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THE EFFECT OF TEXT STRUCTURE AND SIGNALING DEVICES  
ON RECALL OF FRESHMAN ARAB STUDENTS

DISSERTATION

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The problem of this study was to examine the effect of text structure and signaling devices on immediate and delayed recalls of freshman Arabic-speaking students after reading a text.

Subjects for the study were forty-five freshman Arabic-speaking students enrolled in three freshman English courses at a state university. All subjects were male students. The subjects were chosen on a voluntary basis.

The subjects were given the Reading Comprehension Section of the TOEFL. They were then divided into groups of good, average, and poor readers according to their performance on the TOEFL.

Two well-organized passages of expository text with clearly identifiable top-level structure of problem/solution and appropriate reading levels were selected for the study. Two versions of each passage were adapted — one with the signaling devices included in the passage and the other with the signaling devices deleted.

Each subject read one version of each of the two passages. The immediate and delayed recalls of the subjects were scored by an unbiased scorer. The scorer was an expert teacher of English to foreign students.

Hypothesis I stated that good readers would be able to utilize the writer's rhetorical mode of the text at a significantly higher level than average and poor readers. This hypothesis was supported. The results of Chi square analysis was significant at the .03 level for immediate recall, and at the .01 level for the delayed recall.

Hypothesis II stated that readers of each of the three groups who followed the original rhetorical mode of the text would recall significantly more information than those who failed to do so. This hypothesis was also supported. The results of the Two-way Analysis of Variance were significant at the .01 level for both immediate and delayed recalls.

Hypothesis III stated that the students of all three groups would recall significantly more information from the passage with signaling devices than from the passage without signaling devices. This hypothesis was not supported. Signaling devices helped good and average readers to recall significantly more information, while the group of poor readers was not affected by the presence of these signaling devices.

The findings suggest that training non-native speakers in identifying and utilizing different rhetorical structures might facilitate their reading comprehension. There is also a parallel need in writing instruction so that writers can offer this facility to their readers.

TABLE OF CONTENTS

	Page
LIST OF TABLES . . . . .	v
LIST OF ILLUSTRATIONS . . . . .	vi
Chapter	
I. INTRODUCTION . . . . .	1
Statement of the Problem	
Purpose of the Study	
Hypotheses	
Background and Significance of the Study	
Definition of Terms	
Delimitations	
The Sample	
Procedures for Collecting Data	
Procedures for Analysis of Data	
II. REVIEW OF THE LITERATURE . . . . .	12
Studies Related to the Effect of	
Text Structure on Recall	
Studies Related to Writing Instruction	
Controlled Composition Method	
Free Expression Method	
Recent Trends in Composition	
III. METHOD . . . . .	35
Subjects	
Description of Instruments	
Scoring	
Procedures for Collecting Data	
Procedures for Analysis of Data	
IV. PRESENTATION OF FINDINGS . . . . .	43
Introduction	
Testing of Hypotheses	

V. SUMMARY, FINDINGS, AND CONCLUSIONS . . . . .	56
Summary	
Findings	
Conclusions	
Recommendations	
APPENDIX . . . . .	63
BIBLIOGRAPHY . . . . .	72

## LIST OF TABLES

Table	Page
I. Number of Good, Average, and Poor Readers Who Used and did not Use the Original Text Structure in their Immediate and Delayed Recalls	44
II. Mean Scores and Standard Deviations of Good, Average, and Poor Readers Who Used and did not Use the Text's Top-Level Structure in their Immediate and Delayed Recalls	45
III. Two-Way Analysis of Variance for the Data Presented in Table II	46
IV. The Results of Multiple Comparisons Between Good, Average, and Poor Readers	47
V. The Results of Simple Effects of Condition on Good, Average, and Poor Readers	48
VI. Mean Recall of Idea Units from Text with and without Signals for Good, Average, and Poor Readers	50
VII. Two-Way Analysis of Variance for the Data Presented in Table VI	51
VIII. Multiple Comparisons Between the Groups of Good, Average, and Poor Readers	52
IX. The Results of Simple Effects of Condition on Good, Average, and Poor Readers	53

## LIST OF ILLUSTRATIONS

Figure		Page
I.	Analysis of the Idea Units Contained in the Supertankers Passage	37
II.	Analysis of the Idea Units Contained in the Dehydration Passage	38

## CHAPTER I

### INTRODUCTION

Studies investigating the effects of the structure of the text on the amount of information recalled by native speakers of English (1, 2, 5, 7,) have shown that the structure of the text is very helpful for the reader in specifying the logical connections among ideas in texts as well as the subordination of some ideas to others. In their study on native English-speaking ninth-graders of varying reading abilities, Meyer, Brandt, and Bluth (7) found that good readers were able to identify and utilize the original structure of the text in their immediate and delayed recall protocols at a significantly higher level than the average and poor readers. Those students who recognized the overall plan of the text and utilized that plan to organize their recall protocols remembered more content than those who used a different strategy.

The effect of certain signaling devices on recall of native speakers of English was also examined by Meyer (6, 7) who found out that the existence of certain words in texts facilitated reading comprehension and helped readers of average ability to recall more content from a text and retain it longer. Thus, based on Meyer's research, the structure of the text and the presence of certain signaling



devices have a great impact on reading comprehension of native speakers of English.

However, research on the effect of text structure and signaling devices on recall of non-native speakers of English from different language backgrounds is almost non-existent. More research is needed in this area in order to determine whether or not there is a relationship between the structure of the text and the recall protocols of ESL (English as a Second Language) readers of varying abilities.

#### Statement of the Problem

The problem of this study was to examine the effect of the readers' utilization of the rhetorical mode of the author of a text on the amount of information recalled immediately and one week after reading the text.

#### Purpose of the Study

The purpose of this study was two-fold: first, to determine the effect of text structure on recall of freshman Arabic native speakers by comparing the amount of information recalled by good, average, and poor readers immediately and one week after reading two well-organized passages; second, to determine the effect of certain signaling devices on recall by comparing the amount of information recalled from the passage with the signaling devices included and the

amount of information recalled from the passage with the signaling devices deleted.

### Hypotheses

To achieve the purposes of the study the following hypotheses were tested.

1. Good readers will be able to utilize the writer's rhetorical mode of the text at a significantly higher level than the average and poor readers.

2. Readers of each of the three groups who follow the original rhetorical mode of the text will recall significantly more information than those who fail to do so.

3. Students of all three groups will recall significantly more information from the passage with signaling devices than from the passage without signaling devices.

### Background and Significance of the Study

Teaching writing is one of the most challenging tasks to the teacher of English in general and to the teacher of English as a second language in particular. The difficulty of the task is due to a number of reasons. First, writing is not purely linguistic, but rather intellectual, conceptual, and psychological processes. Second, there is no consensus among linguists on the definition and evaluation of composition. Third, and most importantly, is the lack of materials that deal with the subject. All the teacher has at his disposal are grammar exercises and controlled

composition exercises which provide practice in various types of syntactic manipulations on the sentence level.

Composing is a process-product activity and should be viewed as such. For a long time, research in composition focused on the form or the composed product. Current research in composition tends to emphasize the composing process by investigating the strategies writers utilize to achieve the final product.

In her study of unskilled writers, Perl (9) found out that the students showed "consistent" composing processes of prewriting, writing, and editing. Shaughnessy (10), after close investigation of the composition of beginning writers, concluded that there was nothing "random" or "illogical" in what the students wrote.

Reading and writing are complementary skills and neither is entirely linguistic. Research on reading can provide us with valuable information about how people organize their thoughts. The question of how people retain information after reading a text has been examined by many researchers in recent years. Since short term memory is limited, information is stored in the brain by propositions extracted from the text. In order to retain those propositions for a long period of time after reading a text, there must be some sort of plan or logical order by which those propositions are arranged. A number of recent studies (1, 2, 4, 5, 7) have examined the effects of the structure

of the ideas presented in a reading passage on what the reader retains from that passage. Those studies have concluded that there is a strong relationship between the organization of the text and the amount of content retained from that text.

Johnson (4) investigated the relationship between the perceived importance of ideas in a passage and their recall. He found that ideas perceived as being more important to the passage were more likely to be recalled. These results were confirmed by Meyer and McConkie (8), who found that recall was influenced by the logical structure in several ways. The probability of recalling an idea was related to its position in the logical structure; ideas higher in the structure or having more other ideas descending from them were recalled by more subjects. If a particular idea was recalled, there was a high probability that the idea immediately above it in the structure was also recalled.

Taylor (11) studied the effect of the structure of the text on recall of fourth- and sixth-graders. She found that children's memory for expository materials was enhanced if they followed the top-level structure of the text to organize their recall. The sixth-grade good and poor readers who patterned their delayed recalls after the top-level structure of the test passage were able to remember more content than their peers who did not follow this strategy. These findings confirmed what Meyer, Brandt, and Bluth (7) found out about ninth-graders.

The effect of text structure on recall of non-native speakers from different language backgrounds was examined by Carrell (3), who found out that there were differences among various types of rhetorical organization of expository prose on the reading recalls of ESL readers. She also found that students who followed the original structure of the text in their recall remembered far more content than those who failed to do so.

Similar studies are needed to examine the effect of text structure on recall of non-native speakers of varying reading abilities to determine whether or not there are differences between good, average, and poor readers in their ability to recognize and utilize the top-level structure of the text in their immediate and delayed recall protocols.

This study is significant in that it examines the effect of text structure and certain signaling devices on recall of freshman Arabic-speaking students of varying reading abilities. The findings could be of value in understanding how non-native speakers organize their thoughts and in finding more effective ways of teaching reading and writing.

#### Definition of Terms

The following terms have restricted meanings and are therefore, defined for this study.

1. Signaling devices are defined as the explicit markers that do not add propositional content to the text,

but point out relationships among the ideas of the text (such as in contrast, however, but, on the other hand, so that, therefore, as a result, in order to, because, etc.).

2. Text structure refers to the rhetorical mode in which the text is written (such as comparison/contrast, problem/solution, cause and effect, etc.).

#### Delimitations

This study was concerned with freshman native speakers of Arabic at North Texas State University. No attempt was made to study non-native speakers of English from different language backgrounds. No generalizations could be made beyond the population of this study.

#### The Sample

The subjects for this study were forty-five freshman Arabic-speaking students enrolled in ENGL 1000, ENGL 1312, and ENGL 1322 classes at North Texas State University during the Fall semester, 1985. The subjects were chosen on a voluntary basis.

#### Procedures for Collecting Data

Permission to conduct the experiment was obtained from the university. The subjects took a test in reading comprehension. The Reading Comprehension Section of the TOEFL (Test of English as a Foreign Language) was administered. The TOEFL is a standardized test required by most universities in the United States. The students were

divided into three groups of good, average, and poor readers according to their performance in the test.

Two well-organized passages with clearly identifiable text structures and appropriate reading levels for freshman non-native speakers of English were selected. Two versions of each passage were adapted; one with the signaling devices included and the other with the signaling devices deleted. A stratified random assignment procedure was used to assign students to with- or without-signaling versions of the passages. After reading one passage, the students were asked to write down all they could remember from that passage using words from the text or their own words. One week later, the students were asked to write down all they could remember from that passage. The same procedure was used with the second passage.

#### Procedures for Analysis of Data

At the end of the experiment, the students' immediate and delayed recalls were scored by an unbiased scorer. The total number of idea units recalled by each student was calculated.

To test hypothesis 1, Chi square analysis was used to determine whether or not there were differences in use of the author's structure of the text.

To test hypothesis 2, two-way analysis of variance was used to determine the effect of the text structure on the amount of information recalled by the three groups. The

mean total recall scores of good, average, and poor readers who used and did not use the original text structure in their immediate and delayed free recall were calculated.

To test hypothesis 3, the same procedure was used. A two-way analysis of variance was utilized to determine the effect of signaling devices on immediate and delayed recall.



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## CHAPTER II

### REVIEW OF THE LITERATURE

The review of related literature is presented in two sections: (1) studies related to the effect of text structure on recall, and (2) studies related to writing instruction.

#### Studies Related to the Effect of Text Structure on Recall

The question of how people retain information after reading a text has been examined by many researchers (4, 7, 25, 31) in recent years. Those researchers have concluded that information is stored in the brain by propositions extracted from the text. In order to retain those propositions for a long period of time after reading a text, there must be some sort of plan or logical order by which those propositions are arranged.

Kintsch and Keenan (25) examined the effects of the structure of the ideas presented in a reading passage on what the reader retained from that passage. They found that the structure of the text was very helpful for the reader in specifying the logical connections among ideas in the text as well as the subordination of some ideas to others.

Johnson (21) investigated the relationship between the perceived importance of ideas in a passage and their recall.

She found that ideas perceived as being more important to the passage were more likely to be recalled. This finding was confirmed by Meyer and McConkie (31) who found that recall was influenced by the logical structure of the passage. The probability of recalling an idea was related to its position in the logical structure; ideas higher in the structure or having more other ideas descending from them were recalled by more subjects. If a particular idea was recalled, there was a high probability that the idea immediately above it in the structure was also recalled. This indicated that units higher in the hierarchy served as cues for the recall of those immediately below them. They also found that there was a tendency for subjects to recall idea units in the same order that they were presented.

Kintsch and Keenan (25) who investigated the effects of text structure on memory of adults, found that adults were sensitive to the hierarchical structure of ideas in expository texts recalling superordinate concepts more than subordinate concepts after reading.

Meyer, Brandt, and Bluth (29) studied the effect of top-level structure on recall of native English-speaking ninth-graders of varying reading abilities. They found that good readers used the same top-level structure for organizing their recall protocols as the author of the passage, while most students with low reading comprehension skills did not. They found also that students who employed this strategy of

using the top-level structure of the text recalled much more information from the passage than those who failed to do so. The effect of top-level structure of the text on recall of children was also examined by Taylor (39) who found that fourth- and sixth-graders' memory for expository materials was enhanced if they followed the top-level structure of the text to organize their recalls. The sixth-grade good and poor readers who patterned their recalls after the top-level structure of the test passage were able to remember more content than their peers who did not follow this organization.

The application of these findings on reading instruction was investigated by McDonald (27) and Bartlett (2). McDonald (27) found that teaching the top-level structure of stories facilitated recall of poor comprehenders in the primary grades. Bartlett (2) taught ninth-grade students the expository discourse types of problem/solution, comparison, antecedent/consequent, and description. This instruction increased their ability to identify and use the top-level structure of the text and nearly doubled the amount of information recalled.

The effect of different types of expository discourse on recall of native speakers of English was examined by Meyer and Freedle (30). The study was based on Meyer's prose analysis (28). According to Meyer, there are five major types of top-level organizational patterns in expository

text: (1) the problem/solution plan which contains all the features of cause and effect, (2) the comparison plan which presents two opposing viewpoints and can be subdivided into two categories: the alternative view which gives equal weight to the two sides, and the adversative view, which favors one side over the other, (3) the antecedent/consequent plan which presents causal relationships like the "if/then" of antecedent/consequent in logic, (4) the description plan, which develops a topic by describing its component parts, and (5) the collection plan, which lists concepts or ideas by association. Meyer maintains that these top-level structures are not intended to be exhaustive or definitive, but they are equivalent to the major schemata used by authors to organize their texts.

Meyer and Freedle (30) utilized those five top-level structures in their study on adult native speakers of English to examine the effect of different rhetorical organizations on recall. According to Meyer and Freedle, the causation, problem/solution, and comparison schemata had more organizational components or more slots to be filled than the collection/description structure. These additional organizational components in the former three schemata were expected to facilitate encoding, economy of storage in memory, and subsequent retrieval processes. The findings of their study supported this notion. Differences in discourse type affected learning and memory. College students found the

discourse type presenting a collection of descriptions to be less effective for learning and memory than the other discourse types.

The effect of different expository discourse types on recall of non-native speakers of English from different language backgrounds was examined by Carrell (10), who utilized four out of the five rhetorical organizations defined by Meyer. Those types were collection of descriptions, problem/solution, causation, and comparison. She found that certain types of expository organization were more facilitative of recall for ESL readers than others. The highly structured types of organization (causation, comparison, and problem/solution) helped students to recall more information than the loosely organized collection of descriptions. However, the group of Arabic native speakers differed from the other three groups in that they found the collection of descriptions type of discourse equal to the problem/solution type, and better than the causation type. This might be due to the preferred rhetorical pattern of Arabic, which was described by Kaplan (23) as being one of "coordinate parallelism". The most interesting finding of Carrell's study was that students who recognized and utilized the original text structure of the passage recalled more information than those who did not. Only one-fourth of the ESL readers in this study utilized the discourse type of the original text in their immediate recall protocols.

This indicated that explicit teaching of different discourse structures might be effective in facilitating reading comprehension for non-native speakers of English.

Carrell's study, being the first of its type, provides teachers of English as a second language with great insights in the area of ESL reading and writing. However, the study has two weaknesses that make the findings questionable. First, the sample in this study is too small; for example, the group of native speakers of Arabic is sixteen students. This means that only four students have read each type of the four discourse structures utilized in the study. It is almost impossible to draw any conclusions out of the results of such a small sample. Second, drawing on research in contrastive rhetoric and because there were not enough Korean or Chinese subjects to comprise separate groups, Carrell grouped Korean and Chinese students together. Results would have been more convincing, had the groups been homogeneous. Further research is needed in this area to confirm Carrell's findings.

The second recent study in this area was conducted by Connor (12), who compared the amount of information recalled by both native and non-native speakers of English (Spanish and Japanese) after reading a passage. As was expected, the native speakers of English recalled significantly more information than the non-native speakers. There was no significant difference between the amount of information



recalled by the Spanish and Japanese subjects. The most important finding however, was that the difference between native and non-native speakers was in the number of subordinate ideas rather than the higher-level ideas. The ESL subjects tended to mention the major ideas with less elaboration on them.

In sum, there is a whole body of research that indicates that the rhetorical organization of a text has a great impact on learning and memory of native speakers of English. The logical organization of a text makes it easier for the reader to remember more information due to the logical connections of the elements of discourse. The research also indicates that skilled readers are able to recognize and follow the original structure of the text more than poor readers. This strategy enables skilled readers to recall more information than poor readers. However, research on the effect of the structure of the text on recall of non-native speakers of varying reading abilities is lacking. Further research is needed in this area.

#### Studies Related to Writing Instruction

Research in the area of ESL composition, though abundant, has made very little contribution to the understanding of the writing processes of ESL students (41). Research findings are inconsistent and even contradictory. A number of reasons led to this state of affairs. First, many of the studies that have been done so far are case studies with a

limited number of subjects makes it difficult to make definitive generalizations (37). Second, linguists in the past were concerned with the students' written products rather than the process of writing itself. Third, there is no consensus among linguists on the criteria according to which writing can be evaluated. While proponents of controlled composition stress quality, that is error-free compositions, advocates of free composition emphasize quantity over quality in students' writing. Finally, there is no agreement among linguists on the definition of composition. Some linguists view composition as a service activity giving variety in the classroom (33); others define it as the "productive generating of sentences" (36). Consequently, the results of the studies reported by each camp have been interpreted according to each researcher's concepts about composition.

This section will explore the two major approaches to ESL writing as well as the recent trends in methodology.

#### Controlled Composition Method

Structuralism in Linguistics and Behaviorism in Psychology had a profound influence on the teaching of foreign languages. One of the basic assumptions of Structuralism was that the spoken language is primary, and written language is secondary. One learns to speak before learning to write; thus writing is simply a convention that has been added to language through history. Proficiency in English meant only

oral proficiency. No wonder, then, that of the four language skills (listening, speaking, reading, and writing), writing came last in the Audio-lingual approach to language teaching.

Based on the findings of Structural Linguistics, Pincas (35) outlined a program of controlled composition in which she suggested that emphasis should progressively shift from the substitution of words in sentences of different patterns to the substitution of sentences in paragraphs of different types and finally to the substitution of what she termed "literary devices" in whole essays. At first, students would be told what to substitute and where to substitute it. Later, they would be encouraged to develop their own terms for substitution, but at no stage would free expression be permitted. She argued that "since free composition relies on inventiveness, on creativeness, it is in direct opposition to the expressed ideals of scientific habit-forming teaching methods which strive to prevent error from occurring" (p. 185).

Her program reflects the assumptions of the Audio-lingual method which was in vogue at that time. One of these assumptions was that the use of language was the manipulation of fixed patterns which were learnt by imitation. A second assumption was that sequencing of substitution drills would gradually lead to the students' ability to compose freely. Pincas herself admitted that students who were able to handle complex as well as simple sentence patterns could not produce them spontaneously as the need arises. Their

compositions often consisted of monotonous sequences of simple sentences, or of different sentence types sequenced in a "jerky" or "clumsy" way. This type of writing was a natural consequence of the students' long exposure to different types of controlled composition. The students were overly concerned with grammatical correctness, thereby writing simple sentences in order to avoid errors. Students under this kind of instruction are always looking for models to imitate, or words to substitute. They feel insecure when they are left on their own.

Paulston (33) reports an experiment where a composition class was divided into two groups: Group A using a program of controlled composition and Group B writing weekly free papers. While her findings concerning increased proficiency were insignificant, there was a difference in behavior between the two groups. Group A always handed in their papers on time, asked for extra work, and attended an extra conference hour. Group B handed in late papers, very rarely attended the extra hour, and frequently expressed feelings of discouragement. Paulston justifies the use of controlled composition techniques on the grounds that they make it possible to teach one thing at a time, they give the student maximum opportunity for practice in writing correct paragraphs, they make possible a careful grading and sequencing of the language patterns to be written, and they make it possible for the student to work within the limits of his

proficiency. Paulston also gives some practical reasons for using controlled composition techniques. She says that a teacher with fifteen students in a class and five classes a day is not likely to give daily assignments in free composition. Controlled composition makes it possible for one to give frequent writing assignments.

While controlled composition can be helpful in reinforcing other language skills, it has been criticized for its inability to teach true composition skills. Zamel (41) maintains that, in controlled composition, "grammatical facility means writing ability" (p. 69). Taylor (40) notes that "the composition teacher is entirely justified in questioning whether these exercises serve any function beyond grammar manipulation which happens to be in written form" (p. 367). Raimes (36) argues that, in controlled composition, "the student does not invent and organize. That is done for him. He merely changes and manipulates sentences that someone else invented and organized" (p. 390).

Rejecting the notion that writing is the mastery of sentence patterns, other linguists recognize some factors that have been ignored. Organization, style and rhetoric become the crucial aspects of the skill in writing, but, here again, control and guidance are deemed essential. The students are imitating whole passages rather than manipulating sentences. Kaplan (22), pointing out the effect that cultural differences have upon the nature of rhetoric,

suggests the study and imitation of paragraphs. Arapoff (1) concentrates on the importance of discovering, comparing, and imitating stylistic differences, and Carr (9) stresses the importance of reading, studying, and analyzing the organization and logical arrangement of passages. While this group of linguists has changed the direction of research in writing, they still, like the other group, insist upon control. Writing for the ESL student is still essentially seen as the formation of a habit. The imitation of various styles and organization patterns is viewed as being helpful for students who are still coping with the acquisition of language. This kind of practice is far from being a true expression of genuine thoughts and ideas.

#### Free Expression Method

Advocates of a free composition method have maintained that frequent and lengthy writing assignments stressing quantity rather than quality are an effective means of improving writing skill. Erazmus (13) , describing his "program of fluency", says that "it is more important to have the students produce large quantities of material than to produce perfect copy" (p. 28). Under this kind of program, the students are directed to write rapidly with little revision. The student is not devalued for the errors he makes. Erazmus supports his argument with the statement that "language is a self-correcting and self-expanding system and the more that it is used the greater the facility there

is in the use of it" (p. 31). The only evidence in support of this kind of approach is a pilot study conducted by Briere (6). Briere asked the students in his experimental group to write freely for at least six minutes during each class session on any subject. Regardless of the number of errors made, no more than two errors were indicated by the instructor. Weekly compositions ranging progressively from 300 to 500 words in length were assigned and a term paper of a minimum of 1000 words was required. Home and class compositions and term papers were carefully corrected, and students receiving any grade below A were asked to rewrite their compositions. The final tests showed that there was a decrease in error rate and an increase in quantity of output during the course. In his description of the experiment, Briere suggested that one interpretation of the results might be that "an emphasis on quantity will produce greater fluency and also have the concomitant effect of reducing error rate" (p. 148).

In view of the experimental design of the study, these conclusions appear to be unjustified. Briere used two methods of teaching the one group of students. One method involved an emphasis on fluency and quantity; the other emphasized the identification, correction, and revision of errors. Determining which method contributed to the final results is, therefore, impossible.

There is no convincing evidence that asking the students to write freely and at length without correcting their work is likely to reduce the error rate. There is some evidence to the contrary, however. For example, a study by Buxton (8) at Stanford University on the work of 257 students indicated that college freshmen whose writing was graded and thoroughly marked and criticized, and who revised their papers in light of these criticisms, could improve their writing more than the freshmen whose writing received a few general suggestions but no grades or intensive marking, and who did not revise their papers. The subjects were native speakers of English but the results are nevertheless relevant to teaching writing for ESL students.

Braddock et al. (5), after reviewing the research in teaching of composition, concludes that "it does not seem reasonable that doubling the number of aimless writing assignments which are then marked in a perfunctory manner would necessarily stimulate students to improve their writing" (p. 35). Free composition has also been challenged by a number of studies on native speakers (18, 19, 20) which have concluded that writing progress is not related to the frequency of assignments.

#### Recent Trends in Composition

In recent years, interest in the composing process has grown, with a concomitant shift in research. Instead of evaluating the finished products of students, researchers



began to focus on the process of writing. After her review of literature on writing, Zamel (41) concludes by saying: "Rather than ask how to teach composition, we are trying to discover what writing is, what it involves, and what differentiates the good from the bad writer" (p. 74).

In 1963, Braddock, Lloyd-Jones, and Schoer (5), writing on the state of research in written composition, included the need for "direct observation" and case study procedures in their suggestions for future research. In a section entitled "Unexplored Territory", they listed basic unanswered questions such as, "What is involved in the act of writing?" and "Of what does skill in writing actually consist?" (p. 51).

Many aspects of the writing process have been ignored by researchers in the past. Those who were concerned with control, guidance, grammatical correctness, and imitation of models ignored creativity, productivity, and the actual needs of the learners. Writing will be meaningless unless it reflects the genuine need of the learner to express his ideas and experiences through an atmosphere of encouragement and motivation.

Murray (32) argues that the traditional long-standing emphasis of product over process in writing has created serious misconceptions about how writing is produced. He suggests that the act of writing, upon examination, turns out to be a complex process wherein writers use language as a tool to discover and clarify meaning to say exactly what they want.

A study by Perl (34) of the composing processes of five unskilled college writers provides empirical evidence to support these observations. Perl found out that her subjects began writing without any secure sense of where they were heading, acknowledging only that they would "figure it out as they went along" (p. 330). She concluded that, by seeing their ideas on paper, her subjects were able to reflect upon them and change and develop their ideas further. Although writers do plan, they are obliged to adapt their strategies as they write.

While a student's product is presented in lines, the process that produces it is not linear at all. Beach (3), studying the composing processes of native speakers of English, found that experienced writers consider purpose and audience. They consult their background knowledge and as they write, they read back over what they have written to keep in touch with their "conceptual blueprint", which helps them plan what to write next.

A number of recent studies have investigated the composing processes of unskilled native speakers of English (14, 16, 38). These studies have shown that unskilled writers take less time to plan and that their plans are less flexible than the good writers'. They re-scan large segments of their work less often than skilled writers do, and when they do re-scan, it is usually to correct surface-level errors. Their revising is mostly editing; the changes they

make focus on form rather than content. They are overly concerned with accuracy. In addition, inexperienced writers spend little time considering the reader. They find it difficult to move from their "writer-based prose" to prose that conveys a message to the reader (15).

Raines (37), studying the composing processes of unskilled ESL writers, concluded that unskilled ESL writers were similar to unskilled native speakers of English in their lack of planning and their recursive processes at the sentence level. There were also differences: ESL students showed a commitment even to in-class essays. Moreover, they were not preoccupied with correcting errors, but were more concerned with getting ideas down on the page. Like unskilled native speakers, however, ESL writers wrote from an egocentric point of view, taking the reader's understanding for granted.

The composing processes of advanced ESL writers were examined by two recent studies (26, 42). They both concluded that advanced ESL students used many of the strategies used by native language students in composing.

Another area that has been examined in recent years is the effect of certain semantic rules on writing. There is now a growing body of research that reports the results of psychological testing based on theories of language as a set of semantic structures. This testing, which involves observing subjects encode and decode language in a variety of

experimental settings, seems to validate certain semantic interpretations of language processing.

Semanticists have observed that sentences can be broken down into two major sections: (1) the part which contains "old" information, or information that is accessible to the reader in some way; and (2) the part which contains "new" or not accessible information that relates additional information about the theme of the discourse. The topic development can be realized through lexical and syntactic devices which create linkages between units of given information and their antecedents. In decoding a text readers use the devices as tags to connect incoming (new) information with previously stored (given) information. Such devices include exact lexical repetition, referential pronouns, conjunctions, synonyms, and substitutional phrases (17).

Clark and Haviland (11) speculate that if the old information and the new information are repeatedly mixed up, the reader or listener must constantly build new knowledge structures in which to fit new information, and reading or listening becomes inefficient. In support of this speculation, Kieras (24), in his report of a 1978 experiment on given-new conventions and their relation to the accessibility of the theme or the topic of a piece of discourse, concluded that paragraphs that violate the coherence conventions yielded longer reading times, poorer recall, and distortions of apparent theme.

In an experiment to discover the effects of text structure and the presence or absence of certain signaling devices (mainly conjunction devices mentioned by Halliday and Hasan, such as, however, as a result, consequently, but, etc.) on recall of content from a passage by good, average, and poor readers, Meyer (28) found that good readers did equally well with or without the signaling devices in the passage. In addition, poor readers recalled content equally poorly whether or not the writer used signaling devices. Readers of average ability, however, recalled more content and organized their recall protocols if the passage they read contained the signaling devices. The subjects in this experiment were native speakers of English. Similar studies are needed to examine the effects of the structure of the text and certain signaling devices on recall of non-native speakers of English from different cultural backgrounds.

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## CHAPTER III

### METHOD

#### Subjects

Fifty Arabic-speaking students who were enrolled in freshman English classes (1000, 1312, and 1322) at North Texas State University during the Fall 1985 semester volunteered to be the subjects for this study. All the subjects were male students. No female students were enrolled in any of the three freshman English courses. Only forty-five subjects completed all four phases of the study. Five students failed to appear to read one of the passages and were excluded from the study.

#### Description of Instruments

A secured form of the TOEFL test was obtained from the Educational Testing Service for this study. Only the Reading Comprehension Section was administered.

Two well-organized passages of expository text with clearly identifiable top-level structure of problem/solution and appropriate reading levels were selected for the study. The two passages were used by Meyer, Brandt, and Bluth (2) in their study of native English-speaking ninth-graders. One of the passages (the dehydration passage) was also used by Carrell (1) in her study of non-native speakers.

Two versions of each passage were adapted: one with the signaling devices included in the passage and the other with the signaling devices deleted. The first passage dealt with the problem of oil spills from supertankers. The with-signaling version of the supertanker passage began with "A problem of vital concern is the prevention of oil spills from supertankers", while the without-signaling version did not include the words "problem" and "solution" and began with "Prevention is needed of oil spills from supertankers." In addition, in the with-signaling version, the three-fold solution was explicitly pointed out to the reader. In the without-signaling version the solution was not explicitly pointed out and the words indicating it were not underlined. Both versions of the supertanker passage are reproduced in Appendix A.

The idea units of the passage were unchanged; both versions contained the identical 22 idea units. The with-signaling version had 238 words including the title "Supertankers", while the without-signaling version had 208 words including the title "Supertankers". Figure 1 shows the idea units contained in the supertanker passage.

The second passage dealt with the loss of body water required by some coaches so that athletes could attain specified body weights. Again, two versions of this passage were adapted: one with the signaling devices included and the other with the signaling devices deleted. The with-signaling

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1. Prevention of oil spills from supertankers is needed.
  2. A typical supertanker carries a half-million tons of oil.
  3. It is the size of five football fields.
  4. A wrecked supertanker spills oil in the ocean.
  5. This oil kills animals.
  6. This oil kills birds.
  7. This oil kills microscopic plant life.
  8. A supertanker crashed off the coast of England.
  9. It killed more than 200,000 seabirds.
  10. Plant life provides food for sea life.
  11. It produces 70% of the world's oxygen supply.
  12. Wrecks result from the lack of power and steering equipment.
  13. Supertankers have only one boiler.
  14. The boiler provides power.
  15. Supertankers have only one propeller.
  16. The propeller drives the ship.
  17. Use of supertankers cannot be stopped.
  18. Eighty percent of the world's oil supply is carried by supertankers.
  19. Officers of supertankers should be trained.
  20. Supertankers should be built with several propellers.
  21. Ground control stations should be built.
  22. They guide supertankers along busy shipping lanes.
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Figure 1--Analysis of the idea units contained in the Supertanker passage

version began with "A serious problem is the loss of body water frequently required by athletic coaches." The solution to the problem was explicitly stated. The without-signaling version did not include the words "problem" and "solution". Both versions are reproduced in Appendix B. The two versions have exactly the same idea units. The passage contains 22 of these units (the same number as the passage about supertankers). The with-signaling version of the dehydration passage contained 144 words including the

title, while the without-signaling version contained only 116 words including the title. Figure 2 shows the idea units contained in the Dehydration passage.

- 
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1. Loss of body water is required by athletic coaches
  2. This is required of wrestlers
  3. This is required of boxers
  4. This is required of judo contestants
  5. This is required of karate contestants
  6. This is required of football team players
  7. to attain specified body weight
  8. These specified weights are lower than their usual weights
  9. Coaches who require loss of body water should be dismissed immediately
  10. Loss of body water impairs cardio-vascular functioning
  11. This limits work capacity
  12. A loss of 3% of body water
  13. impairs physical performance
  14. A loss of 5% of body water
  15. results in heat exhaustion
  16. A loss of 7% of body water
  17. causes hallucinations
  18. A loss of 10% of body water
  19. results in heat stroke
  20. results in deep coma
  21. results in convulsions
  22. If not treated, death will result
- 
- 

Figure 2--Analysis of idea units contained in the Dehydration passage

#### Procedures for Collecting Data

During the first session the subjects were given the Reading Comprehension section of the TOEFL . The students were then divided into groups of good, average, and poor readers according to their achievement scores on the TOEFL. The mean score of the students was 156 and the standard

deviation was 22. There were two major breaks in the scores of the students. Fourteen students made a score of 178 and above and the standard deviations for this group ranged from 1 to 2.27 above the mean. Those students comprised the group of good readers. Sixteen students made a score of 145 and less and the standard deviations for this group ranged from .54 to 2.45 below the mean. Those subjects comprised the group of poor readers. Fifteen subjects were in the middle with scores ranging from 156 to 165. The standard deviations for this group ranged from 0 to +.4. Those students comprised the group of average readers. The mean scores for the groups of good, average, and poor readers were 182.7, 160.3, and 133 respectively.

Each subject had to read one version of each of the two passages. A stratified random assignment procedure was used to assign the students to with- or without-signaling versions and the order of presentation of the two passages.

During the second session each student read one of the two passages assigned to him. After reading the passage and placing it out of sight, the students were asked to write down all they could recall from the passage either in words remembered from the passage or in their own words. One week later, the students were again asked to write down all they could remember from the previous passage. Then each student read the second passage assigned to him. Students who had read the with-signaling version of the passage about super-tankers during the last session, read the without-signaling

version of the passage about the loss of body water this time and vice versa. The students were told to read the passages carefully and to take as much time as they wanted to read each passage. After reading the second passage and placing it out of sight, the students were asked to write down all they could remember from the passage. One week later, the students were asked to write down all they could remember from the second passage they read.

### Scoring

The students' immediate and delayed recalls were scored by an unbiased scorer. The scorer was an expert teacher of English for foreign students at the Intensive English Language Institute at North Texas State University. The scorer was not informed about the nature of the experiment and the presence or absence of the signaling devices in the passages. One point was given by the scorer for each idea unit recalled by the student. The spelling mistakes made by the students were ignored. In addition, the scorer analyzed the top-level structure of each recall to determine whether or not it was the same as that used by the author of the text.

The top-level structure of the two passages utilized in the study was the problem/solution type identified by Meyer (2). The students who organized their recall protocols in a way similar to that presented in the text, recognizing that there was a problem, giving the causes of that problem, and suggesting ways for solving it, were indicated by the

scorer as following the top-level structure of the text. The students who followed a different strategy, and those who arranged their recall protocols as a collection of isolated sentences, were also indicated by the scorer as not following the original top-level structure of the text.

#### Procedures for Analysis of Data

At the end of the experiment, the number of students in each group who followed and did not follow the original structure of the text was collected and Chi square analysis was used to determine whether or not there were differences between the groups in the ability to recognize and follow the original text structure.

To test hypothesis 2, the scores of the students who followed and did not follow the original text structure in the three groups were calculated and compared. Two-way analysis of variance was used to determine whether or not there were significant differences in the scores of the students under the two recall conditions (same as author and different from author).

To test hypothesis 3, two-way analysis of variance was used to determine the effect of signaling devices on recall of the students in the three groups.



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## CHAPTER IV

### PRESENTATION OF FINDINGS

#### Introduction

The data collected during the experimental procedure were analyzed by two statistical techniques: (1) Chi square analysis, and (2) two-way analysis of variance. The level of significance below which a hypothesis was rejected was set at .05.

#### Testing of Hypotheses

Hypothesis 1. Good readers will be able to utilize the writer's rhetorical mode of the text at a significantly higher level than average and poor readers.

Chi square analysis was utilized to determine whether or not there were differences in the use of the writer's rhetorical mode by good, average, and poor readers. Table I shows the number of students who used and did not use the original organization of the text in each group. The majority of good readers used the same rhetorical mode as the author of the text, while the majority of poor readers did not. The difference between the three groups was significant at the .03 level for the immediate recall and at the .01 level for the delayed recall. This finding confirms the results obtained by Meyer, Brandt, and Bluth (2)

in their study of native English-speaking ninth-graders.

TABLE I

NUMBER OF GOOD, AVERAGE, AND POOR READERS WHO  
USED AND DID NOT USE THE ORIGINAL TEXT  
STRUCTURE IN THEIR IMMEDIATE  
AND DELAYED RECALLS

Level of the Students	Condition of Recall	
	Same as author	Different from author
Immediate Free Recall		
Good	11	3
Average	9	6
Poor	5	11
	$\chi^2 = 6.95 \text{ } p < .03$	
Delayed Free Recall		
Good	11	3
Average	8	7
Poor	4	12
	$\chi^2 = 8.62 \text{ } p < .01$	

Hypothesis 1 was supported.

Hypothesis 2. Readers of each of the three groups who follow the original rhetorical mode of the text will recall significantly more information than those who fail to do so. Table II shows the data collected for the three groups.

TABLE II

MEAN SCORES AND STANDARD DEVIATIONS OF GOOD, AVERAGE, AND POOR READERS WHO USED AND DID NOT USE THE TEXT'S TOP-LEVEL STRUCTURE IN THEIR IMMEDIATE AND DELAYED FREE RECALLS

Level of the Students	Condition of Recall	
	Same as author	Different from author
Immediate Free Recall		
Good	M 16.50 SD 2.31	10.33 .94
Average	M 14.66 SD 1.88	8.66 1.20
Poor	M 12.25 SD .82	6.00 .95
Delayed Free Recall		
Good	M 13.36 SD 2.60	8.00 .80
Average	M 9.87 SD 2.08	5.40 1.20
Poor	M 9.00 SD 1.22	3.83 .68

Two-way analysis of variance (Recall condition  $\times$  Level of the students) was used to determine whether or not the utilization of the original structure of the text helped the students to recall significantly more information. Table III shows the analysis of variance for the data collected for the three groups.

TABLE III

TWO-WAY ANALYSIS OF VARIANCE FOR THE  
DATA PRESENTED IN TABLE II

Source of Variation	Sum of Squares	Df	Variance Estimate	F ratio
Immediate Free Recall				
Groups	122.774	2	61.387	.001
Condition	326.747	1	326.747	.001
Interaction	.240	2	.120	.962
Within cells	119.527	39	3.065	
Delayed Free Recall				
Groups	99.673	2	49.837	.001
Condition	218.739	1	218.739	.001
Interaction	1.482	2	.742	.808
Within cells	134.801	39	3.456	

As can be seen in Table III, there was a significant difference in the amount of information recalled by the three groups under the two conditions of recall. The difference between groups was significant at the .001 level. The difference between the two conditions of recall was also significant at the .001 level for both immediate and delayed recalls. The interaction between groups and conditions was not significant.

Multiple comparisons procedure was used to test the significance between groups. Table IV shows the results of the multiple comparisons between the three groups.

TABLE IV  
THE RESULTS OF MULTIPLE COMPARISONS BETWEEN  
GOOD, AVERAGE, AND POOR READERS

SOURCE OF VARIATION	DF	F VALUE	F
Immediate Free Recall			
Groups 1 (Good) and 2 (Average)	1	20.529	.001
Groups 1 (Good) and 3 (Poor)	1	133.474	.001
Groups 2 (Average) and 3 (Poor)	1	50.116	.001
Delayed Free Recall			
Groups 1 (Good) and 2 (Average)	1	40.824	.001
Groups 1 (Good) and 3 (Poor)	1	108.568	.001
Groups 2 (Average) and 3 (Poor)	1	16.028	.001

There was a significant difference in the amount of information recalled by the group of good readers and both the average and poor readers. The difference was significant at the .001 level. There was also a significant difference between average and poor readers both in immediate and delayed recalls.

The effect of the two conditions of recall (same as author and different from author) on each group was tested by the Simple Effects procedure. The results of the simple effects procedure are presented in Table V.

TABLE V

THE RESULTS OF SIMPLE EFFECTS OF CONDITION  
ON GOOD, AVERAGE, AND POOR READERS

SOURCE OF VARIATION	DF	F VALUE	P
Immediate Free Recall			
Condition Within Group 1 (Good)	1	29.680	.001
Condition Within Group 2 (Average)	1	42.287	.001
Condition Within Group 3 (Poor)	1	37.731	.001
Delayed Free Recall			
Condition Within Group 1 (Good)	1	19.619	.001
Condition Within Group 2 (Average)	1	21.355	.001
Condition Within Group 3 (Poor)	1	23.169	.001

There was a significant difference between the amount of information recalled under the two conditions for each of the three groups in both immediate and delayed recalls. The students in all three groups who recognized and utilized the original organization of the passage were able to recall significantly more content than those who failed to do so. All the differences were significant at the .001 level, thus hypothesis 2 was supported.

This finding confirms the results obtained by Meyer, Brandt, and Bluth (2) in their study of native speakers. It also confirms the results obtained by Carrell (1) in her study of non-native speakers of English from different language backgrounds.

Hypothesis 3. Students of all three groups will recall significantly more information from the passage with signaling devices than from the passage without signaling devices.

Two-way analysis of variance was used to determine the effect of signaling devices on the immediate and delayed recalls of the students in the three groups. The data collected for the subjects are presented in Table VI.



TABLE VI

MEAN RECALL OF IDEA UNITS FROM TEXT WITH  
AND WITHOUT SIGNALS FOR GOOD,  
AVERAGE, AND POOR READERS

Level of the Students	Condition of Recall		
	With signals	Without signals	
Immediate Free Recall			
Good	M	16.70	13.70
	SD	3.40	3.80
Average	M	14.00	10.13
	SD	3.54	3.66
Poor	M	8.43	6.56
	SD	3.65	2.82
Delayed Free Recall			
Good	M	14.42	10.07
	SD	4.41	3.08
Average	M	9.40	5.66
	SD	3.46	2.38
Poor	M	5.12	4.50
	SD	3.46	1.69

The results of the two-way analysis of variance for the data obtained for the three groups is presented in Table VII.

TABLE VII

TWO-WAY ANALYSIS OF VARIANCE FOR THE  
DATA PRESENTED IN TABLE VI

Source of Variation	Sum of Squares	Df	Variance Estimate	F ratio
Immediate Free Recall				
Groups	841.110	2	420.55	.001
Condition	226.254	1	226.254	.001
Interaction	19.680	2	9.840	.472
Within cells	1091.965	84	13.000	
Delayed Free Recall				
Groups	774.906	2	387.453	.001
Condition	217.464	1	217.464	.001
Interaction	41.382	2	20.691	.158
Within cells	920.290	84	10.956	

There was a significant difference between the amount of information recalled under the two conditions. Students recalled significantly more information from the passage with signaling devices than from the passage without the signaling devices. The difference between groups was significant at the .001 level for both immediate and delayed

recalls, and the difference between the two conditions of recall was also significant at the .001 level for both immediate and delayed recalls. The interaction between groups and conditions was not significant.

Two tests of significance of the scores were used: (1) multiple comparisons between the groups to determine whether or not the three groups contributed to the level of significance obtained, and (2) simple effects procedure to examine the level of significance for each group under the two conditions of recall. Table VIII shows the results of the multiple comparisons between the three groups.

TABLE VIII  
MULTIPLE COMPARISONS BETWEEN THE GROUPS  
OF GOOD, AVERAGE, AND POOR READERS

SOURCE OF VARIATION	SUM OF SQUARES	DF	MEAN SQUARES	F VALUE	Sig. of F
Immediate Free Recall					
Groups 1 and 2 (Good and Aver.)	115.679	1	115.679	8.899	.004
Groups 1 and 3 (Good and Poor)	816.171	1	816.171	62.784	.001
Groups 2 and 3 (Aver. and Poor)	322.908	1	322.908	24.840	.001
Delayed Free Recall					
Groups 1 and 2	322.197	1	322.197	29.409	.001
Groups 1 and 3	758.100	1	758.100	69.196	.001
Groups 2 and 3	89.808	1	89.808	8.197	.005

As can be seen in Table VIII, there was a significant difference in the amount of information recalled by good and average readers both in the immediate and delayed free recalls. The difference between average and poor readers was significant for both immediate and delayed recalls, and the difference between good and poor readers was also significant for both immediate and delayed recalls.

Simple effects procedure was utilized to test the level of significance for each group under the two conditions of recall. Table IX shows the results of simple effects for the three groups.

TABLE IX  
THE RESULTS OF SIMPLE EFFECTS OF CONDITION  
ON GOOD, AVERAGE, AND POOR READERS

SOURCE OF VARIATION	DF	F VALUE	P
Immediate Free Recall			
Condition Within Group 1 (Good)	1	7.717	.007
Condition Within Group 2 (Average)	1	8.626	.004
Condition Within Group 3 (Poor)	1	2.164	.145*
Delayed Free Recall			
Condition Within Group 1 (Good)	1	12.130	.001
Condition Within Group 2 (Average)	1	9.541	.003
Condition Within Group 3 (Poor)	1	1.141	.289*

\* Non-significant

The signaling devices helped the groups of good and average readers to recall significantly more information both in their immediate and delayed recalls. The group of poor readers, however, was not affected by the presence of signaling devices both for immediate and delayed recalls; thus, hypothesis 3 was not supported.

In her study of native English speakers, Meyer (2) found that the signaling devices helped only the students of average reading ability. The results shown in Table VIII tend to suggest that non-native speakers appear to be different in this respect.

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## CHAPTER V

### SUMMARY, FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS

The purpose of this study was to examine the effect of text structure and certain signaling devices on recall of freshman Arabic-speaking students of varying reading abilities.

Subjects for this study were forty-five freshman Arabic-speaking students enrolled in ENGL 1000, ENGL 1312, and ENGL 1322 courses at North Texas State University during the Fall 1985 semester.

The instruments used in this study were as follows:

(1) the Reading Comprehension Section of the TOEFL, which was given to determine the reading levels of the subjects, and (2) two well-organized passages, adapted for this study, with clearly identifiable text structures. Two versions of each passage were written— one with the signaling devices included in the passage, and the other with the signaling devices deleted.

Three hypotheses were tested in this study. Hypothesis I, which predicted that good readers would be able to recognize and utilize the original text structure at a significantly higher level than the average and poor readers, was supported. Good readers utilized the original organization of the passage at a significantly higher level than the average and poor readers. The difference between groups was significant

at the .03 level for the immediate recall and at the .01 level for the delayed recall.

Hypothesis II, which predicted that students who followed the original text structure would recall more information in their immediate and delayed recalls than those who failed to do so, was supported. The students in all three groups who utilized the original structure of the passage in their immediate and delayed recalls were able to recall significantly more information than those who did not. The difference was significant at the .01 level for both immediate and delayed recalls.

Hypothesis III, which predicted that the subjects in all three groups would remember significantly more information from the passage with the signaling devices than from the passage without the signaling devices, was not supported. Signaling devices helped only the good and average readers to recall more information both in immediate and delayed recalls, while the group of poor readers was not affected by the presence of the signaling devices both in immediate and delayed recalls.

### Findings

A number of findings related to the use of text structure resulted from this study.

1. The majority of good readers was able to identify and use the rhetorical organization of the text they read. Seventy-eight percent of good readers consistently followed



this strategy in their immediate and delayed recalls. Only this group experienced no decline over time.

2. Sixty per cent of the average readers were able to identify and utilize the original structure of the text in their immediate recall and 53% did so in their delayed recall.

3. Only 31% of poor readers utilized the original text structure in their immediate recall and 25% still did so in their delayed recall.

4. Utilization of the original rhetorical organization of the text facilitated recall and retention of all the subjects in the three experimental groups (see Appendix C). This finding supported Carrell's (2) findings concerning non-native speakers from different language backgrounds. It also confirmed Meyer's (5) findings in her study of native speakers of English.

5. The presence of certain signaling devices helped good and average readers to recall significantly more content from the passage and retain it longer. However, the group of poor readers was not affected by the presence of signaling devices. They did equally poorly whether or not the passage they read contained the signaling devices.

In their study of native speakers of English, Meyer, Brandt, and Bluth found that the presence of signaling devices in a passage helped only the average readers to recall more information from the text. One interpretation of the difference in the results might be that the "good" non-native

reader is possibly closer to the average native speaker's ability, and thus the subjects performed accordingly.

### Conclusions

The ability to use the text structure appears to be an important strategy for remembering information in text. Explicit training of the students in identifying different rhetorical organizations seems to be very helpful in facilitating reading comprehension. To examine this hypothesis, Meyer (4) gave a group of ninth-graders a week of training in identifying and using four different rhetorical organizations. This group read and was tested for recall of texts on three occasions: before training, a day after training, and three weeks after training. A control group did the same tasks but received no instruction about the rhetorical organizations. The trained group could remember nearly twice as much content from the texts after their instruction (both one day after and three weeks after) than they could before; furthermore, the trained group performed nearly twice as well as the control group after instruction. The research findings of this study, along with Carrell's findings, indicate that non-native speakers are not different from native speakers in this regard. Training non-native speakers in identifying and utilizing different rhetorical organizations might facilitate their reading comprehension, helping them to remember more content from texts and to retain it longer.

Two implications for teaching writing can be inferred from those findings: first, explicit training of the students in identifying different rhetorical organizations in composition classes may help the students to organize their ideas according to a plan. Second, if the identification of the rhetorical structure of the text facilitates reading comprehension as indicated by research findings, then explicit teaching of different rhetorical organizations in composition classes might help writers give this facility to their readers.

Another major finding of this study was the effect of signaling devices on recall. Signaling facilitated recall and retention for both good and average readers. This implies that teaching the students how the signaling devices function in relating new information to old information in a text might facilitate reading comprehension. This finding also implies a parallel need in writing instruction so that students may be able to clarify their ideas, thereby, giving their readers the facility in reading comprehension. Stressing the importance of signaling, Meyer (4) says that "to reach the much larger audiences of average readers, a writer ought to include signaling at strategic points, to reveal the major hierarchy of superordination and subordination" (p. 71). Zamel (6) points out that "despite the critical role that conjuncts play in writing, English language students are not always able to take advantage of

them. This may be primarily because they have not been taught to identify them during reading instruction or to use them correctly in their writing" (p. 111).

#### Recommendations

The only empirical studies which have actually examined the effectiveness of reading instruction that is focused on text structure have been done for native speakers of English (1, 3). More research of this nature is now needed in the area of ESL reading and writing instruction.

More research is also needed to examine the effect of text structure and signaling devices on recall of non-native speakers from different language backgrounds other than Arabic.

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## APPENDIX A

### The With-signaling Version of the Supertankers Passage

A problem of vital concern is the prevention of oil spills from supertankers. A typical supertanker carries a half-million tons of oil and is the size of five football fields. A wrecked supertanker spills oil in the ocean; this oil kills animals, birds, and microscopic plant life. For example, when a tanker crashed off the coast of England, more than 200,000 dead seabirds washed ashore. Oil spills also kill microscopic plant life which provide food for sea life and produce 70 percent of the world's oxygen supply. Most wrecks result from the lack of power and steering equipment to handle emergency situations, such as storms. Supertankers have only one boiler to provide power and one propeller to drive the ship.

The solution to the problem is not to immediately halt the use of tankers on the ocean since about 80 percent of the world's oil supply is carried by supertankers. Instead, the solution lies in the training of officers of supertankers, better building of tankers, and installing ground control stations to guide tankers near shore. First, officers of supertankers must get top training in how to run and maneuver their ships. Second, tankers should be built with

## Appendix A-Continued

several propellers for extra control and backup boilers for emergency power. Third, ground control stations should be installed at places where supertankers come close to shore. These stations would act like airplane control towers, guiding tankers along busy shipping lanes and through dangerous channels.

The Without-Signaling Version of  
the Supertankers Passage

Prevention is needed of oil spills from supertankers. A typical supertanker carries a half-million tons of oil and is the size of five football fields. A wrecked supertanker spills oil in the ocean; this oil kills animals, birds, and microscopic plant life. When a tanker crashed off the coast of England, more than 200,000 dead seabirds washed ashore. Oil spills kill microscopic plant life which provide food for sea life and produce 70 percent of the world's oxygen supply. Most wrecks result from the lack of power and steering equipment to handle emergency situations, such as storms. Supertankers have only one boiler to provide power and one propeller to drive the ship.

An immediate halt of the use of tankers on the ocean is not possible since about 80 percent of the world's oil supply is carried by supertankers. Officers of supertankers must get top training in how to run and maneuver their ships. Tankers should be built with several propellers for extra

## Appendix A-Continued

control and backup boilers for emergency power. Ground control stations should be installed at places where super-tankers come close to shore. These stations would act like airplane control towers, guiding tankers along busy shipping lanes and through dangerous channels.



## APPENDIX B

### The With-Signaling Version of The Dehydration Passage

A serious problem is the loss of body water frequently required by athletic coaches of wrestlers, boxers, judo contestants, karate contestants, and 150-pound football team members so that they will attain specified body weights. These specified weights are considerably below the athletes' usual weights.

A solution to this problem is immediate dismissal by school boards of athletic coaches who require loss of body water. This step must be taken due to the fact that the loss of body water impairs cardio-vascular functioning limiting work capacity. More specifically, a loss of three percent of body water impairs physical performance and a loss of five percent results in heat exhaustion. Moreover, a loss of seven percent of body water causes hallucinations. Losses of ten percent or more of body water result in heat stroke, deep coma, and convulsions; if not treated death will result.

### The Without-Signaling version of the Dehydration Passage

The loss of body water is frequently required by athletic coaches of wrestlers, boxers, judo contestants, karate

## Appendix B-Continued

contestants, and 150-pound football team members to attain specified body weights. These weights are below the athletes' usual weights.

School boards should immediately dismiss athletic coaches who require loss of body water. The loss of body water impairs cardio-vascular functioning limiting work capacity. A loss of three percent of body water impairs physical performance and a loss of five percent results in heat exhaustion. A loss of seven percent of body water causes hallucinations. Losses of ten percent or more of body water result in heat stroke, deep coma, and convulsions; if not treated, death will result.

## APPENDIX C

### Samples of Students' Recalls

The following is a sample of a good reader's immediate recall of the Supertankers passage:

Oil spills from tankers is a serious environmental problem. An oil spill from a tanker, which is as large as five football grounds could kill a lot of marine life. For example, an oil tanker by the English coast which caused an oil spill was able to kill 200,000 marine life. It could also kill the microorganisms which could supply us with oxygen and which acts as food for marine animals. Oil spills are caused by the ship manoeuvres and its dependence upon one boiler and one propeller.

The solution to that problem is not to bank tankers from travelling across the seas, as 80% of world oil supplies is delivered through those tankers. It would be a solution to this problem if officers were highly trained and if an additional propeller and boiler added. A control center acting as the control tower for airplanes could be established to lead the ships when its at shore.

The following is a sample of a good reader's delayed recall of the Dehydration passage:

Some athletic coaches of wrestlers, boxers, judo competitors, karate competitors, and football players require

## Appendix C-Continued

their athletes to lose some body water to attain a certain weight. This weight is below the usual weight of the athletes.

School boards should fire those coaches who do this. The loss of water from the body impairs the function of the cardio-vascular which reduces the physical capability of the body. A loss of 3% of body water causes loss of physical ability and a loss of 5% of body water causes heat exhaustion. A loss of 7% of body water causes hallucinations. A loss of 10% or more of body water cause heat stroke, deep coma and convulsions which if not treated would cause death.

The following is a sample of an average reader's immediate recall of the Dehydration passage:

The loss of body water is sometimes required by coaches of wrestlers, boxing, karate and football athletes of 150-pound. This body water loss is usually done to maintain a specific weight. School board should dismiss those coaches. A loss of three percent of body water will effect the performance of the athlete. A loss of five percent will result in heat exhaustion and a loss of seven percent will result in halousination. A loss of ten percent will result in a heat strock and a deep coma and will result in the death of the athlete.

The following sample is from an average reader's delayed recall of the Supertankers passage:

## Appendix C-Continued

There should be a prevention of oil spilling in the water and seas. The wrecked supertankers cause the spilling of oil into the water causing the death of many sea animals and plants life and microscopic plants, and birds. These microscopic plants provide the humans with 70% of the oxygen.

For example, the supertanker crash near England caused the death of many sea birds. The wrecks happens in the supertankers because there is only one boiler and one engine to generate the power and this can't help in the emergency situations. 80% of the world oil is transported by supertankers so we have to do some improvements to prevent oil lost in the water. Supertankers must be built with more boilers and engines to resist emergency situations. Also ground control stations must be built in a way that can contact the ships in an efficient way to lead them through the channels especially the dangerous ports.

The following is a sample of a poor reader's immediate recall of the Dehydration passage:

Lack of the water in the athlete's body is a serious problem.

3% lack of water cause body heate.

5% lack of water cause helosination.

7% lack of water cause a serious problems, if not treated it may cause death.

## Appendix C-Continued

The following is a sample of a poor reader's delayed recall of the Supertankers passage:

Prevention is needed of spills oil from supertankers which it carries half million of oil and its size equal to five football fields. Supertankers spills oil in the ocean and killed animals, birds, and micro plant which is more quantity oxygen come from it.

Officers study this problem and try to find the solution to it.

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