13	5	0.17	-0.25	17	0.19	0.24
25	25	0.83	0.25	17	0.56	0.25	20	0.67	0.63	62	0.69	0.52
26	23	0.76	0.25	6	0.20	0.13	6	0.20	0.25	35	0.39	0.60
27	23	0.77	0.13	21	0.70	0.25	17	0.57	0.25	61	0.68	0.32

N=90

D9: Item Analysis for Each Sub-Group and for the Total Population on PE01

	BRITISH			ETHIOPIANS			OTHERS			TOTAL		
Item	Score	FV	D	Score	FV	D	Score	FV	D	Score	FV	D
1	16	0.53	0.13	8	0.27	0.38	10	0.33	0.38	34	0.38	0.32
2	24	0.80	0.25	28	0.93	0.25	21	0.70	0.25	73	0.81	0.32
3	25	0.83	0.38	16	0.53	0.63	14	0.47	0.63	55	0.61	0.44
4	11	0.37	0.75	10	0.33	0.38	5	0.16	0.25	26	0.29	0.52
5	17	0.56	0.50	24	0.80	0.25	20	0.67	0.75	61	0.68	0.40
6	22	0.73	0.38	19	0.63	0.25	10	0.33	0.50	51	0.56	0.48
7	18	0.60	0.25	27	0.90	-.25	16	0.53	0.25	61	0.68	0.32
8	7	0.23	0.25	2	0.06	-.25	8	0.27	0.38	17	0.19	0.00
9	28	0.93	0.13	15	0.50	0.50	22	0.73	0.25	65	0.72	0.24
10	28	0.93	0.25	24	0.80	0.25	24	0.80	0.38	76	0.84	0.20
11	29	0.96	0.13	26	0.80	0.00	25	0.83	0.50	80	0.86	0.24
12	19	0.63	0.75	14	0.47	0.50	16	0.53	0.63	49	0.54	0.72
13	24	0.80	0.63	19	0.63	0.38	21	0.70	0.63	64	0.71	0.40
14	16	0.53	0.25	23	0.76	0.00	8	0.27	0.25	47	0.52	0.52
15	20	0.66	0.38	18	0.60	0.86	16	0.53	0.75	54	0.60	0.60
16	18	0.60	0.63	15	0.50	0.50	11	0.37	0.00	44	0.49	0.44
17	11	0.37	0.13	15	0.50	0.25	12	0.40	0.00	38	0.42	.12
18	1	0.03	-.13	13	0.43	0.25	8	0.27	0.63	22	0.24	0.28
19	19	0.63	0.50	21	0.70	0.13	18	0.60	0.25	58	0.64	0.28
20	12	0.40	0.38	24	0.80	0.38	8	0.27	0.38	44	0.49	0.44
21	13	0.43	0.25	17	0.57	0.25	15	0.50	0.50	45	0.50	0.24
22	20	0.67	0.13	25	0.83	-.13	13	0.43	-.38	58	0.64	0.28
23	13	0.43	0.25	22	0.73	0.38	17	0.57	0.13	48	0.53	0.36
24	21	0.70	0.50	14	0.46	0.38	7	0.23	0.50	42	0.46	0.52
25	3	0.10	0.13	15	0.50	0.25	4	0.13	0.13	22	0.24	0.28
26	26	0.86	0.13	15	0.50	0.50	19	0.63	0.13	60	0.66	20
27	5	0.17	0.38	17	0.57	0.38	6	0.20	-.13	28	0.31	0.28

N=90

D10: Discrimination Indices for the whole Population on PB02 and PE01

Item	PB02			PE01		
	HS	LS	D	HS	LS	D
1	20	10	0.40	15	7	0.32
2	7	7	0.00	24	16	0.32
3	22	7	0.60	21	10	0.44
4	11	7	0.16	14	1	0.52
5	14	4	0.40	23	13	0.40
6	7	3	0.16	19	7	0.48
7	24	13	0.44	21	13	0.32
8	16	9	0.28	4	4	0.00
9	19	9	0.40	20	14	0.24
10	24	15	0.36	28	13	0.20
11	24	11	0.52	25	19	0.24
12	24	15	0.36	22	4	0.72
13	19	10	0.36	23	13	0.40
14	4	0	0.16	18	5	0.52
15	13	1	0.48	23	8	0.60
16	25	15	0.40	17	6	0.44
17	18	7	0.44	12	9	0.12
18	17	8	0.36	9	2	0.28
19	23	11	0.48	20	13	0.28
20	15	5	0.40	18	7	0.44
21	7	7	0.00	17	11	0.24
22	18	4	0.56	17	10	0.28
23	12	7	0.20	19	10	0.36
22	9	3	0.24	18	5	0.52
25	22	9	0.52	8	1	0.28
26	18	3	0.60	20	15	0.20
27	19	11	0.32	12	5	0.28

N=90, HS=High Scorers, LS=Low Scorers

D11: Summary of Item Statistics on PE01 by the Cultural Groups

D Item	0.13	0.25	0.38	0.50	0.63	0.75	0.86
1			E+O				
2		B+E+O					
3					E+O		
4						B	
5						O	
6				O			
7		B+O					
8			O				
9				E			
10			O				
11				O			
12						B	
13					B+O		
14		B+O					
15							E
16					B		
17		E					
18					O		
19				B			
20			B+E+O				
21				O			
22	B						
23			E				
24				B+O			
25		E					
26				E			
27			B+E				

B=British (N=30), E=Ethiopians (N=30), O=Other Nations (N=30)

D12: Summary of Item Statistics on PB02 by the Cultural Groups

D Item	0.13	0.25	0.38	0.50	0.63	0.67	0.75
1				O			
2	O						
3							E+O
4			B				
5							E
6							E
7				E			
8				B+O			
9				B			
10				O			
11				O			
12		E					
13				E			
14		E					
15		E					
16		E+O					
17			B				
18				O			
19					B		
20				O			
21		O					
22					B		
23			E				
24					B		
25					O		
26		B+O					
27		E+O					

B=British (N=30), E=Ethiopians (N=30), O=Other Nations (N=30)

D13: Distractors Analysis for PB02

British						Ethiopians				Other Nations			
Item	Correct Answer	A	B	C	D	A	B	C	D	A	B	C	D
1	A	23	4	0	3	13	10	7	0	20	6	3	1
2	B	1	13	11	5	1	10	12	7	2	4	16	8
3	B	5	24	0	2	4	15	7	4	5	18	4	3
4	D	7	3	11	9	5	5	13	7	2	3	12	13
5	B	2	13	10	5	11	15	4	0	16	6	8	0
6	A	2	26	1	1	12	11	2	5	14	11	2	3
7	B	0	27	1	2	1	23	2	4	3	24	1	2
8	C	6	11	15	1	3	5	18	4	7	4	18	1
9	C	1	5	20	4	4	4	15	7	5	7	7	11
10	D	1	0	2	27	2	0	2	26	7	4	0	19
11	A	29	0	0	1	20	3	2	5	18	4	1	7
12	B	0	28	1	1	3	22	5	0	4	19	6	1
13	A	22	4	1	3	11	6	8	5	17	5	4	4
14	A	6	2	20	2	2	8	9	11	1	13	8	8
15	D	6	1	7	16	6	3	17	4	6	5	15	4
16	A	30	0	0	0	23	2	5	0	22	2	4	2
17	D	0	1	9	20	0	0	15	15	1	0	19	10
18	A	21	2	1	6	9	7	8	6	16	8	3	3
19	A	24	2	4	0	20	4	6	0	15	8	6	1
20	D	9	6	2	13	7	13	3	7	5	11	4	10
21	D	8	8	10	4	4	6	7	13	8	2	10	10
22	B	1	17	12	0	4	11	15	0	6	11	11	2
23	B	1	18	11	0	2	12	10	6	3	7	11	9
24	C	16	5	9	0	22	4	3	1	17	5	5	3
25	D	4	1	0	25	6	5	2	17	2	3	5	20
26	A	23	1	6	0	6	13	5	6	6	12	9	3
27	C	2	4	23	1	4	4	23	1	4	7	17	2

N=90

D14: Distractors Analysis for PE01

British						Ethiopians				Other Nations			
Item	Correct Answer	A	B	C	D	A	B	C	D	A	B	C	D
1	D	12	2	0	6	20	2	0	8	17	3	0	10
2	C	2	2	24	2	0	1	28	1	3	3	20	4
3	A	25	2	3	0	16	0	12	2	14	3	8	5
4	A	11	9	10	0	10	10	7	3	5	15	9	1
5	D	0	10	3	17	0	2	4	24	0	4	6	20
6	B	6	22	0	2	4	19	4	3	16	10	2	2
7	C	0	7	18	5	1	1	27	1	4	8	16	2
8	D	9	11	3	7	7	5	16	2	12	7	3	8
9	A	28	1	0	1	15	1	7	7	22	5	0	3
10	C	0	1	28	1	0	2	24	4	1	0	24	5
11	B	1	29	0	0	0	26	4	0	3	25	0	2
12	A	19	4	7	0	14	0	15	1	16	4	8	2
13	A	24	4	2	0	19	3	4	4	21	8	1	0
14	B	5	16	3	6	6	23	1	0	8	8	3	11
15	A	20	7	2	1	18	10	1	1	16	11	2	1
16	B	5	17	6	2	7	15	3	5	6	11	12	1
17	A	11	2	7	10	15	1	3	11	12	3	7	8
18	A	1	10	14	5	13	2	11	4	8	18	3	1
19	B	2	19	5	4	1	21	6	2	5	18	2	5
20	B	13	12	4	1	2	24	1	3	18	8	3	1
21	C	10	6	13	1	11	1	17	1	10	3	15	2
22	B	9	20	1	0	0	25	5	0	13	13	3	1
23	A	13	2	11	4	22	0	6	2	17	4	5	4
24	A	21	6	0	3	14	10	0	6	7	7	5	11
25	B	18	3	8	1	15	15	0	0	25	4	1	0
26	B	3	26	0	1	6	15	7	2	6	19	4	1
27	A	5	2	12	11	17	1	2	10	6	3	10	11

N=90

D15: Response Frequency Distribution for Items 2, 21, and 22

Item 2

	A			B*			C			D			Total
	B	E	O	B	E	O	B	E	O	B	E	O	
HS	0	1	0	2	2	2	5	4	4	1	1	2	24
MS	0	0	1	6	6	1	5	4	8	3	4	4	42
LS	1	0	1	5	2	1	1	4	4	1	2	2	24
Total	1	1	2	13	10	4	11	12	16	5	7	8	90

N=90

Item 21

	A			B			C			D*			Total
	B	E	O	B	E	O	B	E	O	B	E	O	
HS	2	1	2	2	2	0	2	1	2	2	4	4	24
MS	4	3	3	4	3	1	5	4	6	1	4	4	42
LS	2	0	3	2	1	1	3	2	2	1	5	2	24
Total	8	4	8	8	6	2	10	7	10	4	13	10	90

N= 90

Item 22

	A			B*			C			D			Total
	B	E	O	B	E	O	B	E	O	B	E	O	
HS	2	0	2	6	6	6	0	2	0	0	0	0	24
MS	5	0	8	9	12	6	0	2	0	0	0	0	42
LS	2	0	3	5	7	1	1	1	3	0	0	1	24
Total	9	0	13	20	25	13	1	5	3	0	0	1	90

N=90

D16: Rank Order
The British in Order of Merit

PB02				PE01			
Testee	Score	F	CF	Testee	Score	F	CF
18, 19	21	2	2	22	22	1	1
8, 29	20	2	4	3, 6, 26	21	3	4
11,	19	1	5	12, 20, 21	20	3	7
6, 17, 21, 24, 26	18	5	10	19	19	1	8
1. 3. 5. 9, 12. 20, 23. 25, 30	17	9	19	29	18	1	9
4, 10, 22	16	3	22	4, 18, 23	17	3	12
2, 15. 16, 28	15	4	26	28, 30	16	2	14
27	14	1	27	8, 11	15	2	16
7	13	1	28	7, 9, 14, 16, 17, 24. 25	14	7	23
13	11	1	29	1, 2, 10, 15	13	4	27
14	9	1	30	27	11	1	28
				13	7	1	29
				5	6	1	30

N= 30

The Ethiopians in Order of Merit

PB02				PE01			
Testee	Score	F	CF	Testee	Score	F	CF
12, 18	18	2	2	18	23	1	1
5, 27, 28	17	3	5	3. 5. 27	20	3	4
9, 16, 19	16	3	8	4, 7, 10, 16, 24, 28, 29, 30	19	8	12
20	15	1	9	15, 19	17	2	14
15	14	1	10	17, 22	16	2	16
14. 17. 22, 23	13	4	14	12, 13, 26	15	3	19
10	12	1	15	6, 14. 20, 21. 25	14	5	24
4, 7. 29, 30	4	4	19	11. 23	13	2	26
1, 2. 3, 26	10	4	23	9	12	1	27
8, 13, 21, 24	9	4	27	2. 8	11	2	29
11, 25	8	2	29	1	10	1	30
6	6	1	30				

Other Nations in Order of Merit

PB02				PE01			
Testee	Score	F	CF	Testee	Score	F	CF
12	20	1	1	17	20	1	1
2	17	1	2	12	18	1	2
3, 5	16	2	4	3, 28, 10	17	3	5
10, 17	15	2	6	2, 5, 11	16	3	8
15, 16, 28	14	3	9	7, 8, 26	15	3	11
6, 9	13	2	11	1, 24	14	2	13
4, 5, 7, 11, 22, 26, 27	12	7	18	14, 21	13	2	15
14	11	1	19	9, 16, 19, 22	12	4	19
21, 23, 24, 30	10	4	23	13	11	1	20
8, 18, 19	9	3	26	4, 27	10	2	22
20	8	1	27	6, 20	9	2	24
1	6	1	28	30	8	1	25
13, 29	4	2	30	18, 25, 23	7	3	28
				15, 29	6	2	30

N= 30

The Whole Population in Order of Merit. N= 90

PB02			
Testee	Score	F	CF
18B, 19B	21	2	2
12O, 29B, 8B	20	3	5
11B	19	1	6
18E, 12E, 6B, 17B, 21B, 24B, 26B	18	7	13
20O, 5E, 27E, 1B, 28E, 3B, 5B, 9B, 12B, 20B, 23B, 25B, 30B	17	13	26
3O, 25O, 9E, 16E, 19E, 4B, 10B, 22B	16	8	34
10O, 17O, 20O, 2B, 15B, 16B, 28B	15	7	41
15O, 16O, 28O, 15E, 27B	14	5	46
6O, 9O, 14E, 17E, 22E, 23E, 7B	13	7	53
4O, 5O, 7O, 11O, 22O, 26O, 27O, 10E	12	8	61
14O, 4E, 7E, 29E, 30E, 13B	11	6	67
21O, 23O, 24O, 30O, 1E, 2E, 3E, 26E	10	8	75
8O, 18O, 19O, 8E, 13E, 21E, 24E, 14B	9	8	83
20O, 25E, 11E	8	3	86
1O, 6E	6	2	88
13O, 29O	4	2	90
PE01			
18E	23	1	1
22B	22	1	2
3B, 6B, 26B	21	3	5
17O, 3E, 5E, 27E, 12B, 20B, 21B	20	7	12
4E, 7E, 10E, 16E, 24E, 28E, 29E, 30E, 19B	19	9	21
12O, 29B	18	2	23
3O, 10O, 28O, 15E, 19E, 4B, 18B, 23B	17	8	31
2O, 5O, 11O, 17E, 22E, 28B, 30B	16	7	38
7O, 8O, 26O, 12E, 13E, 26E, 8B, 11B	15	8	46
1O, 24O, 6E, 14E, 20E, 21E, 25E, 7B, 9B, 14B, 16B, 17B, 24B, 25B	14	14	60
14O, 21O, 11E, 23E, 1B, 2B, 10B, 15B	13	8	68
9O, 16O, 19O, 22O, 9B	12	5	73
13O, 2E, 8E, 27B	11	4	77
4O, 27O, 1E, 6O, 20O, 30O, 23O, 25O, 18O, 13B	7	10	87
15O, 29O, 5B	6	3	90

D17: Kuder-Richardson Formula 20

$$KR20 = \frac{n}{n-1} \times \frac{s^2 - \sum pq}{s^2}$$

Where n = number of items in the test, p = the proportion correct for each item and q = the proportion incorrect (or $1 - p$) and s = the standard deviation of the test.

1. PB02 (British Passage)

$$\frac{27}{26} \times \frac{14.9 - 5.5}{14.9} = 0.655$$

2. PE01 (Ethiopian Passage)

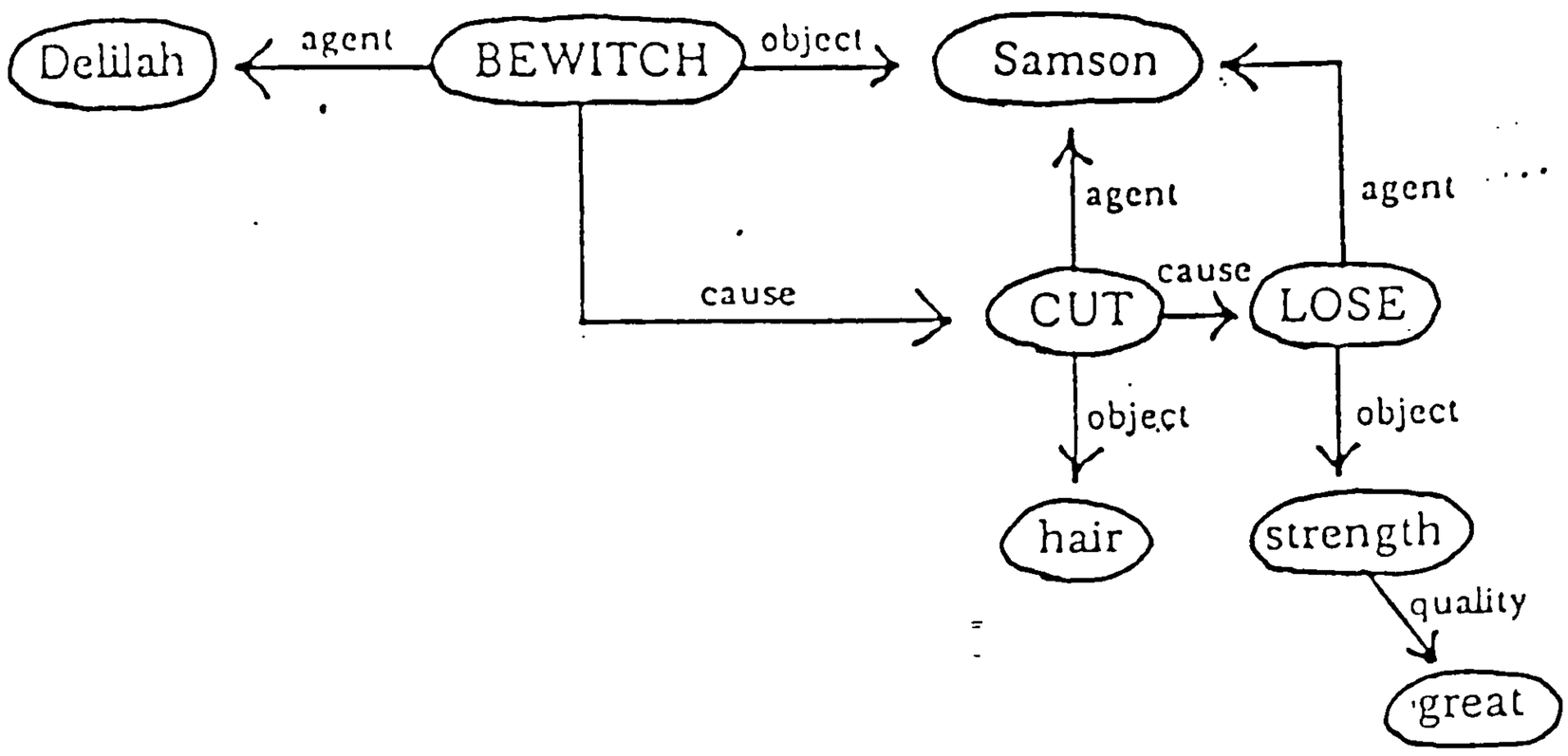
$$\frac{27}{26} \times \frac{16.02 - 5.53}{16.02} = 0.679$$

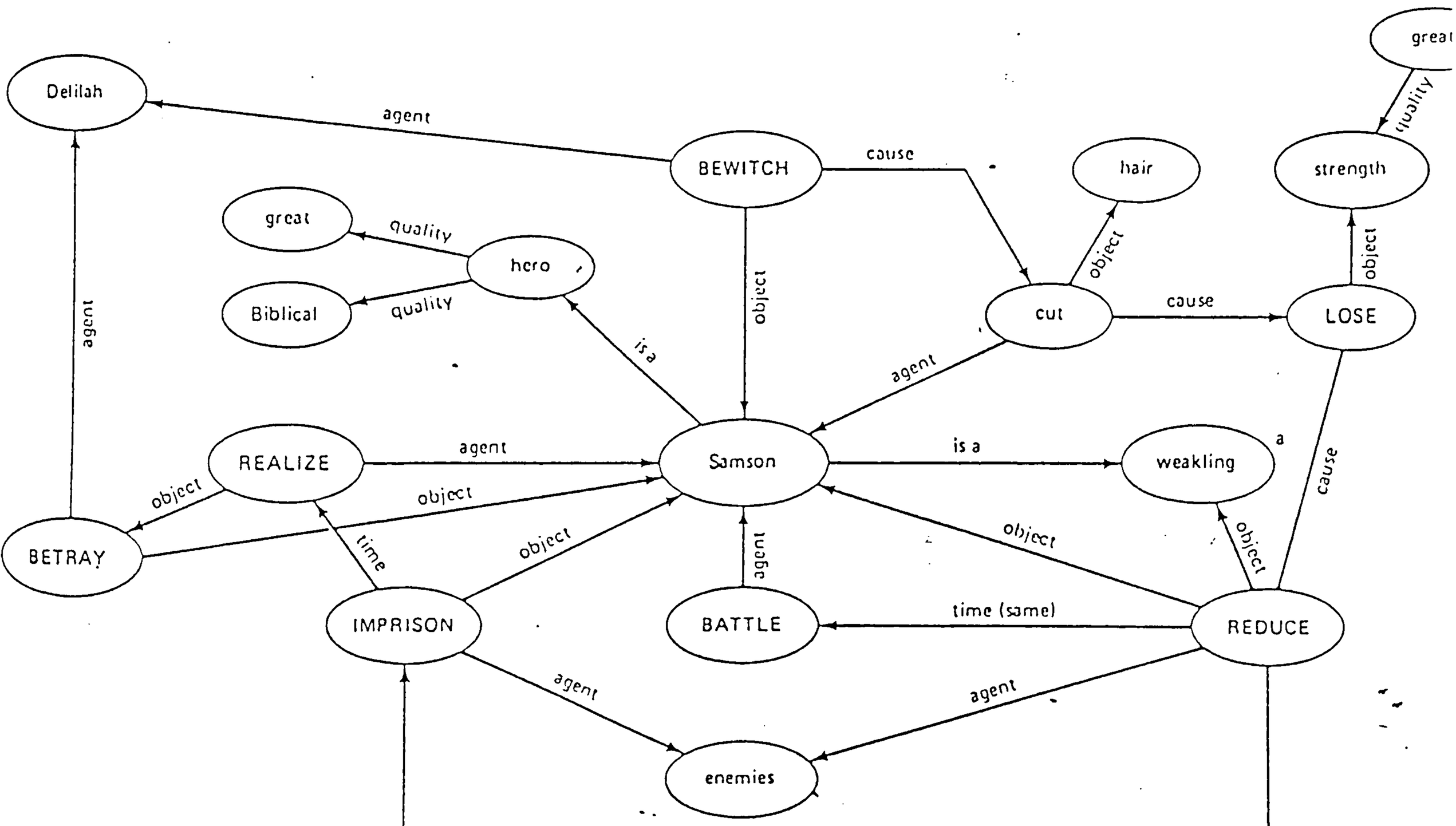
D18: Comparison Between Pre- and Post-Test SI Items

PB02				
	Control Group		Main Group	
	Br (%)	Eth (%)	Br (%)	Eth (%)
Item				
1	40	10	77	43
4	0	0	30	23
5	10	0	43	50
14	60	30	20	7
19	40	40	80	67
20	80	40	43	23
21	10	20	13	43
23	0	10	60	40
26	10	10	77	20

PE01				
	Control Group		Main Group	
	Br (%)	Eth (%)	Br (%)	Eth (%)
Item				
4	10	20	37	33
6	10	60	73	63
8	20	30	23	7
17	30	50	37	50
18	0	20	3	43
21	60	20	43	57
22	40	40	67	83
25	40	50	10	50
27	20	50	17	57

APPENDIX E
Semantic Map





Pearson & Johnson, 1978:38,41