AN ANALYSIS OF THE EFFECT OF CONSTITUENT DIVISION OF READING TEXTS ON STUDENTS OF ENGLISH AS A SECOND LANGUAGE

THESIS

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The effect of constituent division of reading texts on ESL students was examined to note possible benefits to reading comprehension.

An experimental group in each of three ESL proficiency levels was tested on a reading passage divided at the ends of lines at major constituent boundaries. Within each level, the experimental group was compared to a control group in three areas: reading time, test time, and test results.

Results of the study do not support the theory that constituent division of reading texts could be beneficial to ESL students. The differences in reading time, test time, and test results of the experimental group and the control group in each level were insignificant.

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CHAPTER I

INTRODUCTION

The reading process remains, to a large extent, a mystery, despite numerous studies and books written on the subject. Scholarly discussions on the reading process date back to the eighteenth century. In the last one hundred years, especially since the 1950s, reading research has become highly sophisticated, with the application of psycholinguistic knowledge and scientific methods. Various explanations of the reading process itself--and resulting methods for teaching reading--have been developed. Scholars in the field and educators are in a constant flux of accepting, revising, and rejecting these theories and methods; thus Eskey is correct when he states, '... although we do know a great many interesting things about reading, no one knows exactly what reading is or how anybody learns to do it' (Eskey 1979:68).*

While discrepancies and contradictions exist in many current reading theories, Kenneth S. Goodman's analysis-by-synthesis theory is one explanation of the reading process

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*The documentation style of this study conforms to the guidelines of the Linguistic Society of America.

generally accepted today (Goodman 1973b). Put simply, the process involves four steps: sampling the reading, predicting what will come next, testing the prediction by continuing to read, and confirming the prediction. An integral part of the process is 'chunking', which involves recognition, utilization, and retention of surface structure constituents in the process of constructing meaning from the text. Thus, facilitating the reader's skills in analysis by synthesis, which includes improving his ability to utilize constituents in the process, should enhance reading comprehension.

The concept of constituents has been studied in some depth with native English speakers. While studies have not been done with second language learners, it is logical to believe that their reading comprehension would also be enhanced by improving their skills in utilizing constituents since the second language reader transfers a great deal of his ability to read from his native language. A study utilizing constituents in reading could be carried out with second language learners by the use of experimental situations that provide empirical evidence.

Statement of the Problem

The question explored by this study is whether or not the implementation of constituent division improves reading

comprehension in second language learners, specifically in learners of English as a Second Language (ESL).

Purpose of the Study

The purpose of this study is to determine the effect of using reading texts which have been divided at constituent boundaries at the ends of lines on the reading comprehension of second language learners in experimental groups. The experimental groups are made up of ESL students at the beginning, intermediate, and advanced levels.

Null Hypothesis

The use of reading texts divided at constituent boundaries at the ends of lines will have no significant effect on the reading comprehension of English as a Second Language students at the beginning, intermediate, and advanced levels, as determined by timing procedures and reading comprehension tests.

Significance of the Study

This study is concerned with the processing strategies utilized in reading comprehension. More specifically, its chief focus is efficient use of constituents to enhance the process of analysis by synthesis and thus to lead to improved reading comprehension. Since texts divided at constituent boundaries at the ends of lines have been shown to facilitate reading comprehension in native English

speakers (Graf and Torrey in Clark and Clark 1977), perhaps such text formats would also facilitate reading comprehension in second language learners. ESL teachers, reading curriculum developers, and, possibly, textbook writers might profit from learning about this process.

The study will be significant in that it should

1. Examine the effect of texts divided at constituent boundaries at the ends of lines on the reading comprehension of the second language learners;

2. Provide suggestions for teachers, curriculum developers, and textbook writers concerning reading text formats.

Limitations

This study will be limited to the availability of ESL students enrolled in the beginning, intermediate, and advanced levels at the Intensive English Language Institute at North Texas State University.

Definition of Terms

The following terms are defined for the purposes of this study:

1. Analysis-by-synthesis reading model: a reading theory involving a four-step cycle consisting of sampling, predicting, testing, and confirming;

2. Aural input: reception of language by listening;

3. Confirming: verifying that a previous prediction in reading was valid;

4. Constituent: a group of words perceived as a conceptual unit; directs the listener or reader to the underlying meaning of a linear string of words;

5. Constituent analysis: clustering of phonological or graphic symbols into constituents; also known as chunking;

6. Constituent boundary: the division between constituents in a reading text;

7. Constituent passage: a reading text divided at the ends of lines at major constituent boundaries;

8. Construction process: the series of cognitive operations through which listeners and readers build an interpretation, or meaning, from received language; also known as reconstruction;

9. Graphic input: reception of language by reading;

10. Major constituent: a group of words consisting of a complete subject component, a complete verb component, a noun phrase, a verb phrase, or a clause;

11. Non-constituent passage: a reading text with conventional line division;

12. Predicting: guessing what will occur next in reading, based on previous information;

13. Processing strategies: skills in the analysis-by-synthesis reading process;

14. Proposition: the underlying idea, or message, which the listener or reader extracts from a linear string of words;

15. Sampling: reading a portion of a text in order to predict what will occur next;

16. Testing: reading further in the text to determine accuracy of a prediction.

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CHAPTER II

REVIEW OF LITERATURE

The term 'analysis by synthesis' was originally used in reference to a theory of speech perception. In this theory, speech perception involves the internal synthesis of the incoming patterns, which are synthesized according to certain rules and are then matched against the patterns under analysis (Stevens and Halle 1967). When a previously perceived stimulus is recognized, it is identifed by noting its congruence with a basic model held in memory (Downing 1982).

The term has been expanded to refer to perception in general. For example, Bruner's description of perception is similar to the analysis-by-synthesis model of speech perception in that it involves 'an inferential leap from some of the features of an object to a category or hypothesis and a confirmation check in which the category or hypothesis is tested against additional properties of the object' (Anglin in Bruner 1973:3).

The analysis-by-synthesis theory of perception has been further applied to the reading process, most notably by Kenneth S. Goodman (1973b). He was the first to describe reading as a 'psycholinguistic process by which the reader,

a language user, reconstructs, as best he can, a message which has been encoded by a writer as a graphic display' (Goodman 1973b:22). He considers this process to be a cycle of sampling, predicting, testing, and confirming. The cycle is repeated over and over again during the reading task as saccadic movement of the eyes (i.e., periodic fixations) across the lines of the text occurs. At the same time, chunking, or clustering, of information taken in occurs. This combination of the physical process of reading and the simultaneous cycle of analysis by synthesis results in a continuous flow in comprehension and a continual buildup of information being processed. Obviously, the reader is not remembering every word he reads. In fact, he usually does not even read every word. Due to the redundancy of language and the expectations of the reader based on his predicting abilities, he is able to comprehend without taking in every word. In this cycle the reader is internally reconstructing a replica of the textual message (Coady 1979). The entire cyclical process is known as the analysis-by-synthesis reading model, based on the analysis-by-synthesis approach to language performance (Halle and Stevens 1964).

Reconstruction of the textual message presumably occurs during the fourth stage of the cycle, the confirming stage. At this point it is necessary for the reader to

test the accuracy of his prediction and subsequent comprehension against previous information. Previous information consists of the information received from the text and of information received from long-term memory related to the topic of the text. If the reader finds that the reconstruction agrees with previous information, the cycle begins again with sampling. If the reconstruction does not agree with previous information, the reader then turns to a compensatory strategy such as rereading or suspension of belief (Coady 1979). Goodman says that reading is a 'psycholinguistic guessing game' (Goodman in Coady 1979) because it is possible for a reader to create false reconstructions at many points during a reading task.

Diverse research has been carried out on integral aspects of the analysis-by-synthesis reading mode, most notably by Smith (1979), Eskey (1979), Norman (1972), and Wildman and Kling (1978). These aspects, specifically as they relate to processing strategies in ESL students, will be explored in this study. In addition, studies concerning implications for preparation and adaptation of reading text formats will be examined.

A Comparison of Fluent and Poor Readers

Highly skilled readers are difficult to study, in terms of exactly what they are doing as they read, because

they are so skilled that one "has trouble ascertaining the details of what is happening" (Kolers 1972:84). It is generally agreed, however, that they are applying analysis-by-synthesis strategies as they proceed efficiently through a reading task.

The differences between fluent readers and poor readers seem to hinge upon the differences in their ability to recover from false reconstructions or incorrect predictions. Fluent readers recover quickly from incorrect predictions (also known as miscues); their overall reading performance is little affected by them. Poor readers, in contrast, do not recover as quickly and tend to make more errors in prediction, leading to still more errors (Coady 1979). The result is a loss in overall comprehension.

Fluent readers also use a smaller sampling of the text in order to predict than do poor readers. In addition, they experience fewer orthographic, syntactic, and semantic miscues (Coady 1979).

Fluent readers make eye fixations of shorter durations and therefore tend to read faster than poor readers, who often read word by word (Oller, Tullius, and MacNamara in Coady 1979). Processing strategies are hindered when word-by-word reading occurs because meanings of words are forgotten before subsequent word meanings can be taken in and processed. Because relationships cannot be established

between words and between messages, there is a decrease in comprehension (Smith 1971).

Finally, fluent readers rely more heavily on nonvisual information, that is, 'what we already know about reading, about language, and about the world in general' (Smith 1973:6).

Reading Problems of the ESL Learner

The ESL student (and, presumably, the reader in any language other than his native language) who is literate in his native language automatically transfers a great deal of his ability to read to the second language. An obvious example is that students who have learned to read in an alphabetic language do not have to 'relearn' the principle of the alphabet. Lambert and Tucker's (1972) research indicates a significant transfer of children's ability to read in French to their ability to read in English. Other mechanical aspects of reading also transfer from the native language to the second language. Goodman (in Coady 1979:9) goes beyond the mechanical aspects of reading to say that 'learning to read a second language should be easier for someone already literate in another language regardless of how similar or dissimilar it is'.

Proficiency in the second language is required in order to read in that language. Yorio (1971) maintains that difficulty in learning to read in a second language

is related to a lack of knowledge of the second language. He states that 'at all levels, and at all times, there is interference of the native language' (Yorio 1971:108). More specifically, he points out that for the second language learner

> 'the prediction of future cues is restricted by his imperfect knowledge of the language; moreover, because he has to recall unfamiliar cues, his memory span is very short; he therefore easily forgets the cues that he has already stored. These two factors make associations insecure, slow, and difficult' (Yorio 1971:110).

Proficiency in the second language necessarily includes background, or cultural, knowledge. We know, for example, that 'students with a Western background learn English faster, on the average, than those without such a background' (Coady 1979:7). Second language learners must develop cultural inference skills in order to become proficient readers in the second language.

However, the language proficiency problems discussed above are only part of the story when examining reading problems in second language learners. Many ESL students have proficiency in English and yet have little comprehension in reading. In some cases, this lack of comprehension can be attributed to poor conceptual abilities.

Second language readers, like native language readers, may, of course, lack the cognitive skills necessary for reading. Some ESL learners may be able to acquire some English skills but be unable to learn to read. This inability indicates a reading problem (restricted here to mean reading processing problem), as opposed to a language proficiency problem.

In most reading problem cases, ESL students are able to read but are very inefficient at the task. Their poor reading comprehension is an indication that they are 'using a poor combination of process strategies in their reading' (Coady 1979:9). These students, obviously, are slow readers:

> 'Oller (1972), Tullius (1971) and MacNamara (1970) have found that the number of eye fixations and regressions do not differ between native language readers and ESL readers. The actual differences are found in the durations of the fixations. Thus it would appear that they do not extract large numbers of samples from the book but rather spend more time on either the sampling of the text or the reconstructing. Since we do not see satisfactory comprehension, the additional time is evidently not being spent on putting the information gained into memory. Indeed, the comprehension loss seems to be

attributable to a poor use of process strategies' (Coady 1979:10).

Frank Smith (1971) supports this view by pointing out that slow reading speed can prevent the necessary synthesizing of ideas. Put simply, by reading word by word, ESL learners lose the meaning, or message, of the text.

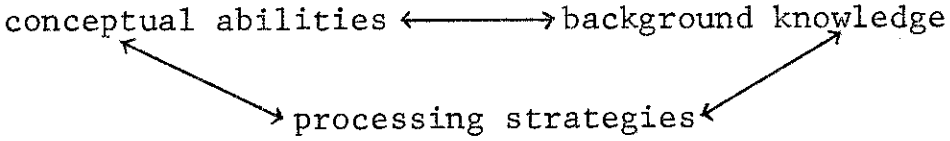
Each ESL reader has unique problems in the various processing stages, with predicting problems being one of the most serious. Specific samples of problems in the stages of the analysis-by-synthesis reading process include the following:

Native	Non-Native
1. Sampling	1. May not know where information is stored, which language units carry the most information.
2. Predicting	2. May be unable to predict structure and meaning, or may predict on basis of native language structure.
3. Testing	3. May not be able to answer the questions 'Does it sound like English', 'Does it make sense?'

4. Confirming	4. May be unable to confirm or may wrongly confirm out of unfamiliarity and/or native language interference.
5. Correcting when necessary	5. May not recognize miscue, may not know how to correct miscue.

(Buck 1973:94-5)

Thus it can be seen that the ESL reader may have problems resulting from lack of proficiency in English or from reading processing deficiencies. Reading may be depicted as an interaction among the three factors discussed above:



(Coady 1979:7).

A breakdown in this interaction, caused by weakness in one or more of the three factors, leads to poor reading comprehension in the ESL reader.

The Reading Comprehension Process

The Relationship between the Listening and Reading Processes

As early as the 1920s, Sapir saw a close relationship between the reading process and the listening process. He

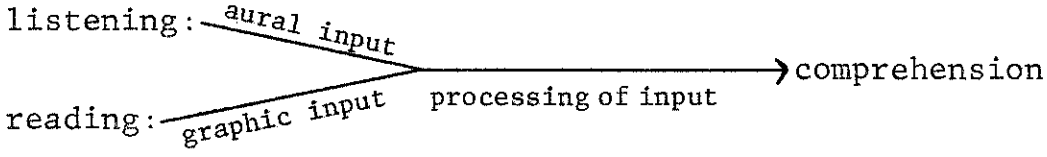
believed that readers (and, in fact, thinkers) are dependent on auditory associations. He stated that

> ' ... the auditory-motor associations are probably always latent at the least, that is, they are unconsciously brought into play. Even those who read and think without the slightest use of sound are, in the last analysis, dependent on it. They are merely handling the circulating medium, the money, of visual symbols as a convenient substitute for the economic goods and services of the fundamental auditory symbols' (Sapir in Lefevre 1968:296).

Among present-day theorists, Goodman (1968) is one of the strongest proponents of the theory that graphic input is recoded into aural input and then decoded into meaning by the reader. He states that reading is actually 'basically a secondary representation of oral language' (Goodman 1968:16).

Several other researchers, including Lefevre (1968), believe that graphic symbols are secondary to speech in the reading process. His theory concerning a multidisciplinary approach to reading is supported by proponents of the current comprehension approach to foreign language instruction (Winitz 1981). Clark and Clark (1977) further support the theory that the listening and reading processes are closely related.

Although the initial input differs in the listening and reading comprehension processes, the processing of the input is handled in the same manner once the lexical meaning is established. The comprehension process can be illustrated in this way:



On the assumption that reading is closely related to listening, as far as the processing of input is concerned, this study makes no effort to distinguish between them. That is, discussion of listening comprehension after lexical access will be included because it also relates to reading comprehension.

The Two Processes of Comprehension

The process of comprehension falls into two somewhat distinct areas of study. The first is the construction process, which is concerned with the way listeners construct an interpretation of a sentence from the speaker's words. The second area is the utilization process, which is concerned with how listeners use the interpretation for further purposes--registering new information, answering questions, following orders, registering promises, etc. (Clark and Clark 1977).

The two processes of comprehension cannot be separated when one considers the purpose of listening, i.e. to cooperate with the speaker. However, for purposes of this study, the construction process, and not the utilization process, will be explored in depth. This study is concerned with those aspects of comprehension that are related to reconstruction of meaning in reading and will not address other aspects of comprehension.

Propositional Content in the Construction Process

During the construction process, the language user's task is to extract the underlying meaning from the words, whether spoken or written. He must take in the spoken or written words, which make up the surface structure, and derive the underlying meanings, which make up the deep structure. The underlying, or deep structure, meaning is called the propositional content.

> 'Psycholinguistic research confirms ... that language is processed at deep structure levels ... we distinguish elements and relationships that are not actually represented in the surface structure but are constructed from the meanings that we derive from the hidden deep structure ... It is becoming clear that reading is not a process of combining individual letters into words, and strings of words into

> sentences, from which meanings spring automatically. Rather, the evidence is that the deep level process of identifying meaning either precedes or makes unnecessary the process of identifying individual words' (Smith and Goodman 1973:179-80).

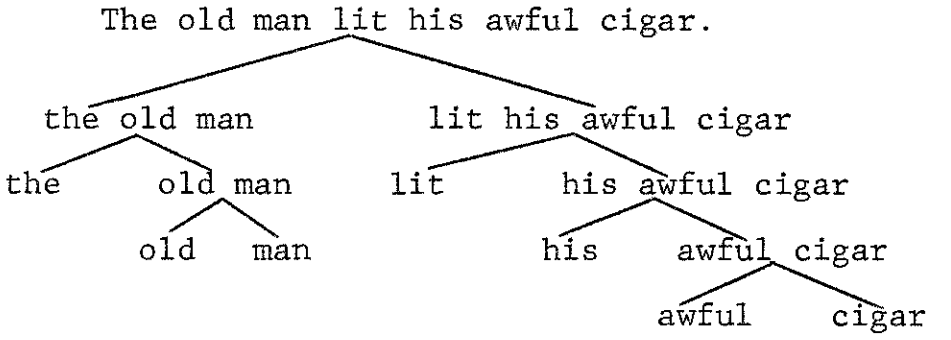
The propositional content is defined as the idea, i.e. what the speaker or writer wishes to convey to the listener or reader. This idea, or message, may serve the purpose of informing, asking about something, warning about something, making a request, etc. The proposition itself has three functions: to denote states or events, to give facts about states or events, or to qualify parts of other propositions (Clark and Clark 1977). For example, the propositions contained in the sentence 'The young troops defeated the army' are 1) the troops were young, and 2) the troops defeated the army. The propositional content, then, is the core idea(s), and each proposition is a predication about one or more entities contained in the writing (Clark and Clark 1977).

Construction of Propositions

'In the construction process, listeners must take a linear string of words and from it construct a hierarchical arrangement of propositions' (Clark and Clark 1977:47). Constituents, which are the 'building blocks' of surface structure, are utilized in this construction process. They

consist of words, phrases, and clauses in the linear, spoken or written sentences. Put simply, constituents, which will be defined in detail shortly, direct the listener or reader to underlying propositions in the deep structure (Clark and Clark 1977).

A typical example of constituents is outlined as follows:



(Clark and Clark 1977:47).

The whole sentence divides into two immediate constituents, 'the old man' and 'lit his awful cigar'; following more divisons, we see the ultimate divisions, i.e. words, at the bottom of the diagram.

The following chart clarifies the relationship between the surface constituents and the corresponding underlying propositions:

Constituent	Underlying Proposition(s)
old man	man, old
the old man	known

Constituent	Underlying Proposition(s)
awful cigar	cigar, awful
his awful cigar	known, belong
the old man lit his awful cigar	light

(Clark and Clark 1977:48).

The theory concerning how listeners actually derive the underlying meaning from a sentence, employing the constituent in a four-step sequence, was posited by Clark and Clark (1977):

1. Taking in raw speech and placing it in short-term memory;

2. Performing constituent analysis: organizing the phonological representation into constituents and identifying their content and function; also known as chunking;

3. Extracting underlying propositions from constituents; building onto a hierarchy of previously constructed propositions;

4. Retaining propositional content while purging short-term memory of the phonological representation.

The four steps may all be taking place simultaneously, or they may overlap to some extent during the entire process. In reading, of course, phonological input is replaced by graphic input. Once lexical meaning is derived, the process is the same in both listening and reading

comprehension. The four-step sequence clearly points out the integral nature of the constituent in the process of deriving meaning from a sentence.

Definition of the Constituent

As stated previously, constituents consist of single words, phrases, or clauses in the surface structure of a sentence. Constituents larger than single words are usually complete at the ends of noun phrases, clauses, and sentences. A sentence may be divided into two major constituents consisting of the subject and predicate. It may be further divided into phrases or clauses. In this study, the term 'major constituent' will refer to the complete subject component, the complete verb component, a noun phrase, a verb phrase, or a clause. 'Constituent boundary' will refer to the break between major constituents in the sentence.

Psycholinguistic studies have shown that a constituent can be replaced by a single word without a change in function and without changing the structure of the sentence (Clark and Clark 1977). 'The little girl', for example, is classified as a constituent because it can be replaced by 'Mary' or 'she' without changing the structure of the rest of the sentence. 'The little' is not considered a constituent since it cannot be replaced with a single word with the same function. In addition, the words that

compose a constituent must move as a complete grammatical unit.

Psychological Reality of Constituents

Constituents are crucial in the four steps of the construction process of comprehension because they are the organizational units utilized in constituent analysis (chunking) and in extracting propositions. Evidence for this statement is based on various psycholinguistic studies which indicate that constituents are psychologically real to language users when they are speaking, listening, reading, or writing. The language user feels that constituents are complete conceptual units; he uses them in the organization of speech, stores them in short-term memory as units, and purges them from short-term memory as units (Clark and Clark 1977).

Martin (1970) did experiments in which subjects were asked to identify natural word groups in sentences in order to determine if they coincided with linguistically defined constituents. His sentence 'Children who attend regularly appreciate lessons greatly' was divided into the following natural word groups: children, children who attend regularly, who, who attend regularly, appreciate lessons, and appreciate lessons greatly. The subjects' groupings matched the established definition of a constituent and indicated conceptual unity.

Levelt (1974) performed similar experiments, with subjects identifying which words in a sentence were most closely related and which words were least closely related. He then used a clustering technique based on a hierarchy to determine the constituents inherent in the relationships chosen by the subjects. Again, the constituents were found to match the established definition.

Fodor, Bever, and Garrett introduced the hypothesis that 'the unit of speech perception corresponds to the constituent' (Fodor and Bever 1965:415). In studies conducted by Fodor and Bever to test the hypothesis, it was found that clicks heard by listeners as they listened to speech were perceived as falling at or near constituent boundaries, even when they fell within constituents. This finding indicates that constituents are regarded as complete perceptual units.

Ladefoged (1967), Reber and Anderson (in Clark and Clark 1977), and Green (in Clark and Clark 1977) carried out experiments to disprove the hypothesis that constituents are real at the perceptual stage and, in fact, occur during the response stage. While their click displacement experiments left questions about <u>when</u> the constituent is actually perceived as a conceptual unit, they supported the theory that the constituent does exist as a unified concept.

Further click displacement studies have shown that listeners locate clicks near major constituent boundaries more easily than around small units such as phonetic segments and syllables (McNeill and Lindig 1973).

Probe-latency studies have indicated that constituents are stored verbatim in working (short-term) memory and used to construct propositions. Subjects found it easier to provide the next word in a sentence when it belonged to the same constituent as the probe word than when it belonged to a different constituent (Ammon 1968).

The reality of constituents in working memory was further explored by Jarvella (1971), who found that listeners were better able to remember clauses belonging to the same sentence than clauses belonging to different sentences. This suggests that large constituents (in this case clauses) are purged from working memory at the ends of sentences (the ultimate constituent boundaries).

The theory that constituents are processed as conceptual units is strengthened by studies which have shown that listeners' comprehension slows down immediately after difficulty in processing the preceding constituent occurs (Foss and Lynch in Clark and Clark 1977). These studies have shown, for example, that embedded relative clauses are more difficult to comprehend than right-branching relative clauses since constituents are harder to detect in embedded structures.

The constituent is the natural unit of speech. In fact, 'language has the convention that if speakers want to pause for thought or to take a breath, they are supposed to do it between, not within, constituents' (Clark and Clark 1977:51). Fluent speakers follow this convention. but non-fluent speakers do not, resulting in decreased comprehension on the part of listeners (Clark and Clark 1977).

Conclusion

Research on important aspects of Goodman's analysis-by-synthesis reading model and the construction process of comprehension, as well as studies on the constituent itself, emphasizes the importance of the role of constituents in comprehension. Since constituents are a vital part of both the analysis-by-synthesis process and the propositional construction process, isolating constituents might aid the reader in his development of skills in both processes. It also seems logical to expect improvement in these skills to lead to improved comprehension in reading.

In a study conducted in 1966, Graf and Torrey (in Clark and Clark 1977) found that isolating constituents for native speakers in reading resulted in improved comprehension. Using a machine that exposed the text line by line at fixed intervals of time, one group of readers read a prose passage that had been divided at the ends of

lines at major constituent boundaries. Another group read the same prose passage that had been divided at the ends of lines within constituents. A multiple-choice comprehension test given immediately following the reading yielded better scores for the group reading the test divided at constituent boundaries than for the other group.

An unanswered question is whether isolating constituents in reading texts has an effect on comprehension in non-native readers of English. Theories and observations by several researchers, as well as the Graf and Torrey study, indicate that research which focuses on this question would be worthwhile. Haber and Haber, for example, have stated that there should be a 'continuous interaction between visual features on the page and hypotheses (or expectancies) in the reader's head' (Haber and Haber 1981: 167). Jones (1968) has observed that since good readers are taking in larger meaningful units, it might be useful to use special visual cues such as natural word groupings in visual materials. Levin and Kaplan (1970), Huggins and Adams (1980), and Jones (1968) have suggested that beginning readers need more visual cues than do proficient readers. Since it has been established that non-native speakers are often weak in processing strategies, natural word groupings might aid them in developing better strategies and result in improved reading comprehension.

The ideas suggested by the researchers above could be applied to ESL readers through research on constituent division of reading texts as a means of discovering its effect on their reading comprehension.

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CHAPTER III

DESIGN AND METHOD

Experimental Design

An ex post facto experimental design was employed in the study. An experimental and control group were established in each of three ESL proficiency levels. Reading passages were given to both the experimental and control group in each level, after which a comprehension test was given to each group.

Description of Conditions and Participants

The subjects for the experiment were ESL students attending classes at the Intensive English Language Institute (IELI) at North Texas State University. IELI provides intensive English language instruction for all proficiency levels, divided into five instructional levels. The students are considered pre-academic since they have not yet attained a score of 500 on the Test of English as a Foreign Language (TOEFL). They attend IELI classes four hours a day, five days a week, for sixteen weeks a semester.

Two classes were randomly chosen from level one (beginning), level three (intermediate), and level five (advanced) respectively. In each level, one class was

randomly chosen to be the experimental group, and the other was assigned as the control group. The number in each class, and therefore in each experimental and control group, varied, as did the native languages of the students in each group.

In level one, the experimental group consisted of nine students: seven males and two females. The native languages represented were as follows: seven Arabic and two Spanish. The control group consisted of ten students, all male and all Arabic speakers. (See Table 3.1.)

In level three, the experimental group consisted of eleven students: ten males and one female. The native languages represented were as follows: seven Arabic, two Japanese, and two Spanish. The control group consisted of twelve students: eleven males and one female. The native languages represented were as follows: nine Arabic, one Korean, one Spanish, and one Thai. (See Table 3.2.)

In level five, the experimental group consisted of eight students: seven males and one female. The native languages represented were as follows: four Arabic, three Thai, and one Malay. The control group consisted of eight students: six males and two females. The native languages represented were as follows: three Thai, two Japanese, one Arabic, one Spanish, and one Chinese. (See Table 3.3.)

TABLE 3.1

DEMOGRAPHIC DATA: LEVEL ONE

Participants	Sex	Native Language
Experimental		
Student 1	Male	Arabic
Student 2	Male	Arabic
Student 3	Male	Arabic
Student 4	Female	Spanish
Student 5	Male	Arabic
Student 6	Male	Arabic
Student 7	Male	Arabic
Student 8	Male	Arabic
Student 9	Female	Spanish
Control		
Student 1	Male	Arabic
Student 2	Male	Arabic
Student 3	Male	Arabic
Student 4	Male	Arabic
Student 5	Male	Arabic
Student 6	Male	Arabic
Student 7	Male	Arabic
Student 8	Male	Arabic

TABLE 3.1--Continued

Participants	Sex	Native Language
Control (cont.)		
Student 9	Male	Arabic
Student 10	Male	Arabic

Overview of Experiment

The experiment was conducted within each level on the same day during the fourteenth week of the semester. The students in all six groups--three experimental groups and three control groups--completed a reading passage, followed immediately by a comprehension test composed of twenty true/false questions. The experiment took place during regular class time and required approximately thirty-five minutes in each group, including time used in giving instructions.

Materials

A reading passage was selected for each level from an ESL reading textbook appropriate in difficulty for the specific proficiency level. Appropriateness of reading passages was determined by the fact that all were selected from textbooks previously adopted by the IELI as classroom textbooks for the three levels under study. Prior to

TABLE 3.2

DEMOGRAPHIC DATA: LEVEL THREE

Participants	Sex	Native Language
Experimental		
Student 1	Male	Arabic
Student 2	Male	Arabic
Student 3	Male	Arabic
Student 4	Male	Arabic
Student 5	Male	Spanish
Student 6	Male	Japanese
Student 7	Male	Spanish
Student 8	Male	Arabic
Student 9	Female	Japanese
Student 10	Male	Arabic
Student 11	Male	Arabic
Control		
Student 1	Male	Arabic
Student 2	Male	Arabic
Student 3	Male	Arabic
Student 4	Male	Arabic
Student 5	Male	Korean
Student 6	Female	Spanish

TABLE 3.2--Continued

Participants	Sex	Native Language
Control (cont.)		
Student 7	Male	Thai
Student 8	Male	Arabic
Student 9	Male	Arabic
Student 10	Male	Arabic
Student 11	Male	Arabic
Student 12	Male	Arabic

adoption, readability cloze tests had been given to students to determine level appropriateness of the textbooks.

Students had not been previously exposed to the reading passages since the specific textbooks used as sources were not in use as classroom textbooks during the semester during which the experiment was conducted. The students' classroom teachers also verified that they had not assigned the selected reading passages as supplemental reading or discussion material.

The following ESL textbooks were used as sources for reading passages:

Level one--Insights and Ideas (Ackert 1982);

Level three--In-Context (Zukowski/Faust et al. 1982); and

TABLE 3.3

DEMOGRAPHIC DATA: LEVEL FIVE

Participants	Sex	Native Language
Experimental		
Student 1	Male	Arabic
Student 2	Female	Malay
Student 3	Male	Arabic
Student 4	Male	Arabic
Student 5	Male	Arabic
Student 6	Male	Thai
Student 7	Male	Thai
Student 8	Male	Thai
Control		
Student 1	Female	Japanese
Student 2	Male	Thai
Student 3	Male	Arabic
Student 4	Male	Thai
Student 5	Male	Thai
Student 6	Female	Japanese
Student 7	Male	Chinese
Student 8	Female	Spanish

Level five--Reading by All Means (Dubin and Olshtain 1981).

The class time allowed for the experiment in each class was forty-five minutes. Therefore, each reading passage was modified in length to some degree in order to facilitate reading within the established time frame. In addition, 'culturally loaded' sentences were deleted or rewritten.

Each reading passage was retyped in two different formats. In the first format, to be used with the control group, conventional line division was used. That is, no effort was made to make ends of typed lines coincide with constituent boundaries. The resulting text looked very much as it did in the original textbook.

In the second format, to be used with the experimental group, ends of typed lines were made to coincide with major constituent boundaries. In a few cases lines were divided within major constituents in order to maintain a more normal appearance of the right margin. The reading passages for the control group and the experimental group in each level may be found in Appendices A-F.

The follow-up comprehension test for each level, consisting of twenty true/false questions based on the reading passage, was written by the researcher. The same comprehension test was given to both the experimental group and

the control group in each level. The comprehension tests for levels one, three, and five may be found in Appendices G-I.

Procedure

The procedure was carried out in each group separately. First, the students were told that they would be participating in a reading comprehension project on which a master's degree thesis would be based. They were told that they would receive no grades for their performance and that their names would not be used in the final paper. They were not informed of the experimental/control status of their group or of the different formats being used in the reading texts.

The instructions (Appendix J) were then read orally to each group after the reading passages had been placed face down on their desks. The same reading instructions were read to each group in all three levels.

A stopwatch was used to record the reading time for each student from the time the instruction 'begin' was given until reading was completed, indicated when the student turned the paper over and looked up from his/her desk. One classroom teacher was enlisted to assist in recording reading times and test times for each group in order to ensure accuracy.

When the last student in the group had finished reading, the reading passages were collected. The true/false comprehension tests were distributed face down on the students' desks, and the test instructions (Appendix K) were read orally. The same test instructions were read to each group in all three levels. Again, a stopwatch was used to record the time required for each student to complete the test; the tests were then collected.

Although there were questions in three of the six groups concerning procedures before reading began, there were no interruptions or other problems during the reading or testing period in any of the groups.

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CHAPTER IV

RESULTS AND DISCUSSION

Results

In order to determine whether or not constituent division of reading texts had any effect on the reading comprehension of ESL students, an experimental group was compared to a control group in each of three ESL proficiency levels. Three variables in each level were examined: reading time, test time, and test results. The results support the null hypothesis that the use of reading texts divided at constituent boundaries at the ends of lines will have no effect on the reading comprehension of ESL students at the beginning, intermediate, and advanced levels, as determined by timing procedures and reading comprehension tests.

The data include results of independent samples t-tests for each level. (See raw scores in Appendices L-N.) The degrees of freedom (df) equal the number of subjects in both groups minus two. The critical significance value is .05.

The term 'constituent passage' refers to a reading passage divided at the ends of lines at major constituent boundaries, i.e. the experimental passage. The term

'non-constituent passage' refers to a reading passage with natural (textbook format) line division, i.e. the control passage.

Reading Time

The descriptive statistics showing the effect of constituent versus non-constituent reading passages on reading time in all three levels are found in Table 4.1. The means and standard deviations are shown in minutes. In level one the mean reading time of 6.6 minutes for the constituent passage (read by the experimental group) is .41 minutes less than the mean reading time of 7.01 minutes for the non-constituent passage (read by the control group). This indicates a slightly faster average reading time for the experimental group. The standard deviation for the experimental group is 2.05 compared to 1.65 for the control group, indicating a greater degree of homogeneity within the control group. The p value determined by the t-test is .641, which is not significant.

In level three the mean reading time of 10.39 minutes for the experimental group is .76 minutes more than the mean reading time of 9.63 minutes for the control group. This indicates a faster average reading time for the control group. The standard deviation for the experimental group is 2.94 compared with 3.41 for the control group, indicating a greater degree of homogeneity within the

TABLE 4.1

EFFECT OF CONSTITUENT VERSUS NON-CONSTITUENT PASSAGE ON READING TIME

Group	Level One					Level Three					Level Five				
	N	M	SD	t	p	N	M	SD	t	p	N	M	SD	t	p
Constituent (Experimental)	9	6.60	2.05	-.475	.641	11	10.39	2.94	.571	.574	8	4.89	1.50	.352	.731
Non-constituent (Control)	10	7.01	1.65			12	9.63	3.41			8	4.66	1.11		

experimental group. The p value of .574 is not significant.

In level five the mean reading time of 4.89 minutes for the experimental group is .23 minutes more than the mean reading time of 4.66 minutes for the control group. The standard deviations of 1.50 for the experimental group and 1.11 for the control group show slightly more homogeneity within the control group. Again, the p value of .731 is not significant.

In examining the effect of constituent versus non-constituent passages on reading time, the experimental group has a faster average reading time than the control group in only one level (level one), and the difference in reading speed is very slight in that level. Thus, insofar as reading time is concerned, the null hypothesis is supported.

Test Time

The descriptive statistics showing the effect of constituent versus non-constituent reading passages on test time in all three levels are found in Table 4.2. The means and standard deviations are shown in minutes. In level one the mean test time of 5.85 minutes for the experimental group is .51 minutes lower than the mean test time of 6.36 minutes for the control group. This indicates a faster average reading time for the experimental

TABLE 4.2

EFFECT OF CONSTITUENT VERSUS NON-CONSTITUENT PASSAGE ON TEST TIME

Group	Level One					Level Three					Level Five				
	N	M	SD	t	p	N	M	SD	t	p	N	M	SD	t	p
Constituent (Experimental)	9	5.85	1.46	.724	.479	11	6.82	2.19	.469	.645	8	6.18	1.98	-.790	.444
Non-constituent (Control)	10	6.36	1.65			12	6.47	1.31			8	7.07	2.50		

group. The standard deviations of 1.46 for the experimental group and 1.65 for the control group show slightly more homogeneity within the experimental group. The p value of .479 is not significant.

In level three the mean test time of 6.82 minutes for the experimental group is .35 minutes higher than the mean test time of 6.47 minutes for the control group. The standard deviation of 2.19 for the experimental group compared to 1.31 for the control group shows more homogeneity within the control group. The p value of .645 is not significant.

In level five the mean test time of 6.18 minutes for the experimental group is .89 minutes lower than the mean test time of 7.07 minutes for the control group, indicating a faster average test time for the experimental group. The standard deviations of 1.98 for the experimental group and 2.50 for the control group indicate greater homogeneity within the experimental group. The p value of .444 is, once again, not significant.

In analyzing the effect of constituent versus non-constituent passages on test time, the experimental group has a faster average test time than the control group in two of the three levels (levels one and five). However, the results are not significant. Thus, insofar as test time is concerned, the null hypothesis is supported.

Test Results

The descriptive statistics showing the effect of constituent versus non-constituent reading passages on test results in all three levels are found in Table 4.3. The means and standard deviations are shown in test points, the highest possible score on the test being twenty points. In level one the mean test score of 15.33 for the experimental group is .83 higher than the mean test score of 14.50 for the control group. This indicates a slightly higher average test score for the experimental group. The standard deviation of 2.69 for the experimental group compared to .97 for the control group shows a markedly greater degree of homogeneity within the control group. The p value of .400 is not significant.

In level three the mean test score of 14.45 for the experimental group is .80 lower than the mean test score of 15.25 for the control group, indicating a higher average test score for the control group. The standard deviations of 2.30 for the experimental group and 2.45 for the control group show an almost equal degree of homogeneity in each group. The p value of .431 is not significant.

In level five the mean test score of 14.13 for the experimental group is .25 lower than the mean test score of 14.38 for the control group, indicating a slightly higher average test score for the control group. The

TABLE 4.3

EFFECT OF CONSTITUENT VERSUS NON-CONSTITUENT PASSAGE ON TEST RESULTS

Group	Level One					Level Three					Level Five				
	N	M	SD	t	p	N	M	SD	t	p	N	M	SD	t	p
Constituent (Experimental)	9	15.33	2.69	.878	.400	11	14.45	2.30	-.803	.431	8	14.13	1.55	-.248	.808
Non-constituent (Control)	10	14.50	0.97			12	15.25	2.45			8	14.38	2.39		

standard deviation of 1.55 for the experimental group compared to 2.39 for the control group shows a greater degree of homogeneity within the experimental group. The p value of .808 is not significant.

Analysis of the effect of constituent versus non-constituent reading passages on test results shows that the experimental group has a higher average test score than the control group in only one of the three levels (level one) and that the difference in test scores in all levels is insignificant. Thus, insofar as test scores are concerned, the null hypothesis is supported.

Overview of Results

Analysis of the statistics in all three levels reveals no significant results concerning the effect of constituent versus non-constituent reading passages on reading time, test time, or test results. However, in level one the experimental group has a lower average reading time, a lower average test time, and a higher average test score than the control group. Thus, the statistical analysis indicates a slightly greater effect of a constituent passage on reading speed and comprehension in the beginning proficiency level than in the intermediate and advanced proficiency levels. In levels three and five no similar pattern may be discerned since neither the experimental group nor the

control group in either of these levels shows consistently better results in the three areas analyzed.

Discussion

Graf and Torrey's study (in Clark and Clark 1977), in which constituent line division was used in a reading experiment with native English speakers, produced significant results, while this study of ESL students did not. The discrepancy between the results of the two studies can possibly be explained by the fact that this study involved a non-contrived reading procedure, i.e. one that allowed for conventional, rather than line-by-line, processing.

The Graf and Torrey study made use of a tachistoscopic reading machine which exposed the reading text line by line at fixed intervals. In this study, on the other hand, an effort was made to establish a conventional reading format. That is, the reading was not timed, and the lines of the text were not lost from view as reading proceeded. Significant results might be obtained from a study of the effects of constituent versus non-constituent passages on the reading comprehension of ESL students if subjects were in a highly controlled experimental situation such as Graf and Torrey's. Conversely, the effects of constituent versus non-constituent passages on the reading comprehension of native English speakers might disappear in a more

conventional reading task such as the one employed in this study.

In addition, the Graf and Torrey study included a short multiple-choice comprehension test following the reading procedures, while this study utilized a true/false comprehension test. The difference in test types could have had some effect on the results of this study.

As stated previously, in this study the experimental group in level one, but not in level three or five, had a slightly better average reading time, average test time, and average test score than did the control group. These results, although insignificant statistically, are consistent with the results of a pilot study conducted in a level one ESL class three semesters prior to the current study. In that study all procedures were identical to the procedures in the current study with one exception: the subjects used slotted cover cards which exposed the text line by line as they read. The reading was not timed, since the students could move the slotted cards as quickly or as slowly as they wished; however, they were not permitted to reread any lines of the text. The experimental group attained a significantly better average reading time, average test time, and average test score. The significance was computed at less than .01 in each of the three areas analyzed.

A conjecture may be made, on the basis of the Graf and Torrey study and the pilot study discusssed above, that the insignificant results derived from the current study are a result of not using a line-by-line reading procedure. Possibly, constituent boundaries are more easily recognized and utilized in tachistoscopic reading than in a conventional reading situation, in which the reader is free to return to previous information in the same line or in previous lines as he reads.

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CHAPTER V

CONCLUSIONS AND RECOMMENDATIONS

Summary of Results

Constituent analysis is an integral part of the analysis-by-synthesis process in reading. The efficient utilization of constituents leads to better processing strategies and hence to improved comprehension in reading. The role of the constituent in facilitating the reading process could have applications for teachers, curriculum developers, and textbook writers working in the field of English as a Second Language.

In order to examine the constituent utilization aspect of the analysis-by-synthesis reading process, an ex post facto experimental design was used to study its implications in the reading processing strategies of ESL students. An experimental and a control group were established in each of three ESL proficiency levels. Reading passages which had been divided at the ends of lines at major constituent boundaries were given to the experimental groups in all three levels, while reading passages which had not been altered in line division (i.e. that had conventional textbook formats) were given to the control groups in all three levels. A follow-up true/false comprehension

test was given to both the experimental group and the control group in each level in order to measure reading comprehension. In addition, reading and testing times were recorded for all students in all groups. The reading times, test times, and test results were analyzed for significance.

The findings of the experiment indicate that the constituent division of reading passages has little or no effect on the reading time or comprehension of ESL students at the beginning, intermediate, and advanced levels of proficiency. Thus, the null hypothesis is supported.

Furthermore, the study provides no evidence that teachers, curriculum developers, and textbook writers should adapt reading text formats through constituent division of lines in the text in order to improve reading comprehension in ESL students. The lack of restrictions inherent in a conventional reading procedure appears to override the effects of constituent boundary division on reading comprehension.

Recommendations for Future Research

As stated in Chapter IV, the experimental group in level one, but not in level three or five, had a slightly better average reading time, average test time, and average test score than did the control group. This finding might provide justification for further research on the constituent division of reading passages for ESL students

at the beginning proficiency level. While this study examined the effects of constituent division of a reading passage in one experimental situation, it might be worthwhile to study the effects of such reading text formats over a period of time. Possibly the long-term effects on reading comprehension would be more significant than the effects discovered in this study.

In addition, research could be undertaken to compare the effects of constituent division of reading passages on the reading comprehension of ESL students from various native language backgrounds. No such attempt was made in this study.

Research similar to the current study, with modification of two aspects, could also be conducted. Specifically, a multiple-choice test or another type of test could be used, and absolute major constituent line division could be employed. In this study line division at major constituent boundaries was sometimes compromised in order to maintain a "normal," textbook appearance of the text. A study involving another type of test and adhering strictly to line division of the text at major constituent boundaries might produce significant results.

Conclusion

The effects of constituent versus non-constituent reading passages on the reading comprehension of ESL students

at three levels of proficiency, as determined by this study, are insignificant. Therefore, providing reading texts employing constituent line division in order to improve reading comprehension in ESL students is not supported. Such texts do not appear to be effective in a conventional reading situation.

APPENDIX A

LEVEL ONE

CONSTITUENT READING PASSAGE

(EXPERIMENTAL GROUP)

Country Music

City people usually think
they are a lot smarter than country people.
They often laugh at simple country ways.
But people do not laugh at country music.
It is one of the most popular kinds of music
in the United States today.

Perhaps it is so popular
because it is about simple human feelings and events--
love, sadness, good times, and bad times.
It tells real-life stories
and sounds the way people really talk.
As life becomes more and more complicated,
it is good to hear music about ordinary people.

Country music, sometimes called country-western,
comes from two kinds of music.
One is the traditional music of the people
in the Appalachian Mountains in the eastern United States.
The other is traditional cowboy music from the West.
The singers usually play guitars,
and in the 1920s they started using electric guitars.

At first city people said country music was low class.
It was popular mostly in the South.
But during World War II, thousands of Southerners
went to the Northeast and Midwest to work in the factories.
They took their music with them.
Soldiers from the rest of the country
went to army camps in the South.
They learned to like country music.
Slowly it became popular all over the country.

In 1925 the radio program called 'Grand Ole Opry'
(which means Grand or Wonderful Old Opera)
started broadcasting country music from Nashville, Tennessee.
Today it broadcasts from the largest television studio
in the world, and Nashville is the center of country music.
Musicians make records in almost sixty recording studios
that are open twenty-four hours a day.
They sell $400 million worth of records every year.
There are hotels, an entertainment park,
stores that sell cowboy clothes, a Country Music Hall of Fame,
and tours past the homes of the big stars.
Most of these singers were very poor when they were children,
but now they live in large, expensive homes.
Millions of people have visited Nashville
and listened to music there.

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Today country music is popular everywhere
in the United States and Canada--
in small towns and in New York City, among black and white,
and among educated and uneducated people.
About 1,200 radio stations
broadcast country music twenty-fours a day.
English stars sing it in British English,
and people in other countries sing it in their languages.
The music that started with cowboys and poor Southerners
is now popular all over the world.

--TURN YOUR PAPER OVER AND LOOK AT THE INSTRUCTOR--

APPENDIX B

LEVEL ONE

NON-CONSTITUENT READING PASSAGE

(CONTROL GROUP)

Country Music

City people usually think they are a lot smarter than country people. They often laugh at simple country ways. But people do not laugh at country music. It is one of the most popular kinds of music in the United States today.

Perhaps it is so popular because it is about simple human feelings and events--love, sadness, good times, and bad times. It tells real-life stories and sounds the way people really talk. As life becomes more and more complicated, it is good to hear music about ordinary people.

Country music, sometimes called country-western, comes from two kinds of music. One is the traditional music of the people in the Appalachian Mountains in the eastern United States. The other is traditional cowboy music from the West. The singers usually play guitars, and in the 1920s they started using electric guitars.

At first city people said country music was low class. It was popular mostly in the South. But during World War II, thousands of southerners went to the Northeast and Midwest to work in the factories. They took their music with them. Soldiers from the rest of the country went to army camps in the South. They learned to like country music. Slowly it became popular all over the country.

In 1925 the radio program called 'Grand Ole Opry' (which means Grand or Wonderful Old Opera) started broadcasting country music from Nashville, Tennessee. Today it broadcasts from the largest television studio in the world, and Nashville is the center of country music. Musicians make records in almost sixty recording studios that are open twenty-four hours a day. They sell $400 million worth of records every year. There are hotels, an entertainment park, stores that sell cowboy clothes, a Country Music Hall of Fame, and tours past the homes of the big stars. Most of these singers were very poor when they were children, but now they live in large, expensive homes. Millions of people have visited Nashville and listened to music there.

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Today country music is popular everywhere in the United States and Canada--in small towns and in New York City, among black and white, and among educated and uneducated people. About 1,200 radio stations broadcast country music twenty-fours hours a day. English stars sing it in British English, and people in other countries sing it in their languages. The music that started with cowboys and poor Southerners is now popular all over the world.

--TURN YOUR PAPER OVER AND LOOK AT THE INSTRUCTOR--

APPENDIX C

LEVEL THREE

CONSTITUENT READING PASSAGE

(EXPERIMENTAL GROUP)

Why People Buy

The most obvious purpose of advertising is to inform the consumer of available products or services. The second purpose is to sell the product. The second purpose might be more important to the manufacturers than the first. The manufacturers go beyond only telling consumers about their products. They also try to persuade customers to buy the product by creating a desire for it. Because of this, consumers think that they want something that they do not need. After buying something, the purchaser can not always explain why it was bought.

Even though the purchaser probably does not know why he or she bought something, the manufacturers do. Manufacturers have analyzed the business of selling and buying. They know all the different motives that influence a consumer's purchase--some rational, some emotional. Furthermore, they take advantage of this knowledge.

Why are so many products displayed at the checkout counters in grocery stores? The store management has some good reasons. By the time the customer is ready to pay for a purchase, he or she has already made rational, thought-out decisions on what he or she needs and wants to buy. The customer feels that he or she has done a good job of choosing the items. The shopper is especially vulnerable at this point. The displays of candy, chewing gum, and magazines are very attractive. They persuade the purchaser to buy something for emotional, not rational motives. For example, the customer neither needs nor plans to buy candy, but while the customer is standing waiting to pay money, he or she may suddenly decide to buy some. This is exactly what the store and the manufacturer hope that the customer will do. The customer follows their plan.

Manufacturing companies compete for special display places. In fact, there is strong competition among them. Each one wants the display placed at eye level in the grocery store. Products that are placed on the top or bottom shelves are not purchased by as many shoppers. The easiest product to choose is the one that is easiest to see, so there are advantages to having a product within easy reach.

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The candy buying is an example of an emotional purchase. However, many purchases are rational, or carefully thought out. People generally consider economy, dependability, and convenience when they are purchasing a product. Thus, they think carefully about their needs and finances before purchasing something. At other times, the reasons behind the purchase may not be clear to a consumer. Consumers may be influenced by an advertisement on television showing a sports hero using the product. This picture remains in a consumer's mind even when he or she is not thinking about the hero. The consumer may want to copy the football star by using the product and so chooses it.

At other times, people buy particular products to get the attention of other people. A particular car, for example, might be chosen because a person is trying to prove that he or she is rich, attractive, and exciting. Other purchases are for pleasure rather than need. Tickets to a baseball game or to a rock concert are examples of this kind of emotional motive, or reason, for buying.

Of course, need remains the most important reason for buying something. Knowing the reasons for buying things makes a better shopper. A person becomes a more rational consumer, one who spends money wisely.

--TURN YOUR PAPER OVER AND LOOK AT THE INSTRUCTOR--

APPENDIX D

LEVEL THREE

NON-CONSTITUENT READING PASSAGE

(CONTROL GROUP)

Why People Buy

The most obvious purpose of advertising is to inform the consumer of available products or services. The second purpose is to sell the product. The second purpose might be more important to the manufacturers than the first. The manufacturers go beyond only telling consumers about their products. They also try to persuade customers to buy the product by creating a desire for it. Because of this, consumers think that they want something that they do not need. After buying something, the purchaser can not always explain why it was bought.

Even though the purchaser probably does not know why he or she bought something, the manufacturers do. Manufacturers have analyzed the business of selling and buying. They know all the different motives that influence a consumer's purchase--some rational, some emotional. Furthermore, they take advantage of this knowledge.

Why are so many products displayed at the checkout counters in grocery stores? The store management has some good reasons. By the time the customer is ready to pay for a purchase, he or she has already made rational, thought-out decisions on what he or she needs and wants to buy. The customer feels that he or she has done a good job of choosing the items. The shopper is especially vulnerable at this point. The displays of candy, chewing gum, and magazines are very attractive. They persuade the purchaser to buy something for emotional, not rational motives. For example, the customer neither needs or plans to buy candy, but while the customer is standing waiting to pay money, he or she may suddenly decide to buy some. This is exactly what the store and the manufacturer hope that the customer will do. The customer follows their plan.

Manufacturing companies compete for special display places. In fact, there is strong competition among them. Each one wants the display placed at eye level in the grocery store. Products that are placed on the top or bottom shelves are not purchased by as many shoppers. The easiest product to choose is the one that is easiest to see, so there are advantages to having a product within easy reach.

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--TURN YOUR PAPER OVER AND LOOK AT THE INSTRUCTOR--

APPENDIX E

LEVEL FIVE

CONSTITUENT READING PASSAGE

(EXPERIMENTAL GROUP)

The Brain's Timetable: Learning More about the 'Body Clock'

Science has moved closer toward identifying the brain site of the 'body clock', the timer that governs all the rhythms of life. A Johns Hopkins University scientist has disclosed that a group of rats has been transformed by precision brain surgery from performing night activity to day activity in a complete reversal of their age-old timetable.

For thousands of years, the wild Norway rat has spent its day sleeping or hiding in deep burrows and its night outside searching for food and water, as a means of surviving against predators. Dr. Curt P. Richter, a noted psychobiologist, has developed a surgical way of destroying the animal's body clock in a special portion of the brain so that it spends most light hours being active and all dark hours sleeping. 'We now know much more about the location of the clock,' said Richter in an interview. The site has been elusive in the past. As one scientist said, 'It seems to be everywhere and yet nowhere when we try to localize it.'

The study, covering 12 years and several hundred domesticated rats, is published by the National Academy of Sciences. Richter said the findings support the view that body clocks have independent function and do not need to rely on outside timers, such as the sun, gravity, or earth magnetism. The body clock, in Richter's opinion, is like a precision self-winding calendar wristwatch with a built-in timer. An opposing view, held by some scientists, compares it to a household electric clock with no built-in timer but rather a synchronous motor that lets it count the oscillations coming over the power lines. The opponents cite the solar eclipse on March 7, 1970, when horses, butterflies, and other day animals went to sleep; and mice, owls, and fireflies woke up.

In Richter's study, the rhythms of the rats' activity previously had not been disturbed by the arrival of lab workers by day and departure at night; but when deprived of their body clocks, the animals adopted a new timetable that was controlled by the working hours of the laboratory.

Like animals, man has evolved a 24-hour clock. Richter believes human beings started out sleeping about 12 hours during light. Introduction of the campfire, he says, enabled man to extend his waking hours so that he now sleeps about a third of the time.

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This is true everywhere, even above the Arctic Circle, where summer brings constant daylight. The 24-hour clock remains steadfast despite efforts to change it. Forty years ago, Dr. Nathaniel Kleitman, a University of Chicago physiologist, descended into Mammoth Cave, Kentucky, to eliminate the influence of the natural dark-light cycle and attempt to reset his body clock to a 28-hour day using artificial lighting. However, his wakefulness rhythm failed to adapt to the new schedule. He had trouble falling asleep after turning out the lights, and he awoke too early.

Over the years, scientists have found that at least 40 functions of the body have rhythms that are timed by the biological clock. Temperature, for example, is regulated so that it is at least two degrees higher in the late afternoon than the low point in the early morning hours. Peak efficiency is reached at certain periods of the day. Time zone effects of air travel cause jet lag. There are also daily rhythms in blood-pressure levels, blood-sugar levels, pulse rate, and even stomach contractions. The effectiveness of drugs given to a patient varies depending on what hours of the day or night they are given. It is likely there are best and worst times to perform surgery, take X-rays, and diagnose disease; but these have tended to be masked in the process of evolution.

--TURN YOUR PAPER OVER AND LOOK AT THE INSTRUCTOR--

APPENDIX F

LEVEL FIVE

NON-CONSTITUENT READING PASSAGE

(CONTROL GROUP)

The Brain's Timetable: Learning More about the 'Body Clock'

Science has moved closer toward identifying the brain site of the 'body clock', the timer that governs all the rhythms of life. A Johns Hopkins University scientist has disclosed that a group of rats has been transformed by precision brain surgery from performing night activity to day activity in a complete reversal of their age-old timetable.

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--TURN YOUR PAPER OVER AND LOOK AT THE INSTRUCTOR--

APPENDIX G

LEVEL ONE

TEST

Name _____

Directions: Write TRUE or FALSE in the blank space before each statement.

_____ 1. Country music is very popular in the United States today.

_____ 2. Country music tells stories about the lives of ordinary people.

_____ 3. People probably like country music because it is about simple things in life.

_____ 4. Country music does not sound the way people talk.

_____ 5. Country music comes from Canada.

_____ 6. Country music singers usually play guitars.

_____ 7. Country music was popular first in cities.

_____ 8. Country music became popular all over the United States during World War II.

_____ 9. Country music became popular in a short time in the United States.

_____ 10. The 'Grand ole Opry' was a radio program for country music.

_____ 11. The first radio program for country music was in New York City.

_____ 12. The first radio program for country music was broadcast in 1970.

_____ 13. Today Nashville, Tennessee, is the center for country music.

_____ 14. Country music is a big business today.

_____ 15. You can see a country music show if you go to Nashville.

_____ 16. A tourist can find many things to do in Nashville today.

_____ 17. Most country music singers came from rich families.

_____ 18. Country music is popular among uneducated people in the United States today.

_____ 19. Today many radio stations broadcast country music.

_____ 20. People in other countries do not like country music.

--TURN YOUR PAPER OVER AND LOOK AT THE INSTRUCTOR--

APPENDIX H

LEVEL THREE

TEST

Name _____

Directions: Write TRUE or FALSE in the blank space before each statement.

_____ 1. The most important purpose of advertising by manufacturers is to tell consumers about products.

_____ 2. Advertisements by famous people can cause consumers to buy particular products.

_____ 3. Advertisements cannot cause people to buy things they do not need.

_____ 4. Manufacturers understand why people buy particular products.

_____ 5. People buy products for different reasons.

_____ 6. Consumers always know why they buy particular products.

_____ 7. People buy bread and milk for rational reasons.

_____ 8. Manufacturers and store managers influence what customers buy by displaying products in a certain way.

_____ 9. Most people plan to buy candy at the grocery store.

_____ 10. It is difficult for stores to sell products displayed near the checkout counters.

_____ 11. Manufacturers compete for the best display places in stores.

_____ 12. The best place for a store to display a product is on the top shelf.

_____ 13. A person may buy a particular car to get the attention of other people.

_____ 14. An example of a purchase for pleasure is a rock concert ticket.

_____ 15. People generally do not think carefully before purchasing something.

_____ 16. The convenience of products is not important to consumers.

_____ 17. Need is the most important reason for buying something.

_____ 18. Manufacturers care about the rational reasons, but not the emotional reasons, for buying products.

_____ 19. Manufacturers can influence consumers without the consumers realizing it.

_____ 20. A consumer who understands why he buys certain products can become a wiser shopper.

--TURN YOUR PAPER OVER AND LOOK AT THE INSTRUCTOR--

APPENDIX I

LEVEL FIVE

TEST

Name _____

Directions: Write TRUE or FALSE in the blank space before each statement.

_____ 1. The 'body clock' is the area of the brain that controls the biological rhythms of our daily lives.

_____ 2. Dr. Richter is a scientist who works at a university.

_____ 3. Dr. Richter has learned more about the body clock by using chemicals in the brains of rats.

_____ 4. Dr. Richter has located the area of the brain that controls the body clock.

_____ 5. After Dr. Richter's experiments, the rats' active time and sleep time were the opposite of what they had been before.

_____ 6. We can not depend on the results of Dr. Richter's experiments because only a few rats were tested.

_____ 7. Dr. Richter believes that the body clock depends on the movement of the sun.

_____ 8. Dr. Richter believes that the body clock has a built-in timer.

_____ 9. The behavior of animals during the solar eclipse in 1970 supports Dr. Richter's findings.

_____ 10. The body clocks of man and animals seem to be similar in the way they operate.

_____ 11. Dr. Richter believes that ancient man slept more during a 24-hour period than modern man does.

_____ 12. People sleep less in areas of the world where there are more light hours.

_____ 13. Man's body clock can not be changed from a 24-hour cycle to a longer cycle by changing the number of dark and light hours in his day.

_____ 14. Scientists have discovered over 100 body rhythms that are controlled by the body clock.

_____ 15. Body temperature is higher in the early morning than in the afternoon.

_____ 16. People are more efficient, that is, they work better at certain times of the day.

_____ 17. When people travel from one area of the world to another, their body clocks are affected.

_____ 18. Blood-pressure levels and blood-sugar levels do not change during the day.

_____ 19. Some times of the day are probably better than others for having surgery.

_____ 20. Scientists are still studying the body clock.

--TURN YOUR PAPER OVER AND LOOK AT THE INSTRUCTOR--

APPENDIX J

READING INSTRUCTIONS

When I say begin, turn your paper over and begin reading. This is not a timed reading, so you will have enough time to read carefully. However, you should read the passage only one time. When you have finished reading it one time, turn your paper over and look at me.

I will collect your papers when you finish. Then you will answer true/false questions about the passage.

If you have any questions about the instructions, raise your hand now.

Begin.

APPENDIX K

TEST INSTRUCTIONS

Now you are going to answer 20 true/false questions about the passage you read. When I say begin, turn your paper over, write your name, and begin answering the questions. Write the word TRUE or the word FALSE in the blank space before each statement. Do not write T or F.

This is not a timed test, so you will have enough time to read the questions carefully. If you do not know the answer to a question, guess. It is important to answer every question.

When you have finished answering all the questions, turn your paper over and look at me.

If you have any questions about the instructions, raise your hand now.

Begin.

APPENDIX L

RAW SCORES

LEVEL ONE

Experimental				Control			
Student	Reading Time	Test Time	Test Score	Student	Reading Time	Test Time	Test Score
1	5.17	3.29	14	1	7.23	8.10	15
2	5.35	5.20	18	2	7.58	5.51	13
3	9.17	6.34	16	3	5.00	5.33	14
4	3.58	5.31	16	4	10.19	8.10	16
5	9.12	7.34	16	5	5.17	3.11	14
6	8.56	8.38	9	6	5.40	5.18	14
7	7.40	5.20	15	7	6.40	6.21	15
8	6.25	6.27	16	8	8.47	8.11	16
9	4.80	5.31	18	9	6.54	6.40	14
				10	8.10	7.60	14

APPENDIX M

RAW SCORES

LEVEL THREE

Experimental				Control			
Student	Reading Time	Test Time	Test Score	Student	Reading Time	Test Time	Test Score
1	7.80	4.58	10	1	14.50	6.46	17
2	16.30	5.50	15	2	6.52	5.39	16
3	12.29	5.39	16	3	8.12	6.54	15
4	11.42	8.10	16	4	15.41	7.49	16
5	12.90	6.26	18	5	14.24	8.51	17
6	8.55	10.41	15	6	6.42	6.25	16
7	9.26	4.20	16	7	8.00	8.40	16
8	12.55	10.41	14	8	8.12	5.14	17
9	8.42	8.43	15	9	9.47	6.60	11
10	6.22	6.25	12	10	5.46	7.34	18
11	8.56	5.59	12	11	8.12	4.28	10
				12	11.20	5.27	14

APPENDIX N

RAW SCORES

LEVEL FIVE

Experimental				Control			
Student	Reading Time	Test Time	Test Score	Student	Reading Time	Test Time	Test Score
1	6.53	9.31	15	1	4.55	6.17	14
2	3.20	4.22	16	2	5.24	4.56	13
3	7.13	4.10	15	3	5.30	10.46	12
4	4.32	4.47	14	4	3.43	8.22	17
5	5.44	6.45	11	5	3.51	5.16	11
6	3.18	5.31	15	6	6.55	10.59	17
7	5.54	7.38	13	7	5.15	7.10	14
8	3.80	8.22	14	8	3.51	4.31	17

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