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COHESION IN TEXT DIFFERENTIATION:

A STUDY OF ENGLISH AND ARABIC

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This copy of the thesis has been supplied on condition that anyone who consults it is understood that its copyright rests with its author and that no quotation from the thesis and no information derived from it may be published without the author's prior, written consent.
This thesis sets out to investigate the role of cohesion in the organisation and processing of three text types in English and Arabic. In other words, it attempts to shed some light on the descriptive and explanatory power of cohesion in different text typologies. To this effect, three text types, namely, literary fictional narrative, newspaper editorial and science were analysed to ascertain the intra- and inter-sentential trends in textual cohesion characteristic of each text type in each language. In addition, two small scale experiments which aimed at exploring the facilitatory effect of one cohesive device (ie. lexical repetition) on the comprehension of three English text types by Arab learners were carried out. The first experiment examined this effect in an English science text; the second covered three English text types, ie. fictional narrative, culturally-oriented and science.

Some interesting and significant results have emerged from the textual analysis and the pilot studies. Most importantly, each text type tends to utilize the cohesive trends that are compatible with its readership, reader knowledge, reading style and pedagogical purpose. Whereas fictional narratives largely cohere through pronominal co-reference, editorials and science texts derive much cohesion from lexical repetition. As for cross-language differences English opts for economy in the use of cohesive devices, while Arabic largely coheres through the redundant effect created by the high frequency of most of those devices. Thus, cohesion is proved to be a variable rather than a homogeneous phenomenon which is dictated by text type among other factors. The results of the experiments suggest that lexical repetition does facilitate the comprehension of English texts by Arab learners. Fictional narratives are found to be easier to process and understand than expository texts. Consequently, cohesion can assist in the processing of text as it can in its creation.

KEY WORDS

COHESION TEXT PROCESSING

ENGLISH ARABIC
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# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SUMMARY</strong></td>
<td>2</td>
</tr>
<tr>
<td><strong>ACKNOWLEDGEMENTS</strong></td>
<td>3</td>
</tr>
<tr>
<td><strong>INTRODUCTION</strong></td>
<td>10</td>
</tr>
<tr>
<td><strong>CHAPTER ONE: Review of the Related Literature</strong></td>
<td>17</td>
</tr>
<tr>
<td>1.0 Introduction</td>
<td>17</td>
</tr>
<tr>
<td>1.1 Cohesive devices: descriptive taxonomies</td>
<td>19</td>
</tr>
<tr>
<td>1.2 Role of cohesion in text</td>
<td>22</td>
</tr>
<tr>
<td>1.2.1 Issues of linguistic descriptions of cohesion</td>
<td>22</td>
</tr>
<tr>
<td>1.2.2 Issues in text processing</td>
<td>32</td>
</tr>
<tr>
<td>1.2.2.1 Models of text processing</td>
<td>32</td>
</tr>
<tr>
<td>1.2.2.2 Bottom-up processing models</td>
<td>37</td>
</tr>
<tr>
<td>1.2.2.3 Top-down processing models</td>
<td>40</td>
</tr>
<tr>
<td>1.2.3 Issues in psycholinguistic description of cohesion</td>
<td>44</td>
</tr>
<tr>
<td>1.2.3.1 Role of cohesion in text processing</td>
<td>45</td>
</tr>
<tr>
<td>1.2.3.2 de Beaugrande’s taxonomy of role of cohesive devices in text processing</td>
<td>50</td>
</tr>
<tr>
<td>1.2.3.2.1 Recurrence</td>
<td>51</td>
</tr>
<tr>
<td>1.2.3.2.2 Definiteness</td>
<td>51</td>
</tr>
<tr>
<td>1.2.3.2.3 Co-reference via pro-forms</td>
<td>52</td>
</tr>
<tr>
<td>1.2.3.2.4 Exophoric reference</td>
<td>52</td>
</tr>
<tr>
<td>1.2.3.2.5 Ellipsis</td>
<td>53</td>
</tr>
<tr>
<td>1.2.3.2.6 Junction</td>
<td>53</td>
</tr>
<tr>
<td>1.2.4 Experimental work on cohesion</td>
<td>54</td>
</tr>
<tr>
<td>1.2.4.1 Cohesion as a cognitive index</td>
<td>54</td>
</tr>
<tr>
<td>1.2.4.2 Cohesion as a social index</td>
<td>55</td>
</tr>
<tr>
<td>1.2.4.3 Cohesion as an index of age</td>
<td>56</td>
</tr>
<tr>
<td>1.2.5 Experimental work on text-type processing</td>
<td>56</td>
</tr>
<tr>
<td>1.2.6 Overview of role of cohesion in text processing</td>
<td>57</td>
</tr>
<tr>
<td>1.2.7 Unresolved issues</td>
<td>58</td>
</tr>
<tr>
<td>1.3 Focus of the present study</td>
<td>58</td>
</tr>
<tr>
<td><strong>CHAPTER TWO: Cohesion in Arabic</strong></td>
<td>60</td>
</tr>
<tr>
<td>2.0 Introduction</td>
<td>60</td>
</tr>
<tr>
<td>2.1 Reference in Arabic</td>
<td>65</td>
</tr>
<tr>
<td>2.1.1 Personal reference</td>
<td>65</td>
</tr>
<tr>
<td>2.1.2 Demonstrative reference in Arabic</td>
<td>73</td>
</tr>
<tr>
<td>2.1.3 Comparative reference in Arabic</td>
<td>79</td>
</tr>
</tbody>
</table>
2.2 Substitution and ellipsis in Arabic

2.2.1 Substitution
   2.2.1.1 Nominal substitution
   2.2.1.2 Verbal substitution
   2.2.1.3 Clausal substitution
2.2.2 Ellipsis
   2.2.2.1 Nominal ellipsis
   2.2.2.2 Verbal ellipsis
   2.2.2.3 Clausal ellipsis

2.3 Conjunction in Arabic
2.4 Lexis in Arabic
2.5 The notion of sentence in Arabic
2.6 Summary
2.7 Orientation

CHAPTER THREE: Trends in Textual Cohesion in English and Arabic

3.0 Introduction
3.0.1 Choice of texts for analysis
3.0.2 Text-type and readership
3.1 The database
   3.1.1 Sources
   3.1.2 Size of the corpus
   3.1.3 The analytical unit
   3.1.4 Grammatical versus lexical density
3.2 Results of the analysis
3.3 Cohesion: frequency in English and Arabic
3.4 Differences between text types across English and Arabic
   3.4.1 Co-reference
   3.4.1.1 Linguistic and rhetorical interpretation
   3.4.1.2 Cognitive interpretation
   3.4.2 Substitution and ellipsis
   3.4.3 Conjunction
   3.4.3.1 Linguistic and rhetorical interpretation
   3.4.3.2 Cognitive interpretation
   3.4.4 Lexis
   3.4.4.1 Linguistic interpretation
   3.4.4.2 Cognitive interpretation
3.5 Differences between English and Arabic across text-type
   3.5.1 Co-reference
   3.5.1.1 Linguistic and rhetorical interpretation
   3.5.1.2 Cognitive interpretation
   3.5.2 Conjunction
   3.5.2.1 Linguistic and rhetorical interpretation
   3.5.2.2 Cognitive interpretation
   3.5.3 Lexis
### 3.5.3.1 Linguistic and rhetorical interpretation

<table>
<thead>
<tr>
<th>3.5.3.2 Cognitive interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>165</td>
</tr>
<tr>
<td>167</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>3.6 Summary</th>
</tr>
</thead>
<tbody>
<tr>
<td>169</td>
</tr>
</tbody>
</table>

### CHAPTER FOUR: Cohesive Function of Parallel Structure

<table>
<thead>
<tr>
<th>4.0 Introduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>173</td>
</tr>
<tr>
<td>4.1 Function of parallelism</td>
</tr>
<tr>
<td>178</td>
</tr>
<tr>
<td>4.2 Parallelism in Arabic</td>
</tr>
<tr>
<td>179</td>
</tr>
<tr>
<td>4.3 Parallel structure in English and Arabic text-types</td>
</tr>
<tr>
<td>183</td>
</tr>
</tbody>
</table>

| 4.3.1 Parallel structure in English and Arabic narratives |
| 184              |
| 4.3.2 Parallel structure in English and Arabic editorials |
| 191              |
| 4.3.3 Parallel structure in English and Arabic science texts |
| 194              |

| 4.4 Psycholinguistic implications of parallel structure |
| 197              |
| 4.5 Summary     |
| 199              |

### CHAPTER FIVE: Cohesive Role of Thematic Patterns

<table>
<thead>
<tr>
<th>5.0 Introduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>202</td>
</tr>
<tr>
<td>5.1 Nature of thematic structure</td>
</tr>
<tr>
<td>202</td>
</tr>
<tr>
<td>5.2 Thematic patterns in English and Arabic text-types</td>
</tr>
<tr>
<td>210</td>
</tr>
</tbody>
</table>

| 5.2.1 Thematic patterns in English and Arabic narratives |
| 210              |
| 5.2.2 Thematic patterns in English and Arabic editorials |
| 215              |
| 5.2.3 Thematic patterns in English and Arabic science texts |
| 221              |

| 5.3 Psycholinguistic implications of thematic patterns |
| 224              |
| 5.4 Summary     |
| 226              |

### CHAPTER SIX: Experimental Study of Role of Cohesion in Text Comprehension

<table>
<thead>
<tr>
<th>6.0 Introduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>228</td>
</tr>
<tr>
<td>6.1 Overview of experimental work on cohesion</td>
</tr>
<tr>
<td>229</td>
</tr>
<tr>
<td>6.2 Experimental studies of cohesion</td>
</tr>
<tr>
<td>231</td>
</tr>
<tr>
<td>6.3 Experiment 1: Hypothesis</td>
</tr>
<tr>
<td>231</td>
</tr>
</tbody>
</table>

| 6.3.1 Choice of texts |
| 231              |
| 6.3.2 Subjects   |
| 232              |
| 6.3.3 Procedure  |
| 232              |
| 6.3.4 Results    |
| 233              |
| 6.3.5 Discussion |
| 234              |
6.4 Experimental 2: Hypothesis
  6.4.1 Choice of texts
  6.4.2 Subjects
  6.4.3 Procedure
  6.4.4 Results
  6.4.5 Discussion

6.5 Pedagogical implications
6.6 Summary and Conclusions

CHAPTER SEVEN: Summary and Conclusions

7.1 summary
  7.1.1 Cross-text type results
  7.1.2 Cross-language results
  7.1.3 Results of experimental study

7.2 Conclusions
7.3 Future Research

APPENDIX A: English Texts Analyzed

APPENDIX B: Arabic Texts Analyzed

APPENDIX C: Texts used in Experimental Study

REFERENCES
# List of Tables

<table>
<thead>
<tr>
<th>Table</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Table 1</td>
<td>Arabic Personal Pronouns</td>
<td>69</td>
</tr>
<tr>
<td>Table 2</td>
<td>Arabic demonstratives</td>
<td>73</td>
</tr>
<tr>
<td>Table 3</td>
<td>Arabic conjunctions</td>
<td>94</td>
</tr>
<tr>
<td>Table 4</td>
<td>Arabic conjunctions equivalent to Halliday and Hasan’s (1976)</td>
<td>97</td>
</tr>
<tr>
<td>Table 5</td>
<td>Lexical and grammatical density in English and Arabic texts</td>
<td>127</td>
</tr>
<tr>
<td>Table 6</td>
<td>Frequency of grammatical co-reference in English and Arabic texts</td>
<td>137</td>
</tr>
<tr>
<td>Table 7</td>
<td>Frequency of conjunction in English and Arabic texts</td>
<td>146</td>
</tr>
<tr>
<td>Table 8</td>
<td>Frequency of substitution and ellipsis in English and Arabic texts</td>
<td>144</td>
</tr>
<tr>
<td>Table 9</td>
<td>Frequency of lexis in English and Arabic texts</td>
<td>150</td>
</tr>
<tr>
<td>Table 10</td>
<td>Intra- and inter-sentential parallel structure per 3,000 words in each English and Arabic text-type</td>
<td>183</td>
</tr>
<tr>
<td>Table 11</td>
<td>Scores of both groups of experiment 1</td>
<td>233</td>
</tr>
<tr>
<td>Table 12</td>
<td>Student’s scores in the Reading Experimental Control Group (CG) and Experimental Group (BG)</td>
<td>238</td>
</tr>
<tr>
<td>Table 13</td>
<td>Mean scores, standard deviation and t value of the students’ scores in Control Group (CG) and Experimental Group (EC)</td>
<td>239</td>
</tr>
</tbody>
</table>
Transcription Convention

In an attempt to use a transcription convention which can be simple for both decoding and printing the Arabic texts, and which closely approximates to the spelling of written Modern Standard Arabic, many earlier studies have been drawn on (Beeston, 1970; Wher, 1980; Bulos, 1965; Williams, 1982; Al-Jubouri, 1983). The slight deviation here is, however, that the Glottal Stop /'/ is omitted from initial position and retained elsewhere. The reason is that it can be pronounced without explicit realisation as is the case with the indefinite article (an) or the preposition (in) in English. It should be noted that the colon (:) after a vowel represents a long vowel sound. Repetition of the same consonant (eg. a Babba = he loved) means a geminated letter. The following list includes only those Arabic sounds which either have no equivalent or may be written differently in English.

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>/'/</td>
<td>Glottal Stop</td>
</tr>
<tr>
<td>/g/</td>
<td>Voiced laryngeal fricative</td>
</tr>
<tr>
<td>/ɡ/</td>
<td>Voiced velar fricative</td>
</tr>
<tr>
<td>/ˈ/</td>
<td>Voiceless laryngeal fricative</td>
</tr>
<tr>
<td>/x/</td>
<td>Voiceless velar fricative</td>
</tr>
<tr>
<td>/ɡ/</td>
<td>Voiceless pharyngeal stop</td>
</tr>
<tr>
<td>/d/</td>
<td>Voiced interdental fricative</td>
</tr>
<tr>
<td>/t/</td>
<td>Voiceless dental-alveolar fricative</td>
</tr>
<tr>
<td>/d̪/</td>
<td>Emphatic voiced dental stop</td>
</tr>
<tr>
<td>/t̪/</td>
<td>Emphatic voiceless dental stop</td>
</tr>
<tr>
<td>/æ/</td>
<td>Emphatic voiced dental fricative</td>
</tr>
<tr>
<td>/s̪/</td>
<td>Emphatic voiceless alveolar fricative</td>
</tr>
<tr>
<td>/ʃ/</td>
<td>Voiceless palatal groove fricative.</td>
</tr>
</tbody>
</table>
INTRODUCTION

Recent upsurge in the study of connected discourse has motivated an ongoing debate as to what makes a text and distinguishes it from a non-text and the way in which this text is processed and understood. The unity of text has been largely associated with some overt linguistic markers called cohesive devices. For Halliday and Hasan (1976), the cohesive "ties" of Reference, Substitution, Ellipsis, Conjunction and Lexis provide a string of sentences with texture which enables them to hold together as a unified text. Thus, cohesion which is realised by those surface signals is a textual phenomenon that is "common to text type of every kind" and as such it is "what makes a text a text" (ibid:13) and differentiates it from non-text. At the other extreme, cohesion is deemed neither necessary nor sufficient for the creation and identification of text (Brown and Yule, 1983). A text can be coherent without being cohesive (Widdowson, 1978). On the other hand, the presence of cohesion does not necessarily ensure textual well-formedness (Enkvist 1978). However, a more moderate view of cohesion has been put forward by de Beaugrande (1980). For him, the functional unity of text requires the presence of seven standards, ie. cohesion, coherence, intentionality, acceptability, situationality, intertextuality and informativity. Thus, cohesion is no more than one `standard of textuality' and not the sole factor in text creation. This dispute suggests the lack of a unanimous and well-defined theory of cohesion regarding its role in the organisation of text.

Neither is there such a definite theory concerning the role of cohesion in the processing of text. Rather, some processing models
have thrown some light on the manner in which certain cohesive devices (e.g. pronouns, noun phrases and ellipsis) are processed (Clark and Haviland, 1977; Sanford and Garrod, 1981, 1982; Mitchell, 1982; Tennant, 1981 among others). In addition, sporadic experimental work has examined how certain cohesive devices are utilized by different subjects (Fine, 1985; Rochester and Martin, 1977; McClure and Geva, 1983; Freebody and Anderson, 1981; Chapman, 1979, 1983; Karmiloff-Smith, 1977; Goddin and Perkins, 1982; Hartnett, 1981 among others). However, the only available taxonomy of the role of cohesion in text processing has been offered by de Beaugrande (1980). Again, he suggests that cohesive devices contribute to the principles of economy and stability which are crucial to the efficient processing of text. The above discussion points to the pressing need for more experimental work so that the explanatory power of cohesion can be adequately attested. It is firmly held here that until this explanatory power is detected, cohesion will remain a descriptive taxonomy void of any theoretical status.

This thesis sets out to shed some light on the role of cohesion in the organisation and processing of text. Thus, it attempts to further illuminate the descriptive and explanatory force of cohesion. Contrary to what is held about the homogeneity of cohesion, this textual phenomenon is conceived of in this study as a variable phenomenon that is determined by text-type among other factors. To validate such a claim, cohesion is examined here in three text types and in two languages, i.e. English and Arabic. The three text types selected are: literary fictional narrative, newspaper editorial and science. This selection is based on the desire to compare three text types which can be easily identifiable in terms of
their readership, reader knowledge, reading style and pedagogical purpose. And in order to ensure maximal comparability across English and Arabic the fictional narratives were selected from contemporary well-known authors in the two languages; the editorials were taken from newspapers written for the intelligentsia in both languages; and the science texts were extracted from introductory science textbooks meant for first year undergraduate students in English and Arabic.

In order to investigate the role of cohesion in the organization of different text types 60 texts (20 for each type and 10 for each language) were analysed. The analysis aimed at ascertaining the intra- and inter-sentential trends in textual cohesion characteristic of each text type and language. The method of analysis in this corpus largely draws on that proposed by Halliday and Hasan (1976) in their "Cohesion in English". However, two points of difference between the Halliday and Hasan taxonomy and their method of analysis and the one pursued here need to be pointed out. One is that the present taxonomy investigates parallelism and thematisation in addition to Halliday and Hasan's five cohesive devices cited above. Second is that whereas those linguists explore inter-sentential cohesion on the grounds that a clause is coherent by virtue of its structure, intra- and inter-sentential cohesion is analysed in this corpus. The present method is in agreement with other existing taxonomies (van Dijk, 1977; de Beaugrande, 1980; de Beaugrande and Dressler, 1981 among others). Still a major deviation from Halliday and Hasan's (1976) taxonomy is that exophoric cohesion which refers to extralinguistic entities is also considered here.

Two small-scale experimental studies were conducted to
account for the role of cohesion in the processing of text. The first study aimed at investigating the facilitatory effect of one cohesive device (i.e., lexical repetition) on the comprehensibility of English science texts by Arab learners. The population of the study was 10 Arab postgraduate students specialising in science at Aston University. The second study attempted to explore the effect of the same cohesive device on the comprehension of three English text types, namely, fictional narrative, culturally-oriented and science texts. 60 Arab undergraduate students specialising in English at Kuwait University undertook the second experiment.

Quite significant and unpredictable results have been yielded by the textual analysis and the experimental studies. Different text types are found to cohere differently. Whereas fictional narratives essentially cohere via pronominal co-reference, editorials and science texts derive much cohesion from lexis. Although in terms of their conjunctive relations the three text types demonstrate great similarity, the additive conjunction is significantly more frequent in fiction than in editorial and science. The three text types seem to resist ellipsis and substitution. Since these results apply equally to English and Arabic, cohesion can be said to be a variable textual phenomenon in the two languages. Its manifestation is dictated by text type among other factors.

Although Arabic and English display great similarity in terms of the distribution of most of the cohesive devices, both languages markedly differ in terms of the frequency of those devices. It has been found that whereas Arabic tends to utilize pronominal and demonstrative co-reference, the additive conjunction 'wa' (and), the causal 'fa' (so), lexical repetition and parallelism more frequently
than English, English uses comparative co-reference and lexical collocation relatively more than Arabic. Arabic also tends to repeat same themes in successive sentences while English, especially in editorials, uses semantically related themes.

Generally, the above results suggest that each text type and each language tend to utilize the cohesive device(s) most appropriate for its processing. Furthermore, the global trends in textual cohesion characteristic of each text type seem to be compatible with the factors cited above, i.e. readership, reader knowledge, reading style and pedagogical purpose.

The results of the experimental studies confirm the assumption that lexical cohesion can facilitate the comprehension of English texts by Arab learners (Berman, 1984). The opacity of text which results from heavy ellipsis and substitution is significantly alleviated by lexical repetition which is typical of the subjects' mother tongue. As for which text type is easier to process, the fictional narrative text rates the highest and quite unpredictably the culturally-oriented text the lowest. That a fictional narrative text is easier to process is not surprising because long exposure to narrative discourse of different types, and the maintainance of time order make subjects process and comprehend it easily (Britton and Graesser, 1980; Urquhart, 1984). The experience of subjects seems to affect processing and comprehending text. The postgraduate students specialising in science understood the science text better than the undergraduate students did.

These findings are interesting because they contradict the view that cohesion is a homogeneous phenomenon. They
also spell out some aspects of the explanatory power of cohesion. Contrary to the assumption that cohesion is neither necessary nor sufficient for textuality, cohesion has been shown to contribute to both the creation and processing of text, as other textual factors do. Besides, the results of the pilot study point to the pressing need of foreign learners of English to be appropriately acquainted with the potential resources of cohesion in this language, as Menke (1981) suggests.

However, the limited scope of this study leaves many unresolved issues open to future research. Future research may find it worthwhile to look at cohesive trends in a greater number of text types so as to further validate the variability of cohesion. Other languages may as well be studied in this respect. The facilitatory effect of each global cohesive trend in the respective text type may prove amenable to empirical verification. The impact of de Beaugrande's seven 'Standards of Textuality' on the organisation and processing of text can be scrutinised. These standards may be examined in different text types and languages. This can provide clues as to what kind of English texts should be studied by foreign learners.

**The Plan of the Thesis**

Chapter One reviews the related literature. It addresses the role of cohesion in the organisation and processing of text. It also points out the taxonomy of cohesion adopted in this corpus. Chapter Two examines the potential resources of cohesion in Arabic. The trends of textual cohesion in the three text types selected are presented in Chapter Three. Here, speculative cognitive
interpretations of global cohesive trends are attempted. Chapter Four and Five focus on Parallelism and Thematisation respectively. The results of the experimental study are reported in Chapter Six. Finally, Chapter Seven summarises the main findings and offers some conclusions and pointers for future research.
CHAPTER ONE

Review of the Related Literature

1.0 Introduction

Cohesion involves the phenomenon of intra-textual cross-reference and semantic connectivity

"The concept of cohesion is a semantic one; it refers to relations of meaning that exist within the text, and that define it as a text."
(Halliday and Hasan, 1976:4)

Or, as de Beaugrande (1980:19) puts it,

"Cohesion subsumes the procedures whereby surface elements appear as progressive occurrences such that their Sequential Connectivity is maintained and made recoverable."

The concept of ‘sentence-connectedness’ has been current at least since Quirk et al.’s (1973) treatment of the phenomenon in the creation of textuality, although the term ‘cohesion’ and its full development in terms of a comprehensive taxonomy, did not appear until Halliday and Hasan’s (1976) investigation of the subject.

This thesis sets out to show that cohesion is not a homogenous phenomenon, realised in identical fashion in all textual functions. Rather, it is inherently variable, and its manifestation can be correlated with global characteristics of communicative event or text type. Just as, within sociolinguistic studies, grammatical and phonological variables can be shown to vary with speaking task (reading word lists, prose text; interview; and casual conversation), so within discourse studies, cohesion can be shown to vary consistently with text type.
A second major concern of this thesis is to investigate the role of cohesion in the comprehension of text. Claims have been made about the importance of cohesion for textuality, or the semantic unity of text (Halliday and Hasan, 1976) which are at the very least debatable; if not actually without any theoretical or empirical basis. What is required is an answer to the question: why does cohesion exist at all, and what purpose does it serve in the cognitive processing of text? This thesis attempts to provide a limited answer to this question in the form of an investigation of reading comprehension in foreign language learners, with cohesion as the controlled variable.

Thus, this thesis addresses itself to the question of the variable realisation of cohesion, in relation to text type, and also to the question of the potential difference that cohesion makes to the comprehension of text. These two questions are cross-related in the empirical investigation reported in Chapter 6 of reading comprehension in foreign language learners, with cohesion as the controlled variable.

The organisation of this chapter is as follows:- Linguistic taxonomies for the classification of cohesive devices are first described in Section 1.1. Then in Section 1.2 theoretical concepts (such as exist) of the functions of cohesion in texts, together with the cognitive domain of the processing of text are approached, from the point of view of artificial intelligence, psycholinguistics and allied fields, and the significance of cohesion within cognitive studies of text is discussed. The chapter concludes with a brief discussion of the issues this thesis intends to resolve.
1.1 Cohesive devices: descriptive taxonomies

Cohesion is a semantic relation that holds between linguistic and extralinguistic entities in text and situation. This relation obtains when the interpretation of one linguistic element is to be sought elsewhere in the text or situation. This is an example.

(1.1) Wash and core six cooking apples. Put them in a fireproof dish.
(From Halliday and Hasan, 1976:2)

In this example, decoding the meaning of ‘them’ entails making recourse to ‘six cooking apples’ in the first sentence. Cohesion is represented by the semantic relation between ‘them’ and ‘six cooking applies.’ ‘Them’ is called a cohesive ‘tie’ (Halliday and Hasan, 1976). Cohesive relations are realised by a set of devices (i.e. ties) which are potentially inherent in the system of language.

For English Halliday and Hasan (1976) are thought to have produced the most comprehensive taxonomy of cohesive devices (Huddlestone, 1978). In what follows is a brief profile of Halliday and Hasan’s (1976) (henceforth H & H) descriptive taxonomy of cohesive devices.

1. Reference
   1.1 Pronominals: he, she, it, they, etc.
   1.2 Demonstratives: this/these, that/those, etc.
   1.3 Comparatives: same, such, different, etc.

2. Substitution
   2.1 Nominal substitutes: one/ones, the same, so
   2.2 Verbal substitutes: do, be, have, do so, etc.
   2.3 Clausal substitutes: so, not.
3. **Ellipsis**
   3.1 Nominal ellipsis: deictic, numerative, epithet
   3.2 Verbal ellipsis: lexical, operator
   3.3 Clausal ellipsis: propositional, modal, general
   3.4 Zero.

4. **Conjunction**
   4.1 Additive: and, furthermore, etc.
   4.2 Adversative: yet, however, etc.
   4.3 Causal: so, consequently, etc.
   4.4 Temporal: then, hitherto, etc.
   4.5 Continuative: now, of course, etc.

5. **Lexis**
   5.1 Lexical reiteration: same item, synonym, superordinate and general term, eg. boy/boy.
   5.2 Lexical collocation: any pair of lexical items which stand to each other in some consistent semantic relation eg. boy/girl.

(These terms are not used here. See criticism p.26)

The above list is by no means exhaustive (for a full discussion see H & H, 1976). However, two points need to be made at this stage. First, H & H consider cohesion as a relation obtaining inter-sententially. Therefore, some cohesive devices which connect clauses intra-sententially (i.e. subordinating conjunctions) are excluded from their taxonomy. Second, since exophoric co-reference is also excluded from their taxonomy, first and second person pronounals are ignored by them. This thesis, however, accommodates all the coordinating and subordinating conjunctions and first and second person pronounals, because it attempts to investigate intra- as well as inter-sentential cohesive links and cohesion here captures both linguistic and extralinguistic entities.
Other taxonomies of cohesion include, besides the above devices, two important cohesive ties. These are: Parallel Structure (Quirk et al, 1973; de Beaugrande, 1980; de Beaugrande and Dressler, 1981; Hartnett, 1981; Koch, 1981, 1983; among others) and Thematic Patterns (Enkvist, 1978; Williams, 1982, 1983; Grimes, 1975 among others). These two devices, which are investigated in this study, are spelled out below.

**Parallel Structure**

1. Single words: nouns, verbs, adjectives, adverbs and participles.
2. Phrases: prepositional, infinitive, participle and gerund.
3. Clauses: noun, adjective, adverb.
4. Sentences

It should be noted that only parallel clauses and sentences are examined in this thesis.

**Thematic Patterns**

1. Single linear progression of themes derived from immediately preceding rhemes.
2. Progression of same themes, and
3. Progression of derived themes (ie there is one 'hypertheme' and several 'teilthemen')

(for full discussion, see Enkvist, 1973; 120-1)

In order for a taxonomy of cohesion to exhaust the potential resources a language has for intra- and inter-sentential connectedness, to a great extent, all the above cohesive devices must be accommodated. Such a taxonomy is adopted here.
1.2 Role of cohesion in text

As stated above (1.0), this section addresses itself to the functions of cohesion as seen by linguists, psycholinguistics and workers within artificial intelligence. In other words, it is primarily concerned with discussing the role cohesion can play in the organisation and processing of text.

1.2.1 Issues in linguistic descriptions of cohesion

Study of the variability of cohesion as an aspect of textuality is made problematic by the lack of a unanimous view as to its nature and role in text making. Linguists have shown varying conceptions in this concern. At one extreme, cohesion is held to be the most significant contributor to the unity and continuity of discourse (H & H, 1976). At the other extreme, it is considered neither necessary nor sufficient for the creation and identification of text (Brown and Yule, 1983).

For H & H (1976), cohesion provides text with its texture, and as such it distinguishes a text from a non-text. This textual phenomenon they argue, is essential for the semantic connectivity of text, and without it a sequence of sentences fails to stand as text. Although H & H recognize other textual factors in text making such as “information structure” and “thematic patterns”, they insist on the exigency of the overt embodiment of cohesion which is “the most important, since it is common to text of every kind and is, in fact, what makes a text a text” (ibid:13).

A linguist’s view of cohesion is very much affected by the way he conceives of text. For H & H, a text is merely a conglomeration of linguistic entities which are tied to each other by
cohesive devices. For de Beaugrande (1980), on the other hand, a text is a `multi-level entity of language` which should satisfy certain requirements. These he calls `standards of textuality`. Cohesion is no more than one standard, six others being required: `coherence, intentionality, acceptability, situationality, intertextuality and informativity` (ibid:19). What identifies a non-text, for him, is one in which those standards are `strongly violated`.

In fact, de Beaugrande (1980) offers a more operational view of cohesion than H & H (1976). His set of cohesive devices captures both linguistic and extralinguistic entities. This is logical, in that a text derives much of its relevance from a `current` and `recoverable` context of situation. Cohesive devices, he suggests, are tied up and dependent on conceptual coherence (Carrell, 1982). After all, it is the semantic relation underlying a cohesive tie that incorporates connectivity into text (Brown and Yule, 1983). Those devices are made useful by virtue of the assumption that "the text is coherent" (de Beaugrande, 1980:134). Thus, unlike Hasan (1984), who views the coherence of text as contingent upon cohesive devices, de Beaugrande suggests that coherence can be achieved without them.

Two points need to be made at this point: first, as Widdowson (1978:29) demonstrates, a text without cohesive ties can maintain semantic continuity.

(1.2) A. That's the telephone.
B. I'm in the bath.
A. O.K.
This text is coherent without being cohesive. Its semantic connectivity is provided by the connectedness of the illocutionary acts which underlie its propositions.

The converse of this is also true. The presence of cohesive devices does not necessarily ensure semantic connectivity. Here is an example:

(1.3) I bought a Ford. The car in which president Nelson rode down the Champs Elysees was black. Black English has been widely discussed. The discussions between the Presidents ended last week. A week has seven days. Every day I feed my cat. Cats have four legs. The cat is on the mat. Mat has three letters.

(Enkvist, 1978:10)

Despite the presence of cohesive lexical items, this text is ill-formed. The distinction between 'ill-formed' text and 'well-formed' text is inseparable from and dependent on coherence (Enkvist, 1978).

The above examples invalidate H & H's (1976) claim that cohesion can alone create the texture of text. In fact, H & H's model of cohesion has come under fire from linguists who either disagree with them on the nature and function of cohesion or find some of their categories of cohesion rather inappropriately defined. H & H (1976:31), for example, view cohesion to lie in the "continuity of reference". Hasan (1984:22) recognizes a set of reference chains (ie. 'identity chain' and 'similarity chain') which integrate continuity in text by virtue of the "lexical and grammatical cohesive patterns" they incorporate into it.

Reference, for H & H (1976), holds between linguistic elements within the textual environment. It therefore subsumes endophoric relations (ie. anaphoric and cataphoric) and excludes any exophoric reference which connects linguistic elements with the
objects representing them in the real world. In this way, H & H view text in dissociation from its social context, unlike de Beaugrande, Enkvist, Brown & Yule and others.

Reference is sometimes associated with 'sense' (Lyons, 1977, 1982), discourse utterances or speech acts (Levinson, 1983) and with experience (Palmer, 1976). Thus, referential relations can embrace both linguistic and extralinguistic entities (Kempson, 1977; Stubbs, 1983; van Dijk, 1977; de Beaugrande, 1980; Huddleston, 1978).

H & H (1976) also insist on the exigency of the explicit realisation of reference and other cohesive devices. But reference can be either explicit or implicit. Implicit reference is seen to be "preferentially addressed by different referring expressions" (Sanford and Garrod, 1982:102). Similarly, conjunctive relations can be either explicit or implicit. When implicit, they appeal to the text user's pragmatic knowledge of the world which helps him make inferences and supply them. Moreover, a reader builds a mental representation of text (Schank, 1982), from which he can retrieve implicit referential relations (Brown and Yule, 1983). H & H do recognize implicit reference, but insist on its overt manifestation in text, a claim which attracts criticism.

In addition, H & H (1976) hold that reference implies 'specificity'. Brown and Yule (1983) argue that objects undergo a state of identity change. Thus, 'them' in H & H's example (ie. 1.1 above) does not refer to the linguistic elements 'six cooking apples' but rather to hypothetical 'apples' in the actual world. That is why two types of 'anaphora' are sometimes distinguished: 'referents' and 'antecedents' (Huddleston, 1978). The first represents linguistic
entities within text, and the second refers to the real objects outside the text boundary, in the real world.

By subsuming `pronominals`, `demonstratives` and `comparatives` under reference, H & H (1976) offer a narrow perspective of this relation. Lexical items and various pro-forms can also be used co-referentially (de Beaugrande, 1980; de Beaugrande and Dressler, 1981; Hobbs, 1978, 1982; van Dijk, 1977; Kalligren, 1979; Lyons, 1977, 1981). Due to the ambiguity of the term reference, the term co-reference will be used in this thesis, to mean reference to the same text-world entity by surface expressions (de Beaugrande, 1980).

H & H's (1976) lexical relations are also criticised. Since lexical reiteration is mostly accompanied by `the` or a demonstrative it shades into grammatical cohesion (Urquhart, 1983). For a demonstrative can perform the cohesive function without repeating the lexical item (eg. `these` instead of `these ships`). Moreover, H & H's category of lexical collocation is seen to have a wide application. Urquhart (1983) holds that all vocabulary items of a language collocate, and hence one cannot be fully certain which element collocates more strongly than another.

Cohesion is sometimes conceived of as the relation between old and new information (Grimes, 1975). For Grimes, cohesion is one aspect of textuality, and two other relations are important: `coherence` and `staging`.

In terms of its function, cohesion, as stated above, is often deemed neither necessary nor sufficient for the creation and identification of text (see examples 1.2 and 1.3 above). A native speaker does not need cohesive devices to distinguish a text from a
non-text. Drawing on his internalised knowledge of the linguistic rules of his language, he can intuitively identify text, because he "knows already - but without knowing that he knows" (H & H, 1976:1). Although H & H are well aware of the role of the reader's competence (Chomsky, 1965) in the identification of text, they consider the explicit verbal representation of cohesive devices the sole criterion in this identification. Thus, they level another criticism at their own claims.

Since cohesion, as argued above, cannot alone account for the organisation of text adequately, other factors must underpin text making. Three major features of textuality have often been identified: coherence, information structure and context of situation. Coherence, which is defined as the semantic relation obtaining between the illocutionary acts that underlie the propositions of discourse, is considered a major contributor to the continuity of text (Labov, 1970, 1972; Labov and Fanshal, 1977; Coulthard, 1977; Widdowson, 1978, 1979; van Dijk, 1977; de Beaugrande, 1980; de Beaugrande and Dressler, 1981; Carrell, 1982; Stubbs, 1983; Enkvist, 1973; 1978; Petofi, 1973; Brown and Yule, 1983; Hobbs, 1978, 1979, 1982; Lyons, 1977, 1981; Urquhart, 1983; Romaine, 1981 among others). Coherence stems from the interrelatedness of illocutionary acts (Labov, 1979). The fundamental problem, as Labov (1970:252) sees it, is to show how utterances follow each other "in a rational, rule-governed manner - in other words - how we understand coherent discourse". Cohesion, as stated above, assumes its value from coherence and not vice versa (de Beaugrande, 1980; Carrel, 1982).
Thus, a distinction must be made between 'cohesive text' and 'coherent text'. On the surface textual level, a sequence of sentences can be cohesive without being coherent. On the other hand, a lack of cohesive devices does not preclude a string of sentences from obtaining pragmatic coherence. When a text is cohesive and not coherent, Enkvist (1978) calls it 'pseudo-coherent'. This occurs when formal devices of cohesion "fail to reflect an adequate underlying semantic coherence in terms of textuality and contextuality" (ibid:110). Thus sentence connectedness calls for a kind of interplay of cohesion and coherence. This is particularly so for written discourse (Labov, 1970; de Beaugrande, 1980). Explicit realisation of cohesion is mostly needed when coherence is least obvious, and it is least needed when otherwise (Hobbs, 1982).

Another important textual feature is information structure. The flow of information in terms of old and new is also held to be a significant contributor to the unity and continuity of text (van Dijk, 1977). This flow of information is of particular relevance to English because:

"In English discourse at least there seems to be a strong tendency to set up certain information as a ground first, and then introduce later information using that ground as a basis for evaluation and comparison."
(Fries, 1979, in Halliday, 1982:219-20)

The flow of information can also enhance the coherence of text because it helps readers to "process..... to evaluate, and to relate a text to previously mentioned information" (Lautamatti, 1978:167). Thematic cohesion which connects the elements of text by a continuous theme is also deemed an important aspect of the semantic continuity of discourse (Gumperz et al, 1984). A text, thus, derives much unity and continuity from the

Context of situation is the third aspect of textuality discussed here. For some linguists, context of situation is more important than cohesion (Sacks, 1972; Urrughart, 1983). Situationality implants specific value into a text as well as providing one of the basic standards of textuality (de Beaugrande, 1980). The pragmatic value of discourse cannot be fully appreciated without making appropriate inferences about the location of utterances in a certain context of situation. The notion of context of situation is further tied up with the participant's verbal and non-verbal actions, experiences and world knowledge (Pelligrini, 1984), which make sentences "make sense". Some linguists recognise what is called "situational cohesion" which is established when a string of sentences are produced in one speech act (Anderson, 1978). Situational cohesion is considered more important than factual cohesion. Besides, sentence interpretation is not solely contingent upon overt cohesive devices, but on the reader's ability to draw inferences about the structuring of speech acts in speech events as well (Hatch and Long, 1980).

The above discussion of the way linguists see the function of
cohesion in the creation of text clearly points to the inadequacy of cohesion as the sole aspect of textuality. Text is not merely a concatenation of linguistic entities: rather, it is a record of ‘Human Thematic Relations’ which captures people’s “beliefs, values and knowledge” (Schank, 1982:32).

It is important to recognize that linguistic structures on a page are not to be equated with whatever semantic continuity (i.e. textual coherence) the reader supplies for those linguistic structures. Analysing text as product is too limited an activity. Text should be seen as the basis for a process. Fillmore (1982:251) suggests that a text is

"a linguistic part of an activity, the individual sentences being.....plans in this activity"

As a product, a text is

"a record of the linguistic half of an activity, the sentences of the text being traces used in carrying out the activity."

A text can even be more than that. It can be a vehicle of different linguistic, psycholinguistic and social entities. Allen (1982:15-16) remarks that a text can be viewed as

"an act, a message in a communicative situation,

a way of organizing some intended content,

a model of possible world,

a means of suppressing information,

an experimental field for grammatical and lexical analysis,

an application of a generative model,

a flow of linguistic data,

a reflection of an author’s temperament,"
a genre piece, a prognosis of certain reactions in the receiver(s)."

If text can straddle all these linguistic and extralinguistic issues, it certainly cannot be accounted for purely in terms of cohesive devices. Halliday (1982) identifies text as an entity which must have "structure, coherence, function, development and character."

We are now in a position to state that the function of cohesion is not as H & H 91976) propose, "to make a text", but rather to assist when necessary in such a creation.

However, a critical appreciation of the limitations of H & H's explanatory comments on cohesion need not prevent acceptance of their categories of cohesion for practical descriptive purposes. In opting to use H & H's categories, a distinction is made between explanatory adequacy and descriptive adequacy. H & H's taxonomy is descriptively adequate if supplemented with categories covering parallelism and thematisation. Their model is not, however, adequate in explanatory terms, since, as has been argued, fuller accounts of textuality must make reference to the reader's internal organisation of reality, his preferred handling of information structure, and his expectations vis a vis the particular text. The view adopted here is that cohesion is only one feature of textuality, and largely derives its value from the other textual features outlined above.

In general terms, the set of linguistic devices available for cohesive purposes is now well understood in terms of its realisational range. Three issues, however, are inadequately understood. First, the importance of cohesion for the maintainence of textuality has been exaggerated. Second, while cohesion has been shown to be a variable device capable of showing authorship
(Gutwinski, 1976; Enkvist, 1978; de Beaugrande, 1980), the importance of this fact has not been fully grasped. If cohesion varies according to author (speaker/writer identity), it is equally likely to vary according to communicative context and discourse event type, in the Hymes (1972) sense. This fact clearly opens up the phenomenon of cohesion to variationist studies on a much wider scale than hitherto appreciated.

A third issue, which has again not been adequately confronted within descriptive models of cohesion, is that of the status of cohesive elements for an account of the role of text processing. Until this issue is resolved, the phenomenon of cohesion will be limited to descriptive taxonomising. For this reason, some light is shed below on the explanatory apparatus of cohesion as evidenced in its contribution to the processing and comprehension of text.

1.2.2 Issues in text processing

It should be noted from the outset that the issue of text processing and comprehension is too vast to be thoroughly reviewed in the limited space of this section. Nor is text processing per se the pivotal concern of this thesis. Rather, the main interest here is to illuminate the role cohesion can play in text processing and comprehension. However, before getting to grips with such a task, a brief and general profile of some major processing models is worth attempting.

1.2.2.1 Models of text processing

de Beaugrande (1981) sets out some pre-requisite criteria which a comprehensive model has to meet so that it can be applicable
to different types of text, reader and reading tasks. These criteria are briefly discussed below.

1. Processor Contributions

In terms of the reader’s application of ‘stored knowledge’ and ‘prior expectations’, two models can be distinguished. ‘Bottom-up’ models view the processor as only analysing surface structures (eg. letters, words, phrases and sentences). On the other hand, ‘top-down’ models see the processor as integrating hypotheses about the material by drawing freely on his own world knowledge and experiences "to constrain understanding and fill in materials" (de Beaugrande, 1981:263).

2. Memory Storage: Abstraction, Construction, or Reconstruction

de Beaugrande (1981) identifies three approaches in terms of the effect of memory on text comprehension. The abstractive approach suggests that only features from the presented material are extracted and stored by the processor. These features are revived at the time of recall. The constructive approach views the processor’s role as integrating the stored knowledge into the text from the very beginning, and hence expanding and modifying the experience received by memory. The modified version of experience is presented when the material is recalled. The third approach, the reconstructive, stipulates further contributions from the processor, even after the experience is retained in memory. The ‘current state of storage’ is assembled by a ‘general organizational pattern’ at the time of recall.

3. Utilization

Some models require that the processor utilize every
feature `on every language level`; others assume that the presented material be used occasionally so that a reader elicits cues and affirms predictions.

4. Automization

The quickness and complexity of understanding entails occasional automatic processing. However, some conscious operations call for more attention. de Beaugrande (1981) inquires the possibility of imposing some control on automatic processes when necessary.

5. Decomposition

The reader is visualised by some models to be decomposing the text in terms of `words and meanings`; other models see him as doing nothing of this. An intermediate position suggests that decomposition occurs when necessary.

6. Processing Depth

Experiments have shown that the stored knowledge and what is recalled markedly differ. It has also been found that disambiguating words facilitates their recall; locating them in contexts results in `deeper processing`; and drawing "follow-up statements for a sample is more effective than judging whether the sample is meaningful as it stands" (de Beaugrande, 1981:265).

7. Scale

Some models focus on recognition of local-scale elements, eg. `sounds, letters, words and sentences`; others concentrate on the comprehension of a global-scale `gist` or `summary` of whole texts. Current models integrate various scales. de Beaugrande (1981) posits
the question of how local and global scales are correlated.

8. Power

'High-powered' models aim at solving general problems; 'low-powered' models, on the other hand, stress the generation of every activity by "a specific occurrence from the environment" (ibid:265).

9. Modularity versus Interaction

A modular model stipulates little interaction between the language levels and among the operations which understanding "traverses in real time" (ibid:265). In an interactive model, this interaction is steadily taking place. Modular models are easy to design and examine, yet their operations are problematic. On the other hand, interactive models eliminate "needless dead-end pathways" by "internal interchange", though they are more difficult to design and test experimentally.

10. Serial versus Parallel Processing

Processing operations occur either serially, one after another or in parallel (i.e. 'concurrently'). Although serial models are amenable to measurement, the need has recently arisen for parallel processing to account for "complex tasks performed in real time" (ibid:266). Both serial and parallel processing does not explain real human activities.

11. Freedom

The freedom of a model is determined by its applicability to "all readers under all conditions"; its ability to deal with
"idiosyncratic or solipsistic readings of particular readers" (ibid:266); and the possibility of modifying its operations when necessary. These issues are important for "empirical evidence."

12. Openness versus Closedness

Some models are closed to their own operations; others constantly expand as "new insights" accumulate, without needing "new design". Open models represent "understanding operations" rather than being "exhaustive statements."

13. Logical versus Procedural Adequacy

A model is logically adequate if it can accommodate "the demands of conventional logic", whereas it is procedurally adequate if it represents the operations done in actual language use.

14. Learning

Various kinds of learning seem to accompany reading a text: "refining one's predictions and expectations; applying knowledge gained early toward the processing of later sections; becoming familiar with content and style, and so forth" (ibid:267). A "learning" model is currently adapting its operations as understanding advances. This "learning" factor, de Beaugrande (1981:167) suggests, "complicates model design."

15. Typology of Materials

A model should be able to account for different types of text (e.g. 'narrative versus expository prose'). However, most models are not designed to explain such differences or even some 'obvious ones.'
16. Status of Programming

Some researchers argue that all models must be "stated as programs". But the computer is deemed incapable of accommodating "emotional, ethical or skeptical motives" (de Beaugrande, 1981:267). It is also rejected because it is 'irreconcilable' with mind.

After this summary of de Beaugrande's (1981) 'Criteria for Designing Process Models', an important question arises: To what extent do existing models meet such criteria? To answer this question, a brief review of some models which represent the "bottom-up" and "top-down" approaches is necessary. For this reason six models, three for each approach, are discussed rather briefly below. The selection is based on what de Beaugrande (1981) considers as representative of each approach (for more models, see de Beaugrande, 1981).

1.2.2.2 Bottom-up processing models

As has been indicated above, the distinction between bottom-up and top-down model rests on the processor contributions. In bottom-up models, these contributions are limited to analysing sentences and their underlying propositions (see van Dijk, 1977, for a good example of this approach). In what follows, three models representative of bottom-up processing are discussed.

Chomsky (1965)

Chomsky's model is an example of a parallel model of the route from surface features to comprehension. This model stresses the processor's 'competence' in converting 'surface structures' into 'deep structures' by means of certain formal rules. While heavily appealing to the listener/reader's tacit knowledge of linguistic rules, the
Chomskyan model excludes the listener/reader's world knowledge and the contribution of memory to understanding.

This model also calls for heavy utilization and decomposition, since every element has to be described and the text is to be decomposed into unreducible units. Processing operations are held to occur automatically because Chomsky and his co-workers have used the notion of "abstract automata" (de Beaugrande, 1981).

Chomsky's model operates serially and on a local scale since operations are carried out by "modular components". And because this model largely depends on formal logic, logical adequacy is inherent in it whereas procedural adequacy is 'quite poor' (Woods, 1970, in de Beaugrande, 1981). This model also lacks power because "generalization across wide ranges of texts" cannot be made out of the rules constraining its operations.

Since memory is excluded from this model, it does not take a stand on storage. Nor is processing depth an issue here because the notion of 'deep structure' is not related to it. This model treats all readers as a "homogenous community", and hence it does not account for various tasks. The fact that all sentences are processed in the same way makes Chomsky's model lack freedom and to a great extent learning. Thus, it does not 'envision' a definite typology of material.

For these reasons, this model has been criticised for being inadequate for 'effective programming' and excluding many factors that perform important functions 'in human communication' among other things (see de Beaugrande, 1981, for other shortcomings of this model).
Clark (1977)

Clark (1977) has developed a model which requires parsing sentences into their constituents and underlying propositions. But propositions here are synonymous with syntactic units (i.e. surface sentences) rather than semantic units. However, the Clark model, unlike the previous one, captures world knowledge, and hence the processor contributions are not confined to handling sentence constituents and propositions. It requires making inferences which are admitted by the text producer.

de Beaugrande (1981) views this model to have taken no stand on memory storage since Clark (1978) conceives of comprehension as grasping the speaker's intended message. Therefore, it is not clear whether this model is constructive or reconstructive.

This model is also very much concerned with linguistic analysis. Therefore, like the Chomsky model, it appeals heavily to utilization which is done on a local scale. In contrast, power is poor in it since sentences and propositions are 'closely interwined'. Thus, this model stipulates much decomposition.

The Clark model seems to be void of automation, freedom, logical and procedural adequacy and to a great extent processing depth. These criteria have not been addressed by this model (de Beaugrande, 1981). However, learning could be possible when listeners/readers "adapt to distributions of "given" and "new" information" (ibid:272).

Being restricted to sentence analysis, the model does not offer a typology of materials. Nor can it be programmed.
Gibson (1971)

Gibson suggests that the processor's contributions are limited to "detecting, extracting, and utilizing the "features" within the presented material" (de Beaugrande, 1981:272). Thus, utilization which is modular is very demanding, especially for trained readers. Similarly, decomposition is heavy. This model clearly operates on a local scale, and power is quite poor in it because emphasis is laid here on "sounds, letters, spelling, grammar and syntax".

Some criteria such as automatization, processing depth, memory storage and typology of material are not significantly appealed to in this model. On the other hand, logical and procedural adequacy and programming are not met by the Gibson model. In terms of learning, the model accounts for it "as skill acquisition through experience and transfer" (de Beaugrande, 1981:273). Freedom is also limited to "different developmental stages in children" (ibid:273). This model is open to operations pertaining to "feature extraction" whereas it is closed to operations of "information-processing".

The above three bottom-up processing models are, thus, limited in scope and fail to incorporate some of de Beaugrande's (1981) criteria. Nor do they account for the fact that different readers can extract different and incompatible meanings from the same text.

1.2.2.3 Top-down processing models

Unlike the bottom-up models which concentrate on surface features, top-down models account for processing the entire text. Again, three models are given below as an example of this approach.

Kintsch (1977)
Conceiving of text as a sequence of propositions, Kintsch (1977) suggests that a text is processed in "chunks" in terms of their underlying propositions. However, it should be noted that textual meaning is not reducible to an (ordered) set of propositions.

For Kintsch, processing those propositions passes through several operations. Propositions are first linked and then matched against "stored world knowledge". Missing propositions are supplied by inferences. A superstructure which represents the 'gist' of the text is finally produced.

Kintsch's (1977) model satisfies many of de Beaugrande's (1981) criteria listed above. Utilization is heavily required, and memory storage appears to be both constructive and reconstructive. The fact that propositions build a "hierarchical network" makes them operate on local and global scales. The various operations of 'deleting', 'generalising' and 'constructing' carried out to form a 'global representation' results in a powerful model. Processing in this model runs in parallel, emphasising procedural adequacy. Learning is heavy in Kintsch's model since comprehending the gist of text entails 'cumulative operations'. In addition, the model is highly interactive, in that readers cannot separate "their knowledge of "facts" from their "inferencing"" (de Beaugrande, 1981:274).

However, although Kintsch concedes the importance of automization, processing depth, freedom and typology of material, he has not accounted for these criteria in his model. He also suggests that decomposition occurs when necessary and that his model is open because adding on a 'parser' is possible.

de Beaugrande (1981:275) describes Kintsch's model as
correlating "functional diversification with functional consensus" in which its appeal lies.

**Schank (1975)**

Schank and his co-workers built 'computer understanders' which simulate human processors in reading stories and answering questions about or summarising what is read. Therefore, Schank (1975) has repudiated models of conventional linguistics and psychology. He also rejected 'semantic' memory in favour of 'episodic memory'.

For Schank (1975), processing requires the reader to recover underlying concepts, draw inferences and make predictions about future expectations. Thus, the reader's stored knowledge is significantly appealed to in this model. The model also appeals to the processor contributions which are "upgraded in scale and power to the applying of "scripts" as global sequences of routine actions commonly done in human affairs" (de Beaugrande, 1981:279).

The actual text is lightly utilized in Schank's model, and hence it is highly constructive. The 'understander' skips certain words and focuses on those which are necessary for generating expectations. Decomposition, in this model, is concerned with events, actions and objects. In its use of 'syntactic knowledge' to convert word meanings into utterance meaning, Schank's model is highly interactive.

Being designed for computers, this model entails serial processing and procedural adequacy. Finally, Schank's model meets other important criteria such as freedom, learning and openness. It calls for predictions on the processor's part and it is constantly evolving. This model can also apply to texts of different
typologies.

**de Beauquarande (1981)**

De Beauquarande's processing model lends itself specifically to "connectivity search", i.e. how textual occurrences relate to one another in the same subsystem or other subsystems. A stretch of text rather than a single sentence is the initial processing unit in this model. This stretch of text is held in working memory "under current limitations of attention, familiarity, and interests" (ibid:287). The end-product of processing, for de Beauquarande (1981), is a text-world model.

Processing, in this model, starts with the recognition of surface words and parsing them "into a structure of grammatical dependencies" (ibid:287). These grammatical dependencies are then correlated with "conceptual dependencies" which are crucial to building a text-world model. Conceptual dependencies could be either implicit or explicit in the text. This, in turn, calls for making inferences so that the "entire text can be modeled".

De Beauquarande (1981), however, criticises his own model to show that there is always a pressing need for evolution. This evolution is also necessitated by the fact that every text is unique. Moreover, texts markedly differ in terms of event-type, readership, reader knowledge, reading style and reader purpose. An integrated theory of processing which can account for all these factors does not exist at the present. Such a theory entails continual evolution as de Beauquarande (1981) suggests.

We have seen that there is a strong correlation between reading and its attendant comprehension and the notion of text (de
Beaugrande, 1980). The researcher’s conception of text very much affects his view as to how this text is processed and understood. A clear-cut distinction between the above models can now be made in this respect. Those models view text from two different but closely-related perspectives. One sees text as a conglomeration of sentences and underlying propositions; the other conceives of it as a ‘story’ or ‘description’. A processing theory, thus, attempts to account for the manner in which those sentences or the message of that story are understood (Sanford and Garrod, 1981).

For de Beaugrande (1980), a text is an actual system whose 'functional unity' hinges upon the interaction of its surface connectivity and underlying conceptual connectivity. In order for the underlying connectivity to be intact, the surface expressions must be compact. This, in turn, contributes to the "efficiency of textuality", which de Beaugrande (1980:132) describes as "processing the largest amounts with the smallest expenditure of resources". Thus, cohesive devices through which the surface connectivity of text is expressed can have a role to play in the processing and comprehension of text. This role is touched upon in what follows.

1.2.3 Issues in psycholinguistic description of cohesion

It has been suggested above that text processing and comprehension is very much affected by the way in which textual information is organised (Bower, 1976; Thorndyke, 1977). That is because comprehension of underlying concepts is largely contingent upon the activation of textual information (Ehrlich et al, 1982). Organising textual information is also held to have a bearing on the cognitive (i.e. mental) representation of text which readers build
(Sanford and Garrod, 1981, 1982; Schank, 1982; Schnitz, 1982; Stenning, 1977; Frederiksen, 1977; Pohl, 1982; Brown and Yule, 1983). Thus, processing and comprehending a text calls for integrating its micro-structures (i.e. surface elements) and macro-structure (i.e. global or semantic structure), in order for a processing model to be theoretically and empirically significant (Glowalla and Collonius, 1982). Since the prime concern here is to illuminate the contribution of cohesion, which is a feature of textuality, to text processing and comprehension of text, a brief discussion of this contribution now follows.

1.2.3.1 Role of cohesion in text processing

Textual information which is seen as having a bearing on the processing of text is partly realised through cohesive devices. These devices are normally provided by text producers (i.e. speakers/writers) to serve as clues which point to the location of information. Speakers/writers are held to supply necessary links and to monitor the construction of the listeners/readers’ inferences so that an accurate interpretation of text is maintained (Bobbs, 1978). This accurate interpretation requires relating incoming (i.e. "given" in the technical sense) information which is introduced by cohesive devices to previous information. In other words, given anaphors which present incoming information have to be connected with their appropriate antecedents.

Connecting given anaphors with prior antecedents instigates a memory search which may be short or long depending on the distance between those anaphors and antecedents. Clark and Haviland (1977) suggest that when two sentences are placed side by side, the first
sets up a context, in the light of which the second sentence is interpreted. This is part of what Clark and Haviland (1977) call the "Given-New Contract" between interlocutors in a communicative event. Violating this contract may result in problematic and long processing and comprehension of given information, they claim.

However, such a 'contract' is not always maintained. An antecedent may lie a few sentences away from its anaphor. In such a case, what determines ease or difficulty of processing is whether or not the semantic identity of the antecedent is carried over through the intervening sentences. If that identity is kept foregrounded in those sentences, locating the antecedent and eventually connecting it with its anaphor becomes easy and fast (Mitchell, 1982). Otherwise, processing given information would be more demanding. In addition, it is not always the case that placing anaphors and antecedents in adjacent sentences makes processing of given information easier or more rapid, because the activation of the principle of 'semantic distance' (Sanford and Garrod, 1981) is contingent on contextually determined conditions. Therefore, placing given information initially in the sentence may or may not facilitate its processing.

Another factor affecting the processing of given information is the semantic relationship between antecedents and anaphors. This relationship is affected by the degree of 'conjoint frequency' (Wilkins, 1971). That is, items which occur too frequently in discourse are said to have a 'high-conjoint frequency'. The opposite is true. Items which are less frequent have a 'low-conjoint frequency'. High-conjoint frequency items (e.g. bus-vehicle) are more familiar to the reader, and hence their relationship is clearer than low-conjoint frequency items (e.g. dog-monster). It follows that when
the relationship between anaphors and antecedents is clear, processing anaphors may be more efficient and rapid because the reader can easily connect them with their antecedents (Sanford and Garrod, 1981). Less frequent anaphors stipulate making inferences which render their processing more demanding on the processor’s part.

The third factor which influences processing given information is whether antecedents are explicitly or implicitly realised in text. Normally, explicit antecedents are easier to locate, which facilitates and expedites processing their anaphors. Implicit antecedents, on the other hand, entail making bridging inferences which, as suggested above, puts a heavier demand on the reader. It is claimed that processing anaphors which refer to implicit antecedents is more problematic. However, this is not always the case, because explicit antecedents may require making inferences. In "I saw two people. The woman was a doctor" (Mitchell, 1982:97), the given information (i.e. 'the woman') is presumably identifiable to the reader, but in order to supply missing information he has to construct a set of propositions (e.g. one of the two people was a woman). Hence, an antecedent is created and processing given information becomes feasible. Thus, making appropriate inferences which puts a heavier demand on the reader is not limited to implicit antecedents.

The above example shows that definiteness does not always indicate specificity of reference. Chafe (1977) gives a similar example. In "I saw the milkman", the definite term 'the milkman' has no prior mention in the text. Rather, missing information is available in the situation. Retrieving this missing
information stipulates that the hearer/reader draw on his pragmatic world knowledge. The hearer/reader is presumably familiar with ‘the milkman’, and hence processing this given information is not problematic. Thus, if sufficient clues of anaphoric reference are available, a search for referential relations is still carried out (Sanford and Garrod, 1981). Semantic relations, therefore, go hand in hand with syntactic signals in the search for a semantically related antecedent.

Some researchers view “phoricity” which is associated with definiteness (Rochester and Martin, 1977) as requiring some kind of decision-making on the reader’s part. A ‘phoric’ (i.e., definite) noun phrase is one which has to be interpreted elsewhere in the text or situation. A non-phoric (i.e., indefinite) expression, on the other hand, does not require further information. Thus, definite noun phrases are not necessarily always easier to process and interpret than indefinite ones.

Pronouns are another cohesive device which introduces given information. Processing pronouns is sometimes believed to be even more problematic than noun phrases (Tennant, 1981). A reader has not only to assign an adequate antecedent, but he also has to locate the concept embodying it in the real world. Such a concept is not explicitly stated in the text. Therefore, in order for pronouns to be properly processed, two possibilities arise. One is to generate various sets of objects to which a pronoun might belong; the other is to generate “new concepts that represent the various sets” (ibid:117). However, noun phrases can equally refer to events and concepts that are either explicitly or implicitly expressed in the text or situation. Nevertheless, definite noun phrases which refer to
explicit entities in the text are still held to be easier to process than pronouns. That is because those specific entities are presumably known to the reader. de Beaugrande (1980), however, argues that retrieval of co-referents is not difficult if anaphoric relations are maintained.

As for processing ellipsis, Tennant (1981) suggests that it is more problematic than that of pronouns and noun phrases. He claims that a reader has to identify the instance of ellipsis and locate its appropriate antecedent. Besides, ellipsis implies contrast, which renders retrieval of missing information more burdensome. However, this is not always true. Processing ellipsis does not necessarily introduce greater difficulty. There is a sort of tension between economy and specificity/explicitness. Using ellipsis is sometimes called for by the 'economy' principle of text (de Beaugrande, 1980). Thus, ellipsis can contribute to the efficient processing of text if it is not unduly frequent. For heavy ellipsis may blur the meaning of text (de Beaugrande, 1980).

In very general terms, the implication of these various studies of the contribution of specific linguistic features to textual difficulty is that there is no well defined set of linguistic features which in themselves can be identified as causing difficulty. Each linguistic feature is dependent on a range of co-textual and contextual factors for the degree of difficulty caused.

In addition, since every text is unique in itself, processing those linguistic features may vary from one text to another within or across event-type. For example, processing pronouns which
might be easy in a literary narrative may not be so in a scientific text as will be shown in Chapter 3. Besides, processing a text is not wholly dependent on those linguistic features. Schank (1975), it has been remarked above, suggests that only those words which are necessary for the reader's expectations and predictions are picked up by the 'understander'. Thus, the actual text is slightly used in Schank's model. Finally, processing cohesive devices is very much affected by the above-cited factors of readership, reading style, reader knowledge and purpose as will be displayed in Chapter 3.

The above rather brief discussion has shown that most researchers have attempted to bring to light how one or more cohesive devices are processed and comprehended. In other words, none of those researchers has endeavoured to offer a definite taxonomy which shows the function all the cohesive devices outlined in 1.1 above perform in text processing and comprehension. However, such a taxonomy has been provided by de Beaugrande (1980). This is the object of the next discussion.

1.2.3.2 de Beaugrande's taxonomy of role of cohesive devices in text processing

As is the case with other researchers, de Beaugrande's (1980) view of the role cohesion can play in the processing and comprehension of text is largely dependent on his conception of the notion of text. It has been stated above, that, for him, a text is an actual system whose 'functional unity' is established by the interaction between its surface and underlying (conceptual) connectivity. The surface connectivity of a text is expressed through cohesive devices, which he considers necessary contributors to the textual principles of economy and stability. These two principles
are, in turn, relevant to what he calls "efficiency of processing" which means "processing the largest amounts with the smallest expenditure of resources" (de Beaugrande, 1980:132). Thus, cohesive devices can assist in text processing and comprehension. Each of those devices is touched upon separately below.

1.2.3.2.1 Recurrence

Recurrence of lexical items, de Beaugrande (1980) suggests, facilitates processing if ambiguity is avoided and the identity of reference is kept intact. However, using words of different parts of speech (e.g. noun, verb, attribute, etc.) with the same reference helps text producers "create new language items" (ibid:136). Similarly, using paraphrase and synonyms rather than exact repetitions highlights the textual principles of 'economy' and 'stability', and hence contributes to the processing of text.

1.2.3.2.2 Definiteness

Using the definite article to denote specific entities is relevant to the connectivity of discourse. It creates "new background knowledge while pretending to keep it alive" (ibid:138). In other words, definiteness helps to activate background knowledge.

However, a text can begin with either a definite or indefinite expression for a 'special effect'. A definite noun phrase engages the reader's interest who expects to know more about that specific entity. An indefinite noun phrase, on the other hand, requires the reader to supply 'attributes', 'locations', etc. and hang them onto given nodes. Consequently, de Beaugrande suggests that if definiteness were only utilised with "uniquely identifiable objects",

51
communication would not be feasible. The need for definiteness, he argues, is necessitated by "the connectivity of stored knowledge" in actual situations. In these situations "efficiency is more crucial than exactness" (ibid:144). Thus, definiteness can contribute to efficient processing.

1.2.3.2.3 Co-reference via Pro-Forms

This category subsumes pronouns, deictics and what H & H (1976) classify as the nominal substitute one/ones. These are derived from their co-referring expressions, but markedly differ from those expressions. Pro-forms are "usually shorter", "comparatively empty of inherent content" and they have a "wider range of potential application" and "obey constraints upon their occurrences" (de Beaugrande, 1980:145). Because these pro-forms contribute to the compactness of surface structure, they represent a kind of trade-off between "compactness and rapid access". Thus, they largely contribute to the economy and stability of text especially if the identity of reference is clear.

1.2.3.2.4 Exophoric Reference

Exophoric reference obtains when the meaning of a pro-form is to be decoded by making recourse to the situation rather than via a co-referent expression explicitly stated in the text. Therefore, exophoric reference relates language entities to the context of situation from which language cannot be divorced. Due to the relevance of situation to the interpretation of certain linguistic items, exophoric reference plays a role in processing and comprehending a text.

Interpretation of exophoric pro-forms (eg. she's not here)

52
appeals to the shared knowledge of interlocutors. In other situations exophoric reference may apply to entities which do not have "conceptual classification: (eg. What on earth is that?)" (de Beaugrande, 1980:151). In such a situation, the speakers expectations which are presumably known to the hearer are violated.

Exophora is also useful when interlocutors have contrasting views about what is happening (eg. This is a holdup. We're not kidding)" (ibid:152). Thus, exophoric reference presupposes the "mutual identifiability of the communicative participants, though more directly for speaking than for writing" (ibid:152).

1.2.3.2.5. Ellipsis

This device has been commented upon above. Ellipsis, like co-referential items, is useful for "repudiating" expected content. As has been stated above, ellipsis represents a kind of trade-off between "compactness and rapid access". Its appropriate realisation in text demonstrates the "regulatory controls on actualization" (ibid:158). Thus, ellipsis does not necessarily render text comprehension difficult as Tennant (1981) assumes.

1.2.3.2.6. Junction

de Beaugrande (1980) suggests that the overt realisation of junctional relations is not always necessary. However, their presence can facilitate the processing of text if they are not "unduly frequent". Explicit conjunctions, he states, signal the conceptual relations underlying sentences, though, in certain cases, they can be inferred via world knowledge. World knowledge and text knowledge have a great bearing on the processing of text for de Beaugrande (1980).
In default of overt conjunctions, the conceptual relations underlying sentences can be arrived at through juxtaposing parallel sentences. This is the only indication of the role of parallelism in de Beaugrande’s taxonomy. Thus, parallelism, like the other cohesive devices, can contribute to the economy of text and eventually facilitate its processing.

However, the above views on how cohesion assists in text processing and comprehension remain theoretical and speculative and need empirical verification. For this reason, the next section provides a profile of some experimental work on different aspects of the role of cohesion in text processing and understanding and on text-type comprehension.

1.2.4 Experimental work on cohesion

Most of the experimental work on cohesion has attempted to show how the use of cohesive devices is determined by cognitive, social and age factors. Some important results in this respect are reported below.

1.2.4.1 Cohesion as a cognitive index

Trying to investigate some interactional and cognitive factors in relation with normal and mentally disordered subjects, Fine (1985) found that these subjects demonstrate differences in their utilization of cohesive devices. Disordered readers usually use contextual information differently. They tend to use the linguistic and cognitive cues available in the textual environment as a way of organising their language and introducing information. Consequently, if the available information is ambiguous, disordered readers are less capable of generating unambiguous information and constructing coherent
discourse than normal readers. This shows how limited the cognitive capacity of disordered readers is.

Normal readers, it has been found, use a causal or temporal conjunction to specify intra-sentential relations more often than mentally disordered readers (Rochester and Martin, 1977). Normal readers also utilize endophoric devices more frequently than disordered readers do.

Some researchers have gone a step further into the mental processes of text producers. A correlation between the use of certain cohesive devices and thinking has been suggested. Some devices indicate the writer's "focus of attention"; others show different mental processes such as "comparison" and "classification" (Hartnett, 1981).

1.2.4.2 Cohesion as a social index

The fact that mentally disordered subjects heavily depend on textual information in dissociation from situational information points to their detachment from their social setting.

It has also been shown that the social status of subjects has a bearing on their use of cohesive devices and generation of coherent texts. Freedle et al (1977) found that when a story was retold by an individual of different social status, its structural complexity of lexicon and syntax was affected more than when it was retold by the intended listener/reader. Well-educated subjects were found to use certain cohesive devices (e.g. adversative conjunctions) selectively to mark focus more often than uneducated subjects (McClure and Geva, 1983).
1.2.4.3 **Cohesion as an index of age**

The age of subjects plays a prominent role in employing certain cohesive devices. In a normal speech situation, children use exophoric reference to indicate extra-linguistic context (Karmiloff-Smith, 1977). She also found that children up to the age of 12 can neither explain nor utilize conjunctions adequately. Younger children were found to make fewer inferences than older children (Osmanson et al, 1978).

1.2.5 **Experimental work on text-type processing**

Some experimental work has been reported on the differences between text types in terms of their processing and comprehension. Since this issue is dealt with in Chapters 3 and 6, it seems worthwhile to report the results of one study.

Britton and Graesser (1983) conducted six experiments to investigate the difference in comprehension between narrative and expository discourse. They suggest that narrative texts are easier to comprehend than expository texts for several reasons. One is that narrative texts are time-ordered. They describe sequences of events which are presumably familiar to readers who "experience them so often" (ibid:51). Second, narrative material is more familiar to people than expository discourse. Narrative texts also maintain a regular and consistent structure, which may facilitate their comprehension. Expository texts, on the other hand, do not maintain such a consistent structure because exposition is not "subject to temporal constraints, causal constraints, and other constraints of "human nature"" (ibid:52). Finally, narrative texts are basically used to introduce concepts. It has been suggested that "descriptions
of sequences of events may have a developmentally privileged status in informational processing" which "may facilitate the processing of narrative texts" (ibid:52).

The above brief discussion has shown how limited empirical work on cohesion is. The evolution of a uniform taxonomy of the role this phenomenon can play in text processing and comprehension calls for much more experimental work. However, the above review provides a glimpse of the function cohesive devices can perform in text understanding. An overview of this function is spelt out below.

1.2.6 Overview of role of cohesion in text processing

In terms of the role of cohesion in text processing and comprehension, two extremes can be identified. At one extreme, cohesion is held to be the key factor in text comprehension (Chapman, 1979). At the other, explicit cohesive devices are deemed irrelevant to text processing and interpretation (Freebody and Anderson, 1981; Steffensen, 1981; Carrell, 1982). Between these two extremes, there is a moderate view which acknowledges some role for cohesion in the processing and comprehension of text (de Beaugrande, 1981).

The view adopted here opts for the more moderate one. It is, therefore, held here that cohesive devices can assist in the processing and understanding of text as they do in its creation. But extent of this contribution remains a matter to be empirically verified. To this end, a limited pilot study which examined the role of one cohesive device (i.e. lexical repetition) in the comprehension of three text types is reported in Chapter 6.

The above review of artificial intelligence and psycholinguistic descriptions of cohesion points to the fact that many
issues are still unresolved. These are outlined in the next subsection.

1.2.7 Unresolved Issues

The limitedness of the experimental work on cohesion leaves a number of issues unresolved. For example, the literature is void of any definite taxonomy which accounts for the function of all cohesive devices, as listed in 1.1 above, in the processing and comprehension of discourse. Nor has their facilitatory effect so far been empirically examined. A model of processing, de Beaugrande (1981) suggests, must be designed to accommodate different text typologies among other things. A third issue is the interaction of cohesion and other textual and contextual factors such as coherence (i.e. underlying conceptual connectivity), pragmatic world knowledge, context of situation, information structure among others. The impact of this interaction on the processing and understanding may be amenable to experimentation. Fourth, the density of certain cohesive devices in particular text types (e.g. lexis in science) is not clearly understood. Finally, the role of parallelism and thematisation in this process is worth highlighting.

Some or all of the above issues may prove fruitful for future research. Future research should attempt to resolve those issues so that an adequate explanation for cohesion can be scientifically pinpointed.

1.3 Focus of the present study

It is not claimed here that this study will endeavour to explore or verify all the above unresolved issues. Such a task is well beyond its scope. However, in the limited space available here
two major issues are scrutinised. One is to try to show that cohesion is a variable rather than homogeneous phenomenon which is realised differently in different text-types. This issue calls for a basis for comparison. For this reason, Chapter One has examined in some detail the range of cohesive devices in English. The range of cohesive devices available in Arabic is set out in Chapter Two. Chapter Three examines variability in the realisation of cohesion in three text types, in both English and Arabic, the purpose of this being to show that variability is not restricted to one language.

The second issue this thesis sets out to explore is the impact of cohesion on reading comprehension. The question of what exactly cohesive devices in texts are for was explored in 1.2. It was argued that experimental work is required which will identify the difference that cohesion makes to the comprehension of text. Chapter Six reports a small-scale study of the role of one cohesive device (i.e. lexical repetition) in text comprehension by a group of foreign learners of English. That role of cohesion is examined in three text types.

Finally, aspects of cohesion which are not accounted for, within linguistic descriptive models or in process-based models, are examined in Chapter Four and Chapter Five, which consider parallelism in text and thematisation respectively.

Chapter Seven provides a summary and discussion of the study of the variable realisation of cohesion in three text types, and the experimental work on the role of cohesion in reading comprehension.
CHAPTER 2
Cohesion In Arabic

2.0 Introduction

Since this thesis sets out to investigate differences in the realisation of cohesion between English and Arabic, a basis for comparison is required. Although the grammatical system of Arabic is well worked territory, devices for textual cohesion have received comparatively little attention. For this reason, this chapter sets out the major cohesive devices of Arabic.

It seems sensible to describe the cohesive devices of Arabic using the same framework of reference as that which has been utilised for English, in the present study, namely the descriptive taxonomy developed by Halliday and Hasan (1976). While the major descriptive categories of Halliday and Hasan—Reference, Substitution, Ellipsis, Conjunction and Lexis—can be applied to Arabic, a description of cohesion in Arabic would be incomplete without reference to two phenomena which do not fall within the Halliday and Hasan framework, namely, Thematic Patterns and Parallelism.

The decision to apply the Halliday and Hasan taxonomy is based on its comprehensiveness and its applicability to the two languages. Descriptive adequacy is not equivalent to explanatory adequacy, however, as has already been argued in Chapter One. For explanation of the necessity for textual cohesion and its role in text processing, analysis must look elsewhere.

Before setting out the cohesive devices of Arabic, it is worth mentioning that such literature as exists (Williams, 1982, 1983;
Koch, 1981, 1983) does not examine the language systematically under all the cohesive devices available in the literature (See Chapter 1, Section 1.1 for a suggested taxonomy of cohesion). Attempts to investigate cohesion in Arabic have not shown how this textual phenomenon is realised in different text types. Nor have they accounted for the role cohesion can play in the processing and comprehension of text. However, those studies are interesting, though they do not amount to a full statement.

A brief evaluation of Williams' (1982) and Koch's (1981) works on cohesion in Arabic is given below.

**Williams (1982)**

Aiming at ascertaining the differences between English and Arabic in terms of their textual development and cohesion, Williams (1982) examined four newspaper texts, two English and two Arabic. The limitation of his data makes him concedes the fact that his results may not be too reliable to draw any generalisations about newspaper writing.

For textual cohesion, Williams (1983) opts for Halliday and Hasan's (1976) five categories of cohesion, namely Reference, Substitution, Ellipsis, Conjunction and lexis. However, finding Halliday's (1967) notion of theme-rheme inadequate for a definition of the Arabic sentence, he adopts the 'Functional Sentence Perspective' of the Prague School of Linguistics. That is because Arabic uses a word order different from that used in English.

Williams (1983:126) found that written Arabic repeats "the theme in successive clauses more frequently than English does, even when it is possible to omit it". The clause, in written Arabic, tends
to derive its theme from the theme or rheme of the previous clause. Inter-sentential relationships are explicit in written Arabic while these are left implicit in English. Ellipsis is not favoured by Arabic written discourse. Although Williams mentions parallelism in passing, he does not explore its cohesive function in Arabic. Thus, his taxonomy of cohesion is not complete.

He also found that Arabic tends to use most of those cohesive devices more frequently than English does. For example, personal pronouns, additive, causal and temporal conjunctions and lexical repetition are much more frequent in Arabic. On the other hand, English uses ellipsis, comparative reference and adversative conjunction more frequently. The difference between the two languages in the use of demonstrative reference and the definite article is not great.

Williams (1982) has accounted for those differences in linguistic terms. That is, he attributes the high frequency of personal pronouns to the nature of the Arabic verb which contains a pronoun; the predominance of 'wa' (and) in Arabic is ascribed to the tendency of Arabic to express inter-sentential relationships explicitly; and lexical repetition is referred to the nature of the Arabic prolific root of words. Although Williams' explanations are superficially adequate, other linguistic and rhetorical reasons can be given. These are expounded in Chapter 3. Moreover, Williams' conception of sentence in Arabic draws on its definition in traditional (i.e. classical) Arabic. Although this is a valid definition, a more operational definition must be worked out so that English and Arabic texts can be comparable in terms of the segments of text. As a syntactic unit, an Arabic sentence is equivalent to the
English clause. But an English sentence is also a semantic unit which may consist of one or more clauses (ie. syntactic units). Such a semantic-syntactic unit should be the basis of the suggested definition which is given at the end of this chapter. Using the traditional syntactic definition, Williams (1982) may be said to have confused intra- with inter-sentential relations.

In addition, Williams has not attempted to explore the cohesive functions of those devices in other text types. Nor has he tried to pinpoint the role of cohesion in the processing of text. In fact, he has not stated whether he considers cohesion a homogeneous or variable phenomenon. Nevertheless, his study remains interesting and his results are valid as will be seen in Chapter 3.

Koch (1981)

Koch sets out to study repetition in Arabic argumentative discourse. Repetition in Arabic, she suggests, operates on different levels: "phonological, morphological and lexical, syntactic and semantic" (Koch, 1981:179). Thus, it is repetition of form and content. This repetition yields much cohesion to Arabic texts. Apart from the linguistic effect of repetition, another rhetorical effect is achieved. Repeating the same idea over and again is a means of persuasion in Arabic argumentative discourse. Koch (1981:180) describes Arabic argumentative discourse as "highly paratactic and polysyndetic: ideas flow horizontally into one another".

Arabic discourse is also parallelistic, she suggests. Koch (1981) recognizes two types of parallelism: listing and cumulative. The first is complete and it indicates that clauses of different content have the same purpose in discourse. The second is less
complete and it creates new items. Koch (1981:177) argues that "while listing parallelism indicates that the new item is textually and rhetorically the same as the preceding one, cumulative parallelism indicates that a new, more intense item is about to begin". She attributes repetition and parallelism in Arabic to the structure of the language and society. Parallelism and parataxis are sometimes criteria of acceptability and not grammaticality. However, these are sometimes dictated by the grammar itself.

Koch (1981) ascribes the difference between Arabic and English in terms of parallelism and parataxis to the mode of argumentation used in each language. In this respect, she identifies two types of argumentation: 'presentation' and 'proof'. The first is used when the truth is clear. Thus, a speaker keeps repeating those clear truths again and again. Proof is used when there is doubt about the truth. Here, there is no reason for much repetition. Presentation is typical of oral societies, Koch (1981) argues.

Koch provides a quite insightful analysis of repetition in Arabic, but she has not examined other cohesive devices. Like Williams, (1983), she has not investigated the effect of this repetition on the processing and comprehension of text.

Other researchers have commented on some aspects of Arabic discourse without investigating cohesion in Arabic texts. The conjunctions 'wa' and 'fa' have attracted the attention of some linguists who have approached Arabic discourse (Dudley-Evans and Swales, 1980; Holes, 1983; Yorkey, 1974 among others). Dudley-Evans and Swales (1980) have noticed that Arabic has a limited number of conjunctions, namely 'wa', 'fa' and 'lakin'. But they have not
attempted to examine the cohesive function of those conjunctions, nor have they explored their role in the processing and comprehension of text. Lexical repetition has also been the object of investigation (Shouby, 1951; Williams, 1983; Koch, 1983; Al-Jubouri, 1983 among others). However, a taxonomy of cohesion has not been attempted. Nor has its realisation in different Arabic text types been investigated.

This thesis attempts to achieve both of these aims, and in addition takes a modest step towards testing the role of cohesion in text comprehension.

In what now follows, a description of the potential resources of cohesion in Arabic is provided.

2.1 Reference in Arabic

Halliday and Hasan designate three sets of devices which are potentially capable of performing a coreferential function in discourse. These are: "personal reference (pronominals)", "demonstrative reference" and "comparative reference". Each will be discussed in turn.

2.1.1 Personal Reference

There are two major categories of pronouns in Arabic: Explicit and Implicit.\(^1\) The first are overtly expressed entities which appear in discourse either as "Independent"\(^2\) or "Enclitics" (Beeston, 1970:40).

---

(1) Explicit and Implicit are my terms.

(2) Wright (1975) refers to "Independent" pronouns as "separate".
Independent pronouns can stand by themselves as "separate" elements. They can occur initially in the sentence as its subject, as in

(2.1) \textit{ana:} (huwa, anta) Ta:lib.

I am (he is, you are) a student.\(^{(1)}\)

It is quite plausible that an independent pronoun follows the noun it alludes to, as in the example

(2.2) Ahmad huwa TTa:libu lmujiddu.\(^{(2)}\)

Ahmad (he) is the industrious student.

Independent pronouns can also occupy final positions. Here is an example

(2.3) ra`aytuhu: ana:.

(I) saw him I.

The occurrence of 'I' in final position is similar to the English reflexive pronoun 'myself', though this is expressed in Arabic by words like 'binafsi:' or 'bi9ayni:' (with my eyes).

\(^{(1)}\) The underlined part is the pronoun in question.

\(^{(2)}\) The 'u' at the end of the noun 'Ta:lib' (student) and the adjective 'mujid' (industrious) is not part of the word but rather a parsing marker (Harakat bina:'). There are two other parsing markers in Arabic, namely 'a' and 'i'. These have the following variants 'un', 'an' and 'in' respectively. They indicate the 'case' of words as follows; 'u,un' = nominative, 'a,an' = substantive; 'i,in' = when a noun, an adjective or a gerund follows a preposition. Other entities may be affected by these markers, but this is beyond the scope of this study to investigate.
Enclitics, on the other hand, cannot stand by themselves as independent entities. Instead, they are always found affixed to other words. The part of speech of the word to which an enclitic is attached determines its function. For instance, if an enclitic is attached to a verb, it is either the agent or the object of the verb. (1) For example,

(2.4) ra’ayna rrajula. ‘Agent’
We saw the man.

ra’a:ha rrajulu. ‘Object’
The man saw her

An enclitic acts as an amplifier if it is connected with a substantive, as in the example,

(2.5) qara’a kita:bah
He read his book

But, at the end of a preposition, an enclitic is considered part of the phrase, as in;

(2.6) laHiqtu bihi;
I caught up with him

The second category, Implicit pronouns, are not verbally exhibited in the discourse (Mubarak 1978). Rather, they are implied in the verb. The verb inflects to show gender distinctions by having a morpheme that helps listeners/readers locate the adequate referent.

(1) Beeston does not mention the function of an enclitic as ‘agent’
Therefore, a native speaker of Arabic can intuitively recognize any implied pronoun and its antecedent. He can, for example, distinguish 'kataba' (he wrote) from 'katabat' (she wrote) by means of the 't' marker (ta:ˈu ttaˈniːt = feminine marker). There are other markers that perform similar functions, but it is well beyond the scope of this study to provide a detailed description of these. After all, this study is not meant to offer a grammar of Arabic.

There are many striking differences between English and Arabic in their use of pronouns. Arabic, for example, does not have the category of 'possessive pronouns' (mine, his, yours, etc.). Instead, possession is indicated in Arabic either by a 'possessive determiner' eg. 'Kitaːbiː' (my book) or by a pronoun which is part of a prepositional phrase, eg. 'lahu' (for him).

Moreover, while only the third person singular (he, she) shows gender distinctions in English, all the second and the third singular and plural pronouns exhibit this distinction in Arabic. In addition, as for number, Arabic pronouns distinguish 'dual' from singular and plural, eg. 'dahabaː' (they, (two) went) vs 'dahaba' (he went) and 'dahabuː' (they (more than two) went).

Finally, Arabic has no equivalent for the third person 'non-human' pronoun 'it'. Instead, 'huwa' (he) and 'hiya' (she) are used to refer to masculine and feminine human and non-human entities respectively.

The Arabic Explicit pronouns are spelt out in the following table which is based on Beeston (1970:40). The only deviations are, however, assigning semantic roles to the different entities and using the terms 'human' and 'non-human' instead of Beeston's 'person' and 'non-person' respectively. The term 'addressee(s)' is also used.
instead of his 'person(s) addressed'.

<table>
<thead>
<tr>
<th>Speech Roles</th>
<th>Other Roles</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Speaker(s)</td>
<td>Addrsee(s)</td>
<td>Other Entities</td>
</tr>
<tr>
<td></td>
<td></td>
<td>human non-human</td>
</tr>
<tr>
<td>Singular</td>
<td>masc. anta, -ka</td>
<td>masc.huwa,-hu</td>
</tr>
<tr>
<td></td>
<td>fem. anti, -ki</td>
<td>fem.hiya, ha:</td>
</tr>
<tr>
<td>Plural</td>
<td>masc.antum,-kum</td>
<td>masc.hum,-hum</td>
</tr>
<tr>
<td></td>
<td>fem.antunna,-kunna</td>
<td>fem.hunna,-hunna</td>
</tr>
<tr>
<td>Dual</td>
<td>antuma:, kuma:</td>
<td>huma:, huma:</td>
</tr>
</tbody>
</table>

Table 1: Arabic Personal Pronouns

As far as the cohesive role played by personal reference in Arabic is concerned, it is typically anaphoric. Beeston (1970) suggests such a function when he remarks that 'a pronoun always refers to a previously mentioned overt entity' (ibid:41). Despite this rather broad generalization, Beeston recognizes the 'non-specific' reference of the third person plural 'they' when used to refer to 'people in general' as in 'they (ie. people) say it will rain tomorrow'. In addition, the third person singular pronoun can allude to 'some fact or idea that has been mentioned', as in 'he isn't coming today, and it is a great pity' (ibid:41).

Although Beeston does not use the terms 'anaphoric' and 'cataphoric', yet he recognises such reference. He recognises, for example, the cataphoric function that can be brought into play by the use of the same pronoun 'to foreshadow any entity term occurring later in the sentence, as in 'it's a great pity that he isn't coming today' (ibid:41).

However, like Arabic linguists, Beeston has not looked into
the cohesive function of pronouns across sentence boundaries. Despite the fact that Beeston's generalisation concerning the anaphoric function of Arabic pronouns does not adequately indicate whether the 'previously mentioned overt entity' resides in a preceding clause or sentence, it, nevertheless, holds true of third person reference. The following example displays such an anaphoric function.

(2.7) jaː 'a rrajul. innahuː yaːtiː mubakkiran daː 'iman. (1)

The man has come. He always comes early.

The third person can also function cataphorically pointing to a forward portion of the text, albeit infrequently. Here is an example;

(2.8) qaːbaltuːhuː fi lMaHaTTa. Iam yakini rrajulu ya9rifu TTariːq.

I met him at the station. The man didn't know the way.

First and second person pronouns are essentially exophoric except in quoted speech, as in;

(2.9) qaːla ali li aHMad "anta rrajulun Tayyib".

Ali said to Ahmad, "You are a kind man".

Exophoric and 'extended' reference which transcends the text boundary is investigated here. Our pivotal concern will be to highlight instances of endophoric and exophoric reference which

(1) The underlined parts are the pronoun and its co-referent. The 'huː' (he) in the second sentence is the pronoun, and 'rajal' (man) in the first sentence is its antecedent.
contribute to the cohesion of text.

Arabic implicit pronouns can also perform a cohesive function by making the listener/reader retrieve their antecedents somewhere in the text. Again, the relevant information may lie in a preceding or following portion of the text. In other words, implicit pronouns can function endophorically, i.e. anaphorically and cataphorically. Moreover, they can occur exophorically, especially when their antecedents lie in the context of situation. The following examples explicate such functions.

(2.10) **dahaba ilawaladu ila dduka:n, lagadi shtarâ: ba9Da IHaIwa:** (Anaphoric) The boy went to the shop. He brought some candy.

(2.11) **ja:‘a yarkuDu musri9an. Kana ilwaladu xa:‘ifan.** (Cataphoric) He came running fast. The boy was scared.

(2.12) (pointing to someone) **sayaDribu bi lHa:‘iT.** (Exophoric) He’ll hit the wall.

Each of the underlined verbs in the above examples has in it an implicit pronoun that refers the listener/reader to its referent in the textual or contextual environment.

Although Arabic pronouns have the potentiality for functioning endophorically and exophorically, they are principally anaphoric in written discourse. Exophoric reference is, on the other hand, a property of spoken discourse. For example, pointing to a passer-by one interlocutor may say;

(2.13) **innani: a9rifuh.**

I know him.

71
Cataphoric reference is the least frequent, except sporadically in narrative texts where the referent is deliberately delayed to motivate a sense of suspense.

Unlike their English counterparts, Arabic pronouns cannot be doubly anaphoric, that is by reference and by ellipsis. It has been stated earlier that the category of 'possessive pronouns', which is capable of such a double cohesive function, is absent from the class of Arabic pronouns. As a result, the occurrence of the pronoun alongside the noun it modifies is entailed, as in the example;

(2.14) hal yumkinuka an tajida barnamijan li ma:ry. barnami-juha: gad fugid (lagad fugida barnamijuhaa).

Can you find Mary a programme; hers has got lost. (From Halliday and Hasan 1976:55)

What enhances the amount of personal reference in Arabic is that its linguistic system allows the occurrence of various kinds of pronouns in one sentence. Here is an example.


(N5, Appendix B)

He visited it (Cairo) once before this time so that the ministry shouldn't transfer him from the compulsory school in which he worked as a teacher.

While only three pronouns (two enclitics; 'ha:' and 'hu' and one independent pronoun; 'huwa:') are underlined, two more implicit pronouns (one in 'za:ra:' (visited) and another in 'yas9a:' (try)) occur. Consequently, five cohesive markers are manifest in this text. This example demonstrates the intrinsic linguistic potential Arabic
has for accumulating all types of personal reference in one chunk.

2.1.2 Demonstrative Reference in Arabic

Beeston (1970) classifies Arabic demonstratives in terms of proximity into two sets corresponding to the English ‘near’ and ‘far’ from the speaker categorised by H & H (1976). The following table displays Arabic demonstratives.

<table>
<thead>
<tr>
<th></th>
<th>Near</th>
<th>Far</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sing.</td>
<td>haːdaː,</td>
<td>daːlika</td>
</tr>
<tr>
<td>Fem.</td>
<td>haːdihi,</td>
<td>tilka</td>
</tr>
<tr>
<td>Plur. &amp; Fem.</td>
<td>haːˈulaːˈi</td>
<td>ulaːˈika</td>
</tr>
<tr>
<td>Masc.</td>
<td>haːdaːni (haːdayni),</td>
<td>daːnika (daːniki)</td>
</tr>
<tr>
<td>Fem.</td>
<td>haːtaːni (haːtayni),</td>
<td>taːnika (taːniki)</td>
</tr>
</tbody>
</table>

Table 2: Arabic demonstratives (1)

The English temporal demonstratives ‘now’ and ‘then’ are not recognised as such in Arabic. However, their cohesive function will be pointed out later in this section.

Some of the demonstratives displayed in the above table may assume other forms but only the commonest ones are included here.

There are major distinctions between demonstratives in both languages. For examples, Arabic demonstratives show gender distinctions. While ‘this’ and ‘that’ are used in English to refer to

(1) Table 2 is based on Beeston’s (1970:42). The nearer item is mentioned first in the table. Whereas Beeston recognizes three sets of demonstratives (i.e. near, medium, and far), only ‘near’ and ‘far’ are listed here.
masculine and feminine entities, Arabic employs two different demonstratives to fulfil this role (see table 2). Furthermore, a specific category is used to refer to two entities (dual).

As for the behaviour of demonstratives in discourse, Beeston (1970:42) suggests that they 'resemble .... pronouns in being allusive, and requiring a context to make the allusion understandable'. By context, Beeston means 'co-text' rather than the context of situation. That is because he also recognises their 'generalised' reference when they refer to some 'fact or idea that has been mentioned, and not to an overt entity' (p.42).

Like their English counterparts, Arabic demonstratives are typically anaphoric. They point back in the text, as in the following example.

(2.16) yu:jadu kita:bun 9ala rraf. da:lika lkita:bu li:.

There is a book on the shelf. That book is mine.

As for the cataphoric reference of demonstratives, this is restricted to 'this' in English. 'That' is, on the other hand, always anaphoric (Halliday and Hasan 1976:68). Similarly cataphoric reference is typical of 'ha:da:' (this) in Arabic, whereas 'da:lika' (that) is essentially anaphoric as in the above example. The following example is an instance of cataphoric reference.

(2.17) yajibu an yaltazima kullun minna: biha:da:.

Each one of us should abide by this: (followed by what should be abided by).

Although this function is plausible, a listener/reader expects 'hada' (this) to refer back in the text, that is to perform an anaphoric function.

74
However, this cataphoric function of ‘haːdaː’ (this) is only plausible in such a context. This is also true of the English ‘this’.

Beeston (1970:43) argues that the Arabic demonstrative ‘dːliːka’ (that) can refer to ‘an entity already known to the hearer’ as in ‘That is false’. In fact, ‘that’ in this context maintains an exophoric relation which is cohesive.

Demonstrative reference in Arabic can be doubly anaphoric, that is by reference and by ellipsis. Here is an example;

(2.18) yuːjaːdu Kitaːbun 9ala TTaːwilə. daːliːka liː.

There is a book on the table. That’s mine.

In English, the cohesive function of ‘these’ and ‘those’ corresponds to that of ‘this’ and ‘that’ respectively. In other words, while ‘these’ can function anaphorically and cataphorically, ‘those’ is always anaphoric. This is not the case in Arabic, that is ‘haːˈulaːˈi’ (these) and ‘ulaːˈika’ (those) are typically anaphoric. For example, in 2.17 above ‘haːdiːhi’ (these) cannot replace ‘haːdaː’ (this) because it requires a noun to modify such as ‘haːdiːhi ttaː9liːmaːt’ (these instructions). The other plural demonstrative, ‘haːˈulaːˈi’ (these), cannot be used in that context. The following examples demonstrate how ‘haːˈulaːˈi’ (these) and ‘ulaːˈika’ (those) behave in discourse.

(2.19) ya.greenhabu lˈawlaːdu ila lma.ḍrasati mu.backirin. haːˈulaːˈi awlaːduːn mujtahiduːn. (Anaphoric)
The boys go to school early. These boys are industrious.
(2.20)  Kana Ilfa:ra:ginatu agwiya:
    ula:'ika ri:ja:lun 9i:zi:ma. (Anaphoric)
The Pharaohs were powerful. Those men were great.

(2.21)  liman ha:dihi (tilka) lkutub. ha:dihi: (tilka) li:
    (Anaphoric by reference and ellipsis)
Whose are these (those) books? These (those) are mine?

Thus, the plural demonstratives are essentially anaphoric. Like their
singular counterparts, they can be doubly anaphoric as in 2.21.

The dual demonstratives are also primarily anaphoric, as in
the example;

The two boys have come. These (two) boys are nice.

The noun 'wa:la:da:n' (boys) can be omitted, and hence the dual pronoun
is doubly anaphoric as in 2.21.

All the previous pronouns can perform an exophoric function
indicating an entity in the context of situation as in;

(2.23a)  ha:da: yawmun laTi:f.
This is a nice day.

(2.23b)  (pointing to some pictures)
ha:dihi: Suwarun ja:mi:la
These are beautiful pictures.

(2.23c)  (two boys pass by)
These (two) boys are naughty.

The Arabic demonstrative adverbs 'hunna:' (here) and
'huna:lika' (there) can maintain anaphoric relation when they refer to
an entity mentioned previously in the text, as in the following
example;
(2.24)  `innaniː fi lkaraj. saʾantaziruka hunaː.
I’m in the garage. I’ll wait you here.

(2.25)  sayatagabalu lfariːqaani fi listaid. saʾaraːka
hunaxa ʿidan
The two teams will meet in the stadium. I’ll see you there, then.

These demonstratives can indicate exophoric reference as well, as in

(2.26)  ta9aːla hunaː! qif hunaːk!
Come here! Stand there!

Despite the fact that the temporal demonstratives ‘now’ and
‘then’ are not treated as demonstratives in Arabic but rather as
adverbs of time, they correspond to their English counterparts in
their textual function. They can be anaphoric, as in the example;

(2.27)  lagad habaTati TTaːʾira. ʿalʾaːn yumkinuna ttanaffusa
biHurriyya.
The plane touched down. Now we can breathe freely.
(slightly adapted from Halliday and Hasan 1976:75).

(2.28)  Kaːna ya9batu bikulli shayʾin wahwa Sagiːr. lam yakun
ya9rifu qimata lʾashyaːʾi 9indaʾidin.
He was careless about everything when he was young. He
didn’t know the value of things then.

However, the anaphoric reference of these temporal entities
occurs in quite restricted contexts in both languages. Moreover,
this anaphoric reference may be conflated with the conjunctive
function of ‘now’ and ‘then’.

The last demonstrative according to Halliday and Hasan’s
taxonomy is the definite article. ‘ʿalʾ (the) occurs in contexts that
English does not tolerate. For example, it can modify not only nouns but adjectives and gerunds as well. These three linguistic entities are spelt out in the following example;

\[(2.29) \quad \text{la: targabu l'bintu ljami:latu fi l'daha:bi ila l'masrah.}\]
The beautiful girl doesn't feel like going to the theatre.

In this example, 'al' (the) appears with the nouns 'bint' (girl) and 'masrah' (theatre), the adjective 'jami:la' (beautiful) and the gerund 'daha:b' (going). Despite this broad application of 'al' (the), only the instances of this article with nouns that refer to entities mentioned in the text or situation that are considered cohesive here. Its occurrence with adjectives and gerunds is, on the other hand, confined to the boundary of the single clause. Thus it is not cohesive.

As far as the textual function of 'al' (the) is concerned, it can occur anaphorically, as in the example;

\[(2.30) \quad \text{ja:'a rajulun ila l'maHatta. istaqalla l'rajula awwala qita:r. (1)}\]
A man came to the station. The man took the first train.

'al' (the) can also perform an exophoric relation which is cohesive. However, this is possible when the referent is present in the situation as in this example;

\[(2.31) \quad \text{dahaba ila l'madrasa.}\]
He went to the school.

\[(1) \quad \text{'al' (the) should be assimilated in 'r' (rrajulu) but it is written for ease of reference.}\]
Here, there is a specific school in the interlocutors' minds. It can also be exophoric if the entity can be identified on 'extralinguistic grounds' (Halliday and Hasan, 1976:71). In this case, it can modify entities which have only one member in their class as in 'algamar' (the moon); or it can occur with entities that are representative of their class as in 'almar'a' (the woman) in;

(2.32) almar'atu aktaru taHammulan mina rrajul.
The woman can bear more than the man can.

Such exophoric reference is labelled, 'Homophoric' by Halliday and Hasan (1976:71).

The linguistic system of Arabic allows the occurrence of the definite article together with a demonstrative, as in the following example;

It's a beautiful car. I want to buy this (the) car.

Thus, Arabic has the potentiality for enhancing the number of cohesive devices in discourse. Such density is not plausible in English.

2.1.3 Comparative Reference in Arabic

Halliday and Hasan recognise two types of comparative reference: "general" and "particular". The first denotes "likeness" or "unlikeness" of objects. Consequently, two things may be "the same", "similar" or "different". This type of comparison is expressed by a set of adjectives and adverbs which Halliday and Hasan (1976:77) term "adjectives of comparison" and "adverbs of comparison" respectively.
Particular comparative reference, on the other hand, means comparison in terms of "quantity" and "quality". Therefore, one object must be "bigger" or "smaller", "better" or "worse" than another. Particular comparison is embodied through a class of "ordinary adjectives and adverbs of some comparative form" (ibid:77).

The only type of comparison in Arabic conforms to Halliday and Hasan’s particular comparative reference. This is realised by a form that can be derived from any dynamic verb. The comparative form should rhyme with the word ‘af‘al’, eg. ‘afDal’ (better), ‘akbar’ (bigger), etc. This type is typically followed by ‘min’ (than). This is an example;

(2.34) Karim adka: min 9aliyy.
Kareem is cleverer than Ali.

This type does not display gender or number distinction. In fact, Arabic has another type of comparison which corresponds to the English superlative degree, but this is excluded from Halliday and Hasan’s taxonomy. It will not be tackled here either.

On the other hand, general comparative reference as dealt with by Halliday and Hasan does not exist in Arabic. In fact, Arabic does not have a definite set of adjectives and adverbs that are capable of expressing this form of comparison. Nevertheless, Arabic has the resources that can accommodate such a type. For example, all the adjectives and adverbs that show ‘identity’ of objects can be realized in Arabic by the words ‘nafs’ and ‘muTa:biq’ (same); those used for ‘similarity’ can be expressed as ‘miTl’ and ‘muShaa:bih’ (such, similar); whereas the ones which indicate ‘difference’ have the Arabic equivalent ‘a:xar’ and ‘muxtalif’ (other, different). Some of
the English adverbs have one-word equivalent in Arabic, eg. 'bittamaːtul' (identically), while some have a phrase as an equivalent, eg. 'bitariːqatin mumaːtila' (likewise) (Ba9alabki, 1972).

Although those Arabic words or phrases are not considered as expressions of comparison, the occurrence of any of them in a context similar to its English counterpart will be counted as a cohesive device.

The meaning of an instance of comparison can be retrieved either from a previous or a succeeding portion of text. Thus, comparative reference items can function either anaphorically or cataphorically. Here are examples of this;

(2.35a) laː urːiːdu haːdíhi ssayyaːra. abHaːtu 9aŋ waːHidatin aːkbaːr. (Anaphoric).
I don’t want this car. I’m looking for a bigger one.

(2.35b) ˈassayyaːratu lˈuxraː munasːibah. laːkin haːdíhi ssayyaːratu Sagːiːra. (Cataphoric)
The other car is suitable. This car is small.

Comparative reference can also occur exophorically, as in;

(2.36) (someone has got a letter)
kuntu atawagga9u risaːlata:n muxtalifa.
I’ve been expecting a different letter.

It seems that almost all the above examples which indicate the cohesive function of the different entities involved are instances of intersentential cohesion. However, any pair of sentences can be collapsed into one compound or complex sentence, hence providing an instance of intra-sentential cohesion. In other words, what has been said so far holds true on both levels of analysis, ie. intra- and inter-sentential cohesion. An example will be sufficient to
illustrate this;

I don't want this car because it's small.

This is an instance of personal reference 'ha:' (it) which has to be interpreted in the light of its coreferent (the car) which lies in the previous clause. Thus a cohesive anaphoric relation obtains intrasententially.

2.2 Substitution and Ellipsis in Arabic

In fact, the literature of Arabic linguistics is completely void of any treatment of substitution and ellipsis in the Hallidayan sense. There is what is called in Arabic 'albadal' (substitution), but this refers to the relationships obtaining among the constituent elements of the single clause or sentence. Abdul-Latif (1982) also spells out the cases in which ellipsis can occur in the sentence. Still substitution and ellipsis have not been investigated as potential cohesive devices at the inter-sentential level. In other words, the role these two notions play in the creation of cohesive texts has not been scrutinised. This is principally due to the much restricted unit of linguistic analysis, the sentence.

2.2.1 Substitution

2.2.1.1 Nominal Substitution

Despite the fact that substitution and ellipsis have not been treated as textual factors, this does not rule out their existence. Arabic has the resources that accommodate them. For example, the English nominal substitute 'one' has the Arabic
equivalent `wa:Hid` which can occur in somehow similar contexts. The following example demonstrates how this substitute functions in Arabic.


This sandwich is not fresh. Get me another one.

Here, `wa:Hid` (one) substitutes for `sandwich` in the sentence, hence creating an anaphoric cohesive relation which links the two sentences in one text. The defining elements accompanying the presupposed item (not fresh) are also repudiated by `a:xar` (another). Thus, the Arabic word `wa:Hid` (one) has performed a function similar to that performed by its English counterpart.

The variant substitute `ones` is completely absent from Arabic. Instead, the whole nominal group has to be repeated. Therefore, in

(2.39) These examples are wrong. Give some new ones.

`ones` has no equivalent in Arabic because `one` cannot be pluralised. Therefore, the only plausible way for conveying the meaning of `Give some new ones` in Arabic would be;

(2.40) a9Ti ba9Da l`amtillati Ijadi:da
Give some new examples.

The example displays how repetition of the whole nominal group is imperative.

Example 2.38 above shows the only context in which the nominal substitute `wa:Hid` can occur in Arabic. But this cohesive function should not be conflated with the other structural functions
of `one'. In order for such conflation to be avoided, examples of the structural functions will be given. According to Halliday and Hasan `one' can function as a "personal pronoun", "cardinal numeral", "indefinite article" and "pro-noun". These are spelt out in 2.41.

(2.41a) **Personal reference**


One never knows when he'll die.

(2.41b) **Cardinal numeral**

inTalaga 9ashra, wala:kin 9a:da wa:Hid

Ten set out, but only one came back.

(2.41c) **Indefinite article**

uri:du finja:nan mana lgahwa; iدان uskub linafsika wa:Hidan

I'd like a cup of coffee. The pour yourself one.

(2.41d) **Pronoun**


If such a one be fit to govern, speak.\(^{(1)}\)

The last example resembles the usage of `one' as a general noun. In C, it is equally likely for an Arabic native speaker to repeat `finja:n' (cup) rather than using `one'. Actually, this is also applicable to the instances where `wa:Hid' (one) is used as a cohesive device. Repetition of the same entity is always equally plausible.

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\(^{(1)}\) All the English examples are taken from Halliday and Hasan, pp.98-102.
The English nominal substitute 'same' does not occur as such in Arabic. As stated earlier, the word 'nafs' which means 'same' can be used as a comparative reference item. Therefore, for the English example;

(2.42) I'd like a hamburger. I'll have the same.

the following is the only likely equivalent in Arabic:

uri:du nafsa shshay'.
I'll have the same thing.

The word 'shay' (thing) has substituted 'hamburger' and hence 'nafs' (same) is an instance of comparative reference, and not a nominal substitute.

2.2.1.2 Verbal Substitution

Verbal substitution which is not dealt with in Arabic in the Hallidayan sense is much more restricted. The occurrence of the verbal substitute 'do' is only possible in yes/no answers as in the example;

(2.44) hal katabta ddars? na9am, lagad fa9alt.
Have you written the lesson? Yes, I have done.

And here, repeating the same verb 'katabt' (written) is equally likely.

But while the verbal substitute 'do' is quite adequate in certain contexts in English, it is not in Arabic. The following instance is, for example, impossible in Arabic.
(2.44) Have they removed the furniture? They have done the desks, but that's all. (1)

The lexical verb, 'remove' must be repeated in Arabic.

Like the nominal substitute 'one', 'do' has other structural functions that should not be confused with its cohesive function. Halliday and Hasan categorize these structural functions as "lexical verb", "general verb", "verbal operator" and "pro-verb". The function that can occur in Arabic will be illustrated below so that confusion does not arise.

(2.45a) **General Verb**

rubbama: yaf9alu ha:da ddawa:'u l'a9a:ji:ba ma9ah.
This medicine might do wonders for him.

(2.45b) **Pro-verb**

ma:da: ka:nat taf9al? lam takun taf9al ayya shay'.
What was she doing? she wasn't doing anything.

The categories "lexical verb" and "verbal operator" do not exist in Arabic. In fact, the verb 'yaf'âl' (do) is not used to form questions in Arabic.

2.2.1.3 **Clausal Substitution**

As for clausal substitution, the Arabic demonstrative 'da:lik' (so) can be used to convey the same meaning as the English clausal substitute 'so'. What determines which function 'da:lik' (that, so) is meant to perform is the context. The following is an instance of clausal substitution;

(1) This example is from Halliday and Hasan, p.14.
(2.46) a9taqidu annahu sayanjaHu ha:dihi lmarra a:malu da:lik. 
I think he'll pass this time. I hope so.

The only other plausible environments for clausal substitution in Arabic are in such expressions: 'aZunnu da:lik' (I believe so), and 'yaf9al da:lik' (do so). The examples show this;

(2.47) tab9an ta9rifu TTari:q aZunnu da:lik. 
Of course you know the way? I believe so.

hal aT9amta TTifl aHaduhum fa9ala da:lik. 
Have you fed the baby? Someone did so.

The negative clausal substitution is even much more restricted in Arabic. This is only possible in expressions like: 'rubbama: la:' (perhaps not), 'bitta'ki:d la:' (certainly not), as in the example;

(2.48) hal tusal:iduhu law kunta maka:nii?

rubbama: la: (bitta'ki:d la:)
Would you help him if you were me?

Perhaps not (certainly not)

But a straight equivalent of the truncated expression 'I hope not' does not exist in Arabic:

The above examples demonstrate the anaphoric function of these substitution elements. In fact, this is the only function since they should substitute for items mentioned previously in the text.

I should like to reiterate that the previous instances are not treated as substitution elements in Arabic. The primary concern here is to highlight the resources this language has to mark the major cohesive functions designated by Halliday and Hasan. However, as
stated earlier, Arabic native speakers normally opt for repeating the same entity when a substitution element can be used. This also holds true of ellipsis which will be discussed below.

2.2.2 Ellipsis

Like substitution, the notion of ellipsis has not been treated by Arab linguists across sentence boundaries. Cantarino (1974) discusses ellipsis in nominal sentences. He argues that "those members which are already mentioned in the sentence are easily understood from context are omitted." One of his examples is:

(2.49) ayna umma yaa fu'ad? mari:Da fi lbayt.
Where is your mother Fuad?(1) He said: 'ill at home'.

This is not an instance of nominal ellipsis as we shall see in the course of this section.

2.2.2.1 Nominal Ellipsis

To ascertain whether or not Arabic has the potentiality for such a relation, recourse will again be made to Halliday and Hasan’s examples. According to them 'a nominal group having Deictic, Numerative, Epithet or Classifier as Head is always elliptical'. But "if it contains a partitive Qualifier, it is not elliptical unless the partitive Qualifier is itself elliptical" (p.149).

When the head of a nominal group is an "epithet" it may be elliptical in Arabic as in the example.

(1) Faul is an Arabic name for a male person.
(2.50) man yadu:nu zamanannatwal, alguDba:nu lmaHniyya amIguDba:nu lmustaqi:ma? almustaqi:ma la: tankasiru
bisuhu:la.

Which last longer, the curved rods or the straight
rods? - The straight are less likely to break.

The epithet 'almustaqi:ma'h (straight) in the second sentence is
elliptical. The noun 'rods' is ellipted.

It should be noted that the ellipted item precedes the
electical element (ie. deictic, numerative, epithet and classifier) in
Arabic. It is quite the opposite in English.

If the head is a "numerative" ellipsis can take place.

Here is an example;

(2.51) arba9at maHar:rattuxra: tabi9athum, wa arba9atunuxra:.
Four other oysters followed them, and yet another four.

The second occurrence of 'arba9a' (four) is the elliptical numerative.
The noun 'oyster' is elided.

The noun cannot be deleted after a deictic in Arabic. The
typical English instance in 2.52 does not occur in Arabic.

(2.52) They haven't got my usual morning paper. Can I borrow
yours? (1)

The ellipted noun 'paper' must be repeated in the question.

The classifier 'is very rarely left to function as Head'
(ibid:153). Thus this category is quite restricted in English.
However, corresponding adjective can occur in certain contexts in
Arabic. For example;

(2.53) ha:dihi: rabTaTu 19unugi 1Hari:riyyati 1lati: laday.
amannaka tufaDDilu lgu7niyya?

These are the silk ties I've got. Or would you like the
cotton?

(1) The English examples in 49, 50 and 51 are taken from Halliday and
Hasan, pp.148-151.
Here the noun 'rabTa' (tie) is deleted from the question. On the other hand, 'one' in the following instance does not have the same function in both languages.

(2.54)  ha:dih: rabTa:Tu 19unugi 1Har:i:riyyati 1lati: laday asta:Ti:9u an ugrIDaka wa:Hida in aHbabt.

These are the silk ties I've got. I can lend you one if you like.

While 'one' in the English example is elliptical (it presupposes 'one silk tie') it is an instance of nominal substitution in Arabic. If 'rabTa' (tie), which is supposed to be elided, is used in the second sentence, the meaning will be completely different. It will mean 'I can lend you one and only one tie'. Therefore it is not elliptical in Arabic, because it cannot be followed by 'rabTa Hari:riyya' (a silk tie).

Some types of English ellipsis do not occur in Arabic. For example, Arabic does not have an equivalent for;

(2.55)  I hope no bones are broken? - None to speak of.

Instead, the nominal substitute has to be employed in Arabic. The result is 'wala: wa:Hida' (not any one). Repeating the noun 'bone' is even more likely in Arabic.

2.2.2.2 Verbal Ellipsis

Verbal ellipsis is more restricted in Arabic. Direct equivalents of certain English elliptical instances do not exist in this language. For instance, the following type does not occur in Arabic.
(2.56) Have you done the homework? Yes, I have.

An Arabic speaker would tend to either use the verbal substitute as in;

(2.57) na9am, laqad fa9alt.
Yes, I have done;

or repeat a whole clause as in;

(2.58) na9am; laqad 9amaltuh (9amaltu lwa:jib).
Yes, I have done it. (I have done the homework)

This is due to the fact that the verb ‘have’ does not occur as an auxiliary in Arabic.

Nevertheless, verbal ellipsis is plausible in certain contexts in Arabic, as in the following example;

(2.59) ma:dā; kunta taktub? - addars.
What have you been writing? - The lesson.

It is more likely to repeat ‘aktub addars’ (write the lesson) rather than using ellipsis in this context.

Moreover, ‘operator ellipsis’ is not feasible in Arabic since it does not have this category. Consequently, the following instance is not possible in Arabic.

(2.60) Is John going to come? He might. He was to, but he may not. He should, if he wants his name to be considered.

(From Halliday and Hasan, p.170)

Here, the lexical verb ‘come’ should be used in Arabic. The above example would, then, read as follows in Arabic;

91

Is John going to come? Maybe. He was to come, but maybe not (he may not). He should come if he wants his name to be considered.

Similarly, "lexical verbal ellipsis" does not occur in Arabic. Accordingly, the following structure which is adequate in English has no equivalent in Arabic.

(2.62) Has he sold his collection yet? - He has some of the paintings.

(From Halliday and Hasan, p.172)

In Arabic, repeating the lexical verb ‘ba:9a˚’ (sold) is mandatory.

2.2.2.3 Clausal Ellipsis

Clausal ellipsis is only plausible in yes/no answers in Arabic. For example;

(2.63) hal katabta ddars? - na9am.

‘na9am˚ (yes) presupposes the clause ‘I have written the lesson’. Clausal ellipsis assumes two forms in English: "modal" and "prepositional". The following example demonstrates which of these occurs in Arabic.

(2.64a) ma:da ka:na TTa:libu sayaf9al? - yaktubi ddars.

What was the student going to do? - write the lesson.

(2.64b) man ka:na sayaktubu ddars? - aTTa:lib

Who was going to write the lesson? - the student.

In ‘a˚ the modal element (the subject and the operator) is deleted,
hence an instance of "modal ellipsis" maintains. But "prepositional ellipsis" which demands omitting the 'complement', the 'adjunct' and the 'lexical verb' is quite unacceptable in Arabic. Therefore, 'b'aTTa:libu ka:n' (the student was) is inappropriate in Arabic.

Consequently, the only plausible environment for verbal and clausal ellipsis in Arabic is yes/no and WH-questions. Yet it does not even occur in this environment as freely as it does in English. For example, 'yes it has' as a response to 'has the plane landed?' is not possible in Arabic. It is more likely to respond to that question in Arabic as either 'na9am (yes) or 'na9am laqad habaTat' (yes it has landed).

To recapitulate, substitution and ellipsis apparently occur in quite restricted contexts in Arabic, and repeating the entity in question is even more likely. However, when they occur, they always maintain an anaphoric relation. Their occurrence is more typical of spoken discourse in both languages. The figures which will be spelt out in Chapter Three verify this conclusion.

2.3 Conjunction in Arabic

Most, if not all, linguists refer to a set of particles as being capable of connecting single words, phrases or clauses. However, inter-sentential linkage which those conjunctions effect between independent sentences has not been explored. Moreover, there is a lack of consensus as to which particles can function as connectives. The following table exhibits a great deal of incongruity which stems from the four classifications involved.
\begin{table}[h]
\centering
\begin{tabular}{ll}
\textbf{Nasr (1967)} & \textbf{Abdul-Latif (1982)} \\
\hline
conjunction syllables & conjunction words \\
\hline
\textit{wa} (and) & \textit{tumma} (then) \textit{aw} \\
\textit{fa} (and+) & \textit{or} \textit{la:} (not) \textit{bal} \\
\textit{li} (imperative) & \textit{but} \textit{la:kin} (but) \\
\hline
\end{tabular}
\end{table}

\begin{table}[h]
\centering
\begin{tabular}{ll}
\textbf{Wright (1975)} & \textbf{Thatcher (1942)} \\
\hline
inseparable conjunctions & separable conjunctions \\
\hline
\textit{wa} & \textit{ida:} (when since), \textit{am} \textit{anna:} (as for) \textit{an} \\
\textit{fa} & \textit{ida:} (when if), \textit{in} (if, whether) \\
\textit{li} & \textit{li} (so that) \\
( imperative) & \textit{illa:} (if not), \textit{aw} \textit{baynama:} \\
\textit{aw, tumma, Hatta:,} & \textit{aw, baynama:} \\
\textit{9indamma:, kay (so} & \textit{(while) tumma,} \\
\textit{that} \textit{lamma:} (after} & \textit{Hatta:, kay,} \\
\textit{when}, \textit{law (if)} \textit{ma:} & \textit{la:kin, lamma:,} \\
\textit{(as long as)}, \textit{mata:} & \textit{law, ma:, mata:,} \\
\textit{(when)} & \textit{mud (mundu)} \\
\hline
\end{tabular}
\end{table}

\textbf{Table 3: Arabic Conjunctions}\(^2\)

(1) The plus (+) sign means that the particle 'fa' can mean other things besides 'and'. This will be explained in the course of this section.

(2) The meaning of each particle is given once.

The four classifications shown in table 3 can be divided into two major groups: the Arab linguists' group (Nasr 1967; Abdul-Latif 1982) and the Western linguists' group (Wright 1975; Thatcher 1942). Still the classifications belonging to the first group
manifest discrepancies as regards the terms used to refer to the
different sets. Furthermore, the conjunction 'Hatta' (till, so that)
is not classified as such by Nasr. The second group, on the other
hand, displays more consistency regarding the terms used (separable vs
inseparable). In addition, although Thatcher’s list subsumes more
conjunctions the linguists of this group recognize more conjunctions
than are identified by the other linguists.

The discrepancies demonstrated by those lists give rise to
two types of indeterminacy. The first pertains to the lack of
consensus among linguists as to what is to be classified as
conjunctions. Next, as is the case in English, some conjunctions seem
to assume more than one relation. There is also some disagreement as
to what relation can be embodied by which conjunction.

Abdul-Latif (1982:261-4) designates some of the relations
certain particles can perform. These are as follows:

1. Addition: wa
2. Sequence: fa, _umma
3. Sequence and Grading: fa
4. Purpose: Hatta:
5. Alternative: aw
6. Specification and Equation: am
7. Negation: la:kin (not preceded by 'wa')
8. Partial Contrast: la:
9. Complete Contrast: bal (this can be either positive
   or negative)

Although Abdul-Latif (1982) stresses the significance of
the context rather than the meaning of the particle itself, which is
partly similar to the idea of the underlying semantic relation that relates clauses rather than the conjunction itself (Brown and Yule 1983), he does not show how these conjunctions behave across independent sentence boundaries. His investigation does not go beyond the confines of complex sentences.

Despite the fact that the conjunctions shown in table 3 more or less represent the Arabic conjunctive system, it seems desirable to broaden the classification so that it can accommodate most of Halliday and Hasan’s conjunctions. The suggested taxonomy considers conjunctions with a view to their function in text irrespective of what labels they are given. Some might be adverbs and most of them are prepositional phrases. What actually matters here is what relation a certain ‘expression’ is meant to effect.

In the following table, the Arabic equivalents of some of the English connectives will be given. These are mapped onto Halliday and Hasan’s detailed table (pp.242-3). Our main reference for providing the most appropriate meanings of those connectives is the widely used English-Arabic dictionary ‘Al-Mawrid’.

<table>
<thead>
<tr>
<th>Additive</th>
<th>Adversative</th>
</tr>
</thead>
<tbody>
<tr>
<td>wa (and); wa’ayDan (and also);</td>
<td>ma9a da:lik (yet, though, nevertheless);</td>
</tr>
<tr>
<td>wala: (nor, and not); wa’illa:</td>
<td>la:kin (but); 9ala:</td>
</tr>
<tr>
<td>(or else); 9ala:watan 9ala:</td>
<td>ayyati Ha:1 (however; anyhow);</td>
</tr>
<tr>
<td>da:lik (furthermore, in addition, besides);</td>
<td>birragmi min da:lik (despite)</td>
</tr>
<tr>
<td>badalan min da:lik (alternatively);</td>
<td>this); filwa:qi9 (in fact, actually, as a matter</td>
</tr>
<tr>
<td>bilmuna:- saba (by the way); ayy anna (that is);</td>
<td>of fact); fi: nafsila:lagt (at the same time);</td>
</tr>
<tr>
<td>bima9na: a:xar (in other words); 9ala:</td>
<td>badalan min (instead); bila:jafra:</td>
</tr>
<tr>
<td>sabi:li lmita:1 (for instance); min na:Hiyat</td>
<td>(rather) 9ala 19aks (on the contrary); 9ala 1’aqail</td>
</tr>
<tr>
<td>in in contrast); fawqa da:lik,</td>
<td>(at least) 9ala ayyati Ha:1 (in any case);</td>
</tr>
<tr>
<td>tumma (then).</td>
<td>fi: ayyi l’afwa:1 (in either case) bi:ayyati</td>
</tr>
<tr>
<td></td>
<td>Tari:qatin ka:mat (whichever way it is); mahma:</td>
</tr>
<tr>
<td></td>
<td>yakuni l’amr (however it is).</td>
</tr>
</tbody>
</table>
Causal | Temporal
---|---
lida:lik (so, therefore, consequently); idan (hence); bisababi da:lik (because of this, on account of this); liha:da ssabab (for this reason); nati:jatan lida:lik (as a result of this, in consequence); liha:da lgaraD (for this purpose); a:xidan bi9ayni l’i9tiba:r (with this in mind); bisabab, li’anna (for, because); 9ala: haida l’sas:s (on this basis); liha:dihi lgayya (to this end); idan (then); fi: tilka liHa:a (in that case); fi: mitli ha:da ZZaruf (in such an event); taHta ha:dihi ZZuru:uf (under the circumstances); wa’illa (otherwise); taHta Zuru:uf unxa: (under other circumstances); biha:da lnxuSu:S (ashsha’n) (in this respect); 9ada: da:lik (aside from this).
9inda’idun (just then); tumma, ba9da da:lik (next, after that); fi: nafsi lwag (at the same time); sa:bigan, anifan (previously); gabla da:lik (before that); axi:ran (finally, at last); awwalan, axi:ran 9alayhi (thereupon the end); fi iHa:l (at once); 9ala: da:lik (after a time); fi lmarrati tta:liya (next time); fi: mun’a:sabatin uxxra: (on another occasion); fi lyawmi tta:li: (next day); ba9da sa:9a (an hour later); fi: guDu:nı da:lik (meanwhile); Hatta: da:lika lHi:n (until then); fi: ha:dihi llaHza (at this moment); ligayati l’a:n (up to now; hitherto); huna: (here); mina l’a:n faSa:9idan (from now on, henceforward); bixtıSa:r (in short, briefly); 9ari:ban, 9a:jilan (soon); ba9da qal:il (after a time).

Continuative

al’a:n (now); Tab9an (of course); hasanan (well); 9ala: ayyati Ha:l (anyhow); bitta’ki:d (surely); 9ala 19umu:m (after all).

Table 4: Arabic Conjunctions equivalent to Halliday and Hasan’s (1976)

This list is not by any means exhaustive. Some Arabic conjunctions have synonyms other than those given in the table. Only the commonest terms have been included here. Table 4 also shows that sometimes a one-word English conjunction has a phrase as its equivalent in Arabic, eg. ‘furthermore = 9ala:watan 9ala: da:lik’.
Some Arabic conjunctions perform more functions than some of their English counterparts do, eg. ‘then’ can be an additive in Arabic, a function that does not exist in English.

97
Table 4 also indicates how the same conjunction can assume various forms, eg. ‘then’ = ‘tumma’, ‘idan’ and ‘ginda’idin’, albeit the different function performed by each. Finally, some Arabic conjunctions can accommodate more than one English equivalent, eg. ‘lidalik’ = ‘so’, ‘hence’ and ‘therefore’.

The presence of any conjunction does not necessarily entail that it creates the same relation as that conveyed by its English counterpart. It is the goal of a grammar to probe such potentiality which is beyond the scope of the present study. The pivotal concern here is to bring to light the way conjunctions behave in discourse. If any of them relates two clauses or sentences by some kind of relation, it will be considered cohesive.

A major distinction between English and Arabic in this concern is that English makes use of a variety of conjunctions. It is the logical relationship between a pair of sentences that dictates which connective to be employed. In contrast, Arabic uses a relatively small number of connectives, mainly, ‘wa’, ‘fa’, and ‘la:kin’. The great frequency of these does not preclude other conjunctions from occurring, albeit sporadically.

A brief resume of the way in which some Arabic conjunctions behave in discourse will be given below.

In fact, ‘wa’ is the most frequent of all conjunctions in Arabic. Almost all linguists who approached Arabic have been struck by its great frequency. Williams (1982:119) noticed that ‘wa’ is used not only as a coordinator but also as a subordinator. Yorkey (1974) remarks that teachers at the American University of Beirut refer to ‘the wa-wa method of writing’ because it is profusely used by Arab students. He refers this to the tendency of Arabic towards using
coordination as a favoured structural device. Dudley-Evans and Swales (1980) also observed the redundancy of ‘wa’ in Arabic. They noticed, among other things, the lengthy sentences of Arabic. Actually, this is another factor which enhances the over-abundance of ‘wa’. Holes (1983), too, maintains that the English punctuation system is particularly problematic for Arab students. Despite the introduction of the comma and the full-stop, many Arab writers still tend to ‘pile clause upon clause, separating them only by ‘wa’ or ‘fa’. ‘Wa’ can mark temporal sequence, simultaneous action, semantic contrast and semantic and temporal sequence, logical sequence, purpose, result or concession’ (p.234). Holes also suggests that ‘wa’ is often used to signal clause or sentence boundaries. For example, in the following example of Taha Hussein’s text, ‘wa’ recurs five times.


(N1, Appendix B)

And but the month elapsed, and the Azhari returned to Cairo, and our friend remained in the same place and manner, he didn’t travel to Cairo, and he didn’t wear the turban, and he neither put on the ‘jubba’ nor the ‘quaftan’.

(1) The punctuation marks are kept intact. ‘Jubba’ and ‘qufTan’ are types of the uniform of Al Azhar people.
First of all, this example is typical of the frequency of co-ordinate clauses which are piled loosely in Arabic. Such a structural device enhances the frequency of 'wa' in text. Moreover, the occurrence of 'wa' with the adversative 'but' is typical of Arabic. In fact, 'wa' appears with most other conjunction. In this case, it is the other conjunction that links incoming and ongoing discourse rather than 'wa'. 'And' does occur with other conjunctions in English (e.g. and also), but it cannot occur with 'but', since the latter sometimes contrasts with the meaning of 'and', although in spoken colloquial English and can have an adversative meaning.

In the above example, 'wa' takes place with 'but' at the very beginning of the text. An adversative relation that is embodied by 'but' obtains here. The occurrence of 'wa' here resembles its resumptive function in spoken discourse, 'but' in the example connects two portions of discourse, the portion in which it occurs and a preceding one.

'wa' is often meant to demarcate sentence boundaries as another comma. For this reason, not all the inter-sentential instances of 'wa' should be treated as real conjunctions. However, at the intra-sentential level, 'wa' is always cohesive because it joins clauses together in larger sentences.

Excluding the first instance of 'wa' in 2.65, the second instance is temporal (after the passing of the month, the Azhari returned to Cairo). The fourth (wa lam..) and the fifth (wa lam..) are additives. The third instance, on the other hand, conveys a causal or a logical sequence relation (as a result of the Azhari's return to Cairo, 'our friend' remained, etc.). However, this third instance of 'wa' can be dispensed with or without amputating the
meaning.

No doubt that such a wide range of usage is also applicable to the English ‘and’, which has functions other than ‘addition’ (Quirk et al 1973). It can be causal (so, therefore, because), temporal or in spoken discourse it can be a loose connector of discourse episode.

However, this rather loose and undue frequency of ‘wa’ calls for attention from the discourse analyst.

Similarly, ‘fa’, the second most frequent conjunction occurs rather loosely, though less frequently than ‘wa’. ‘Fa’ can indicate different relations between discourse units. In the following example, it expresses a causal relation;

(2.66) lam yakun axu:hu yuHibbu an yaHtamilah, fa asha:ra bi’an yakqa: Haytu huwa sanatan uxra:.

(N1, Appendix B)

His brother didn’t like to put up with him, so he recommended that he stay where he was one more year.

‘Fa’ is temporal or sequential in the following text;

(2.67) wasur9anna ma staraddati ssayya:ratu sur9staba l’u:la: fa qtaraha khalid an yatawaggafu: qali:lan liyatajawalu: fi ZZala:m.

(N2, Appendix B)

No sooner had the car retained its first speed than Khalid suggested that they stop to wander in the darkness.

Like ‘wa’, ‘fa’ can occur with other conjunctions as in the following example;
(2.68) fa amma l kita bu ladi: lam yakun buddun min Hifzihi: kullih fa ulfiyyatu Enu Malik.

(N1, Appendix B)

As for the book which he had to learn completely was Ulfiyyatu buu Malik.

'Fa' in this example resembles the occurrence of 'wa' with 'but' in 2.65. Here it is the conjunction 'amma' (as for) which relates this chunk with the preceding one. 'Fa' conveys a resumptive function here.

'La:kin' (but) takes on another from in Arabic 'bal'. 'bal' can indicate an additive relation as in the example;


(N3, Appendix B)

Only now has he realized the source of that feeling of relief, it is disclosing under his very eyes with great serenity and openness, it has also (even) destroyed every barrier of boredom.

In contrast, 'bal' in the following text is adversative;


(N3, Appendix B)

Not only because his mother didn't like cross words, but because he didn't want that either.

Many conjunctions can take place in the same text in Arabic as in the example;


(N3, Appendix B)
And but he, however (anyhow), does not hate his father to that extent.

One conjunction either 'but' or 'however' is sufficient to indicate the (adversative) relation here. 'la:' is recognised by some linguists as a conjunction (see table 3), but it is a negative marker in this example.

'tumma' is another conjunction that can appear in various contexts. It is principally a temporal conjunction (then), as in the example;

(2.72) warubbama: Zahara li awwali marra tumma xtafa: limuddatin tata: waHu bayna shahrayni wasana.

(S2, Appendix B)

Perhaps it appeared for the first time, then it disappeared for two months or a year.

'tumma' can also be additive, as in;

(2.73) ...an yatruka arba9ata aTfa:l, an yuTalligak' antibila: ayyi sabab, tumma yatazawwa ja min tilka l'imra' ati shshawha:'

(N3, Appendix B)

...to leave four children to divorce you without any reason, and (to) marry that deformed woman.

We have seen how several relations can be expressed by the same conjunction in different contexts. This is in line with Abdul-Latif's (1982) remark concerning the effect of the context on the meaning of the conjunction. This is not unusual in English when 'then', for example can indicate causal and temporal relations in different contexts. But it is not typical of English to use such a multiplicity of conjunctions (and, but, however) in one sentence as
Arabic does. Nor is it acceptable in English to use a conjunction in a context where it is not needed.

Finally, we would like to provide a few examples which clearly display that conjunctions other than those recognised by most linguists (see table 3) can occur in Arabic. This may, hopefully, reveal that Arabic does have the potential resources for indicating the different relationships between discourse units. Importantly, this shows how restricted the other linguists' classifications are. In fact, those linguists draw on the traditionally recognised particles.

(N10, Appendix B)

And thus he ended up with an 8th grade job at the ministry of religious affairs.

(NE3, Appendix B)

In contrast, the Soviet Officials reiterate that deploying American missiles in Europe will make the Soviet Union deploy more missiles.

(2.76) matalan da:lika shshalxiu TTwai:lu 9ala lgadami lyumna:.
(N4, Appendix B)

For example, that long wound on the right foot.

(S2, Appendix B)
In addition (furthermore), noticeable growth in the genital organs also takes place, so (therefore) the womb grows.


(N9, Appendix B)

This is in addition to the disturbance he causes to the neighbours.

(2.79) wa ma9a da:lik fa:hwu yabdu: fi ssab9i:n.

(N10, Appendix B)

And despite this, he looks in his seventies.

The above examples represent the three text types selected for analysis in this study. This proves beyond doubt that Arabic written varieties display a variety of conjunctions. Such a variety is still limited compared with that of English.

Dudley-Evans and Swales (1980) noticed this limitedness when they remark that Arabic has equivalents of most English conjunctions which appear in translated English texts, but in 'other works use is restricted to the equivalents of 'and', 'so' and 'but' ('wa', 'fa' and 'la:kin')' (quoted in Williams, 1982:9). This view concerning the potentiality of Arabic to accommodate most English connectors validates my previous argument (see table 4).

2.4 Lexis in Arabic

Arabic utilises a very rich reservoir of lexical items. This richness has given rise to certain characteristics. To this effect, Shouby (1951:298) observed the abundance of forms of ‘muba:lagah’ (exaggeration) and ‘tawki:d’ (assertion). These two characteristics are carried out by the repetition of pronouns and
certain words to get across their meanings or significance. These also result in the abundance of ‘metaphors’ and ‘similes’ and ‘long arrays of adjectives to modify the same words’ (ibid:298-9).

Another device which is brought into play as a result of the wealth of lexical items in Arabic is the play on words. This leads Shouby to believe that in Arabic thoughts are the vehicles of words and not vice versa. The great emphasis laid on the value of words is partly due to the ‘pleasure derived from the sounds of words and the rhythm and harmony produced by the combinations of words’ (ibid:295). The influence of this "musicality" was more apparent at the turn of the century when a literary style called 'sajj' (word rhyming) was the dominant criterion of good writing.

Thompson et al (1983) consider the stylistic devices of assertion and exaggeration as one of the potential ‘obstacles to good English writing’ by Arab learners. It is an inherent feature of Arabic that main points are over-asserted. Patai (1976), Hamady (1960), Suleiman (1977) and Protho (1955) among others hold that the greater use of exaggeration and assertion relative to English extends to all language communication.

These two major characteristics of assertion and exaggeration are implemented in a variety of ways. One is lexical repetition which is a major source for the cohesion of text. The following is an example which exhibits a lot of lexical repetitive items.
He learned from the book strange things, some are called 'aljawhara', and some are called 'alxariida', and some are called 'alrahabiyya', and some are called 'assirajiyya', and some are called 'laamiyyat 'al'af9aal.' The words 'ba9D' (some) and 'yusamma:' (called) are repeated five times each. The author could have listed those names after a colon, but the musical effect they produce coupled with the parallel structures which enhance such musicality made him opt to repeat them. It seems that Arab authors are so much influenced by the musical effect of words that a certain structural pattern is imposed on their writing. Parallel coordinated structures are the device that can best convey that effect. This is partly in line with Shouby's (1951) notion of musicality.

In an endeavour to explore the 'role of repetition in Arabic argumentative discourse', Al-Jubouri (1983:101-8) observed three levels at which repetition occurs: 'the morphological level', 'the word level' and the 'chunk level'. These are some of his examples.

At the Morphological Level

(2.81a) laysat istiqla:lan... wa layst isti:la:lan not exploitation... and not confiscation

(2.81b) yagtu:lu:ni: wa la: yanfa9u:ni They kill me and they don't do me any good.
(2.81c) aDDu9afa: `... al`agwiya:`
the weak ... the strong

The repeated words have the same morphological endings. However each pair in b and c is related by antonymy, while in a they are collocates.

At the Word Level

(2.82a) almad:fi9u wa ssuyu:f
the guns and the swords

(2.82b) assawa:9igu wa DDarabat:
the thunderbolts and the blows

(2.82c) taDHiyatun wa badlun wafida:
sacrifice and sacrifice and sacrifice

Here lexical repetition hinges on synonyms in c and collocation in a and b.

At the Chunk Level

(2.83a) wakam min aHza:bin Hakamat tumma Hu:kimat
Many political parties ruled and got ruled

(2.83b) wa tawallat tumma ndatarat
and took power then perished

(2.83c) wa rtafa9at tumma sagaTat
and rose and fell

According to Halliday and Hasan `Hakamat' and `Hu:kimat' in a are repetitions of the same word. In b and c repetition is carried out by
antonyms.

Such lexical repetition is not restricted to the same paragraph. Repetition of lexical items across paragraphs is another means for assertion. This is more obvious in newspaper editorials. Here is an example from the Saudi daily 'Asharg Al-Awsat'.

(2.84) Paragraph 1

asha:ra 19a:hilu ssu9u:di...
The Saudi King indicated...

Paragraph 2

wa akkada 19a:hilyu ssu9u:di...
And the Saudi King confirmed...

Paragraph 3

laqad aSa:ba 19a:hilu ssu9u:di...
The Saudi King arrived at...

Paragraph 4

ha:da: wa qad asha:ra 19a:hilu ssu9u:di...
This and the Saudi King indicated...

Paragraph 5

tumma da9a lmalik...
Then the King called for...

Paragraph 6

wa ta:labba lmalik...
And the King asked...
Paragraph 7

wagad aSal:ba lma:lik...

And the King arrived at...

(NE10, Appendix B)

This editorial is made up of ten paragraphs. In seven of which either ‘the Saudi King’ or just ‘the King’ initiates the paragraph. This is besides the profuse repetition of certain words such as: Islam, Islamic, Mosliims, fanaticism, the Islamic conference etc.

Therefore, in Arabic the same point is revisited at different stages and this brings about much lexical repetition. The entire effect of a piece of writing hinges upon such lexical density. Williams (1983) asserts that Arabic tends to favour ‘lexical repetition’. He holds that in Arabic ‘the same theme’ is repeated in ‘successive clauses... more frequently than English does, even when it is grammatically possible to omit it’ (ibid:126). Thus, while English favours ellipsis and precision, Arabic opts for redundancy. Williams also suggests that ‘greater redundancy will often lead to greater cohesion, but greater cohesion will not always lead to great redundancy’, (ibid:126).

Semantic and structural redundancy which rests on lexical repetition was also observed by Holes (1983) in almost all registers of written Arabic. He maintains that such redundancy ‘attracts praise, not blame’ (p.26) in the Arabic literate community.

Koch (1983) argues that ‘the key to the linguistic cohesion of the texts and their rhetorical effectiveness’ depends on repetition. She also observed three levels of repetition: ‘lexical’, ‘morphological’ and ‘syntactic’. Repetition, she maintains, is a
persuasive device which "occurs on all levels and in a number of guises". These are, "frequent use of lexical couplets" and "repetition of content" which is implemented by "paraphrase". Koch argues that such repetition is intrinsic in the "lugah" (language) which "is not a tool for communicating non-linguistic or pre-linguistic ideas" (p.55).

Thus, most linguists who have approached Arabic are in agreement that it is a language which derives its most obvious cohesive force from lexical repetition. This will be further elaborated in Chapter 3.

Showing that different linguists acknowledge parallelism and repetition is not the same as proving that its most obvious cohesive form derives from these.

2.5 The notion of sentence in Arabic

As a syntactic unit, a sentence in Arabic assumes two major forms: nominal and verbal. A nominal sentence consists of a subject which is normally a noun or a pronoun, and a predicate which is either a noun, a verb or a preposition with its genitive (i.e. adverb) (Wright, 1975), there being no equivalent to a copula. The following examples illustrate the different forms of a nominal sentence.

(2.85a) Zaydun Ta:l i b u n.  
Zeid (is) a student.

(2.85b) zaydun shar:fun.  
Zeid (is) honest.

(2.86c) zaydun ma:ta.  
Zeid died.

(2.85d) Zaydun fi lma: si j.  
Zeid (is) in the mosque.
A verbal sentence is one in which the subject follows the verb or has only a verb which "includes both subject and predicate" (Wright, 1975:251). These are two examples of a verbal sentence.

(2.86a) maːta zaydun
died Zeid.

(2.86b) maːta
died (Zeid).

However, discourse is not merely a string of syntactic units which are mutually exclusive. Rather, such syntactic units are normally fused together resulting in semantically independent units which constitute larger discourse. In other words, a stretch of syntactic units are connected by coordination or subordination, the thing that yields more complex structures. These structures are, thus, governed by certain semantic and pragmatic rules and not only syntactic ones.

As a semantic unit, the sentence in English has more clear-cut boundaries than that in Arabic. At least the beginning and the end of the English sentence are demarcated by a capital letter and a period, a question mark or an exclamation mark. In Arabic, on the other hand, sentence boundaries are most often far from being definite. A similar set of punctuation marks theoretically exists in Arabic (Al-Khateeb, 1983), but in practice, punctuation is often differently applied. Holes (1983) argues that despite the introduction of the full-stop and the comma into Arabic, Arab writers still `pile up' clauses loosely connected by `wa' and `fa'. It was suggested in 3.3 above that those two particles, especially `wa', are sometimes used as punctuation signals marking the beginning of sentences.
Consequently, in the near absence of a distinct punctuation convention, the determination of sentence boundaries in Arabic texts becomes one of the most problematic issues facing a discourse analyst. And since this study is primarily concerned with exploring intra- and inter-sentential relations, sentence boundaries must be clearly demarcated so that inter-sentential relations can be examined. This calls for a new definition of the Arabic sentence as a semantic unit.

Like English, Arabic has the potential for connecting syntactic units by a set of coordinating and subordinating words. The result is larger semantic chunks which are equivalent to the English compound and complex structures. Here are some examples.

(2.87a) i(lam yadhab 9aliyyun ila lmadrasati li’annahu: mari:D.
(Complex sentence)
Ali didn’t go to school because he was ill.

(2.87b) daras 9aliyyuni ddarsa ‘wa Kataba Iwa:jib.
Ali studied the lesson, and wrote the homework.
(Compound sentence).

In (a) one clause is subordinated to the other by the underlined subordinating word. In (b) each clause has the same informational status and the two clauses are, therefore, coordinated.

Accordingly, this procedure will be opted for in the Arabic texts examined here. Demarcation of semantic units (i.e. sentences) will be based on the inter-relationships obtaining among their constituent syntactic units (i.e. clauses). In other words, a sentence will be one which is semantically independent of preceding or following sentences. Such a sentence may consist of one or more
syntactic units.

Consequently, the demarcation of sentences in the Arabic texts examined in this study will be based on this procedure. A string of sentences will be fused in one longer sentence depending on the type of semantic relationships among its constituent clauses. The following is an example from an Arabic narrative text. In this text, slashes are used to separate clauses while numbers demarcate sentence boundaries.


(NI, Appendix B)

The car moved/carrying Rajab, and Samara and Ahmad Nasr in the front seat while the others were piled in the back seat as one body with five heads (1). It went to Al-Haram street in semi-emptiness of pedestrians and cars (2). And Rajab suggested Sagara road as a place for rest/so his suggestion was welcomed by those/who knew the road/and who didn't (3).

This text is, then, divided into three semantic units. The first consists of three clauses. Although the second is not explicitly connected with the first, it is implicitly so, the implication being 'and it (the car) was carrying'. Each of the first and the second clauses has equal informational value, and hence they are coordinated, albeit implicitly. The third clause, which carries inferior informational value, is subordinated to the second.

Sentence 2 is semantically independent and is, thus, set off as one sentence. Its informational import (ie. the car's
direction) is independent of that of the preceding sentence (ie the car’s load) and that of the following sentence (ie. Rajab’s suggestion).

The third sentence consists of four clauses, two coordinate (though ‘fa’ (so) is sometimes treated as a subordinator) and two subordinate. As stated in the discussion above, coordinating or subordinating clauses rests upon the informational status of the clause.

To sum up, the definition of the Arabic sentence offered here is principally based on semantic independence. A sentence is treated as such if it is semantically independent of incoming and ongoing discourse. As shown above, such a semantic unit can consist of one clause or a string of clauses which are semantically related.

In light of the above examples, sentence boundaries in Arabic can be demarcated. The suggested procedure may be rather unconventional, (no doubt, that the present procedure is not a perfect one), but it accords with the purpose of the analysis to be carried out in the next chapters.

Without a syntactic unit which is comparable across the two languages, and which takes account of the inter-relationships and dependencies of clauses, no sensible statistical analysis can be carried out of cohesion types and their frequency in English and Arabic.

2.6 Summary

The potential resources of Arabic for textual cohesion are described under the major headings of Halliday and Hasan’s (1976) taxonomy: Reference, Substitution, Ellipsis, Conjunction and Lexis.
An overview of related works on cohesion in Arabic (Williams, 1982; Koch, 1981; 1983) is first outlined. Section 2.1 focusses on co-referential relations. Pronominal co-reference is utilized slightly differently in Arabic because it has a different linguistic system than that of English. Three types of pronoun are used in Arabic; enclitics (attached or dependent), independent and implicit (contained in the verb). The frequency of this relation is expected to be higher in Arabic than in English since the linguistic system of Arabic allows the occurrence of almost all those pronouns in one clause or sentence.

Besides the demonstratives used in English, Arabic has demonstratives for 'dual'. In addition, the definite article has a much wider application in Arabic. For example, it can accompany nouns, gerunds and adjectives, and it can modify a word already modified by another demonstrative. Thus, demonstrative co-reference is also expected to be more frequent in Arabic.

Comparative co-reference varies in the two languages. Whereas Arabic has the potential to express 'general' and 'particular' comparison, it does not have the set of comparative adjectives and adverbs that occur in English (eg. equally good). Therefore, this device may be less frequent in Arabic.

Section 2.2 discusses substitution and ellipsis. The occurrence of these two devices is quite restricted in Arabic which favours lexical repetition. Moreover, certain instances of substitution and ellipsis which can occur in English are impossible in Arabic (eg. Have you done the homework? Yes, I have.). In this case, the lexical verb (ie. done) must be repeated in Arabic. Thus, what is possible as ellipsis in English occurs as substitution in Arabic.
Consequently, these two devices are expected to be quite scarce in the Arabic texts.

Conjunction is addressed in Section 2.3. Although Arabic can accommodate most of Halliday and Hasan's (1976) conjunctive relations, a small number of conjunctions usually occurs in Arabic, namely 'wa' (and); 'fa' (so) and 'la:kin' (but). 'Wa' and 'fa' have a wide range of meanings which makes them very frequent in Arabic discourse. These can also stand alone or occur with other conjunctions. Their occurrence is still enhanced by co-ordination and parallelism. Conjunctions are, then, expected to be more frequent in Arabic.

In section 2.4 lexis is discussed. Lexical repetition is typical of Arabic discourse. This device can occur at various levels: phoneme, morpheine, words, phrases, clauses and sentences. Arabic derives much cohesion from lexical redundancy (Williams, 1983). Therefore, this device is expected to be more frequent in Arabic.

A brief statement of the nature of the sentence is given in Section 2.5. Some exploration of the difficulty of ascertaining sentence boundaries is necessary because a comparative analysis of clause connection and sentence connection, in three text-types in the two languages, must have a comparable base. Comparative statements about the frequency of inter-clause and inter-sentence connectives cannot be made unless it can be assumed that the grammatical units involved are in fact comparable across languages.

The brief exploration of the sentence in Arabic proposes that a sentence is one which contains at least one syntactic unit which is semantically independent of contiguous sentences, and which
will fall into the class of either nominal sentences or verbal sentences.

Further discussions of parallelism in Arabic at the level of structure above clause, and of theme is to be found in Chapters 4 and 5 respectively.

2.7 Orientation

This chapter has provided a full statement of the cohesive devices of Arabic in order to provide the reader with a linguistic description which is comparable in depth of detail to the description apparatus of Halliday and Hasan. The categories which are described and illustrated in this chapter form the basis for statistical comparison of

a) intra language variation across text types

b) cross language variation within text types

Chapter Three presents the statistical analysis of cohesion along these dimensions and assumes the validity of the categories set out in this chapter.
CHAPTER THREE

Trends in Textual Cohesion in English and Arabic

3.0 Introduction

Chapter One outlines the repertoire of devices for textual cohesion in English, and examines the theoretical status of cohesion in text processing. Chapter Two presents an analysis of cohesion in Arabic. This chapter presents an analysis of the variable realisation of cohesion both in English and Arabic in three text types: Literary Narratives, Newspaper Editorials and university undergraduate Science Texts. The aim in doing so is to examine variability in cohesion in different text types and across the two languages, English and Arabic.

A comprehensive statistical analysis of every possible type of cohesion in the three text types is well beyond the scope of this thesis. In this chapter, the categories of cohesion selected for statistical analysis are essentially the major categories of Halliday and Hasan (1976): reference, substitution, ellipsis, conjunction and lexis. Two further important cohesive devices, parallel structure and thematic patterning, which do not fall within the H & H (1976) framework, (see Chapter I for a critique of H & H) are presented in Chapters Four and Five respectively. All of these categories are recognised by analysts of the field, though different writers place different emphasis on each category, and of course do not necessarily interpret each category in an identical way. (See Chapter I for full discussion of types of cohesion).

3.0.1 Choice of texts for analysis

The choice of text types requires some comment. It was
argued in Chapter One that the absence of an explicit theory of text taxonomy is a disadvantage for practitioners who wish to analyse differences between types of language event. However, it would hardly be practical to wait until such a taxonomy exists. Therefore, ad hoc decisions have to be made regarding the delimitation of types of text, for which there is no theoretical basis. In spite of this theoretical lacuna, it can reasonably be claimed that for the lay person, literary narrative fiction, newspaper editorials and undergraduate science texts are reasonably clearly identifiable language events. The three selected are intentionally, and markedly, different from each other.

3.0.2 Text-type and readership

In selecting the three text types (literary fictional narratives, newspaper editorials and undergraduate science texts), it was assumed that:

1. the texts would differ in terms of information density.
2. the texts would tap very different kinds of knowledge of the world
3. the texts would attract different types of reader
4. the texts would normally be approached with different reading styles.

Thus, in addition to different linguistic differences, it was predicted that the texts would involve different knowledge bases, different reader identity and different reading styles. It was not the aim of this study to test any of these predictions in a controlled way. Rather, these are working assumptions which assisted in locating maximally different text types. The differences between the texts can be summarised as follows:

120
Thus, the selection of the three text types for analysis was motivated by an interest in identifying three clearly identifiable kinds of written text; and the immediate goal was to show that the cohesive conventions of each text-type are distinctive.

Having established the types of text for analysis, the task was then to compare each text type across English and Arabic. This immediately raises the issue of whether textual event-types are in fact comparable across languages. In comparing Arabic and English science texts, it is apparent that the "facts" presented belong to a single "world" body of scientific knowledge. While there is probably no such thing as universal scientific knowledge, in any absolute sense, it is nevertheless more likely that 'universal truth' will be found at the level of the undergraduate textbook - universal, that is in the sense of being shared by scientists operating in different socio-cultural contexts.

Turning to newspaper editorials, the likelihood that Arabic and English editors share the same world knowledge, and the same perceptions about the political world of which they write, must be very remote. In the case of literary narrative, the non-comparability of the socio-cultural worlds depicted in English and Arabic fiction
respectively becomes even more apparent.

The cross-language comparability of the texts examined shows best fit, then, in the case of science texts, and shows worst fit in the case of literary narrative.

However, the validity of the cross-language comparison does not rest on the strict equivalence of the categories and concepts of knowledge expressed in the text, but in the comparability of textual event in the Hymes (1972) sense. The validity of the contrastive study of cohesion undertaken rests on the comparability of English editorials with Arabic editorials; of English literary narrative with Arabic literary narrative; and of English introductory science with Arabic introductory science, as textual event-types.

3.1 The database

3.1.1 Sources

Literary fictional narratives

Twenty-first century writers were selected for both Arabic and English, to ensure comparability of era. For English, the following authors were selected: Graham Green, James Joyce, D.H. Lawrence, Virginia Wolf, Fitzgerald, Drabble, Huxley, Moorehead, Naipaul and Foster. For Arabic, the following authors were selected: Taha Hussein, Najeeb Mahfouz, Abas M. Al-Aaghad, Tawfeeq Al-Hakeem, Yousif Idreesi, Al-Tayab Saleh, Mahamoud Taymour, Rushdi Saleh, Mustafa Mahmoud and Ghassan Kanafani. Long dialogues occurring in literary narrative texts were excluded from the database,\(^1\) to ensure comparability of content in terms of textual event-type. The justification for this exclusion is that dialogues are likely to be

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\(^1\) A short dialogue occurs in an Arabic text (N2, Appendix B)
less comparable, across languages, than essays of straight narrative. The culture-specific norms of conversation are likely to be further apart from those for straight narrative, when English and Arabic are compared.

Newspaper Editorials

Editorials from the Observer, the New York Times, the Guardian, Financial Times, Sunday Telegraph, Herald Tribune and the Washington Post were selected as the database for English. For Arabic, the database was taken from the following newspapers: Al-Nahaar, Al-Anwaar, Al-Watan, Al-Seyasah, Al-Riyadh and Akhbaar Al-Youm. These include Egyptian, Kuwaiti, Saudi and Lebanese newspapers.

The English and Arabic editorials are not claimed to be comparable in the strict sense of the word in terms of content, since the concerns of the readership of each are inevitably different. However, the audience aimed at is broadly comparable, in that educated professionals and intelligentsia form the readership of English and Arabic editorials.

Science Texts

With the aim of ensuring comparability of content, general science texts originally written in English and Arabic, and aimed at university undergraduate students were selected. The science text samples represent a diverse collection in terms of subject matter: biology, transistor application, principles of computing, electrical engineering, surgery, landfill technology, drugs, health standards, manufacturing technology, biotechnology, petro-chemical industry and irrigation applied to English. (10)

(1) The Arabic scientific texts address different topics.
3.1.2 Size of the corpus

In all, ten samples of each text-type for each language were investigated, making a corpus of twenty literary fictional narratives (10 English, 10 Arabic); twenty newspaper editorials (10 English, 10 Arabic); and twenty science texts (10 English, 10 Arabic).

3.1.3 The analytical unit

Two major points need to be made, prior to the presentation of trends in cohesive patterning.

First, a statistical analysis of cohesion in Arabic and English cannot proceed without defining its unit of analysis. The sentence in Arabic is a problematic concept, and the reasons for this are fully discussed in Chapter Two, Section 2.5. The clause, however, is not a problematic unit in Arabic (see Section 2.5) where it was proposed that a satisfactory working definition of the sentence can be arrived at by applying a syntactic unit which can account for the two types of sentence in Arabic (ie. nominal and verbal). However, how two or more syntactic units (ie. clauses) are contained in a more complex sentence is accounted for in semantic terms (see 2.5).

The decision to delimit the sentence independently from any punctuation marking is absolutely necessary, given the random use of punctuation in written Arabic, if an account of intra- and inter-sentential cohesion is to be presented.

It is emphasised that the type and frequency of intra- and inter-sentential ties in Arabic can only be estimated if a working definition of the sentence is assumed. It is for this reason that the framework for defining 'the sentence' in Arabic was covered in Chapter
Two, Section 2.5.

By electing to apply a syntactic criterion for sentence definition in Arabic, sentence boundaries can be, to a great extent, clearly determined in the Arabic texts. The sentence as a unit of language is not unproblematic in English as well. Some linguists define it in syntactic terms, some in semantic terms, and some opt for punctuation as a delimiting system. However, there is a difference between linguists' definitions of 'the sentence' and how the sentence appears to operate in the creation of text. It is at least possible that the creation of 'the sentence' is governed by the kind of semantic principle which Arabic appears to require, namely that a fundamental underlying semantic unit is a completely meaningful unit independent of other contiguous sentences.

It is well beyond the scope of the present work to resolve the issue of the nature of the sentence for English, and indeed for Arabic. The primary interest was in a working definition, on the basis of which some statistical analysis of major cohesive devices in the two language could be carried out.

A second major point to be made is that, given the limitations of a study such as this, only some of the cohesive resources of the two languages could be examined. For the statistically based analysis this study elects to focus on only five major categories of cohesive devices described in the literature: Reference, Substitution, Ellipsis, Connectives, Lexical Repetition and Parallelism. The cross-language statistical comparison is based on these categories.

However, parallelism and thematisation which are important textual devices are treated in Chapters 4 and 5 respectively. The
first is treated quantitatively and qualitatively whereas the second is treated only qualitatively.

With these two preliminary points in mind, the results of the statistical analysis of the three text types in English and Arabic are presented below.

3.1.4 Grammatical versus lexical density

In order for the statistical analysis of lexical density to be maximally adequate, both the grammatical density and the lexical density in each text were worked out on the basis of a frequency count of all the vocabulary items in each text. Stubbs' (1986) technique was adopted here because it can be handled manually. Stubbs's formula for determining 'Lexical Density' in spoken discourse can be summed up as follows:

If the total number of words in the text = T,
and the number of lexical words = L,
Then
LD = 100L/T

(Stubbs, 1986:33)

Before applying this formula, a clear-cut distinction between lexical words and grammatical words must be made. Lexical or 'content' words, Stubbs suggests, comprise: Noun, Adjective, Adverb and Main Verb; grammatical or 'function' words comprise: Auxiliary Verb, Modal Verb, Pronoun, Preposition, Determiner and Conjunction.

Accordingly, lexical and grammatical density in the English and Arabic texts was explored: 300 words in each text were counted. A few more words were sometimes added so that a clause or sentence
became complete. The English texts posed no serious problems, since words in English are orthographically distinct. In Arabic, on the other hand, where one graphological unit can comprise two or three words such as 'biTab9iha:' (with her manner) spacing between graphical strings does not define words. A still more serious problem is which words are to be classified as lexical and which as grammatical. Following Stubbs' example, lexical words are those mentioned above, and all other words are grammatical.

3.2 Results of the Analysis

Lexical density

The frequency of lexical words and grammatical words and lexical density in the texts examined here are shown in the following table. In this table A stands for Arabic and E stands for English.

<table>
<thead>
<tr>
<th></th>
<th>Total No of words</th>
<th>Grammatical words</th>
<th>Lexical words</th>
<th>Lexical Density</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A</td>
<td>E</td>
<td>A</td>
<td>E</td>
</tr>
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<td>3044</td>
<td>3074</td>
<td>1567</td>
<td>1216</td>
</tr>
</tbody>
</table>

Table 5: Lexical and grammatical density in English and Arabic texts.
In general terms, Table 5 shows:

1) that English texts are lexically more dense than Arabic ones.
2) that the three text-types in Arabic do not differ significantly from each other in terms of lexical density.
3) that literary fictional narrative texts in English are significantly less lexically dense than science and editorial texts.

Explanatory comments now follow.

That English texts are lexically more dense than Arabic ones can be ascribed to a number of linguistic and rhetorical factors. First, Arabic comprises a greater number of grammatical particles than English. These occur quite frequently in written discourse. Among these particles the conjunctions 'wa' and 'fa' which have a wide and free application in Arabic. Second, some grammatical elements such as 'al' can modify not only nouns in Arabic but adjectives and gerunds. These lexical elements are mostly modified in Arabic written discourse. 'The' can also modify a noun that is already modified by a demonstrative. Third, Arabic allows the occurrence of many conjunctions in one clause or sentence. It also allows the occurrence of many pronouns in one clause or sentence. Fourth, parallel structure is a preferred rhetorical device in Arabic. This device increases the frequency of those particles, the definite article, connectives and pronouns. Finally, Arabic has been recognised as a highly redundant language in which lexical repetition occurs on all levels (ie. words, phrases, clauses and sentences). Such repetition also increases the number of some particles such as prepositions and demonstratives. No wonder, then, that Arabic texts are grammatically more dense, and lexically less dense, than English ones.

The previously mentioned particles, conjunctions, pronouns
and demonstratives occur in all the varieties of Arabic written
discourse. The Arabic texts examined here also tend to favour co-
ordination and parallel structure. This makes the difference between
those texts in terms of lexical density insignificant. But as
editorials and science texts in both languages utilise far more
lexical repetition, lexical density is slightly higher in Arabic
editorials and science than in narratives, which is what might be
expected.

This also accounts for the third finding. Narrative texts
in both languages prefer grammatical cohesion which is essentially
established by long chains of pronominal co-reference items. In
contrast, editorials and science texts derive much of their cohesion
from chains of lexical items. Thus, lexical density is significantly
higher in English editorials and science texts than in narratives.

3.3 Cohesion: frequency in English and Arabic

With the aim of detecting the cohesive properties of the
selected English and Arabic texts, cohesive devices were sought
across clauses and sentences. The absolute number of clauses and
sentences in each text type is not identical, since the size of the
selected texts was determined by the number of words, as stated
earlier, and not by the number of clauses or sentences.

In order to make it easy for the reader to interpret the
following results, two sample text analyses, one for English and one
for Arabic, are introduced first. In the following analyses, R stands
for reference; C for connectives; and L for lexis. Substitution and
ellipsis do not occur in the texts. From now on, slashes are used to
set off clauses, and numbers appear at the end of sentences.
They shook hands without speaking (1). She made room for Philip and his luggage amidst the loud indignation of the successful driver/, whom it required the combined eloquence of the station master and the station beggar to confute (2). The silence was prolonged / until they started (3). For three days he had been considering / what he should do / and still more what he should say (4). He had invented a dozen imaginary conversations /, in all of which his logic and eloquence procured him certain victory (5).

(N1, Appendix A)

<table>
<thead>
<tr>
<th>Sentence number</th>
<th>Cohesive item</th>
<th>Type</th>
<th>Presupposed Item</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>They</td>
<td>R</td>
<td>Miss Abbot and Philip (preceeding text)</td>
</tr>
<tr>
<td>2.</td>
<td>She</td>
<td>R</td>
<td>Miss Abbot (preceeding text)</td>
</tr>
<tr>
<td></td>
<td>Philip</td>
<td>L</td>
<td>Philip (preceeding text)</td>
</tr>
<tr>
<td></td>
<td>the</td>
<td>R2</td>
<td>Station (preceeding text)</td>
</tr>
<tr>
<td></td>
<td>driver</td>
<td>L</td>
<td>Station (preceeding text)</td>
</tr>
<tr>
<td></td>
<td>Station</td>
<td>L</td>
<td>Station (preceeding text)</td>
</tr>
<tr>
<td></td>
<td>master</td>
<td>L</td>
<td>Station (preceeding text)</td>
</tr>
<tr>
<td>3.</td>
<td>they</td>
<td>R</td>
<td>Philip and Miss Abbot (S.2 and preceeding text)</td>
</tr>
<tr>
<td>4.</td>
<td>he</td>
<td>R3</td>
<td>Philip (S.2)</td>
</tr>
<tr>
<td>5.</td>
<td>He</td>
<td>R</td>
<td>&quot;</td>
</tr>
<tr>
<td></td>
<td>him</td>
<td>R</td>
<td>&quot;</td>
</tr>
<tr>
<td></td>
<td>his</td>
<td>R</td>
<td>&quot;</td>
</tr>
<tr>
<td></td>
<td>eloquence</td>
<td>L</td>
<td>eloquence (S.2)</td>
</tr>
<tr>
<td>Clause number</td>
<td>Cohesive item</td>
<td>Type</td>
<td>Presupposed Item</td>
</tr>
<tr>
<td>---------------</td>
<td>---------------</td>
<td>------</td>
<td>------------------</td>
</tr>
<tr>
<td>1.</td>
<td>Station</td>
<td>Lx2</td>
<td>driver (preceeding clause, S.2)</td>
</tr>
<tr>
<td>2.</td>
<td>until</td>
<td>C</td>
<td>(preceeding clause, S.3)</td>
</tr>
<tr>
<td>3.</td>
<td>he</td>
<td>R</td>
<td>he (Philip) (preceeding clause, S.4)</td>
</tr>
<tr>
<td>4.</td>
<td>and he</td>
<td>C</td>
<td>(preceeding clause, S.4)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>R</td>
<td>(&quot; &quot; &quot; &quot; &quot; )</td>
</tr>
<tr>
<td>5.</td>
<td>his him</td>
<td>R</td>
<td>(he preceeding clause S.5)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>R</td>
<td>(&quot; &quot; &quot; &quot; &quot; )</td>
</tr>
</tbody>
</table>

At the inter-sentential level, 11 cohesive co-reference items and 6 cohesive lexical elements occur. Some connect contiguous sentences while some connect the text with prior discourse. Between clauses, on the other hand, 4 cohesive co-reference items, 2 cohesive lexical elements and 2 connectives take place. They link the clauses in which they lie with immediately preceeding clauses.

This sample text is indicative of the higher frequency of cohesive devices between sentences than within sentences. There are also differences between clauses and sentences in terms of their cohesive properties. While more co-reference pronominal and lexical items are used to establish cohesion between sentences, some co-reference items and more connectives maintain cohesion within sentences. It is clear, of course, that while such assumptions may apply to this narrative text and similar texts in English, other text types might exhibit differences in this respect.

(N8, Appendix B)

The Sultan didn't forget / that a precious jewel had been dropped in Cairo (1). That jewel was Ibn Khuldoun (2). And Barquq was clever /as he was a murderer (3). And Kings used to adorn their clothes with precious stones / and they also used to decorate their councils with scholars (4). And the Sultan assigned a salary for the distinguished scholar / who had become the object of conversations in Cairo (5).
<table>
<thead>
<tr>
<th>Sentence number</th>
<th>Cohesive item</th>
<th>type</th>
<th>Presupposed Item</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>the Sultan</td>
<td>R</td>
<td>the Sultan (preceeding text)</td>
</tr>
<tr>
<td></td>
<td>Cairo</td>
<td>L</td>
<td>&quot;</td>
</tr>
<tr>
<td></td>
<td>that jewel</td>
<td>R</td>
<td>a jewel (S.1)</td>
</tr>
<tr>
<td></td>
<td>Ibn Khuldoun</td>
<td>L</td>
<td>&quot;</td>
</tr>
<tr>
<td>2.</td>
<td>And Bargug</td>
<td>C</td>
<td>(S.2) Bargug (preceeding text)</td>
</tr>
<tr>
<td></td>
<td>And the Kings</td>
<td>C</td>
<td>(S.3) Sultan (S.1)</td>
</tr>
<tr>
<td></td>
<td>precious stones</td>
<td>L</td>
<td>jewel (S.1,2)</td>
</tr>
<tr>
<td>3.</td>
<td>And the Sultan</td>
<td>R</td>
<td>the Sultan (S.1)</td>
</tr>
<tr>
<td></td>
<td>the Scholar</td>
<td>R</td>
<td>Scholars (S.4)</td>
</tr>
<tr>
<td></td>
<td>Cairo</td>
<td>L</td>
<td>Cairo (S.1)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Clause number</th>
<th>Cohesive item</th>
<th>Type</th>
<th>Presupposed Item</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>2.</td>
<td>he</td>
<td>R</td>
<td>Bargug (preceeding clause, S.3)</td>
</tr>
<tr>
<td>3.</td>
<td>and they</td>
<td>C</td>
<td>(preceeding clause, S.4) Kings (preceeding clause, S.4)</td>
</tr>
<tr>
<td></td>
<td>their decorate</td>
<td>R</td>
<td>Clause S.4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>L</td>
<td>adorn (preceeding clause, S.4)</td>
</tr>
<tr>
<td>4.</td>
<td>he</td>
<td>R</td>
<td>Scholar (preceeding clause, S.5)</td>
</tr>
</tbody>
</table>
There are 4 cohesive co-referential items, 10 cohesive lexical elements and 3 connectives between the sentences of this text. At the intra-sentential level, 4 cohesive reference items, one connective and one cohesive lexical item are used.

Again, more co-reference pronominals and lexical items function cohesively between sentences, while co-reference items create cohesion within sentences. However, Arabic texts normally utilize more connectives within sentences, but the occurrence of two relative pronouns in this text dictates the number of connectives, typically ‘wa’ and ‘fa’, within sentences.

The above texts point to the great similarity between narrative texts in the two languages in terms of their cohesive properties.

In view of those sample analyses, the English and the Arabic texts were analysed with a view to examining the trends in textual cohesion typical of each text type and detecting cross-language differences across text types. These trends are presented below.

3.4 Differences between text types across English and Arabic

Variability in the realisation of cohesion has so far been investigated in fairly small-scale studies. Most of these studies have concerned themselves with either exploring cross-text type differences in terms of co-referential and conjunctive relations (Frawley and Smith, 1983; Smith and Frawley, 1983; Gopnik, 1972; Ellegard, 1978), or examined different relations within the same text-type (Gutwinski, 1976). However, an attempt to see how all the cohesive devices, set out in Chapter 1, Section 1.1, are utilized by
different text types has not been reported.

Not only is the scope of early studies limited to cohesion typology and exemplification, but those differences have been accounted for (if they have been accounted for at all) in terms of linguistic factors. A cognitive interpretation for global trends in cohesion has not so far been attempted, nor has cohesion been treated as an interesting feature of text-type differentiation.

In the following discussion, the scope of the analysis examines global trends in co-reference, substitution, ellipsis, conjunction and lexis in the three text types selected. Parallelism and thematisation which are not treated by H & H (1976) are discussed in Chapters 4 and 5 respectively. Interpretations for the cohesive trends can be based on linguistic and rhetorical factors, but can also, and perhaps more fruitfully, make reference to inferred cognitive processing of text. Because there is no well established tradition for the interpretation of global trends in cohesion, the interpretive remarks which are offered here must be seen as mere speculation. They are, in general, informed by accounts of processing and textual knowledge discussed in Chapter 1, and rely particularly on de Beaugrande (1980). The speculative interpretive comments in the following discussion must of course be subject to experimental validation before they can be treated as proved.

It should also be noted that a speculative interpretive account is not given for minor trends in textual cohesion across text type and language type. It is well beyond the limited scope of the following discussion to assume such a task which may prove worth taking up further by future research. Therefore, interpretative comments will be devoted here to pronominal co-reference, the additive
conjunction 'and' and lexical repetition across text type and language type. In order to point out the role of cohesion in both the organisation and processing of text some linguistic and rhetorical interpretation of those global trends in textual cohesion is given in addition to the speculative cognitive interpretation. For ease of reference, each cohesive device is discussed separately below.

3.4.1 Co-reference

The term co-reference is used here instead of reference because, following de Beaugrande (1980:144), reference refers to inter-relationships between linguistic expressions and the objects representing them in the real world, whereas co-reference concerns "the use of alternative expressions in a text for the same text-world entity."

The frequency of co-referential items in this corpus is demonstrated in the following table. In this table and the following tables in this chapter 'C' stands for the frequency of cohesive devices across clauses; 'S' for their frequency across sentences; 'FN' represents fictional narratives; 'NE' represents newspaper editorials; and 'ST' represents science texts. It is also worth noting that each figure in the following tables represents the frequency of the respective cohesive tie per 3,000 words, the total number of words of each text type in each language.
<table>
<thead>
<tr>
<th></th>
<th>Pronominal</th>
<th></th>
<th>Demonstrative</th>
<th></th>
<th>Comparative</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>C</td>
<td>S</td>
<td>C</td>
<td>S</td>
<td>C</td>
<td>S</td>
</tr>
<tr>
<td><strong>FN</strong></td>
<td>English</td>
<td>134</td>
<td>289</td>
<td>7</td>
<td>21</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>Arabic</td>
<td>277</td>
<td>297</td>
<td>15</td>
<td>86</td>
<td>-</td>
</tr>
<tr>
<td><strong>NE</strong></td>
<td>English</td>
<td>52</td>
<td>44</td>
<td>8</td>
<td>53</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Arabic</td>
<td>128</td>
<td>58</td>
<td>17</td>
<td>121</td>
<td>-</td>
</tr>
<tr>
<td><strong>ST</strong></td>
<td>English</td>
<td>38</td>
<td>28</td>
<td>9</td>
<td>80</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Arabic</td>
<td>110</td>
<td>53</td>
<td>22</td>
<td>168</td>
<td>-</td>
</tr>
</tbody>
</table>

Table 6: Frequency of grammatical co-reference in English and Arabic texts

The table evidently shows that the three text types display marked differences in terms of the distribution and frequency of co-referential relations in both languages. Whereas pronominal co-reference is more dense across sentences in fictional narratives, it is relatively more frequent across clauses in editorials and science texts. However, this device occurs significantly more across clauses and sentences in fictional narratives than in editorials and science texts in both languages (level of significance p > 0.5). Although demonstrative co-reference is distributed identically in the three text types, in that it is more frequent across sentences, this device occurs significantly more in editorials and science texts than in fictional narratives in English and Arabic (level of significance p > 0.5). Comparative co-reference, on the other hand is comparatively low in the three text types, though it is relatively higher in
editorials.

These cross-text type differences are accounted for below.

3.4.1.1 Linguistic and rhetorical interpretation

Pronominal co-reference seems to play a prominent role in the organisation and structuring of fictional narratives. It can maintain the continuity of the participant and event lines which are deemed necessary for holding a fictional narrative together (Gutwinski, 1976). These two lines involve characters within the sequence of events, and hence incorporate coherence by providing the semantic continuity of the action of fictional discourse. Pronominal co-reference is also held to contribute to foregrounding and right branching in this type of text (Frawley and Smith, 1983).

Expressed mostly by third person pronouns and personal possessives, as is the case in this study and earlier studies (Gutwinski, 1976; Frawley and Smith, 1983; Ellegard, 1978; Gopnik, 1972), pronominal co-reference is an adequate device for representing characters and events in fictional narratives. It would not be painstaking for the reader to assign referents for pronouns, especially because pronouns are unlikely to be ambiguous (de Beaugrande, 1984). This has a great bearing on the processing of fictional narratives as will be seen in the next sub-section.

The frequency of pronominal co-reference in this type of discourse is further enhanced by its tendency to utilise co-ordination frequently. This is an example.

(3.1) He had been walking all day and he was very tired (1); he found a dry spot and he sat down (2).

(N10, Appendix A)
Each sentence of this text consists of two co-ordinate clauses in which two instances of third person pronouns that refer to the same entity occur. The sequence of events characteristic of fiction seems to dictate this pattern which enhances the frequency of pronominals in this text type. 'Walking all day' results in getting 'tired' and this naturally leads to looking for a place (i.e. a dry spot) to 'sit down'. The person (i.e. character) involved in such a sequence of events must be overtly indicated, otherwise an illogical consequence will be brought about since an action cannot occur without a 'doer'.

On the other hand, editorials and science texts favour subordination which is needed for specifying their entities and clarifying different conceptual relations. Moreover, participant and event lines which require pronominal co-reference are either completely missing, as is the case in science, or quite short as in editorials. The type of entities involved in these two text types may be confused rather than clarified by a high frequency of pronominal co-reference. As for editorials, they are discursive by nature since they deal with various factual events. Thus, pronominal co-reference cannot be used in them as systematically as it is used in fiction. This is an example.

(3.2) President Reagan's speech before the United Nations General Assembly yesterday is a profound let-down (1). Mr. Mikhail Gorbachev has seized....(2).

(NES, Appendix A)

Here, the themes in the two sentences are different, and hence using a pronoun as the subject of the second sentence is somehow misleading. No wonder, then, that pronouns are less frequent in
editorials. This also applies to science texts which still require more specificity that cannot be expressed by pronominal co-reference.

The exigency of specificity and clarity of entities in editorials and science texts may explain why demonstrative co-reference is higher in them than in fiction. Demonstratives, especially the definite article which makes up the major bulk of this device here, typically occurs with lexical items which are very frequent in these two text types. Finally, comparative co-reference is relatively low in this corpus. However its comparative higher frequency in editorial may be ascribed to the occasional need for comparing the factual entities addressed in this type of discourse.

3.4.1.2 Cognitive interpretation

As pronominal co-reference is necessary for the organisation of fiction, its presence must in some way facilitate its processing and comprehension. A fictional narrative basically revolves around characters and events. Pronominal co-reference can be seen as a way of elaborating the story’s contribution to the perception of character. Perception of character is carried out through actions, and the reader has to perceive these actions in order for him to perceive characters. Recurrence of pronominal co-reference keeps the identity of previous characters alive in the reader’s mind. A reader intuitively expects that a chain of pronouns refer to previously stated characters or actions. That pronouns are unlikely to be ambiguous (de Beaugrande, 1984) makes a reader easily assign their adequate referents, even if these reside in far removed sentences. This, in turn, enables the reader to connect new anaphors with prior antecedents, and hence easily and rapidly process new
information by integrating it into memory.

Pronominal co-reference can be said to have a light processing load. Being inherently empty of content and having a short form (de Beaugrande, 1980) may make them easy to process because they make the information load of fiction lighter by making a number of references to the same entity through a chain of pronouns rather than by introducing new entities in the form of lexical elements. The effect of this pattern is that a fairly large 'chunk' of text is processed before a new actor/agent is introduced via a new nominal. It is clear, then, that narrative fiction is closer to the spoken end of the spoken-written continuum, in that, as Farag (1986) has already established, long chains of pronominals are preferred in the oral versions of narratives. These chains of pronominals can therefore be seen as contributing to the semantic economy of text, a principal which de Beaugrande (1980) considers crucial to efficient processing. Clearly, there is a correlation between the requirement for semantic economy/information load, and the constraint that fictional narrative must provide entertainment, and must therefore not make excessive demands on cognitive load.

On the other hand, if those pronouns were replaced by nominal expressions, this would increase the information load. They might also come between the text and the reader by interfering with the perceived development of character and plot. That may explain the trade-off between pronominal co-reference and lexis in the three text types. Where pronominal co-reference is high, lexis is low and vice versa.

The light processing load of pronouns makes them an adequate device which meets the requirements of readership, reader
knowledge and purpose, reading style and the pedagogical objective of the text. These should have a certain bearing on the processing of text as argued in Chapter 1, Section 1.2. Lewis (1982) suggests that the purpose of the reader can affect his predictions and eventually his processing of text. Rumelhart (1984) states that readers make hypotheses throughout reading and once such hypotheses are confirmed comprehension is ensured. Andersson (1978) seems to entertain the same view in that confirmation of the reader’s expectation results in efficient understanding. A reader expects chains of pronominal co-reference in a fictional narrative and he hypothesises that these refer to the same entity (i.e. characters or actions), and mostly, if not always, his expectations and hypotheses come true, the thing that facilitates and expedites processing. Besides, a fictional narrative is normally written for a general non-intellectual reader who reads it rapidly to extract the significance of the story and eventually get entertained. The fact that pronominal co-reference is highly predictable makes its processing rapid and easy, the thing that contributes to the pedagogical objective of the text, that is to entertain.

Unlike fictional narrative, science texts overtly and editorially covertly have a pedagogical purpose: training the reader in concepts. The readership of the latter categories, however, is different. Editorials are meant for general intellectual readers who read them for the analytical appreciation of world affairs (i.e. political and social issues). The kind of knowledge involved in an editorial requires specificity and informational density which would be ruled out by long chains of pronominal co-reference. Journalistic
discourse has been found to have a participant and event line like fiction (Frawley and Smith, 1983) as stated above. An editorial, however, is discursive, and dense, and will require higher informational density than is permitted for narrative, and will thus prohibit lengthy chains of pronominals. An example of isolated pronominal co-reference shows the chain-length restriction for an editorial extract.

(3.3) Ten years ago next week, Dr. Henry Kissinger, then at the height of his powers as US Secretary of State, proclaimed a bold objective: 'that within a decade no child will go to bed hungry' (1). Ten years on, those words spoken at the UN World Food Conference ring hollow indeed (2).

(NES8, Appendix A)

Only one instance of third personal possessive (i.e. his) occurs in this text. The diversity of topics which is dictated by the factual entities addressed in an editorial does not leave room for the occurrence of many instances of pronominal co-reference. As mentioned above, the use of a pronominal may therefore confuse rather than clarify reference. If, for instance, 'those words' in the second sentence was replaced by the pronoun 'they', the reader would not easily know whether reference is made to 'years', 'powers' or 'words' in the first sentence. Assigning the appropriate referent will entail making bridging inferences (Clark and Haviland, 1977), which slows down processing.

Science texts are found to contain infrequent pronominal co-reference, and such co-reference as exists tends significantly to be intra-sentential. Specificity and clarity are pre-requisites of science texts, and clarity is served by lexical identification of
entities. This lexical density seems to be more adequate than pronominal co-reference to express the technical knowledge involved in science. As in editorial, long chains of pronominal co-reference can confuse rather than clarify issues. This, in turn, renders processing more problematic.

3.4.2 Substitution and ellipsis

Table 7 shows the frequency of these two devices in this corpus.

<table>
<thead>
<tr>
<th></th>
<th>Substitution</th>
<th></th>
<th>Ellipsis</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>C  S</td>
<td>C  S</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FN</td>
<td>-  1</td>
<td>2 -</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Arabic</td>
<td>2  2</td>
<td>3 -</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NE</td>
<td>3  4</td>
<td>1 -</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Arabic</td>
<td>- -</td>
<td>- -</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ST</td>
<td>-  1</td>
<td>-  2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Arabic</td>
<td>1 -</td>
<td>-</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 7: Frequency of substitution and ellipsis in English and Arabic texts.

The table shows that substitution and ellipsis are quite infrequent in the three text types in both languages. The scarcity of these devices in written discourse has been confirmed by other researchers (Johns, 1983; Williams, 1982; Halliday and Hasan, 1976).
However, an explanatory reason for such scarcity of substitution and ellipsis in written discourse has not so far been reported. Some researchers, as stated in Chapter 1, Section 1.2, assume that processing ellipsis is much more problematic than processing pronouns and noun phrases (Tennant, 1981). Tennant (1981) attributes this assumption to the fact that processing ellipsis not only requires the identification of the instance of ellipsis but also stipulates assigning the appropriate antecedent. Thus, two mental operations are at work, which makes processing ellipsis more demanding. In addition, ellipsis entails contrast which further complicates its processing. But this is not necessarily true. de Beaugrande (1980) views ellipsis and substitution which he terms 'pro-forms' as contributors to the economy of text. Thus, they can be seen as a kind of trade-off between "compactness and rapid access" (ibid:158). As such, these two devices allow "enormous savings in the creation and utilization of surface structure" (ibid:151). Therefore, substitution and ellipsis can be said to have a facilitatory effect on the processing of text provided that their occurrence is not unduly frequent and the identity of reference is not ambiguous. On the other hand, heavy ellipsis, de Beaugrande (1980:158) suggests "would demand increased effort for connecting the underlying text-world model". This may, to some extent, explain why this device is not very much favoured by written texts which demand specificity and easy and efficient connection of text-world model. Moreover, a written text must "stand on its own feet" and this is established through the referential value which must be clear from the text.

Finally, ellipsis may be deliberately used to serve a certain purpose. A writer occasionally employs ellipsis to control
the content of the text (Lewis, 1982). His assessment of the reader's knowledge sometimes makes him omit certain elements.

3.4.3 Conjunction

The frequency of conjunctive relations in this corpus is spelt out in the following table.

<table>
<thead>
<tr>
<th></th>
<th>Additive</th>
<th>Adversative</th>
<th>Causal</th>
<th>Temporal</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>C</td>
<td>S</td>
<td>C</td>
<td>S</td>
<td>C</td>
</tr>
<tr>
<td>FN</td>
<td>40</td>
<td>7</td>
<td>14</td>
<td>9</td>
<td>7</td>
</tr>
<tr>
<td>Arabic</td>
<td>118</td>
<td>56</td>
<td>11</td>
<td>9</td>
<td>36</td>
</tr>
<tr>
<td>NE</td>
<td>14</td>
<td>6</td>
<td>3</td>
<td>17</td>
<td>5</td>
</tr>
<tr>
<td>Arabic</td>
<td>68</td>
<td>45</td>
<td>10</td>
<td>5</td>
<td>21</td>
</tr>
<tr>
<td>ST</td>
<td>20</td>
<td>3</td>
<td>17</td>
<td>7</td>
<td>5</td>
</tr>
<tr>
<td>Arabic</td>
<td>56</td>
<td>70</td>
<td>4</td>
<td>4</td>
<td>32</td>
</tr>
</tbody>
</table>

Table 8: Frequency of conjunction in English and Arabic texts.

The table clearly shows that conjunction is essentially an intra-sentential cohesive device in the three text-types in both languages.

The most striking difference between the three text types lies in the frequency of additivity which is significantly more frequent in fiction than in editorial and science (level of significance p > 0.5). This holds true for English. In Arabic, on the other hand, this relation is significantly more frequent in
fiction than in science. Thus, in both languages fictional narratives
tend to utilise additive conjunctions very frequently. This trend is
accounted for below.

3.4.3.1 Linguistic and rhetorical interpretation

That additivity is a major characteristic of fictional
discourse has been confirmed by other researchers who examined
literary fictional narratives similar to the present corpus
(Gutwinski, 1976; Smith and Frawley, 1983; Cheong, 1978). Fiction is
held to cohere additively (Smith and Frawley, 1983). Mostly expressed
by `and`, additivity incorporates "right branching" and highlights the
seriation of events in this type of discourse (ibid).

The high frequency of `and` in fiction has been mostly
attributed to the tendency of this text type to use co-ordination in
preference to subordination. However, an explanatory cognitive
interpretation has not been reported. This is attempted below. But
before getting to grips with that interpretation, a word in passing on
the other conjunctive relations seems necessary. It terms of those
relations, the English text types are typically adversative, temporal
and causal respectively. In Arabic, they are causal, temporal and
adversative, except editorials in which adversativity is significantly
higher than temporality. This suggests that adversativity is
significant for this type of text. Smith and Frawley (1983) suggest
that journalistic discourse essentially coheres adversatively through
the contrasting conditions of the real world. Cross-language
differences are dealt with in the next section.
3.4.3.2 Cognitive interpretation

The high frequency of 'and' is an aspect of oral narrative discourse (albeit with a number of functions). The question is: why is it so frequent in oral and oral-related traditions? - and conversely, why is subordination more characteristic of science and editorial texts? In section 3.4.1, it was argued that the entertainment purpose of fictional narrative militates against high information density and therefore against heavy nominal usage. The same factor (entertainment value) may have some bearing on the prediction of 'and' as a connector. Since 'and' is semantically a fluid element, acquiring meaning from contextual environment, processing may be facilitated and speeded up in some way through the presence of just such element. It would be that there is a relationship between reading efficiency and textual dependency, in that elements whose exact meaning is predicted by context may have faster meaning-retrieval than elements which are more independent. It would be possible to establish experimentally whether such a principal holds true or not. If it were a valid principle, it would go same way towards why the ubiquitous 'and' appears with such frequency in literary and oral narrative. Presumably, one constraint on the construction of literary fictional narrative is that processing for story line and character portrayed must not require more mental effort than is compatible with reading.

Clearly, the relatively low frequency of 'and' in science and editorial, with the high frequency of subordination, must be linked with the need for these text types to create more specific kinds of meaning and meaning connectivity than narrative fiction. If the meanings conveyed by science and editorial are in some sense more "specific" and less open to "semantic negotiation on the basis of co-
text" than those in narrative fiction, then, again, this should be amenable to experimental validation.

So what is being suggested is not that "and is easy to process" but rather that contextual dependency of meaning facilitates processing, and this principal could embrace far more in language than the element 'and'. It could account for the relationship between form and function, the norm (rather than the exception) being that a very significant proportion of the lexicon is multi-functional (eg. bank, form, bed, yellow - each of which has radically different and unrelated meanings in different contexts). Precisely those lexical elements which are commonest in spoken language are those at issue. The more specialised the written language term, the more technical, the less likely it is that the precise meaning of linguistic elements will be derivable from contextual knowledge. Conversely, the meaning of linguistic elements which are common in spoken discourse can be easily derived from contextual knowledge. Their frequent use in speech renders them highly predictable. Hence, their meanings can be efficiently and rapidly processed. This is applicable to 'and' with which the reader is quite familiar. The degree of familiarity has a bearing on efficient processing. Because readers are more familiar with narrative discourse, narrative passages have been found easier to process and comprehend than expository passages (Britton and Graesser, 1983). By the same token, the reader's familiarity with 'and' makes him easily process the relations it effects. No wonder, then, that 'and' is highly frequent in fictional narratives which are meant to be read rapidly. Such a goal requires a conjunction like 'and' which can enhance the reading style of a fictional narrative.
3.4.4 Lexis

Two major lexical relations are investigated here: identical lexical elements which subsume repetition of same item (eg. boy-boy) and semantically related elements which include any pair of lexical items that stand to each other in any identifiable semantic relation (eg. part to whole, part to part, etc). The frequency of these two relations in the present corpus is demonstrated in Table 9 below. In this table IE stands for identical elements and SRE for semantically related elements.

<table>
<thead>
<tr>
<th></th>
<th>IE</th>
<th>SRE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>C</td>
<td>S</td>
</tr>
<tr>
<td>FN</td>
<td>16</td>
<td>132</td>
</tr>
<tr>
<td>Arabic</td>
<td>43</td>
<td>225</td>
</tr>
<tr>
<td>NE</td>
<td>21</td>
<td>281</td>
</tr>
<tr>
<td>Arabic</td>
<td>49</td>
<td>327</td>
</tr>
<tr>
<td>ST</td>
<td>32</td>
<td>464</td>
</tr>
<tr>
<td>Arabic</td>
<td>66</td>
<td>478</td>
</tr>
</tbody>
</table>

Table 9: Frequency of lexis in English and Arabic texts

Table 9 clearly shows that lexis is typically an intersentential cohesive device. Editorials and science texts tend to use IE significantly more than fictional narratives do (level of significance \( p > 0.5 \)). This holds true for English. In Arabic IE is significantly more in science than in fiction, but although this
difference is quite big between editorials and fiction, it is not significant. SRE, on the other hand, is significantly more frequent in fiction and editorial than in science in English. Again, the difference in this respect is not significant in Arabic, albeit considerable. Some tentative interpretation now follows.

3.4.4.1 Linguistic interpretation

It was argued in 3.4.1 that fictional narratives deal with characters and events to which reference can be best made by pronominal co-reference. The notion of trade-off between pronominals and lexis can explain why IE which consists of repetition of same items in this corpus is not frequent in fiction. Conversely, since pronominal co-reference is relatively low in editorials and science texts, lexical repetition is highly frequent in them. Again, it was suggested in 3.4.1 that the entities involved in editorials and science texts require much specificity and clarity so that readers can grasp the concepts in those texts properly. This aspect is elaborated on further in the next sub-section.

Thus, it seems that lexical repetition plays an important role in the organisation of editorial and science texts. Their semantic continuity is established via the relatedness of lexical items throughout the text. In science, this semantic continuity is contingent on the interrelationships between exact repetitions of previous entities. In editorials, on the other hand, this semantic continuity is ensured partly through exact repetitions and partly through lexical collocates which are semantically related to the hyper topic of the editorial. This suggests that whereas science texts
heavily appeal to the reader’s text knowledge, editorials as well as fiction appeal to his text-world knowledge. This has implication for the processing of text, an issue that is addressed below.

3.4.4.2 Cognitive Interpretation

It seems that lexical repetition is sometimes inescapable. de Beaugrande (1980:137) suggests that since some concepts have only one name "the use of specially defined terms must be consistent, despite the repetitiousness entailed". This is typically so in "scientific reports" (de Beaugrande, 1980). Thus, lexical repetition is unavoidable in science and to a certain extent in editorial texts. Such lexical repetition meets with the readership, reader knowledge and purpose, reading style and pedagogical objective of those two text types. Editorials, it was suggested in 3.4.1, are written for general intellectual readers who aim at the analytical appreciation of world political and social affairs. Science texts are also meant for specialists who aim at extracting technical knowledge. In both text types, the writer, like a teacher, sets out to inform (teach) the reader and train him in concepts. This pedagogical purpose may dictate lexical repetition so that the concepts involved can be adequately processed and understood. This is an example.

(3.4) I consider biology a natural science (1). I consider biotechnology an engineering science (2). In my mind, the finality of biology as a natural science has been, and is to arrive at a theory of living matter (3). The finality of biotechnology as an engineering science is to utilize living matter for producing and degrading large quantities of matter (4).

(S8, Appendix A)

In order for the scientist to point out the difference between the 'finality' of both sciences, as he conceives of it, he keeps repeating
same lexical item. It is evident that such repetition is inevitable since most of the terms (e.g. biology, biotechnology, science, engineering) cannot be replaced by other forms.

No doubt this lexical repetition results in a dense information load in editorials and science texts. Therefore, their processing is expected to be much slower than that of fiction. The slow processing rate seems to be partly determined by the author who, like a teacher, releases information step by step. This is necessary here because the intake of new information must be well-paced. Therefore, the reader processes such a dense information load one step at a time rather than in large chunks as is the case in fiction.

Recurrence of lexical items also has an important bearing on the processing of editorials and science. One of the prerequisites of efficient processing, as stated in Chapter 1, Section 1.2, is the maintainance of the semantic identity of reference in contiguous sentences (de Beaugrande, 1980; Sanford and Garrod, 1981). Recurrence of lexical items, de Beaugrande (1980:135) argues, "would entail sameness of reference", and hence impresses the current items on memory. Processing should therefore be efficient "as the point of connection in the ongoing text-world model should be obvious" (ibid:135). Thus, lexical repetition keeps the semantic identity of reference alive in the text and this facilitates connecting new anaphors with previous antecedents, which facilitates integrating new information in memory (Clark and Haviland, 1977). Repetition of same lexical items in adjacent sentences makes the memory search insigated by new anaphors short, and hence processing is speeded up. For these reasons, lexical repetition can be said to have a facilitatory effect.
on the processing of text. This assumption is empirically tested in Chapter 6.

On the other hand, SRE may be more demanding on the processor's part. The reader has to activate his pragmatic world knowledge to set up an adequate antecedent which is not explicitly realised in the text. This, in turn, slows processing down (Clark and Haviland, 1977). However, ease or difficulty of processing SRE can be determined by the relationship between anaphors and antecedents, as Sanford and Garrod (1981) suggest in Chapter 1, Section 1.2. If the two items (i.e. anaphor and antecedent) are frequently used, processing new information would not be problematic. Editorials normally employ familiar elements (e.g. voters, elections, referendum) and their processing would not be as demanding as imagined. However, compared with exact lexical repetition, SRE can still be slower and more demanding to process.

3.5 Differences between English and Arabic across text-type

We have seen in 3.4 that the three text types cohere similarly in English and Arabic. Fictional narratives essentially cohere via chains of pronominal co-reference whereas editorials and science texts derive much cohesion from lexical repetition. This suggests that cohesion is a variable phenomenon in both languages.

However, the two languages display marked differences in terms of the frequency of major cohesive devices across those text types. It seems that those differences in global trends in textual cohesion are very much dictated by language type rather than by text type. That is the three Arabic text types tend to utilise certain
cohesive devices such as pronominal and demonstrative co-reference, additive and causal conjunctions and lexical repetition much more frequently than their English counterparts do. In other words, cross-text type differences in the frequency of those cohesive devices represent tendencies typical of each language in this respect.

Therefore, the following discussion will attempt to account for cross-language trends in textual cohesion across the three text types examined here. As in 3.4, cross-language differences are accounted for in linguistic, rhetorical and cognitive terms. Since the cognitive interpretations outlined in 3.4 equally apply to the three text types across both languages, more emphasis is laid here on the implications of the high frequency of major cohesive devices for processing Arabic texts. As in the previous section, minor cohesive trends as regards substitution, ellipsis, comparative co-reference and adversative, temporal and ‘other’ conjunctions are not dealt with in the following discussion.

3.5.1 Co-reference

The three Arabic text types employ pronominal co-reference across clauses and demonstrative co-reference across sentences and clauses significantly more frequently than their English counterparts (level of significance $p > 0.5$). This tendency is accounted for below.

3.5.1.1 Linguistic and rhetorical interpretation

High frequency of pronominal co-reference in Arabic argumentative discourse has been ascribed to the nature of the Arabic verb which contains an implicit pronoun (Williams, 1982). This seems to hold true for the three text types under discussion. However,
other reasons can account for such a tendency. It was argued in chapter 2, Section 2.1 that Arabic has three types of pronoun: independent (eg. huwa = he), enclitic (attached, dependent) (eg. kita:buhu: = his book) and implicit (contained in the verb) (eg. kataba = he wrote). In addition, Arabic has special pronouns for the category 'dual' (eg. kataba: = they (two) wrote) and other markers which function like pronouns (eg. katabu: = (they wrote). The linguistic system of Arabic allows most, if not all, of those pronouns to occur in the same clause or sentence (eg. arrajulu huwa qa:da sayya:ratahu: binafsih = the man (he) drove (he) his car himself). English, on the other hand, neither has such a multiplicity of pronouns nor tolerates such a high frequency of pronominal co-reference in one clause or sentences. The example also shows that in Arabic the pronoun can occur with its co-referent (eg. arrajulu huwa = the man he) in one clause. Such occurrence is impossible in English. No wonder, then, that pronominal co-reference is significantly more in the Arabic texts.

High frequency of demonstrative co-reference in Arabic can equally be attributed to some linguistic factors. The definite article 'al' (the) has a much wider application in Arabic. It can accompany nouns, adjectives and gerunds (eg. al9ayshu fi lmuduni lkabi:rati yu’di SSiHRa = (the) living in (the) big (the) cities hurts (the) health). This example shows that 'the' almost always accompanies abstract nouns in Arabic. It can also occur with elements already modified by a demonstrative (tilka ssayya:ra = that (the) car). 'The' does not have such a wide application in English. And since lexical repetition, as will be shown later in this section, is
more frequent in Arabic, it is not unusual that demonstrative co-reference is more frequent in the Arabic texts.

Frequency of co-reference is further enhanced by co-ordination and parallelism which are typical of almost all written Arabic texts. A written Arabic text normally runs as a string of parallel co-ordinate clauses in which instances of pronominal co-reference are particularly very frequently. This is an example:

(3.5) yamraD /wa yanHal / wa yamur:t.

(N6, Appendix B)

He gets sick / and he paralyses / and he dies.

However, this is more typical of fictional narratives than of editorials and science texts which tend to use subordination more frequently than fictional narratives do. But, compared with their English counterparts, Arabic editorials and science texts still utilise co-ordination and parallelism more frequently, as will be shown in Chapter 4. This explains why pronominal and demonstrative co-reference is significantly more greater in these two text types on Arabic.

3.5.1.2 Cognitive interpretation

The facilitatory effect of pronominal co-reference on the processing of fictional narratives in both languages has been outlined in 3.4.1.1 above. The high frequency of this device across clauses in Arabic editorials and science texts must have a bearing on the processing of these two text types. Editorials and science texts in Arabic typically have a dense information load. Efficient processing of these two text types, therefore, calls for a certain kind of trade-off between their informational density and what de Beaugrande (1980).
terms "rapid access" which is crucial for storing knowledge in memory. The light processing load of pronouns which, as suggested in chapter 1, Section 1.2, have a compact form and are void of an inherent meaning (de Beaugrande, 1980) makes them adequate candidates for establishing the required trade-off. Thus, density of pronouns across clauses in Arabic editorials and science texts can be seen as contributing to their semantic economy which is an important function of cohesive devices. The principle of semantic economy is also central to efficient processing (de Beaugrande, 1980). Therefore, pronominal co-reference can, to some extent, alleviate the informational density of Arabic editorials and science texts. This density may be much enhanced if full forms were frequent across clauses as they are across sentences.

In addition, high frequency of pronominal co-reference can facilitate processing new information in those two text types. Recurrence of this device can keep the semantic identity of reference alive in the reader's mind. This is again another important factor which contributes to efficient processing (de Beaugrande, 1980; Sanford and Garrod, 1981). That pronouns and their co-referents normally occur in contiguous clauses may expedite processing new information. Readers have been found to search the most immediate context for a probable antecedent (Clark and Haviland, 1977). Thus, connecting a pronominal anaphor with its antecedent which is expressed in an immediately preceding clause is easy and rapid. The proximity of anaphors and antecedents instigates a quite short memory search. This, in turn, speeds up integrating new information into memory.

In fact, processing pronouns in Arabic may be even lighter
than that in English. As stated above, pronouns in Arabic can be implicit in the verb or attached to another element. In the former case, processing a pronoun does not add to the cognitive load on the processor’s part. In the second, a pronoun is processed as part of the element to which it is attached. This light processing load can be viewed as alleviating the phonological and morphological complexity of Arabic texts. This is a speculative assumption that requires empirical investigation.

Similarly, the high frequency of demonstrative co-reference across sentences in the three Arabic text types may have a facilitatory effect on their processing. What is noteworthy about Arabic texts in this concern is that anaphors are almost always defined and they are sometimes doubly modified (i.e. by ‘the’ and another demonstrative). This phenomenon suggests that the semantic identity of those anaphors is over-asserted. Such over-assertion may also have an important bearing on the processing of those texts in which the identity of reference may become ambiguous amidst their typical informational density if not asserted. Therefore, connecting definite anaphors with previous antecedents which normally lie in adjacent sentences should be easy and fast (Tennant, 1981). Although definiteness should not always be equated with easy processing, it activates background knowledge (de Beaugrande, 1981). This background knowledge keeps the semantic identity of reference intact in successive sentences. On the other hand, leaving those anaphors undefined may require activation of the reader’s pragmatic world knowledge in order to connect incoming
anaphors with prior antecedents, especially if those anaphors and antecedents are related by collocation. Consequently, the high frequency of demonstrative co-reference to define anaphors which repeat previous antecedents can contribute to efficient processing of Arabic texts.

3.5.2 **Conjunction**

One striking difference between the three text types in both languages is that whereas conjunction is essentially an intra-sentential device in English, it is an intra- and inter-sentential device in Arabic. Thus, while inter-sentential relations are mostly implicit in English, in Arabic these are almost always overtly realised (Williams, 1982).

Another striking difference between the two languages concerns the frequency of additive and causal conjunctions. These two conjunctions occur significantly more across clauses and sentences in the three Arabic text types (level of significance p > 0.5). The only slight deviation, however, is that causality occurs almost equally between sentences in science texts in English and Arabic. Cross-language differences in terms of these two relations are discussed below.

3.5.2.1 **Linguistic and rhetorical interpretation**

It was suggested in Chapter 2, Section 2.3 that although Arabic has the potential to accommodate most of H & H's (1976) conjunctions, only three conjunctions, namely, 'wa' (and), 'fa' (so) and 'la:kin' (but) predominate in Arabic written discourse (Dudley-Evans and Swales, 1980). In this corpus, 'wa' and 'fa' are the most frequent conjunctions. 'la:kin' is very low here.
High frequency of 'wa' and 'fa' is mostly attributed to the rhetorical factors of co-ordination and parallelism (Williams, 1982; Holes, 1983; Yorkey, 1974; Dudley-Evans and Swales, 1980). This is quite true as shown in 3.5 above.

'Wa' and 'fa' are also used to connect successive mostly parallel clauses which are piled upon one another despite the introduction of some punctuation signals such as the comma and the full-stop as Holes (1983) argues. In fact, Arabic has a punctuation convention similar to that used in English (Al-Khateeb, 1983) but punctuation markers are often arbitrarily applied. Thus, the frequency of 'wa' and 'fa' in Arabic can be ascribed to the indeterminacy of sentence boundaries.

These two conjunctions can express various conjunctive relations (ie. additivity, adversativity, causality, temporality, etc.) (Holes, 1983). As suggested in 2.3, they can occur with other conjunctions (eg. wa la:kin = and but; fa amma: = and as for (and but)). 'And' can occur with other conjunctions in English (eg. and because) but not with 'but'. Nor does English tolerate such a high frequency of 'and', especially across sentences. After all, sentence boundaries in English are comparatively well demarcated. In addition, English editorials and science texts favour subordination.

As for causality, Smith and Frawley (1983) suggest that this is a "high-level plot function" in fiction. Science texts, they argue, deal with postulated rather than real causes. This may explain why this relation is particularly low in the English texts.

A cognitive interpretation for the high frequency of 'wa' and 'fa' has not so far been reported. A speculative interpretation
is attempted in what now follows.

3.5.2.2 Cognitive interpretation

As for the cognitive function of ‘junction’ in text, de Beaugrande (1980:159) suggests that it serves to link configurations of knowledge "between spaces or between entities within spaces". Explicit realisation of "junction" relations is not always necessary since those configurations of knowledge can be related through certain inferential strategies that people normally apply. However, explicit relations, de Beaugrande (1980) argues, can facilitate processing provided that their occurrence is not "unduly frequent". Implicit relations, on the other hand, can lower "processing ease" but they increase "processing depth".

In fact, implicit relations may be sometimes adequate when sentence boundaries are well demarcated. In this case, boundaries of knowledge configurations can be easily perceived, and hence underlying conceptual relations can be supplied by the reader. But the situation is completely different when sentence boundaries are far from being distinct, as is the case in the Arabic texts. Here, determining boundaries of knowledge configurations would be quite demanding on the processor’s part. At least, the processor’s contribution may be very heavy because he has to set off those knowledge configurations first and then he has to supply missing conceptual relations. Such a task would enhance processing difficulty of Arabic texts which are already informationally dense and phonologically and morphologically complex. Therefore, these characteristics of Arabic texts coupled with their indistinct sentence boundaries may call for overt realisation of inter-sentential relations. It has been suggested above that ‘wa’
and ‘fa’ can operate as sentence-boundary markers. As such, these two conjunctions serve to signal spaces between configurations of knowledge among other functions. By this token, ‘wa’ and ‘fa’ can determine when one text segment starts and another ends, and hence they can contribute to efficient processing of Arabic texts.

Being informationally dense and phonologically and morphologically complex, Arabic texts require the type of conjunctions whose relations can be easily and rapidly processed. It was suggested in 3.4.3 that the fluid nature of ‘and’ makes it acquire meaning from the context wherein it occurs. This equally applies to ‘wa’ and ‘fa’ in Arabic. As suggested in Chapter 2, Section 2.3, these two conjunctions can be used in different contexts where they express various relations. Contextually dependent elements, as argued in 3.4.3, are highly predictable, and as such they are easy to process. For the reader who most frequently uses ‘wa’ and ‘fa’ in his speech the relations these two conjunctions effect are similarly easy to process. Thus, ‘wa’ and ‘fa’ can have a facilitatory effect on the processing of Arabic texts. Their presence would relieve the processor from retrieving underlying conceptual relations if ‘wa’ and ‘fa’ were missing. In addition, that their relations are easy to process may enable the reader to rapidly process new configurations of knowledge. This is particularly important for Arabic texts which inherently have a dense information load.

Viewed from another perspective, ‘wa’ and ‘fa’ can be said to have a simple phonological and morphological structure. That is why they are always attached to other elements whether they be other conjunctions (e.g. wa la:kim = and but) or some lexical or grammatical terms (e.g. wa rrajulu... = and the man...). Other conjunctions should
always stand on their own. Thus, it follows that ‘wa’ and ‘fa’ do not add much to the phonological and morphological complexity of Arabic texts.

Finally, these two conjunctions are sometimes void of an inherent meaning. That is when they occur as sentence boundary signals or together with other conjunctions, they can be dispensed with without amputating the meaning of text. de Beaugrande (1980) demonstrated how many instances of ‘and’ in children’s stories can be omitted without affecting the meaning of these stories. It is true that in Arabic texts, ‘wa’ and ‘fa’ always relate incoming to ongoing discourse, but in contexts like the above they can be deleted without impairing textual meaning. The point here is not whether it is more appropriate to keep ‘wa’ and ‘fa’ or dispense with them but rather their presence in such contexts does not enhance the cognitive load on the processor’s part. When they accompany other conjunctions, it is the other conjunctions rather than ‘wa’ and ‘fa’ which express the respective relations. Thus, ‘wa’ and ‘fa’ have no processing load whatsoever here. This equally holds true when they occur as sentence-boundary markers. Therefore, ‘wa’ and ‘fa’ can be said to facilitate rather than enhance the information load of Arabic texts.

The above assumptions are speculative and demand further validation.

3.5.3 **Lexis**

In terms of their lexical cohesion, the three Arabic text types tend to utilize IE and SRE across clauses significantly more than their English counterparts do (level of significance p > 0.5). At the inter-sentential level, lexical
repetition is much more frequent in the Arabic fictional narratives and editorials, whereas these two text types employ lexical collocation relatively more frequently in English. Differences in this respect is not significant. Science texts in both languages tend to use lexical repetition very frequently.

These differences are accounted for in what follows.

3.5.3.1 Linguistic and rhetorical interpretation

The tendency of Arabic written texts to use lexical repetition very frequently has been referred to the prolific word root which can generate many derivatives (e.g. 9alima = knew; 9ilm = science; 9alim = scientist; mu9allim = teacher, etc.) (Williams, 1982). Williams (1982, 1983) suggests that Arabic derives much cohesion from this redundant repetition. Arabic, he argues, tends to repeat themes in successive sentences even when it is grammatically possible to omit them.

Lexical repetition in Arabic has also been attributed to certain rhetorical devices such as ‘tawki:ld’ (assertion), ‘muba:lag’ (exaggeration), ‘musicality’ and the use of long arrays of adjectives to describe the same entity (Shouby, 1951). This tendency is sometimes ascribed to the mode of argumentation stated above. Koch (1981, 1983) identifies this mode as ‘presentation’ according to which many points are normally repeated over and again to stress the same viewpoint. This repetition, no doubt, aims at convincing the reader of a certain view, a mode typical of Arabic editorials. For example, in one Arabic editorial, the term ‘dialogue’ recurs in every sentence so that the reader is convinced that ‘dialogue’ is much more effective than deadly weapons.
The following example is an instance from that editorial:

(3.6) The regime has called for dialogue (1). And the dialogue has been one of the opposition parties’ claims (2). And Syria calls for the dialogue... (3). And Saudi Arabia moves toward the dialogue... (4). And France emphasises the importance of the dialogue... (5).

(Translated literally from the Lebanese newspaper ‘Al-Nahaar’, 21 March 1983)

Repetition of the term ‘dialogue’ in almost each sentence is meant to emphasise or even over-assert the main point (i.e. dialogue) in that editorial. Such repetition is not tolerated by English editorials whose discursive nature requires the use of diverse lexical items to express the various affairs (i.e. political and social) of the real world. Therefore, lexical collocation is relatively more frequent in them than in their Arabic counterparts.

Science texts in both languages pose no marked differences in terms of lexical repetition which is, as suggested in 3.4.4, often unavoidable in this text type (de Beaugrande, 1980).

Fictional narratives in both languages display some difference in this respect. Whereas lexical repetition is still relatively high in the Arabic narratives, it is very much restricted in their English counterparts. This can be ascribed to the higher frequency of co-ordination and parallelism in Arabic narratives, as will be shown in Chapter 4, and to the nature of Arabic which allows the occurrence of the referent alongside the pronoun alluding to it.

In light of the above brief discussion, it can be concluded that lexical repetition plays a very important role in the organisation of Arabic written discourse. This device seems to largely contribute to the surface connectivity and semantic continuity
of Arabic written texts which derive much cohesion from the great redundancy resulting from lexical repetition, as Williams (1982, 1983) suggests. In contrast, English written texts, except science, tend to exhibit more textual economy and precision. This is more true of English fictional narratives. English editorials, on the other hand, rely partly on lexical repetition and partly on \textit{SRE} for their connectivity and continuity. Thus, it follows that whereas Arabic texts appeal more heavily to surface cohesion which is mostly realised by lexical repetition, their English counterparts, especially narratives and to some extent editorials appeal more to semantic coherence which is established via SRE. Although this category is relatively frequent in the Arabic fictional narratives and editorials, lexical repetition still constitutes a major cohesive property of these text types. No doubt that such lexical repetition must have a role to play in the processing of Arabic written texts. This role is explained in the next sub-section.

3.5.3.2 Cognitive interpretation

It was suggested in Chapter One, Section 1.2 that lexical anaphors (i.e. noun phrases) are easy to process (Tennant, 1982). Connecting those anaphors with specific antecedents must be easy and fast. However, ease or difficulty of processing lexical anaphors is determined by three factors: clarity of the semantic relationships between anaphors and their respective antecedents, the semantic distance between anaphors and antecedents and whether antecedents are explicit or implicit in the text or situation (Sanford and Garrod, 1981). Lexical repetition in the Arabic texts seems to establish these three factors. Firstly, anaphors normally repeat the same
antecedents in previous sentences, as shown in the above example. Therefore, the semantic relationships between those anaphors and antecedents must be very clear. Secondly, occurrence of anaphors and antecedents in adjacent sentences facilitates and expedites their connection, which facilitates and speeds up processing new information. Thirdly, antecedents are almost always explicitly stated in the previous text. This also makes assigning antecedents for lexical anaphors quite easy. Moreover, recurrence of antecedents in immediately preceding sentences instigates a quite short memory search, which that expedites integrating new information into memory.

de Beaugrande (1980), as suggested in Chapter One, Section 1.2, suggests that recurrence of same lexical elements keeps the semantic identity of reference alive in the reader’s mind. As argued above, this factor is of particular relevance to the efficient processing of Arabic texts in which this identity of reference may become ambiguous as a result of their dense information load. Thus, lexical repetition can have a facilitatory effect on the processing of Arabic written texts.

On the other hand, SRE which requires activation of the reader’s pragmatic world knowledge may be more demanding on the processor’s part. This device slows down processing new information (Clark and Haviland, 1977). The nature of Arabic texts suggested above demands a device which facilitates and expedites their processing. This is best achieved by lexical repetition which, as Berman (1984) argues, renders Arabic texts transparent. Ellipsis and substitution, on the other hand, make those texts opaque, Berman (1984) states. This may account for repetition of themes in successive sentences in Arabic written discourse, although such
successive sentences in Arabic written discourse, although such repetition can be sometimes grammatically dispensed with (Williams, 1982, 1983).

That the English fictional narratives and editorials tend to utilise more frequently than their Arabic counterparts suggests that the reader’s world knowledge is appealed to more heavily in them. Lexical repetition in the Arabic texts points to involving the reader’s text knowledge more heavily in Arabic.

The previous speculative interpretations remain theoretical and require empirical verification. Such a task is well beyond the scope of this study to handle. However, a small-scale study of the facilitatory effect of one cohesive device (i.e. lexical repetition) on the understanding of three English text types by Arab learners is reported in Chapter 6.

3.6 Summary

This chapter has investigated the global trends in textual cohesion in three text types in English and Arabic. The three text types selected are fictional narratives, newspaper editorials and introductory university science texts. Selection of these text types was motivated by interest in investigating three easily identifiable texts in terms of their readership, reader knowledge and purpose and reading style. 60 texts were analysed, 20 for each text type (10 for each language). Investigation of trends in textual cohesion has aimed at providing evidence for the variability of the phenomenon of cohesion in different text types. It has also attempted to shed some light on the role of cohesion in the processing of text. In other words, this chapter has tried to point out the descriptive and
explanatory apparatus for cohesion as a textual phenomenon.

Different text types are shown to cohere differently. Whereas fictional narratives essentially cohere through pronominal coreference, editorials and science texts derive much cohesion from lexical repetition. This holds true for English and Arabic. The three text types in both languages avoid heavy ellipsis and substitution.

As for the facilitatory effect of those global trends in textual cohesion on the processing of the three text types, it has been found that each text type opts for the cohesive tie which meets its readership, reader knowledge and purpose and reading style most adequately. For example, pronominal co-reference can facilitate the processing of fictional narratives by enabling the reader to perceive the characters and actions of the story. The light processing load of pronominal co-reference also enhances the reading style of a fictional narrative which is meant to be read rapidly. This in turn contributes to the entertainment goal of the text. Pronominal co-reference also plays an important role in the organisation of fiction, in that it contributes to the continuity of the participant and the event lines which hold the text together.

Lexical repetition serves similar functions in editorials and science texts. The type of concepts involved in these two text types require much specificity and clarity, which can be best carried out by lexical elements. Thus, lexical repetition can assist in the organisation of editorials and science texts by ensuring their semantic continuity. This device can similarly contribute to
efficient processing. By keeping the semantic identity intact in contiguous sentences, lexical repetition helps readers to easily connect new anaphors with their previous antecedents, the thing that facilitates processing new information.

In terms of their conjunctive relations, fictional narratives are found to utilize the additive ‘and’ much more frequently than editorials and science texts. The fluid nature of ‘and’ which makes it express various relations enables the reader to easily process those relations.

Although in English and Arabic the distribution of those cohesive devices is almost identical across the three text types, both languages differ considerably in the frequency of those devices. Arabic texts generally tend to use pronominal and demonstrative coreference, additive and causal conjunctions and lexical repetition much more frequently than English. On the other hand, comparative coreference and lexical collocation are more frequent in the English texts. The high frequency of those devices in the Arabic texts is viewed as representing a kind of trade-off between the phonological and morphological complexity and information density typical of those texts and efficient processing. In such types of text, the most important prerequisite for efficient processing is the maintainance of the semantic identity of reference in successive clauses and sentences which are loosely connected. Frequency of those cohesive devices, especially pronominal and demonstrative co-reference and lexical repetition, keeps the identity of reference alive in those sentences, and clauses.

In the light of the above trends, one can conclude that cohesion is a variable phenomenon which is realised differently in
different text types. In addition, there is always a kind of trade-off between those cohesive devices, in that when pronominal coreference is dense lexis is low and vice versa. In Arabic, this trade-off obtains within the same text type, in that pronominal coreference is dense across clauses while lexis is dense across sentences. As for cross-language differences, it can be said that whereas English favour textual economy, Arabic opts for redundancy from which it derives much cohesion.

Finally, it should be remembered that the cognitive interpretations of global cohesive trends typical of each text type and language type are speculative, and require empirical verification.
CHAPTER FOUR

Cohesive Function of Parallel Structure

4.0 Introduction

Parallel structure occurs frequently in both English and Arabic, and has been noted in political rhetoric, poetry, fiction, and biblical religious writing. The form it takes is often of a tripartite nature, as far as English is concerned. This is an example:

(4.1) His cheeks were aflame; his body was aglow; his limbs were trembling.

Joyce 'A Portrait of an Artist as a Young Man' (See N9, Appendix A)

In this example, three clauses with the same grammatical structure follow each other in rapid succession, each involving predication of an NP representing a part of the body, and each VP being an intransitive verb of process in continuous aspect.

Parallel structure thus involves the use of particular syntactic and semantic configuration more than once, in rapid succession. The general expectation for English appears to be, as in the above example, of a tripartite nature. An example from political rhetoric, again at the level of independent clause, shows the expectation of closure at the third occurrence.

(4.2) It ought to be possible to examine such links seriously. It ought to be possible to discover, for instance, whether people who have no jobs, or who are claimants, or who live in sub-standard housing, or who live in broken families...are more likely to commit particular crimes or to be the victims of particular crimes. It ought to be possible...to try to construct policies which are designed to prevent these crimes
from happening.

(Editorial from 'The Guardian', 7 April 1987, p.12)

In this example, the three sentences start with the same clause (ie. it ought to be possible) followed by an infinitive phrase (ie. to examine, to discover, to try to construct). Although the parallelism is broken after the infinitive phrase in the second sentence which is a rather long one, its textual effect is apparent. Koch (1981) calls incomplete parallelism such as this "cumulative parallelism" which creates new items. The creation of new items highlights the rhetorical effect of parallelism, that is "it creates new, broader classes", and by doing so "the rhetorical effect of alluding to the class gets more forceful" (ibid:178). This is a very important end for political rhetoric which aims at convincing the hearer/reader of a certain viewpoint or winning him over to one side or party.

Besides having three independent sentences, each beginning with a parallel clause, the second sentence contains two completely parallel clauses (eg. who live...who live...). Complete parallelism has been termed "listing" (Koch, 1981). It repeats equal syntactico-semantic configurations more than once. In this "listing parallelism", clauses which are assumed to have the same informational value (Koch, 1981) run in a list. It is like saying 'first, second, third, next...'. Listing parallelism also shows that the things repeated belong to a certain phenomenon. In the above example, two types of people (ie. those who live in sub-standard housing, and those who live in broken families) are listed. Both types of people belong to one category (ie. those who are likely to commit crimes...etc).

The above example shows how parallelism comes to a closure
at the third occurrence.

Arabic, on the other hand, appears to tolerate much larger strings: up to seven or eight occurrences of the semantico-syntactic structures are quite normal in political discourse. This phenomenon of long concatenated strings of parallel structure, loosely connected with ‘wa’ or ‘fa’, has already been commented on in Chapter Two Section 2.3, where sentence/clause connection is discussed. An example of just such structural parallelism in Arabic political rhetoric now follows.


(Modified from Koch, 1981, pp.172-5)

Can we ignore that there is an Arab circle? (1). Can we ignore that there is an African continent? (2). Can we ignore that there is an Islamic world? (3). For it is not accidental that our land is in the South-west of Asia (4). For it is not accidental that our land is located in the north-east of Africa (5). For it is not accidental that the Islamic civilization and the Islamic heritage, which the Mongols raided, who plundered the ancient capitals of Islam, returned to Egypt and sought refuge there (6).

This text can be divided into two parts. In the first part sentences 1, 2 and 3 follow each other in parallel, and in the second part sentences 4, 5 and 6 run in parallel. Complete parallelism takes place in the first set (ie. sentences 1, 2 and 3), where the same semantico-syntactic units recur in the three sentences. Each sentence consists of two clauses, a main clause (ie. the question) and a
nominal clause. In every sentence a new noun phrase which consists of an attribute and a noun is introduced (e.g. an Arab circle, an African continent, and an Islamic world); and the new elements introduced are themselves related to each other in that they are members of a semantic class: geographically defined societies.

In the second part of the text, sentences 4 and 5 represent complete parallelism whereas in 6 it is cumulative (i.e. incomplete). In fact, the rest of all the above sentences which is not quoted here represents cumulative parallelism. However, the example shows the potential of Arabic political rhetoric for parallelism which can, in certain cases, accommodate a much larger number of semantico-syntactic units than that in English.

Further examples of parallelism in religious discourse, which of course has a common historical ancestry, can be seen in the following texts.

(4.4) Quran

wa shshamsi wa DuHa:ha: (1)
wa Igamari ida: tala:ha: (2)
wa nnaha:ri Tda: jalla:ha: (3)
wa llayli ida: yagsha:ha: (4)

(From Sur:ra `Shams" (The Sun) No. 91, translated by Abdullah Yousef Ali)

By the Sun and his (glorious) splendour (1)
By the Moon as she follows him (2)
By the Day as it shows up (the Sun’s) glory (3)
By the Night as it conceals it (4)

Bible

3. The voice of the Lord is upon the waters; the God of glory thundereth; the Lord is upon many waters.

4. The voice of the Lord is powerful; the voice of the Lord is full of majesty.

176
5. The voice of the Lord breaketh the cedars; yea, the Lord breaketh the cedars of Lebanon.

(From Psalm 29, Old Testament, Oxford)

In the text from Quran, every verse begins with a prepositional phrase. Verses 2, 3 and 4 have an adverb clause of comparison. Thus, complete syntactic units are repeated in 2, 3 and 4. In each unit, the lexical items (i.e. Sun, Moon, Day and Night) are semantically related. This semantico-syntactic parallelism is a striking feature of the textual unity of the text.

Similarly, in the biblical text three sentences repeat the same compound subject (i.e. the voice of the Lord), and two have semantically related subjects. The rest of those sentences is either a verb of process in the continuous aspect or a transitive verb (i.e. breaketh). The first and the third sentences in 3 have a place adjunct each, whereas the second closes with the verb. In 4, the verb of process is followed by an adjective. In 5, an object follows the transitive verb. Thus complete and cumulative parallelism is displayed in the text. Repetition of the same words or semantically related items reinforces the textual unity.

In poetry, too, within English, structural parallelism is clear. Here is an example.

(4.5) In that I loved you, love, I worshiped you.
In that I worshiped you well, I sacrificed.
All of most worth I bound and burnt and slew:
Old peaceful lives; frail flowers’ firm friends; and Christ.

(From W. Owen’s ‘To Eros’)

In Owen’s short poem, ‘In that + adverbial clause’ precedes the main clause in both the first and the second lines. In the third
line, three transitive verbs of action + process appear, each of them involving a violent, shameful act. The direct object of these verbs, 'All of most worth' is expanded in the last line, so that the semantic antities affected by the three violent actions are specified. The quadruple, rather than tripartite pattern, underlines the moral seriousness of the last direct object, 'Christ'.

4.1 Function of parallelism

The question must be asked, 'What does the use of parallel structure signify?' To suggest that it has persuasive or aesthetic or forceful force is not a full answer because the question remains, 'Why does it have such force?' Adequate investigation of this question belongs in the field of psycholinguistics and/or social psychology, and is certainly beyond the scope of this thesis. There is one aspect of parallelism, however, which should be thoroughly integrated within the framework of the present discussion, and that is its cohesive function.

H & H's (1976) taxonomy of cohesion excludes parallelism, yet its role in creating textual semantic unity, which is what cohesion is all about, has been commented on by many linguists (Quirk et al, 1973; Hartnett, 1981; Koch, 1981, 1983; de Beaugrande, 1980 among others).

In the processing of text, its potential is visualised as "freeing attention away from parsing surface structures, so that conceptual-relational content can receive greater concentration" (de Beaugrande, 1980:127). For readers normally tend to "re-use already apperceived structures" (ibid: 226). When people build 'text-world models', conceptual dependencies and grammatical dependencies are
utilized in parallel. Parallel structure gives rise to making inferences: "that locations and events are approximate in space and time" (de Beaugrande, 1980:161). This happens when sentences are used in juxtaposition and the conjunctive relations between them are not explicitly stated. Parallelism of form, de Beaugrande, 1980 suggests, points to "relatedness of actions". It is also viewed as demonstrating relatedness of equal ideas (Hartnet, 1981). Thus, parallel structure not only incorporates relatedness of syntactic forms but also relatedness of conceptual semantic relations underlying those syntactic forms.

4.2 Parallelism in Arabic

The inclusion of this device in this study is of particular relevance to Arabic which derives much of its cohesion from repeated use of syntactic and/or semantic configurations that run in parallel. The heavy reliance of Arabic on parallel structure and syntactic and semantic repetitions has been recognized by many linguists (Holes, 1983; Williams, 1982, 1983; Al-Jubouri, 1983; Koch 1981, 1983; Swales and Dudley-Evans, 1980; Shouby, 1951; Kaplan, 1966, 1967; Yorkey, 1974; Thompson et al., 1983; and Cowman, 1978 among others).

However, the role this device actually plays in textual cohesion in Arabic has not been thoroughly explored, although it has been mentioned in passing (Williams, 1983). Williams suggests that Arabic favours lexical repetition which results in great redundancy. This degree of redundancy which is unacceptable in English written discourse incorporates much cohesion into Arabic discourse.

The most comprehensive treatment of the role of parallel structure in Arabic is that of Koch (1981). Investigating cohesion
and persuasion in Arabic argumentative discourse, she shows that the basic constraint on the formation of discourse is 'paradigmatic patterning'. Accordingly, she identifies two types of constraint on Arabic discourse: syntactic and rhetorical. Syntactic constraint is imposed by the grammar of the language, whereas rhetorical constraint is imposed by the culture.

Koch (1981) argues that, as a language, and a discourse, Arabic is 'parallelistic' and 'paratactic'. Such parallelism and parataxis are sometimes consciously used by the writer. They may even, indeed, be criteria of 'acceptability' rather than 'grammaticality'. However, parallelistic or paratactic structure is, in certain cases, dictated by the grammar of Arabic as being "the only choice that the grammar allows" (p. 184).

Koch (1981) ascribes the high frequency of parallelistic or paratactic structure in Arabic discourse to two main factors. One is the oral culture in which the style of Arabic argumentative discourse is deeply rooted. The other is a rhetorical reason which has to do with how 'truth' is handled. Koch (1981) recognizes two types of argumentation whereby 'truth' can be presented. The first is called 'presentation' and this occurs when truth is already established and available. Therefore, the role of the arguer is to simply repeat the same thing again and again. The second which is called 'proof' is needed when there is doubt about the truth. This calls for establishing or proving it.

Koch (1981) argues that argumentation in Arabic is dominantly implemented by 'presentation'. This mode of argumentation is typical of "hierarchical societies, where truths are not matters
for individual decision" (p.194). Thus, argumentation in Arabic calls for making truths "present in discourse: by repeating them, paraphrasing them, doubling them, calling attention to them with external particles" (p.195). This creates what Beeston (1970:120) terms "rhythmic balance between two (occasionally three) clauses which are also marked by a careful parallelism of sentence". Such rhythmic balance and parallelism is reminiscent of a style called "saj9" which was dominant in the 19th and early 20th centuries. This style emphasised the form of words rather than the content of discourse. Although attempts to change this mode of rhetoric were made in the middle of the 19th century, "repetition and balance, synonyms and paradigms, are essentially and authentically.....at the heart of the language, the discourse, and the rhetoric in a way which cannot be simply disposed of" (Koch, 1981:197).

As for its cohesive effect, "repetition", Koch (1981:198) argues, "creates linguistic cohesion by evoking classes of items, it creates persuasive force by creating classes, and in doing each of these things it creates language". She identifies two categories of parallelism: 'listing parallelism' and 'cumulative parallelism'. The first occurs when complete syntactic patterns follow one another in parallel. It is equivalent to listing in English (ie. first... second... finally). The cohesive force of listing parallelism, is brought about by "indicating that the same level of generality is being maintained" (ibid:170). Cumulative semantic parallelism which is not as complete as listing parallelism, establishes cohesion by creating an intellectual momentum and "the parallelism and lexical echoing create a sort of momentum in the text which reflects its content" (ibid:172). Thus, parallelism is "simultaneously cohesive
and rhetorical" (ibid:172).

Koch (1982) considers repetition to be a major "text-building strategy". She concludes by remarking that

"repetition and paradigmatic patterning, are also the keys to the dynamic process by which juxtaposition in the syntagma of discourse continually create and modify the extra-textual paradigms from which syntagma are built" (ibid:179)

This repetition, she maintains, occurs on all levels: "phonological, morphological and lexical, syntactic, and semantic" (ibid:179). In other words it is a repetition of form and content.

Clearly, parallel structure is a powerful textual device which calls for further investigation both in Arabic and in English. Investigation should take account of a variety of text-types so that the role of this device in different types of discourse can be ascertained. Koch's (1981) study was only concerned with argumentative Arabic discourse. She did not look into parallelism in other text-types. The present study endeavours to explore the cohesive role of parallel structure in the three text-types examined in this corpus.

It was argued in Chapter One that parallel structure operates on four linguistic levels: single words, phrases, clauses and sentences. Only parallel clauses and sentences are examined in the following discussion, which focuses on the cohesive function of parallel structure within and between sentences, and examines its use in the three selected text-types examined here.

182
4.3 Parallel structure in English and Arabic text-types

The three English and Arabic text-types were analysed with a view to determining the cohesive role and frequency of intra- and inter-sentential parallel structure. This frequency is shown in the following table.

<table>
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<th>Intra-sentential Parallel Structure</th>
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<tr>
<td><strong>NARRATIVES</strong></td>
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<tr>
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<td>11</td>
</tr>
<tr>
<td>Arabic</td>
<td>125</td>
<td>28</td>
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<tr>
<td><strong>EDITORIALS</strong></td>
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<td>2</td>
</tr>
<tr>
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<td>8</td>
</tr>
<tr>
<td>Arabic</td>
<td>53</td>
<td>27</td>
</tr>
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</table>

Table 10: Intra- and inter-sentential parallel structure per 3,000 words in each English and Arabic text-type.

The above figures display some qualitative similarities between the two languages across text-type in the distribution of parallel structure within and between text segments. Firstly, in both languages, narrative texts tend to use intra- and inter-sentential parallel structure more frequently than the other two text-types do, though this device occurs almost equally between sentences in the Arabic narratives and science texts. The distribution of this device
also indicates that its use is much more dense within than between sentences in the three text-types of both languages. Thus, parallel structure essentially contributes most to the intra-sentential cohesion of texts. This finding conforms with Koch's (1981) conclusions concerning parallelism across clauses in Arabic.

Table 10 also displays some quantitative differences across language and text type. Intra- and inter-sentential differences between the two languages are statistically significant at the 0.5 level. This holds true for the three text-types. The difference between Arabic narratives and the other two Arabic text-types in the frequency of intra-sentential parallel structure is also significant at that level. This applies to the difference between English narratives and editorials in this respect.

The following discussion offers some interpretive comments on the cohesive role of this device in the three text-types in both languages.

4.3.1 Parallel structure in English and Arabic narratives

Table 10 clearly points to the tendency of narratives in both languages to utilize parallel structure more frequently than the other two text-types, especially within sentences. It was argued in 4.0 above that narratives are among the types of discourse which employ this device for aesthetic or persuasive purposes. This is particularly so for Arabic. Tentative reasons are given in the course of this sub-section.

Some other tentative reasons for such a tendency can be suggested. Firstly, the fact that narrative has a participant line and an event line which hold it together stipulates the use of
coordination that is relevant to right branching (Cheong, 1976; Smith and Frawley, 1983). Although subordination can also occur in parallel, parallelism has largely been associated with coordination. Secondly, narrative was found to be largely reliant on additive relations for its cohesion (Smith and Frawley, 1983). This additivity was also found to be a major characteristic of the narratives examined in this corpus (see chapter 3). Therefore, parallel structure is a device favoured in this text-type for highlighting its additivity, which contributes to the connectivity and continuity of its participant line and event line. This is of particular relevance to the Arabic narratives in which coordinate clauses are piled upon one another loosely connected by ‘wa’ or ‘fa’ (Holes, 1983). In English, on the other hand, this is not tolerated in the written mode, though it can and frequently is in the spoken mode (Farag, 1986).

The manner whereby parallel structure can serve to ensure the connectivity and continuity of discourse can be exemplified by citing de Beaugrande’s (1980:161) example.

(4.6) The king was in his counting house, counting his money;  
The queen was in the parlour, eating bread and honey;  
The maid was in the garden, hanging out the clothes;  
Along came a blackbird and pecked off her nose.

The juxtaposition of these parallel sentences, de Beaugrande (1980) argues, gives rise to "strong inferences": that the places and events in the text are proximate in their "location" and "time" respectively, and that the "pecked off nose" was the "maid’s" not the "queen’s". Thus, in default of explicit relations, parallel structure can play a
role in inferring such relations, and is the structural feature which highlights the continuity of the text. Placing those parallel sentences side by side also establishes their surface connectivity (i.e. cohesion) through the semantic relatedness of lexical items such as 'king, queen, maid; counting, money; bread, honey, eating; garden, blackbird, pecked'.

The aesthetic and persuasive effect of parallel structure can be seen in the following example from James Joyce's 'A Portrait of the Artist as a Young Man'.

(4.7) His cheeks were aflame; his body was aglow; his limbs were trembling.

This text portrays a situation between the two lovers. The 'Artist' turns away from his lover and his emotional state is very succinctly demonstrated in those three parallel sentences, which explicitly show the intensity of the situation. The relation underlying those sentences is that of additivity. Without being overtly realized, that relation can be inferred from juxtaposing those parallel structures. The repeated use of the pronominal (e.g. his), the semantically related items (e.g. cheeks, body, limbs; aflame, aglow) ensures the surface connectivity of the text. Its semantic continuity is established via the conceptual relations underlying those surface elements. Each sentence contributes to the intensity of the situation. Those repeated items are easily processed and comprehended, for their occurrence in juxtaposed sentences makes it easy for the reader to locate their antecedents. Consequently, this device can, to some extent, free the reader's mind away from exerting too much effort to work out surface relations and eventually help him dwell more
thoughtfully on "conceptual-relational content" (de Beaugrande, 1980).

It was stated earlier that Arabic discourse generally favours parallel structure, especially within sentences. This is much more evident in the narratives studied here. However, stylistic factors play a prominent role in the frequency of this device in narrative. 'Taha Hussein', for example, was found to opt for utilizing this device much more frequently than other authors. It is well beyond the scope of this chapter to investigate further the relative frequency of parallelism in different authors.

Some of the major characteristics of Arabic such as over-assertion, emphasis and musicality (Shouby, 1951; Koch, 1982, 1983; Al-Jubouri, 1983) can be implemented by parallel structure, among other things. Those characteristics entail repetition of certain syntactic and/or semantic configurations within and between parallel structures.

This repetition, Koch (1983) suggests, takes place on all levels (i.e. words, clauses, sentences). Repeated elements introduces a certain redundancy into text, and redundancy supplies Arabic with much of its cohesion (Williams, 1983). Parallel structure, then, immensely enhances the cohesive devices in Arabic by repeated use of those elements. This is an example.

ssira:jiyya /, wa ba9Duha: yusamma
rraHabiyya /, wa ba9Duha: yusamma:
lamiyyatu l’sf9a:1 (4).

(N1, Appendix B)

As for the book which he had to learn completely it was ’ulfiyyat bnu Maalik
(1). And as for the other book it was ’majmo9 ’almutoun’ (2). And the Azhari
had recommended before his departure that he (the boy) start with ’Al-ulfiyya’
until he finished it and learned it perfectly, he learned strange things from
the other book. Some of them are called aljawhara, and some of them are called
alkhariida, and some of them are called alsiraajiyya, and some of them are called
alrahabiyya, and some of them are called laamiyyat alaf9aal.

This example illustrates the frequency of loosely connected parallel
clauses which run in one sentence, a feature which lends musicality to the
text. This is achieved by repeated use of equally balanced clauses which also repeat same items (ie. some, called). They also
emphasise the cumulative burden of learning many things so that one
can be a knowledgable person, a target which ‘the boy’ in that story
dreamed to attain. In other words, those parallel clauses aim at
underlining that point.

This text exemplifies Koch’s (1981) listing parallelism’. Complete syntactic units are used in parallel. Putting the things to be ‘learnt’ in such a list indicates that the ‘strange things to be learnt’ have the same level of generality. By doing so, listing parallelism, as Koch (1981) argues, contributes to the cohesion of text.

Apart from their rhetorical effect, those parallel clauses and sentences (ie. sentences 1 and 2) contribute to the surface connectivity (ie. cohesion) and the semantic continuity (ie.
coherence) of that text. Its surface connectivity is established through repetition of some pronouns (e.g. he, them, it), the additive 'wa' and 'as for', the comparative 'other' and the same items of book, learn, 'ulfiyyat bnu Maalik, called, some'; whereas its semantic continuity is ensured by the relatedness of certain items such as 'started, finished; names of topics' (e.g. jawhara, siraajiyya - etc) which all pertain to 'strange things'.

Written English, on the other hand, does not favour such a frequency of parallel structure in one sentence. Example 4.7 above shows that two parallel sentences can be tolerated. Even intra-sentential parallel structure cannot run infinitely in the way it does in Arabic.

For example:

(4.9) All is ripling, all is dancing, all is quickness and triumph.

(From Virginia Wolf's 'The Waves')

In this text, only two parallel clauses run in one string. Unlike in the above example, 'and' does not join the three clauses. Their additivitiy can be deduced from the underlying conceptual relation which need not be overtly manifested. The continuity of those three clauses derives from that semantic relation that is expressed through the items 'ripling, dancing and quickness and triumph'. They form part of a picture which portrays happiness and great joy.

Inter-sentential parallelism is not very frequent in the narratives of both languages. However, it is still comparatively favoured more by the Arabic narratives than by their English
counterparts. Inter-sentential parallelism in the Arabic narratives represents Koch’s (1981) cumulative parallelism, in that it is not complete. Instead of showing the level of generality of things used in parallel, cumulative parallelism, it was stated above, creates an intellectual momentum which is further highlighted by lexical echoing that reflects the content of the text. This is an example:

(4.10) awa lam yaqul hamma;m annahu: lan yufarriTa fi: hawa: sa:ra....(1) awa lam yaqul annaha; Hilyatan mu:naga....(2)

(N6, Appendix B)

Didn’t Hammam say that he would not dispense with Sara’s love....(1) Didn’t he say that she was an elegant ornament....(2)

Inter-sentential parallelism is maintained here in the first clause of each sentence (ie didn’t Hammam (he) say). This parallelism is broken in the rest of those sentences. Thus, it is incomplete. This is what Koch (1981) calls cumulative parallelism. The lexical echoing of the item ‘say’, ‘Hamma;m and ‘Sara’ reflects the content of the text which, in fact, revolves around those two characters (ie Hamma;m and Sara) and their love story. Koch (1981:178) equates the beginning of such sentences with the ‘refrain of a ballad’ and "parallelism" which, she argues, "keeps the reader to a definite viewpoint". When the "paradigmatic class of items which share the repeated or parallel "refrain" gets larger, the rhetorical effect of alluding to the class gets more forceful" (ibid: 178). This type of cumulative parallelism creates a ‘rhetorical rise in momentum: the parallel items at the beginning mark the advent of new ideas (ibid:178). Koch (1981:177) maintains that "cumulative parallelism indicates that a new, more
intense item is about to begin".

Inter-sentential parallelism, like parallelism across clauses, is not favoured by the English narratives examined in this study. Inter-sentential relations are mostly implicitly expressed. The semantic continuity of discourse is dependent on other means than on parallelism. The thematic movement, which will be discussed in the next chapter, may be one means by which such continuity is established.

4.3.2 Parallel Structure in English and Arabic editorials

Compared with the narratives analysed here, the English and the Arabic editorials tend to use much less parallel structure within and across sentences. A tentative explanation may be suggested. First, editorials deal with diverse factual worlds which stipulate the use of diverse tenses to express different temporal events. Consistency in tense has been recognised as a cohesive device (Hartnett, 1981; de Beaugrande, 1980; Quirk et al, 1973). Such consistency is, to a great extent, maintained in narratives and science texts. On the other hand, the occurrence of diverse tenses breaks parallelism. Second, the short range of the participant line and event line in editorials, as opposed to those in narratives, limits the frequency of parallel structure in this type of discourse. Third, the factual entities of editorials require the use of subordination more than the possible worlds of narratives do. As stated earlier, though subordinate clauses can run in parallel, parallelism is more typical of coordination. Coordination does occur in editorials but it is mostly used adversatively rather than additively. Journalistic discourse, it was argued in Chapter 3,
Section 3.4.3 coheres adversatively (Smith and Frawley, 1983).

However, this device is comparatively much more frequent in the Arabic editorials than in their English counterparts. This difference can be ascribed to some inherent cultural factors. As discussed in section 4.2, argumentation in Arabic is viewed as one of 'presentation' (Koch, 1981), as opposed to 'proof' in English. The former is used when the truth is clear and the latter when otherwise. Thus, stating a clear truth, in Arabic, results in much repetition, which can be represented by repeated syntactic and/or semantic configurations.

Parallel structure is, then, utilized for persuasive purposes in the Arabic editorials. This is an example.

(4.11) wa ma: akkadahu: tagri:ru wa zar:rati
lx:a:rijiyya l'amri:kiyya 9ani Htara:mi
Hugu:gi l'insa:n fi: misr/ yash9uru bihi:
kullu muwa:tin fi: bila:dina / wa yas9ad
bihi: / wa yahriSu 9alayh (1). fa
Hurriyyatu lfard hiya atmanu ma: yamlu:k
/, wa agla: ma: yatamassak bih (2).
Hurriyyatuhu: fi: an yu9li na ra' yah /, fa
la: yunakkal bihi: /, wa la: yuTrad min
waZi:fatih / wa la: yuhaddad fi: rizgih
(3). Hurriyyatuhu fi: mumu:rasiti
nashah:Tihi ssiyas:i: /, fa la: yuTDahad
/, wa la: yunbad /, wa la: yuHram min
mawg9i:ih (4).

(NE9, Appendix B)

And what the report of the American State Department has confirmed about human rights in Egypt is felt by every citizen in our country and he is pleased with it and he is keen on it (1). The individual's freedom is the most precious thing he owns and it is the most expensive thing he adheres to (2). His freedom in expressing his ideas, and he is not harmed, and he is not fired from his job, and he is not threatened in his living...(3). His freedom in practising
his political activity, and he is not oppressed, and he is not abandoned, and he is not denied his position...(4).

This text explicitly spells out the occurrence of intra- and intersentential parallel structure in the Arabic editorials. Two or three parallel clauses exist in each sentence, and sentences 3 and 4 are parallel. The frequency of this device in the above text aims at emphasising the 'freedom' Egyptian people enjoy. In order to persuade the reader of that 'freedom', many parallel examples are given within and between sentences.

Sentences 3 and 4 represents 'listing parallelism'. A list of issues occurs as a result of 'expressing one's ideas' and 'practising his political activity'. Those issues acquire the same level of generality by occurring in parallel. The paradigmatic patterning of those clauses is shown by the use of the words 'harmed, fired and threatened; oppressed, abandoned and denied' in the two sentences respectively. Such listing enhances the amount of injustice that may be incurred in the absence of 'freedom'.

Furthermore, the role parallelism plays in organising and creating information is displayed in the text. In sentence 1, the new items 'pleased' and 'keen' reflects the 'Egyptian citizen's' happiness with the 'human rights' in his country. Thus, the repeated use of parallel structure in those sentences reflects the content of the text by creating a new and broader class of issues that highlight such content. This incorporates semantic cohesion into the text.

Apart from their rhetorical effect, those parallel structures abound in cohesive items which contribute to the surface connectivity of text. For example, the recurrence of the pronominal
'hi' (it) and the implicit pronoun (he), the conjunctions 'wa' and 'fa' and the same lexical item 'freedom' contributes to the surface connectivity of the text. The continuity of the text is further established by the occurrence of items which have some semantic affinity (eg. felt, pleased, keen; individual, citizen, country; own, adhere; precious, expensive; harmed, fired, threatened; oppressed, abandoned, denied; position, job, living; practise, activity). Moreover, the juxtaposition of those parallel sentences (ie. sentences 3 and 4) gives rise to inference regarding their underlying additive relation which is not explicitly realized. Thus, this device can provide clues as to what conceptual relation obtains between sentences.

This device is not, however, favoured by the English editorials, since it raises redundancy in an editorial to too high a level which, although accepted in Arabic, is frowned upon in formal written English texts.

4.3.3 Parallel structure in English and Arabic science texts

English and Arabic behave similarly in that both languages use parallelism less frequently in editorials than in science texts. A distinguishing feature of Arabic, however, is that editorials and science texts have distinct patterns. Whereas Arabic science texts and editorials employ parallelism at the intra-sentential level with equal frequency, at the inter-sentential level, science texts use more parallelism than editorials. The Arabic science texts are more in line with the Arabic narratives in this respect.

The greater frequency of parallelism in science texts suggests that the clearer the pedagogic function of author vis a vis
reader, the more likely it is that parallelism will increase. In a pedagogic setting, the intake of new information has to be correctly paced, otherwise the learner/reader will be overwhelmed.

There is some implication that the political demagogue controls his political audience in much the same way as a teacher controls information flow for his students. The masses must be moved, but only one small step at a time.

The fact that editorials display less parallelism than science texts suggests that the pedagogic function of editorials is more covert than that of science texts.

Compared with their English counterparts, the Arabic science texts allow a great deal more parallelism at the intra- and inter-sentential levels. Therefore, whereas the English science texts, like the other two English text-types, largely reject parallel structure, this device seems to be favoured here as in the other varieties of Arabic written discourse. Here is an example

(4.12) wa hunaːka naw9un taːnin mina lhɑːydrojįːn waznuːhυ ddariyy (2) /, wa taːtəwːiː nawaːtu ɗarratiːhįː 9aːlaː brɔːtoːn wɑːHid wa nyuːtɔːn wɑːHid (1).
wa naw9un taːlit mina lhɑːydrojįːn waznuːhυ ddariyy (3) /, wa taːtəwːiː nawaːtuːhυː 9aːlaː brɔːtoːn wɑːHid wa nyoːtɔːnayn (2).

(S4, Appendix B)

And there is a second kind of hydrogen, its atomic weight is (2), and its nucleus contains one proton and one neutron (1). And a third kind of hydrogen, its atomic weight is (3), and its nucleus contains one proton and two neutrons (2).

Again, 'wa' joins two parallel sentences and two parallel clauses within each sentence. The frequency of some cohesive elements
within those parallel clauses and sentences highlights the surface connectivity of text. For example recurrence of ‘wa’ and repetition of some lexical items such as ‘hydrogen, proton, neutron, atomic, weight, nucleus, contain’ contribute to the cohesion of text.

This text exemplifies listing parallelism in which two types of ‘hydrogen’ are listed in parallel. Intra- and intersentential parallelism is complete here since complete syntactic units are repeated. Placing the two types of ‘hydrogen’ side by side reveals their equal level of generality. This, in turn, provides cohesion to the text.

Although English science texts, on the other hand, do not tolerate this device, the need sometimes arises when a string of parallel clauses or sentences are relevant to elaborate a certain point. For example, ‘collapse’ in the following text may be caused by several factors. These are given in semi-parallel sentences.

(4.13) Collapse may be due to many causes: it may be practical, confined to certain building elements without affecting the entire structure; it may be due to local overloading or vibration; or it may be caused by very unusual circumstances...

(52, Appendix A)

The probable causes of ‘collapse’ are given in those sentences which are not completely parallel. However, such elaboration is not likely to occur in the other two types of discourse in the same manner. Here again the repeated use of cohesive element (eg. it) ensures the text connectivity. The semantic affinity of words such as ‘collapse, building, structure, overload’ contributes to the continuity of that text. The alternative relation between those sentences is also easy
to deduce by having them in such a sequence.

Some psycholinguistic implications of parallelism are given below.

4.4 Psycholinguistic Implications of Parallel Structure

The implications of parallel structure for the processing and comprehension of discourse have been alluded to in 4.0 above. As de Beaugrande (1980) argues, this device frees the reader's attention away from "parsing surface structures", and hence helps him concentrate more heavily on the 'conceptual-relational content' of the discourse. That is because placing parallel clauses or sentences in juxtaposition renders their conceptual relationships easy to infer, and hence explicit manifestations of those relationships is not necessary.

In the above cited Arabic examples, 'wa' is predominantly used to join parallel clauses and sentences. This conjunction has different meanings (see Quirk et al., 1973 for details on 'and'). The repeated use of 'wa' to express different conjunctive relations is in a way an appeal to the pragmatic relations underlying surface structures. In other words, inferring the appropriate relationship between parallel clauses or sentences is something the reader has to work out. To do so, the reader has to invoke his text and world knowledge. This is more obvious in English where explicit relations between parallel structures are not normally realized. But because parallelism is more typical of Arabic than of English, this device must have a significant effect on the processing and comprehension of Arabic discourse. This effect should be experimentally establishable.
Listing parallelism, which is very frequent in the Arabic texts, "indicates that the new item is textually and rhetorically the same as the preceding one" (Koch, 1981:177). Repetition of same items in parallel clauses or sentences must in some way facilitate text processing and comprehension, in that the memory search instigated by a non-new item or structure is bound to be very short. Antecedents for anaphors always lie in adjacent clauses or sentences which must facilitate and expedite processing and eventually comprehension.

Cumulative parallelism can equally affect the processing and comprehension of text. It has been argued above that this type of parallelism creates new language items and builds up a momentum of ideas, in which ideas follow one another in a flow. The semantic relationships between the new items created by cumulative parallelism may require a reader to resort to his pragmatic world knowledge. Thus, while listing parallelism seems to appeal to the reader's textual knowledge, cumulative parallelism seems to appeal to both his text and world knowledge.

The fact that the Arabic narratives make use of more parallelism than the other text-types therefore leads us to conclude that they are easier to process and comprehend.

This interpretation of the findings is testable and deserves empirical exploration. Chapter 6 concerns itself with just this task.
4.5 Summary

In this chapter, an attempt has been made to shed some light on the cohesive function of parallelism. It has been found that besides its persuasive, aesthetic and forceful functions (ie in political, rhetoric, religious rhetoric and poetry), parallelism can contribute to the semantic unity (ie. cohesion) of the text. Two types of parallelism have been discussed: ‘listing parallelism’ and ‘cumulative parallelism’. The first stipulates repetition of same words; the second creates new but semantically related language items. By repeating exact words, listing parallelism highlights the textual and rhetorical function of text. The textual aspect is represented by the semantic unity instilled into the text by repetition of cohesive lexical items. Such repetition suggests that the informational value of parallel clauses and sentences are the same, which contributes to the rhetorical effect of the text.

Cumulative parallelism also serves textual and rhetorical functions. The semantic relatedness of newly created items integrates semantic continuity into the text. The momentum of ideas effected by this type of parallelism has a forceful rhetorical impact on the reader.

The role parallelism can play in the processing of text has also been illuminated. Both types of parallelism affect the processing and comprehension of text. Listing parallelism keeps the semantic identity of antecedents, which are explicitly stated in the prior discourse, foregrounded. This facilitates their retrieval and eventually the processing of given information. Cumulative parallelism is suggested to appeal to the reader’s text and world knowledge. By repeating the same syntactic and semantic
configurations it serves the same processing functions as those of listing parallelism. But creating new items, when parallelism is broken, entails making recourse to one's world knowledge in order for given anaphors and previous antecedents can be connected.

Arabic and English texts display marked differences in the utilization of parallelism. Generally, whereas English seems to limit parallelism, especially in editorial and science texts, Arabic seems to opt for it as a preferred rhetorical device; in that in English two or almost three parallel units (i.e. clauses or sentences) occur, in Arabic more than six can take place.

Parallelism is most frequent in fiction and least frequent in editorial texts, though between clauses the difference between Arabic science texts and editorials is peripheral. This difference is more noticeable in English. Some pedagogic interpretation has been given above. In essence the explanation offered is that the intake of new information has to be appropriately paced for a learner of scientific concepts, otherwise the learner/reader will be overwhelmed. In editorials, the editor often adopts the role of "clarificator", who teaches the audience, hence he has to control information only one small step at a time.

Within the limited scope of this thesis, the other functions of parallelism (i.e. aesthetic and persuasive) cannot be explored. These may prove worth taking up further by future research within the domains of stylistics and/or literacy criticism. Widdowson (1975) suggests that stylistic serves an intermediate link between linguistics and literary criticism. Such a relationship, no doubt, has a great bearing on teaching literature because "the value of
stylistic analysis is that it can provide the means whereby the learner can relate a piece of literary writing with his own experience of language and so extend that experience" (Widdowson, 1975:116). After all, extending the learner's knowledge of language and his pragmatic experience must be at the core of all human sciences.
CHAPTER FIVE

Cohesive Role of Thematic Patterns

5.0 Introduction

This chapter focusses on the cohesive function of thematic patterns in the organisation of the three text-types examined in this corpus. Furthermore, it touches upon the kinds of knowledge involved in those patterns and their psycholinguistic implications for the processing and comprehension of discourse.

Therefore, the chapter is divided into three major sections. The first spells out the nature of thematic structuring; the second provides an account of the most recurrent thematic patterns in the text-types analysed here; the third throws some light on the psycholinguistic implications of those patterns for text processing and interpretation.

5.1 Nature of Thematic Structure

Thematic patterns are one aspect of the structure of discourse. Although H & H (1976) do not include them as a cohesive device, they recognise their role in the organisation of discourse. The remark that

"The organisation of each segment of a discourse in terms of its information structure, thematic patterns and the like is also part of its structure..., no less important than the continuity from one segment to another."

(H & H, 1976:299)

For some linguists, the continuity of discourse is held to stem from the distribution of information over its segments (van Dijk,
1977). That each sentence should indicate the relation between old and new information is crucial for "the continuity of discourse" (ibid:94).

Interest in the distribution of information structure over discourse segments has given rise to a number of dichotomies. The most well-known of these are: given/new; theme/rheme; topic/comment; subject/predicate. Apart from the diverse terminology, each part of those dichotomies has a counterpart in the other respectively. The dichotomies that are recurrently used in the present chapter are given/new and theme/rheme.

The notion of 'theme' has its roots in the 'Functional Sentence Perspective' (FSP) technique of the Prague School Linguists (Firbas, 1966, 1971; Danes, 1964, 1974 among others.) The FSP technique is essentially concerned with the distribution of a degree of communicative dynamism (CD) over the clause or sentence elements. Danes (1964) identifies 'CD' "in terms of the degree to which an expression advances, or fails to advance, the process of communication" (in Lyons, 1977:509). The theme carries the lowest degree of CD, whereas the rhyme has the highest degree of CD (Williams, 1983).

Theme is further associated with given information and rhyme with new information. Theme and rhyme are determined by the speaker. What the speaker treats as "recoverable either anaphorically, or situationally" is said to be given information, while what he "presents as not being recoverable from the preceding discourse" is labelled new information (Halliday, 1967:204). Chafe (1976:30) also refers the assignment of given and new information to

203
the speaker who decides whether or not the information is "in the consciousness of the addressee at the time of the utterance". Lyon's (1977:507) definition of theme and rheme is not different from Halliday's and the Prague School Linguists'. He considers theme "the expression used by the speaker for what he announces as the topic of his utterance: it is the thematic subject". Rheme, for him, refers to "the information which the speaker wishes to communicate". However, some linguists conceive of given information as what the listener can "identify uniquely", whereas new information is, on the other hand, "unidentifiable" (Clark and Clark, 1977:92).

'Newness' is, in fact, a relative phenomenon, and it must be related to the notion of 'Given' (van Dijk, 1977). He asserts that "newly introduced individuals are related to at least one of the individuals already present" (ibid:94).

The position of theme and rheme in a clause or sentence has resulted in some controversy. For some linguists, theme occurs initially and rheme finally in a clause or sentence (Halliday, 1979; Danes, 1974; Firbas, 1975). The theme of a clause or sentence, Firbas and Danes argue, is what has been mentioned before, or the backgrounded information; the rheme is what has been said about the theme, or the foregrounded information. Halliday (1969:180) suggests that theme is represented by "the subject of a declarative sentence, the WH-element of a WH-interrogative and the finite verb in a polar interrogative". Lyons (1977:507), however, has reservation as regards the correlation between "thematic status and initial position". Irrespective of their position in a clause or sentence, theme and rheme in the present study are viewed as introducing information which is either recoverable or unrecoverable from prior discourse.
respectively.

As for the role of theme in the organisation of discourse, Enkvist (1973:115) considers the study of theme as important as that of "ordinary syntax for describing patterns of sentence". He envisages the task of intersentence grammar and text linguistics as being of prime significance for "describing patterns of thematic cohesion in a string of sentences" (ibid:116). To this effect, Enkvist (1973:116) holds that a 'Theme Dynamics' is needed because

"theme dynamics charts the patterns by which themes and rhemes recur in a text and by which they run through a text, weaving their way from clause to clause and sentence to sentence".

Although Enkvist is sceptical about the correlation between theme and initial position, he maintains that this is often the case, but not always. Lewis (1982) also maintains that thematic or rhematic elements can occur initially in a clause or sentence. However, placing thematic elements in initial position "is often communicatively significant" (ibid:52). Lewis (1982:53) delineates Danes's (1974) thematic patterns (TP) as follows: T=Theme, R=Rheme.

(a) \[ T_1 \leftarrow R_1 \]
\[ T_2 \rightarrow R_2 \]
\[ (T_2 = R_1) \text{ eg. } "The giant frightened everybody" "They hid in the woods". \]

(b) \[ T_1 \leftarrow R_1 \]
\[ T_2 \rightarrow R_2 \]
\[ (T_1 = T_2) \text{ eg. } "The giant frightened everybody" "He ran after them". \]

205
Giora (1983) considers the simple linear thematic pattern in which the rheme of one sentence yields the theme of the next a cohesive principle. However, she has not investigated the different thematic patterns in different text-types. For Grimes (1975:113), cohesion is associated with the introduction of "new information and keeping track of old information, rather than with what the content of the new or old information actually is". Thus, information structure in terms of given/new contributes to the cohesion of discourse.

Finally, given information has been often associated with definite expressions, and new information with indefinite items (Brown and Yule, 1983:169). These linguists argue that definite and indefinite expressions can be realised by "lexical units" which are semantically related to already mentioned units, "anaphoric or exophoric pronominals" or by "pro-verbs". But although Chafe (1976) holds that associating given information with definiteness is quite plausible, he asserts that this is not always the case. In "I saw the milkman...", the term 'milkman' is introduced as new information, albeit definite. However, this correlation between given information and definite expressions and new information and indefinite ones may have some bearing on the processing and comprehension of discourse. This suggestion is elaborated on in Section 3 in this chapter.

Investigating thematic patterns is of particular
relevance to written Arabic discourse which, as Williams (1983:124) remarks

'tends to repeat the theme in successive clauses more frequently than English does, even when it is grammatically possible to omit it. And in written Arabic the theme of a clause tends to have some referent as the theme or rheme of the previous clause more frequently than English'.

However, the notion of theme/rheme in Arabic has not been thoroughly explored. It is, therefore, discussed in some detail below.

Notion of theme in Arabic

Williams (1983:121) found Balliday's (1979) definition of theme "inadequate for a treatment of Arabic". He offers two reasons for such inadequacy. One is the frequent sentence order VSO; the second is the "freer word order" in Arabic, as compared with English. He, therefore, opts for the Prague School Linguists' 'functional Sentence Perspective' (ESP), according to which theme and rheme are designated in view of their 'communicative dynamism' (CD).

Owing to the Verb-Subject-(Object) order of a verbal Arabic Sentence, and the several functionals (eg. inna, anna, la9alla, amma:, etc) that are usually placed at the beginning of a nominal sentence, due care must be taken when the theme of an Arabic sentence is assigned. As for the theme of a verbal sentence, Beeston (1970:63) argues, it is always the noun phrase that follows the verb. He calls it "the logical theme". By this token, in 'died the king', 'the king' is the logical theme.

In a nominal sentence, the theme, Beeston (1970) suggests,
always occurs initially. And the functionals 'inna, anā and la9alla' assign an object status to the theme which follows them. But the functional 'amma:' points out an emphatic contrast between the theme it precedes and another entity in the previous discourse. It is common to have 'fa' with 'amma:' to mark the beginning of the predicate. In this case, whatever comes before 'fa' is the theme, as in Beeston's (1970:66) example:


This is what happened in Egypt; in Syria (with raised tone), the conditions of the country were different from that.

According to Beeston's definition of theme, it is not clear whether only 'fi shsha:m' (in Syria) or the elements 'ha:da: (this... Syria)' is the theme of this sentence. On the other hand, when a phrase comes before the subject, as in 'fi lyawmi tta:li: ja:'a abu:hu' (on the following day, came his father), 'his father' is the unmarked theme, whereas the prepositional phrase is the theme proper.

Applying certain transformational rules to some Arabic sentences, Anshen and Schreiber (1968), Snow (1965) and Lewkowicz (1967, 1971) agree that the comment of what they call "a topic-comment sentence, when first generated, must contain an NP that in its original form is identical, except for case, with the topic" (Lewkowicz, 1971:813). For example, in the 'topic-comment sentence' 'alwaladu ja:a'a abu:hu' (the boy - his father came') is the comment which has the NP 'his father' which, in turn, contains the replacive pronoun 'his' that refers to the topic 'the boy'. But whereas Snow (1965) and Anshen and Schreiber (1968) consider a topic-comment
sentence as essentially a 're-ordered simple sentence', Lewkowicz (1971) views it as NP + S, as traditional Arab grammarians do. Lewkowicz (1971:810) also proposes "a severe restriction... on the structure of the sentences to be embedded as relative clauses".

However, almost all the linguists who tackled the notions of theme/rheme or topic/comment in Arabic agree on which element(s) in the sentence to be labelled theme/topic or rheme/comment. But Beeston's (1970) treatment of theme which avoids the intricate transformational rules, seems to fit in with the purpose of this study, and will, therefore, be opted for in the present analysis. However, in the case of 5.1 above (ie. This is what happened in Egypt...) the text will be viewed as consisting of two grammatically independent sentences, each has its own theme.

It should be noted that in the following discussion only the most recurrent thematic patterns in the three text-types are emphasised. The rationale for this choice is based on the role of those patterns in introducing the given information that has to be tied up with the prior discourse. By this token, thematic patterns contribute to the continuity of discourse. The role of rhematic patterns in ensuring this continuity cannot be ignored. If thematic patterns establish the surface connectivity (ie. cohesion) of discourse through recurrent semantically related items, rhematic patterns, may be assumed to establish the underlying semantic continuity (ie. coherence) of discourse via their relatedness to the overall topic. However, it is beyond the scope of this thesis, which is not primarily meant to investigate the information structure of discourse, to explore rhematic patterns. The kind(s) of knowledge involved in rhematic patterns is a considerable task that needs
further exploration.

5.2 **Thematic patterns in English and Arabic text-types**

The frequency of cohesive devices (including parallel structure) was shown in Chapters 3 and 4 to be greatly affected by text-type among other factors. Similarly, the frequency of thematic patterns is also expected to vary from one text-type to another. However, as certain text-types exhibit some similarities in the density of a certain type of cohesion (i.e., lexical cohesion in editorials and science texts), thematic patterns may be, in some ways, similar in certain text-types. These patterns can be affected by some factors such as the nature of worlds typical of a text (i.e., factual vs possible), the participant and event lines, and by some rhetorical and cultural factors typical of each language. In other words, thematic pattern is partly dependent on language choice and partly dependent on text-type.

The following discussion throws some light on the most recurrent thematic patterns in each text-type in both languages.

5.2.1 **Thematic patterns in English and Arabic narratives**

Thematic patterns have to be contextually illustrated. The following text is part of the first paragraph of Drabble's 'Jerusalem the Golden' (see N5, Appendix A).

(5.2) 'Gabriel had known for some time before kissing Clara that he was about to kiss somebody (1). He was on the whole an honourable man, and had not kissed anyone except his wife since his marriage, save in the way of courtesy, so the act was for him a significant one (2). He was slightly uneasy about the lack of choice and the sense of desperation which had finally pushed him to
it, but did not feel they reflected ill upon Clara (3); he truly admired her, and the eagerness with which she had returned his onslaught had turned, through relief, his admiration into a kind of love (4).

In this text, the themes of the three sentences following the first one repeat the same theme (i.e. he) which refers to the theme of the topic sentence. This thematic progression which recurs through the whole paragraph represents pattern ‘b’ in which a passage has "run-through themes" with different rhemes. Thematic pattern ‘b’ seems to be the most frequent in fictional narratives. This pattern contributes to the continuity of the participant line, which is held to hold the narrative together (Gutwinski, 1976; Cheong, 1978). That is why it is favoured as the pattern which weaves across the sentences of a narrative.

However, other patterns, especially ‘a’, occur between sentences in a narrative, though much less frequently. This is an example.

(5.3) Tom Brangwen never loved his own son as he loved his step-child Anna (1). When they told him it was a boy, he had a thrill of pleasure (2). He liked the confirmation of fatherhood (3). It gave him satisfaction to know he had a son (4). But he felt not very much outgoing to the baby itself 95). He was its father, that was enough (6).

(N8, Appendix A)

The theme in sentence 4 (i.e. It) refers to the rheme of the preceding sentence (i.e. confirmation of fatherhood). This thematic pattern represents pattern ‘a’ in Danes’s (1974) classification. Another thematic pattern occurs in sentence 2. ‘They’, the theme of the subordinate clause does not repeat any previous theme or rheme.
Rather, it is semantically related to the topic of the paragraph. Drawing on his world knowledge of a 'birth' situation, the reader can assign the anaphor 'they' to the people who told 'Tom Brangwen' about the 'baby-boy'. Thus, thematic patterns can involve two kinds of knowledge: textual knowledge and world knowledge. The first entails connecting incoming with ongoing information within a text; the second stipulates making inferences that are necessary for a thorough understanding of the discourse. The thematic pattern in sentence 2 is in line with pattern 'c' in Danes's (1974) taxonomy. However, this pattern is, like pattern 'a', much less frequent than pattern 'b' which can still be seen in this example (i.e. sentences 3, 5 and 6).

Intra-sentential thematic patterns display similar consistency, in that either the same theme recurs in adjacent clauses, which is normally the case, or the theme of one clause derives from the rheme of the preceding one. For example, in the above text, the theme of the subordinate clause (i.e. he) in the first sentence refers to 'Gabriel', the theme of the main clause. The second sentence consists of three clauses. The themes in the main clause and the second coordinate clause are the same (i.e. he). In the third subordinate clause, the theme (i.e. the act) refers to the rheme of its preceding clause (i.e. kissing). This thematic pattern recurs in sentence 3. Thus, thematic patterns across clauses demonstrate almost the same consistency and regularity as those occurring between sentences, in that patterns 'b' and 'a' are predominantly used. The first is, however, more frequent. Intra-sentential thematic movement, thus, highlights the continuity of the participant line of a narrative. This is established by keeping the theme foregrounded in
discourse and hence tying incoming with ongoing knowledge becomes easier. The slight difference between thematic patterns within and between sentences seems to largely lie in the kinds of knowledge involved. Whereas inter-sentential thematic patterns appeal to both types of knowledge (i.e. textual knowledge and world knowledge), those occurring across clauses seem to lend themselves to textual knowledge more heavily.

The Arabic narratives also seem to favour pattern "b" which is characteristic of almost all varieties of Arabic written discourse. Therefore, recurrence of same themes in successive sentences is quite noticeable. This is an example.


(N2, Appendix B)

They crossed Al-Haram Road (1). Then they turned to Saqara Road (2). And there, the car sped up in a dark road (3). And the boundaries of the road became clear under the car light (4). It was stretching endlessly, surrounded from both sides by jarozina trees/whose branches met (5). And it was enveloped from both sides by a rural space (6). It was covered with silence, and it was crossed by a dark canal (7). Its surface appeared to be dark grey, distinct from its surrounding under the faint light of the stars (8).

Thematic pattern "b" recurs in sentences 1 and 2. It also
takes place in 4, 5, 6, and 7. The theme in sentence 3 (ie. the car) repeats another theme in the same paragraph. Whereas the theme in 8 refers to the rhyme of the preceding sentence, thus, thematic pattern ‘b’ is the most dominant and ‘a’ is very much less frequent in those narratives.

However, the Arabic narratives, like their English counterparts, can repeat themes which have to be retrieved from the situation, as in the following example.

(5.5) \( \text{nahaDa ba\textit{kiran} jiddan dalika SSaba\textit{H}} \) (1). ka\textit{na} lxa\textit{dimu qad rafa\textit{a} ssari\textit{ra} ila; saTHi lfun\textit{duq}...(2).

(N3, Appendix B)

He woke up very early that morning (1). The servant had put the bed on the roof of the hotel (2).

The theme in the second sentence has no previous mention. It can, however, be retrieved from the situation. In a 'hotel' situation, a servant is likely to exist.

Thus, thematic patterns across sentences are very similar in the Arabic and the English narratives. These patterns also involve both textual knowledge and world knowledge as those occurring in English.

Across clauses, thematic patterns in the Arabic narratives show a great deal of consistency as those taking place across sentences. A look at sentence 5 above shows that the theme of the relative clause (ie. whose branches...) refers to the previous rhyme (ie. trees). In sentence 6, the same theme (ie. it) recurs in both coordinate clauses. Thus, theme movement at the intra-sentential level mostly represents pattern 'b' and less frequently 'a'. Intra-sentential thematic patterns in the Arabic narratives, like those in
their English counterparts, seem to largely involve textual knowledge.

Thus, text-type plays a prominent role in determining the type of thematic patterns in discourse. Both the English and the Arabic narratives favour almost the same types of thematic patterns (i.e. mostly 'b' and less frequently 'a') within, and between sentences. These patterns seem to highlight both the participant and the event lines and the cohesion of those narratives. This is established by recurrence of same themes or ones related to preceding rhemes, the thing that enhances the number of cohesive devices. For example, in the above-cited texts either pronominal co-reference items or definite noun phrases are repeated. These co-refer with already stated elements. In this way thematic patterns do contribute to the cohesion of text.

5.2.2 Thematic patterns in English and Arabic editorials

The diversity of the factual worlds of editorials and the short range of their participant line, compared with that in narratives, may give rise to some inconsistency in intra- and intersentential theme progression. A variety of thematic patterns is expected to exist in the English editorials examined here. The Arabic editorials, like other varieties of Arabic written discourse, would favour repetition of same themes or previous rhemes. Consequently, while the English editorials and narratives may favour different thematic patterns, their Arabic counterparts may display great similarity in this concern.

In the English editorials, thematic pattern 'c' in which "progression of derived themes (there is one hyperthema and several Teilthemen)" (Danes, 1970:77) may be predominantly recurrent.
The following paragraph illustrates theme movement in one of the English editorials.

(5.6) This week's film from Ethiopia is just the beginning (1). Most of Africa is heading into what the World Bank calls a 'nightmare' of famine and economic collapse (2). This year's drought, the worst for 15 years, has yet to take its toll, and next year's harvest is expected to be even worse (3). Even this disaster is no more than a small downward turn in a steady decreasing trend (4). One-fifth less food is produced for every African now than in 1960, and if the trend continues the crop in 1988 will be no better than this year's terrible harvest, even if the weather is good (5).

(NB8, Appendix A)

The themes in the sentences of this text are derived from the 'hypertheme' (ie. 'Famine in Ethiopia') of the editorial. They are semantically related to it. None of them repeats a previous theme or rhyme. Frequent repetition of same themes which is accepted in a narrative would be frowned upon in an editorial. The above text does not have a participant line which calls for such repetition. Rather, it deals with factual worlds which entail elaborating on diverse aspects of a major hypertheme. Thus, theme movement across sentences in the text largely corresponds with Danes's (1974) pattern 'c'.

However, other thematic patterns are plausible in an editorial. Editorials, it was suggested in Chapter 3, can have a participant line whose range is not as long as that in narratives. When this participant line maintains, pattern 'b', which is the most frequent in narratives, recurs in editorials. For example, in the second paragraph of NB4, Appendix A 'two men' (ie. M Georges-Andre Cheballaz and Herr Willi Ritschard) are referred to. Accordingly, the themes in successive sentences in that paragraph run as follows: 'The
two men', 'Herr Ritschard', 'Losing them', 'Both men', 'Herr Ritschard' and 'he' respectively. This theme progression typifies pattern 'b' which is brought about by the participant line running through the paragraph. However, it does not continue as long as it does in narratives.

Thematic pattern 'a' in which the theme in one sentence refers to the theme of a previous one occurs less frequently in the English editorials. This is an example.

(5.7) The UN has improved conditions for ending or containing violent quarrels between its members. They may....

(NE2, Appendix A)

A theme of a sentence has sometimes to be retrieved from the situation, because it has no previous mention in the editorial. This is an example.

(5.8) In normal times the latest unemployment figures would have cast gloom over the Tory Conference this week. As these are hardly normal times,..........

(NE9, Appendix A)

Reference in the second sentence is made to 'these times', a theme that has to be decoded by making recourse to the situation.

Theme movement in editorials, therefore, involves world knowledge more than text knowledge. A reader has to invoke his prior knowledge of the world so that diverse entities can make up one hyper topic, if so to speak. The diversity of the factual worlds of editorials, as opposed to the possible worlds of narratives, accounts for the diverse thematic patterns across the sentences of an editorial.
Thematic patterns within sentences are, on the other hand, more consistent, in that themes in dependent clauses mostly repeat previous themes or rhemes. The following example is an instance of this regularity.

(5.9) Since the Soviet proposals do contain constructive elements, there is no absolute reason why they should not be the basis of negotiation.

(NE5, Appendix A)

The underlined theme in the third clause refers to that in the first (i.e. Soviet proposals). In the following example, the theme in one clause refers to the rhyme of an adjacent clause.

(5.10) The region's chairman, Dame Betty Patterson, wrote to authority members asking how they would vote and telling them that if they didn't support the cuts, she would sack them.

(NE10, Appendix A)

The underlined themes in the second and the third clauses refer to the preceding rhemes. 'She', the theme of the fourth clause, refers to the theme of the first clause (i.e. region's chairman). Thus, thematic patterns across clauses in the English editorials very often represent 'b' and 'a'. This results in more consistency in intra-sentential theme progression than that between sentences.

However, quite less frequently, the theme of one clause does not refer to a previous theme or rhyme but is rather related to the hypertheme of the editorial. This is shown in the example.

(5.11) The breakup is expected to mean that local rates will go up, long distance rates will continue to fall, customers may receive multiple bills and the telephone equipment market will become competitive.
(NE7, Appendix A)

All the underlined themes are semantically related to the hypertheme of the editorial (i.e., The breakup of the American Telephone and Telegraph Co.).

Thus, while intra-sentential thematic patterns largely involve textual knowledge, they sometimes involve world knowledge.

In the Arabic editorials, on the other hand, intra- and inter-sentential theme progression represents patterns ‘b’ and ‘a’. This reflects a tendency typical of Arabic written discourse to repeat the same themes in successive sentences or themes referring to or derived from previous rhemes. This largely rests upon the editor’s interest in emphasising the main point(s) of his editorial and eventually persuading his readers. This is an example.


(NE10, Appendix B)

The Saudi King addressed the core of the truth/when he had drawn the attention to the danger of blind fanaticism (1). Blind fanaticism caused the war between the two parts of Pakistan/and brought about dividing it into two sectors (2). And blind fanaticism caused the killing of tens of thousands of the Moslem brothers in the war/which had been waged between Iran and Iraq for 34 months (3). And blind fanaticism is, in fact, the evil/that complicates every simple misunderstanding/until it becomes an unresolved problem (4).
Sentences 2, 3 and 4 in this text repeat the same theme (i.e. blind fanaticism). This theme progression represents pattern 'b'. Pattern 'a' is exemplified in sentence 2 whose theme repeats the rheme of the preceding sentence. Thus, thematic pattern 'b' is predominant between sentences in the Arabic editorials. Pattern 'a' is, on the other hand, less frequent.

Inter-sentential thematic patterns in the Arabic editorials mostly involve textual knowledge, since they favour repetition of previously stated themes.

Across clauses, thematic movement is very similar to that between sentences. The above example shows that the themes in successive clauses are either the same (eg. sentences 1, 2 and 3) or the theme of one clause refers to the rheme of a previous one (eg. sentence 4). Thus, intra- and inter-sentential thematic patterns are alike. Intra-sentential theme movement also involves textual rather than world knowledge.

Thematic patterns in the Arabic editorials, like those in the Arabic narratives, are greatly affected by the tendency of Arabic written discourse to use lexical repetition and parallel structure. A string of sentences or clauses with the same themes are joined by 'wa' or 'fa' as the above example clearly shows.

As for the contribution of thematic patterns to the cohesion of those editorials, this is more evident in the Arabic ones. Repetition of same themes enhances the number of cohesive items. In the English editorials, on the other hand, employing semantically related themes seems to highlight the coherence of the text more than its cohesion.
5.2.3 Thematic patterns in English and Arabic science texts

The possible worlds of science, like those of narratives, may produce consistency in thematic patterns within and between the sentences of the science texts examined here. The need for much definition, restatement and exemplification may entail repetition of same themes or ones referring to previous rhemes. This is an example from an English science text.

(5.13) Patterns are made slightly larger than the required casting, to allow for the contraction of the molten metal/that takes place on cooling. Patterns are also invariably made in more than one piece, to facilitate the removal of the pattern from the mould and help minimise any damage to the mould/that may be caused during this skilled operation.

(S1, Appendix A)

The same theme (i.e. patterns) is repeated in the two sentences which make up the paragraph. Thematic pattern 'b' which is represented in this text is the most frequent in the English science texts studied here. However, other patterns are also likely in science, though less frequently than 'b'. Successive sentences can have themes which address different aspects of some concept. For example, in the third paragraph of S3, Appendix A, sentences 1, 2 and 3 have the following themes: 'The total defect concentration', 'The number of defects per unit volume of a solid' and 'The nature and concentration of defects' respectively. The three themes, then, tackle various aspects of 'defects' which is the hypertheme of the paragraph. This theme progression is very much similar to Danes's (1970) pattern 'c'.

Thematic pattern 'a' also occurs in those texts. This is an example.
(5.14) Instead of laying down hard and fast values, the latest limit state codes are based on statistics, for example, the frequencies of certain windloads or variations in tests. These are called characteristic loads, and are augmented by factors allowing for possible deviations from such values.

(S2, Appendix A)

'These', the theme of the second sentence, refers to 'windloads' in the rhyme of the previous one. This is thematic pattern 'a'. Sometimes, the 'theme' has no previous mention in the preceding text. Rather, it is based on the information encoded in the previous sentence. For example, the theme of the third sentence of the above text reads as follows: 'This leads....'. 'This', here does not repeat a particular entity, but it summarises the adjacent sentence immediately preceding it. It is also feasible to have a theme that repeats the hypertheme of the science text. Sentence 4 of the above text, for instance, has 'So the limit state design...' as a theme. This is, in fact, the hypertheme of that text.

Thus, inter-sentential theme movement commonly corresponds to thematic patterns 'b' and 'a' and less frequently 'c'. These patterns mostly involve textual knowledge. After all science deals with postulated worlds that are not retained in the schemata of ordinary readers. Therefore, reader's world knowledge is not always involved in those thematic patterns.

Intra-sentential thematic patterns are also very similar to those occurring across sentences. In example 5.13, the themes in the two relative clauses in both sentences refer to the rhemes of their adjacent clauses. Thus, thematic pattern 'a' is exemplified here. In 5.14, the theme of the coordinate clause repeats that in the first
clause (ie. these). Here, thematic pattern 'b' is represented. Thematic patterns 'b' and 'a' are predominant between clauses in the English science texts. Like inter-sentential thematic patterns, these involve textual rather than world knowledge.

The Arabic science texts are very similar to the other varieties of Arabic written discourse in terms of theme progression. Intra- and inter-sentential theme movement represents patterns 'b', which is most dominant, and 'a', the next most frequent pattern. Here is an example.


(S2, Appendix B)

Puberty in girls takes place with the beginning of menstruation and the constitution of the qualities of sex (1). It usually begins in Egyptian girls at the age of 12 up to 14 (2). And it may appear at 11 and it rarely occurs before that (3). And as we move north/puberty comes late/for it happens at the age of 22 in the North Pole (4).

The four sentences have 'puberty' as their theme. Recurrence of the same theme in successive sentences is typical of the present science texts, as it is of almost all types of Arabic written discourse. Therefore, thematic pattern 'b' is the most frequent in those texts.

Other thematic patterns such as 'a' and the one in which 'teilthemes' are related to a 'hypertheme' occur in those texts, albeit infrequently. Thus, inter-sentential theme movement embodies
textual knowledge rather than world knowledge.

Thematic progression across clauses in the Arabic science texts is quite similar to that taking place between sentences. In the above example, the theme of the coordinate clause in sentence 3 repeats that of the first clause, and so is the case in Sentence 4. Therefore, thematic pattern 'b' is also most frequent across clauses in those texts. Pattern 'a' may occur but much less frequently. Intra-sentential theme movement, thus, invokes text rather than world knowledge.

The contribution of thematic patterns to the cohesion of the English and the Arabic science texts is considerable. Recurrence of same themes or ones related to previous rhemes enhances the number of cohesive items within and between sentences.

5.3 Psycholinguistic implications of thematic patterns

This final section attempts to pinpoint, albeit briefly, the psychological implications of thematic patterns for processing and comprehension of the present text-types.

Themes in those texts are expressed either by definite/indefinite expressions (i.e. mostly in editorials and science) or by pronominal co-reference elements (i.e. mostly in narratives). It was stated in 5.0 that a theme mostly introduces old (given) information which needs to be connected with an antecedent in the prior discourse. Locating the appropriate antecedent calls for a memory search. This can usually be short or long. The nearer the antecedent from an anaphor (which is represented by a theme), the easier and faster the memory search is. In addition, explicitly stated antecedents facilitates and expedites that search.
In the English and the Arabic narratives pronominal coreference, especially third person pronouns, are most frequently used as thematic elements. Very often, proper names are utilized to refer to the same persons. Locating an antecedent for a pronominal anaphor is both easy and fast to carry out, for an antecedent should reside in the textual environment. The absence of an immediate context of situation in written discourse in general, makes it mandatory that a third person pronoun refer to an explicit antecedent that can be retrieved from the text. Thus, the memory search instigated by an anaphor acting as a theme may be short and easy to tackle. Recurrence of third person pronouns or proper names keeps the identity of antecedents foregrounded, which is expected to facilitate processing and comprehension.

In editorials, noun phrases are mostly used as themes. Repetition of same and definite noun phrases in the Arabic editorials may render them relatively easy to process and interpret. Themes in their English counterparts are semantically related rather than repeating each other. In order for a reader to process and understand an English editorial, he should activate his prior world knowledge so that anaphors are assigned appropriate antecedents. Thus, the memory search for antecedents may be longer and more demanding in the English editorials than in the Arabic ones.

Processing and comprehension of the science texts analysed here may not be significantly different in both languages. Themes in the two languages are mostly introduced by definite noun phrases in Arabic and definite/indefinite ones in English. Repetition of same themes may facilitate processing and comprehending the text.
Furthermore, such lexical repetition can alleviate the opacity of science texts resulting from their complex lexicon. Hence, recurrence of same themes can, to some extent, make the memory search for antecedents easy and fast.

Recurrence of pronominal co-reference items and lexical elements are among the devices that contribute to the economy and stability of discourse. The principles of economy and stability, de Beaugrande (1980) suggests, play an important role in text processing and eventually understanding.

However, the above assumptions are intuitively oriented. Their verification, which is worth meticulous investigation, requires much empirical experimentation.

\[\text{5.4: Summary}\]

This chapter has investigated the most frequent thematic patterns in the three text-types in this corpus. The role these patterns can play in the cohesion and processing and comprehension of those texts has been briefly touched upon. Besides, the kind(s) of knowledge involved in them has been outlined, though in passing.

In terms of thematic progression, the narratives and the science texts in both languages were found to favour patterns ‘b’ and ‘a’ respectively. Cross language difference lies in the thematic patterns typical of editorials. For whereas the Arabic editorials favour patterns ‘b’ and ‘a’, their English counterparts display a variety of thematic patterns, especially pattern ‘c’.

Thematic patterns can be claimed, as stated earlier, to be partly dependent on language choice, and partly on text-type.

Interestingly enough, intra sentential thematic movement in
each text-type seems to largely conform to that occurring across sentences in the respective text-type. This holds true for narrative and science texts in both languages. However, intrasentential theme progression is more consistent than that between sentences in English editorials. This consistency in the flow of information from clause to clause and sentence to sentence contributes to the continuity of discourse (Labov, 1972).

The main concern here has centred on theme progression. This has been motivated by the assumption that connecting the given information introduced by thematic elements with prior information in a discourse immensely contributes to its continuity. The role of rhematic patterns in this concern should not be overlooked. However, it is beyond the scope of this thesis to investigate it.
Chapter Six

Experimental Study of Role of Cohesion in Text Comprehension

6.0 Introduction

This chapter presents the results of two studies of the effect of a particular type of cohesion on reading comprehension, namely, lexical repetition, which as we have seen is a striking feature of Arabic. In general terms, Arabic allows lexical repetition to a greater extent than English, as is clear from an analysis in three text types, presented in Chapter 3. In addition, the study of textual parallelism presented in Chapter 4 suggests that extensive structural parallelism (which contains an element of repetition) is also more characteristic of Arabic than English.

The impact of repetition on text comprehension is something which lends itself well to preliminary experimental studies of the role of cohesion in Arabic. The selection of this feature of Arabic textuality for examination in an experimental setting is thus justified by the results of general patterns of cohesion presented in earlier chapters.

The two experiments outlined in this chapter are intended to contribute to the debate on the issue of exactly what difference cohesive patterning makes to text comprehension. The results of the experiments are interpreted in the light of the review of the role of cohesion in text which is presented in Chapter One.

Clearly, a comprehensive experimental study of cohesive phenomena in text processing would select a battery of devices within Arabic; within English; within English texts read by Arabic speakers; and within Arabic texts read by English speakers. The two studies
reported are to be seen as an exercise in experimental work on cohesion, and more specifically, are intended to show that in the context of English language learning by Arabic speakers a) the absence of Arabic-like patterns of cohesion significantly affects comprehension level, and b) that while the type and frequency of cohesive patterning is an important factor, there is also a separate effect deriving from text-type, and by implication information density.

6.1 Overview of experimental work on cohesion

We have seen in Chapter One, Section 1.2.3 that the experimental work on cohesion has emphasised certain aspects of the function of this textual phenomenon in the processing and comprehension of text. For example cohesion has been shown to be a useful index of social and cognitive factors. The type of reader (e.g. normal vs disabled; young vs adult; normal vs well-educated) affects the type of cohesive devices used in a communicative or reading setting. Cohesion has also been found to be indicative of the writer's mental processes (e.g. focusing, comparison and classification). In reading, cohesive devices serve as clues which point to the location of necessary information. Thus, coherent texts are held to be less susceptible to forgetfulness than incoherent ones.

However, this is not the end of the story. Many issues are left unresolved. These are outlined in Chapter One, Section 1.2.4. But an important issue needs to be mentioned here. One is to what extent does the characteristic cohesive property of a certain language affect the comprehension of different foreign text types? For it has been assumed that ESL learners need to know about the resources of
cohesion in English (Menke, 1981).

To this end, two experiments are outlined here. They both aim at investigating the impact of lexical repetition, a major cohesive property of Arabic discourse, on the comprehension of English texts by Arabic-speaking students. The role of this cohesive device (i.e. lexical repetition) is examined in three text types.

The motivation underlying this experimental work is twofold. One is the consensus among the linguists who have approached Arabic discourse that this language derives much cohesion from lexical repetition (Koch, 1981, 1983; Williams, 1982, 1983). The other rests upon Berman's (1984:142) implication for FL readers who need maximal transparency in marking the relations between one part of the text and another. Trying to explore the impact of syntax on FL readers, she suggests that certain cohesive devices, namely ellipsis and substitution, may affect the transparency of a text. This transparency may be seriously impaired in the case of learners whose language "not only tolerates but approves of lexical and grammatical repetition as a preferred rhetorical device" (ibid:142).

These experiments were conducted on Arabic-speaking learners of English, the first involving postgraduates within the context of a British university, the second involving undergraduates in the context of Kuwait University. It seemed essential to test the effect of the selected cohesive device (lexical repetition) on a population whose native language was already investigated for cohesive patterning. The choice of population, then, is linked with the focus of Chapter 3 which compares cohesive patterning in English and Arabic. It is emphasised that the scope of the experimental work undertaken,
and described here, is limited. Comprehensive experimental work of the full repertoire of cohesive devices native to Arabic and imported in the foreign language learning tests being left to future investigators.

It should be noted that experimenting on Arabic-speaking student is a deliberate decision. For I had been teaching at Kuwait University when this study was conducted. It could equally be conducted on native learners. Below is an account of the two experiments.

6.2 Experimental studies of cohesion

Two studies of reading comprehension were carried out, one on adult native speakers of Arabic carrying out postgraduate research at a British university, and one on undergraduate students of English at Kuwait University. The first population was used to focus on the question: Do ellipsis and substitution contribute to comprehension difficulty, and can full forms and repetitions render a text more comprehensible? The second population was used to answer the question: is the cohesion effect identical in different text types?

6.3 Experiment 1: Hypothesis

That increased lexical repetition would render a text easier to understand.

6.3.1 Choice of text

An expository English text which has a scientific flavour was selected. Instances of ellipsis and substitution were increased in one version which was the control group text. In the experimental group almost all instances of some of the cohesive devices (e.g.
pronominals, substitution and ellipsis) were replaced by lexical items, especially same items. This produced an Arabic-like text. Here is an example from the two versions of the same texts.

Control Text

The idea of a fish being able to generate electricity strong enough to light bulbs - or even run a small electric motor - is almost unbelievable. Several kinds are able to do so.

Experimental Text

The idea of a fish being able to generate electricity strong enough to light bulbs - or even run a small electric motor - is almost unbelievable. Several kinds of fish are able to generate this amount of electricity to light bulbs or run a small electric motor.

A set of 15 multiple-choice questions was devised to test comprehensibility of the micro-structures of the text. The questions for both groups (i.e. control and experimental) were the same (see Appendix C).

6.3.2 Subjects

Ten Arabic-speaking postgraduate students from 3 Arabic speaking countries (Palestine, Syria and Iraq) underwent the experiment. These had already had between seven and eight years of compulsory English at school in their country of origin before joining Aston University. Some of the subjects were PhD students; having spent between two and five years of postgraduate academic study at Aston University. The ten students were researching in two different areas, engineering and chemistry.

6.3.3 Procedure

The subjects were randomly divided into two groups: a control group and an experimental group. 30 minutes were allocated to
both groups to complete the text. Every subject was asked to read the text thoroughly and then circle the option which best answered the question or completed the sentence. The subjects were told that the purpose of the exercise was an experiment in reading. The total mark was out of 20.(1)

The results yielded by this experiment are spelled out below.

6.3.4 Results

The scores of the five subjects of each group are presented in the following table. They are arranged from highest to lowest, and are ordered in accordance with the students' level. That is the subjects who, for example, scored 16 in the control group and 20 in the experimental group were tentatively of equivalent level in terms of level and type of course they were doing (e.g. both were PhD students in electrical engineering) and the period they spent in Britain.

<table>
<thead>
<tr>
<th>control group</th>
<th>experimental group</th>
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<tbody>
<tr>
<td>16</td>
<td>20</td>
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<td>15</td>
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<td>6</td>
<td>18</td>
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<td>2</td>
<td>17</td>
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Table 9: Scores of both groups of experiment 1.

Questions 4, 6, 7, 8 and 13 were given two marks each (see Appendix c.).
6.3.5 Discussion

The scores shown in Table 9 points to a significant difference in the performance of the experimental group. The experimental group students comprehended the 'doctored' text (i.e. containing lexical repetition in place of ellipsis) significantly better than did the control group. This result offers an answer to the above question: ellipsis and substitution do contribute to comprehension difficulty. This difficulty can be said to have been counteracted by full forms and repetitions which are major characteristic cohesive properties of the subjects' mother tongue (i.e. Arabic). The present finding confirms the previous assumption by Menke (1981) that ESL learners can perform better if given orientation in the cohesive resources of English.

If it is the case that lexical repetition enables reader to more easily retrieve information from prior text, then this would suggest that anaphors identified in the text are easier to connect with ongoing information. It is probably the case, then, that given information which is introduced by a full form is easier and faster to process; and conversely, processing ellipsis and substitution is more demanding. This is exactly what would be expected, if as was argued in Chapter One, Section 1.2.3, the performance of parallel operations creates heavier processing load.

The present finding also confirms Berman's (1984) suggestion: that for Arabic learners, lexical repetition, which is not only tolerated by their mother tongue but is also a preferred rhetorical device, eliminates the opacity of text resulting from instances of ellipsis and substitution. In other words, lexical repetition makes the text more transparent, and hence easier to
comprehend.

This finding also accords with Tennant's (1981) conclusion that noun phrases would be easier to process than nominal ellipsis and substitution. Presumably, the memory search for connecting incoming with ongoing information is made easier when noun phrases which repeat explicit antecedents are used to introduce given information than when ellipsis and substitution are used for the same purpose.

6.4 Experiment 2: Hypothesis: that the facilitatory effect of lexical repetition is operative in contrasting text-types.

6.4.1 Choice of texts

Three English texts, namely a fictional narrative text, an expository science text and an expository culturally-oriented text were selected for this experiment. This selection was twofold. One, it aimed to examine the possibility that narrative texts are easier to comprehend than expository texts. The second reason was to select three text types which differed in terms of content. Two are expository: the culturally-oriented text on 'falconry' and the science text on 'electric fish'. However, each text addresses different content. The fictional narrative text describes a series of actions and their underlying motivation: 'Annette attempts to swing on the chandelier in the dining-room'. The scientific text on the ability of three kinds of fish (i.e. electric rays, electric eel and electric catfish) to generate electricity is a straightforward piece of expository scientific prose. The culturally-oriented text addresses 'falconry' which is a famous hunting pastime in Arabia. The literary fictional narrative operates in the realm of imagined actions, and their purposes. Thus, the content of the three texts selected for the
experiment is clearly different from one text to another.

Two versions of each text were produced. The control group version contained a number of instances of pronominal co-reference, substitution and ellipsis. In the experimental group text, on the other hand, these instances were replaced by lexical items. The following samples illustrate how the two versions of the fictional narrative text and the culturally-oriented text differ. It should be noted that the scientific text which was used for experiment 1 is the one used here.

a) Fictional Narrative Text

Control Text

There were two things which Annette had wanted very much to do since she arrived. One was to carve her name on a wooden bust by Grinling Gibbons.

Experimental Text

There were two things which Annette had wanted very much to do since she arrived. One of these things was to carve her name on a wooden bust by Grinling Gibbons.

b) Culturally-Oriented Text

Control Text

If it is on the ground, they dive at it.

Experimental Text

If the prey is on the ground, the falcon and the hawk dive at it.

(See Appendix C)

A set of 15 multiple-choice questions which aimed at testing the subjects' comprehension of the micro or specific details of text was devised for each text-type. The questions for both groups were the same (see Appendix C for texts and questions).
6.4.2 Subjects.

Ninety first year undergraduate students were tested, thirty on each text type. All subjects were first year undergraduate students of English language and literature at Kuwait University.

The reason why this particular sample was selected was that first year students represent a link between two distinct educational stages, high (ie. secondary) school and university, and would be less "contaminated" (in cultural terms) by exposure to Western education. In Kuwait, where the experiment was executed, students study English for eight years at school. First year students of English at Kuwait University have to pass satisfactorily three remedial courses in speech, reading and writing before they are permitted to specialise in English or transfer to other departments.

The population for this experiment represents 3 different nationalities all of whom had been educated for 8 years in the Kuwaiti school system, Palestinians, Egyptians and Kuwaitis. They all speak Arabic as a first language, and English to them is a foreign tongue.

When the experiment was carried out, the subjects had just started their remedial courses.

6.4.3 Procedure

As in the first experiment, the subjects were randomly divided into two groups: a control group and an experimental group. Each group consisted of 15 students for each text. The subjects were told that the tests were connected with research on reading which would contribute to the improvement of both the reading syllabus and their performance. Therefore, they were asked not to write their names, and hence the scores would not affect them. They were asked to
read the text thoroughly and circle the option (a, b, c or d) which best answered the question.

The time allocated to complete the test was 30 minutes for all subjects. The total score was out of 15, the total number of questions (see Appendix C).

6.4.4 Results

The following table summarises the scores of the students on the three text-types, giving the frequency of each score in terms of number of students obtaining it. In the following table CG stands for Control Group; EG for Experimental Group; SC for Scores and ST for Number of Students.

<table>
<thead>
<tr>
<th>Narrative Text</th>
<th>Science Text</th>
<th>Culturally Oriented Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>CG</td>
<td>EG</td>
<td>CG</td>
</tr>
<tr>
<td>SC</td>
<td>ST</td>
<td>SC</td>
</tr>
<tr>
<td>11</td>
<td>3</td>
<td>15</td>
</tr>
<tr>
<td>10</td>
<td>2</td>
<td>14</td>
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<tr>
<td>8</td>
<td>4</td>
<td>13</td>
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<td>7</td>
<td>1</td>
<td>12</td>
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<td>6</td>
<td>3</td>
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<tr>
<td>5</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

Table 12: Student's Scores in the Reading Experiment\(^{(1)}\) in Control Group (CG) and Experimental Group (EG).

\(^{(1)}\) The number indicated next to each grade represents the number of students who scored that grade. The first number 11-3, for example, means 3 students scored 11. In each case, the number of students is 15.
The mean and standard deviation and the t value were computed on the basis of the above scores. The result is shown below.

<table>
<thead>
<tr>
<th>Narrative Texts</th>
<th>Science Texts</th>
<th>Culturally Oriented Texts</th>
</tr>
</thead>
<tbody>
<tr>
<td>CG</td>
<td>EG</td>
<td>CG</td>
</tr>
<tr>
<td>Mean</td>
<td>7.867</td>
<td>13.533</td>
</tr>
<tr>
<td>Sd</td>
<td>2.416</td>
<td>1.125</td>
</tr>
<tr>
<td>t v</td>
<td>8.235</td>
<td>8.035</td>
</tr>
</tbody>
</table>

**Table 13**: Mean Scores, Standard deviation and t value of the students' scores in Control Group (CG) and Experimental Group (EC).

6.4.5 Discussion

The results of experiment 2 confirm those of experiment 1. The experimental group performed significantly better than the control group (significance level $p > 0.1$), which shows that eliminating ellipsis and substitution in favour of full forms and repetition does indeed have a facilitatory effect on comprehension. This effect is observed in all text types, and hence the hypothesis is confirmed.

Although the experiment did not set out to examine the relative difficulty of the 3 text types, it can be seen that the highest scores are associated with narrative texts. This confirms work by Britton and Graesser (1983) showing that narrative passages are easier to process and understand than expository texts. They
suggest that readers are more familiar with narrative texts than expository texts (by virtue of amount of exposure from an early age); and degree of familiarity with "story-line descriptions" would go some way towards explaining the highest scores with narrative. It was not predicted that scores would be highest on the narrative text. Comparing the expository text (electric fish) with the culturally familiar text (falconry), it can be seen that the proximity of falconry to their world knowledge does not produce performance superior to that for the science text. The narrative text representing a story-line with culturally unfamiliar actions produces higher scores than the falconry text, with culturally familiar descriptions. This suggests that the reader's world knowledge and experience is less important than the more major difference of text type, i.e. narrative vs expository prose, the former representing a more accessible model of communicating.

In comparing the results for the two kinds of expository prose (science vs culturally-oriented), some uncertainty arises. The control group does marginally better on the science text than on the falconry text, whereas the contrary is true for the experimental group. Further testing would be desirable to show conclusively whether "cultural familiarity" can be shown to differentiate performance in types of expository text.

Comparing the results for the science text in both experiments suggests that the postgraduate subjects of experiment 1 did better than the undergraduate subjects of experiment 2. This is not implausible since the postgraduate students were specialising in science, whereas the undergraduate ones were students of literature. Therefore, familiarity with the topic may have a facilitatory effect
on text comprehension. Further confirmation of this assumption is needed. In addition, it can be assumed that long exposure to English in an English-speaking community may also positively affect the subjects' performance.

6.5 Pedagogical implications

In very general terms, the implication of the two experiments reported here is that English texts could be tailored to resemble the learners' language in terms of cohesive patterning. The 'tailoring' could then be gradually diminished, so that ultimately the foreign reader will approach authentic English texts: authentic, that is, in terms of their cohesive properties. One source of the improvement of reading performance could involve instruction on the potential cohesive resources of English, as Menke (1981) suggests.

6.6 Summary and Conclusions

This chapter has presented the results of two experiments on reading comprehension. In the two experiments, one or more English texts were read by Arabic-speaking learners. In experiment 1 only one science text was read by 10 postgraduate students of science at Aston University. The experiment was intended to examine the cohesive effect of lexical repetition on text comprehension. The second experiment, which was undertaken by 90 undergraduate students of English at Kuwait University, tested that cohesive effect on the comprehension on three types of text.

The two experiments show that:

1. English texts can be made easier to comprehend by Arabic-speaking students if their cohesive patterning
is altered to a more Arabic-like type, in which ellipsis and substitution are replaced by full forms and lexical repetition.

2. The facilitatory effect of using lexical repetition, rather than ellipsis and substitution, which is of particular significance for Arabic speakers, is maintained across 3 text types: literary fictional narrative, science prose and culturally-oriented prose.

3. The Arabic speaking readers tested perform better on narrative than on expository prose.

4. There is some uncertainty as to whether within expository prose, cultural distance/familiarity might be a significant factor affecting comprehension, conflicting results having been obtained in the control and the experimental group.

5. Predictably, postgraduate research students working in the British university context outperform the undergraduate population on the science text. Presumably, their greater experience of the general subject matter of science/engineering has made the content of the text in some way more accessible.

These findings accord with those of other researchers. The fact that lexical repetition highlights the transparency of English texts for Arab students is in line with Berman’s (1984) assumption mentioned above. The facilitatory cohesive effect of noun
phrases when used to refer to specific antecedents conforms to Tennant's (1981) in that full forms are easier to process than ellipsis and substitution. Finally, the fact that narrative texts are easier to comprehend than expository texts is in agreement with Britton and Gaesser's (1983) finding in this respect.

Clearly, the scope of these two experiments is limited as stated in Section 6.0. Psycholinguistic experimental work is required on cohesive devices other than lexical repetition, and should ideally compare native with non-native speakers; and adults with children. The work described in this chapter is to be seen as an exercise in the type of work that could be developed.
CHAPTER SEVEN

Summary and Conclusions

7.1 Summary

This thesis has set out to explore the role of cohesion in the organization and processing of text. In other words, it has attempted to shed some light on the descriptive and explanatory apparatus for cohesion in text. Since cohesion is held here to be a variable rather than a homogeneous phenomenon which is dictated by text type among other factors, three text types have been selected. These include: literary fictional narrative, newspaper editorial and science. Trends in intra- and inter-sentential textual cohesion have been examined in those text types in English and Arabic. The role of cohesion in the processing of text has been partly accounted for by two small-scale studies which endeavoured to ascertain the impact of one cohesive device (i.e. lexical repetition) on the comprehensibility of English texts by Arab learners. The results of the textual analysis and the experimental study are summarised below. For ease of reference, cross-text and cross-language results and the results of the pilot study are spelt out separately.

7.1.1 Cross-text type results

Except for the relative infrequency of comparative coreference and substitution and ellipsis in the three text types, these text types have demonstrated significant differences in their use of other cohesive devices. These differences are outlined in what follows.
1. Fictional narratives tend to use pronominal co-reference significantly more than the other two text types do in both languages. This significant difference holds true for intra- and inter-sentential pronominal co-reference.

2. Inter-sentential demonstrative co-reference is significantly more frequent in the English editorials and science texts than in the English fictional narratives. In Arabic, on the other hand, the difference in this respect is not significant.

3. The additive conjunction `and' is significantly more frequent between clauses in the English fictional narratives and between clauses and sentences in their Arabic counterparts than in the other two text types in each language.

4. English editorials and science employ IE significantly more frequently than English fictional narratives do. On the other hand, SRE is significantly more frequent in editorials and fictional narratives than in science texts. In Arabic, IE is significantly more frequent in science than in fiction. The difference between editorial and fiction in this respect is quite big but not significant. SRE is much more frequent in fiction and editorial than in science, but the difference is also insignificant.

5. Fictional narratives in both languages tend to utilize parallelism more frequently than editorials and science texts do.
6. Fictional narratives and science texts in English opt to previous themes or rhemes in successive sentences whereas editorials tend to use diverse themes which are semantically related. In Arabic, repetition of previous themes or rhemes is typical of the three text types.

7.1.2 Cross-language results

In fact, the distribution of those cohesive devices is almost identical in the two languages, but English and Arabic considerably differ in terms of the frequency of those devices. The cross-language differences in this concern are listed below.

1. Intra-sentential pronominal co-reference is significantly more frequent in the three Arabic text types.

2. Demonstrative co-reference across clauses and sentences is significantly more frequent in Arabic text types.

3. The additive conjunction 'and' and the causal 'so' is significantly more frequent across clauses and sentences in the Arabic texts.

4. Arabic tends to use lexical repetition much more frequently than English, whereas 'SRE' is more frequent in English, although the difference in both cases is insignificant, across sentences. At the intra-sentential level, lexical repetition and 'SRE' is significantly more frequent in the three Arabic text types.

5. Parallelism is significantly more frequent in the Arabic texts.

246
6. As mentioned above, whereas in English, editorials use diverse themes across sentences, Arabic editorials tend to repeat same themes or themes.

7.1.3 Results of-experimental study

1. Lexical repetition has a facilitatory effect on the processing and comprehension of the three text types.

2. Lexical anaphors are easier to process and understand than ellipsis and substitution elements.

3. Fictional narratives are easier to process and understand than expository texts.

7.2 Conclusions

In the following discussion some speculative conclusions regarding the effect of global trends in textual cohesion on the organisation and processing of the three text types examined here are drawn.

The high frequency of pronominal co-reference in fictional narratives suggests that this device considerably contributes to their organisation and processing. Recurrence of pronominal co-reference which is mostly made up of third person pronouns and personal possessives in this corpus contributes to the connectivity and
continuity of the participant line and the event line which hold a narrative together (Gutwinski, 1976). Thus, this device can play an important role in the structuring of fictional narratives.

As for its role in the processing of fictional narratives, pronominal co-reference, as argued in Chapter 3, Section 3.4, has a light processing load which helps the reader to perceive the characters and actions of the story. Understanding a story hinges upon perception of characters and actions. In addition, long chains of pronouns keep the semantic identity of reference intact in successive sentences, which facilitates connecting new anaphors with previous antecedents. Pronominal co-reference can also contribute to the economy of text (de Beaugrande, 1980). This principle is crucial to efficient processing as de Beaugrande (1980) suggests. Thus, pronouns can be said to produce as a kind of trade-off between "compactness and rapid access" (ibid:151). As such, pronouns can help the reader to process large chunks of the text, the thing that speeds up reading and adds to the reader's entertainment. Thus, this global trend of pronominal co-reference meets with the readership, reader knowledge, reading style and pedagogical purpose of fictional narratives.

High frequency of lexical repetition in editorials and science suggests that this device greatly contributes to the creation of these two text types. Recurrence of semantically related items can ensure their surface connectivity and conceptual continuity. This lexical repetition seems to be dictated by the type of knowledge involved in each text type. However, whereas in science texts the technical concepts which normally have only one name (de Beaugrande,
1980) make it imperative that exact repetitions of same lexical items are unavoidable, the discursive nature of editorials sometimes calls for the use of diverse lexical elements, and hence the relative high frequency of SRE in them. But lexical repetition is still favoured more than SRE by both text types. Lexical repetition also appears to be in agreement with the author's motivation in editorials and science texts. In both text types, the author sets out to train the reader in concepts which require much specificity and clarity. Such an objective is best established by lexical forms rather than by pronominals which may blur the identity of reference.

Lexical cohesion can play a prominent role in the processing of editorials and science texts. Recurrence of same lexical items entails "sameness of reference" (de Beaugrande, 1980:135). This in turn, contributes to the principals of stability and economy of text. Keeping the semantic identity of reference alive in contiguous sentences helps readers locate appropriate antecedents easily and quickly. Consequently, processing new anaphors which repeat explicit antecedents would be efficiently carried out (Tennant, 1981; Sanford and Garrod, 1981, 1982). Moreover, the occurrence of same entities in adjacent sentences instigates a short memory search, the thing that expedites processing newly given information.

However, the dense informational load of editorials and science texts may make their processing much slower than that of fiction. A reader cannot process such a dense informational load in chunks but rather one step at a time. In fact this process is very much dictated by the writer who releases that informational load one step at a time. This slows down the pace of processing in editorials
and science texts.

That \textit{sRE} is more frequent in fiction and editorials suggests that these text types appeal to the reader's pragmatic world knowledge. For this reason, lexical collocation may be demanding on the processor's part. In order to connect anaphors with antecedents which are expressed by different lexical elements, the reader has to activate his world knowledge to create the necessary antecedent (Tennant, 1981). Thus, processing may be slowed down (Clark and Haviland, 1977).

The high frequency of the additive 'and' in fiction also has a bearing on the processing of this type of discourse. It was suggested in Chapter 3, Section 3.4 that the fluid nature of 'and' makes it highly predicted by the reader. Thus, a reader can easily process the conceptual relations expressed by 'and'. Being familiar with 'and' in his speech, the reader does not have to exert a great cognitive effort to process the relations it effects.

The cross-language differences suggests that English and Arabic considerably differ in terms of their major cohesive properties. Generally, whereas English favours and derives much cohesion from textual economy, Arabic essentially coheres through textual redundancy. In English, high occurrence of one cohesive tie very much restricts that of another. For example, in the three English text types there is a kind of trade-off between pronominal co-reference and lexis in that when the former is high the latter is low and vice versa. These two devices normally occur concurrently in the Arabic text types. But it seems that a kind of trade-off takes place within the same text type in that while pronominal co-reference is
dense across clauses lexis is high across sentences. This is particularly so in Arabic editorials and science texts. Thus, Arabic text types are not only redundant in terms of lexis but also in terms of pronominal co-reference. This is not unusual since Arabic verbs characteristically have implicit pronouns.

Moreover, redundancy in Arabic is also manifest in the high frequency of the additive ‘wa’ and the causal ‘fa’ which almost always occur across sentences and clauses. Therefore, whereas intersentential relations are mostly implicit in English, they are almost always explicit in Arabic.

Finally, parallelism plays an important role in the cohesion of Arabic discourse. Almost all Arabic text types tend to favour parallelism as an optimal rhetorical device which enhances the frequency of most cohesive ties. This is not the case in English where subordination is preferred to parallel co-ordinate clauses, especially in editorials and science. To conclude, Arabic discourse seems to be highly repetitive, additive and parallelistic.

The above characteristics can have a bearing on the processing of Arabic texts. Lexical repetition can keep the semantic identity of reference alive in successive sentences. Readers can therefore easily and rapidly connect new anaphors with prior antecedents. This in turn may facilitate integrating new information into memory. Besides, recurrence of pronominals across clauses can alleviate the typical information density of Arabic texts. Similarly, overt realisation of intersentential relations can help the reader process the configurations of knowledge across those sentences whose boundaries are far from being distinct. High frequency of ‘wa’ and ‘fa’ can also lessen the phonological and morphological complexity of
Arabic texts. Finally, parallel clauses normally repeat similar points. Therefore, processing new information which repeats previous one is presumably easy and fast. By the same token, processing same themes which characteristically occur in adjacent clauses and sentences must be easy.

The above cross-language differences point to the fact that whereas English texts largely appeal to the reader's text-world knowledge, their Arabic counterparts appeal to the reader's text knowledge more heavily.

The results of the experimental study point to the facilitatory effect of lexical repetition which is typical of the learners' mother tongue on the understanding of English texts. The presence of lexical repetition renders the meaning of text transparent while heavy ellipsis and substitution make it rather opaque as Berman (1984) suggests. The experience of subjects seems to affect the processing and comprehension of text. The postgraduate students specialising in science processed and understood the science text better than the undergraduate students specialising in English did. The results also suggest that fictional narratives are easier to process and grasp than expository texts. Long exposure to narratives of different types and their being time ordered make this text type easier to process and comprehend (Britton and Graesser, 1983; Urquhart, 1984). These results point to two main things. One is that foreign learners need to be well acquainted with the potential resources of cohesion in English. Another is that they require longer exposure to different text types since expository discourse makes the largest bulk of the curriculum.
7.3 Future research

It was stated from the outset that this thesis cannot provide resolutions for all the issues raised here. Therefore, unresolved issues must be taken up by future research. It may prove useful to explore global cohesive trends in more text types and other languages. The facilitatory effect of each cohesive global trend on the processing of the respective text type may be worthwhile exploring. This facilitatory effect on the recall of text can also be tested. Other textual standards, as designated by de Beaugrande (1980), can be examined in different text types. The impact of these standards on the processing, comprehension and recall of different text types may as well be detected. If the effect of these standards was determined in English texts designed for foreign learners, the results would provide clues as to what kind of English texts are more adequate for the needs of those learners. Finally, future research can attest the validity of the speculative interpretations of the impact of major cohesive trends on the processing of different text types in English and Arabic given in Chapters 3, 4 and 5. If those cognitive interpretations were proved valid, cohesion could be said to have an explanatory power as it has a descriptive power. This issue which has been partly pinpointed here requires further verification so that the theoretical status of cohesion is fully established.
Appendix A

English Texts Analysed

N = Narrative
NE = Newspaper Editorials
S = Science

N 1. Foster 'Where Angels Fear to Tread'

When the bewildered tourist alights at the station of Monteriano, he finds himself in the middle of the country. There are a few houses round the railway, and many more dotted over the plain and the slopes of the hills, but of a town, medieval or otherwise, not the slightest sign. He must take what is suitably termed a 'legno' - a piece of wood - and drive up eight miles of excellent road into the Middle Ages. For it is impossible, as well as sacriligious, to be as quick as Baedeker.

It was three in the afternoon when Philip left the realms of common sense. He was so weary with travelling that he had fallen asleep in the train. His fellow-passengers had the usual Italian gift of divination, and when Monteriano came they knew he wanted to go there, and dropped him out. His feet sank into the hot asphalt of the platform, and in a dream he watched the train depart, while the porter who ought to have been carrying his bag ran up the line playing touch-you-last with the guard. Alas! he was in no humour for Italy. Bargaining for a legno bored him utterly. The man asked six lire; and though Philip knew that for eight miles it should scarcely be more than four, yet he was about to give what he was asked, and so make the man discontented and unhappy for the rest of the day. He was saved from this social blunder by loud shouts, and looking up the road saw one cracking his whip and waving his reins and driving two horses furiously, and behind him there appeared the swaying figure of a woman, holding star-fish fashion on to anything she could touch. It was Miss Abbot, who had just received his letter from Milan announcing the time of his arrival, and had hurried down to meet him.

N 2. Naipaul 'The Mimic Men'

The sanctions my mother had invoked on the docks were not important. We were a haphazard, disordered and mixed society in which there could be nothing like damaging exclusion; and before the end of that first fortnight we had found ourselves attached to the neutral, fluid group which was to remain ours for the next five or six years. The men were professional, young, mainly Indian, with a couple of local whites and coloured; they had all studied abroad and married abroad; on Isabella they were linked less by their background and professional standing than by their expatriate and fantastically cosmopolitan wives or girl friends. Americans, singly and in pairs, were an added element. It was a group to whom the island was a setting; its activities and interests were no more than they seemed. There were no complicating loyalties or depths; for everyone the past had been cut away. In that
fortnight we got to know as much about the group as there was to know; all that followed was repetition and ageing. But at the beginning we were dazzled. We had come to the island expecting the meanness and constriction of island life; we were dazzled, as by the sunlight itself, by the freedom which everyone who welcomed us proclaimed by his behaviour. The clothes! So light, so fresh, so prodigally changed. We were dazzled to be among the rich, to be considered of their number; and to get, from this, the conviction that in such a setting a comparable wealth would soon be ours as well. Austerity and prudence were forgotten. In that fortnight we spent! We gave as much as we received. We consumed quantities of champagne and caviar. It was part of the simplicity of our group; we loved champagne and caviar for the sake of the words alone.

N 3. Moorehead 'The White Nile'

Obviously the problem of the Nile was never going to be cleared up by learned speculation in London. The answer could be found only in Africa itself, and now the chief hopes of the geographers were fixed upon Samuel Baker and his wife, who in March 1863, following their meeting with Speke and Grant, had set off southwards from Gondokoro. It was known that Speke had confided to them the general position of the Iuta Nzige, which was the possible second source of the Nile, and that they had decided to go in search of it.

Baker is a kind of fulcrum in African exploration. He stands in the centre of all theories, emotions, and moral attitudes, never deviating too far one way or the other. Without being in the least dull he is a practical, down-to-earth man, who knows precisely what he wants and where he is going to go. One feels with him that the fates are fighting an unequal battle; however outrageous the odds against him, things will calm down in the end and everyone will come round to his sober and sensible way of thinking. In some ways he is almost a caricature of the professional Victorian, the solid, whiskered clubman-figure who is absolutely fixed in his habits and his loyalties, but equally determined to enjoy himself. Yet he is a difficult man to define; having attached one label to him you find that you must quickly add another. Thus you might describe him as a splendid specimen of Thackeray's hunting-and-shooting Anglo-Indian nabobs, but then he writes extremely good books and is a very fair linguist; he is a prosperous member of the trading middle-class, but then he himself does not engage in business, he travels abroad on the most hazardous and daring journeys.

N 4. Huxley 'Brave New World'

With eyes for the most part downcast and, if ever they lighted on a fellow creature, at once and furtively averted, Bernard hastened across the roof. He was like a man pursued, but pursued by enemies he does not wish to see, lest they should seem more hostile even than he had supposed, and he himself be made to feel guiltier and even more helplessly alone.

'Negro, that horrible Benito Hoover!' And yet the man had meant well enough. Which only made it, in a way, much worse. Those who meant
well behaved in the same way as those who meant badly. Even Lenina was making him suffer. He remembered those weeks of timid indecision, during which he had looked and longed and despaired of ever having the courage to ask her. Dared he face the risk of being humiliated by a contemptuous refusal? But if she were to say yes, what rapture! Well, now she had said it and he was still wretched - wretched that she should have thought it such a perfect afternoon for Obstacle Golf, that she should have trotted away to join Henry Foster, that she should have found him funny for not wanting to talk of their most private affairs in public. Wretched, in a word because she had behaved as any healthy and virtuous English girl ought to behave and not in some other, abnormal extraordinary way.

He opened the door of his lock-up and called to a lounging couple of Delta-Minus attendants to come and push his machine out on to the roof. The hangars were staffed by a single Bokanovsky Group, and the men were twins, identically small, black, and hideous. Bernard gave his orders in the sharp, rather arrogant and even offensive tone of one who does not feel himself too secure in his superiority.

N 5. Drabble ‘Jerusalem the Golden’

Gabriel had known for some time before kissing Clara that he was about to kiss somebody. He was on the whole an honourable man, and had not kissed anyone except his wife since his marriage, save in the way of courtesy, so the act was for him a significant one. He was slightly uneasy about the lack of choice and the sense of desperation which had finally pushed him to it, but did not feel that they reflected ill upon Clara; he truly admired her, and the eagerness with which she had returned his onslaught had turned, through relief, his admiration into a kind of love. He had not expected to be so well received, for his vanity, once secure, had been steadily eroded by years of disastrous marriage, and having kissed her, having felt lips more hungry than cold, and a body that trembled with anticipation and not with apprehension, he felt himself to be made over again, to be a new man. He had forgotten the simplicity of such acts, and their lovely associations with the unfamiliar and the unexplored.

Clara seemed to him, in his ignorance, to be everything that Phillipa was not: warm, enthusiastic, easily amused, amusing, and wonderfully, mercifully unexhausted. She listened to everything and everyone, as though she could not hear enough, and her face was mobile and expressive; she smiled and frowned and concentrated in rapid, vivid succession, and her features never set into a civil parade of attention. When she was bored, she inspected, frankly, the furniture. And she wanted him; she had wanted him to ask her round for a drink. In his gratitude, he could have kissed her for that alone. Other girls had seemed to want him, but he had never put them to the test, being unwilling to face the slightest, most minimal coolness, being too unsure of his reception.
N 6. Fitzgerald 'The Beautiful and Damned'

Gloria had lulled Anthony’s mind to sleep. She, who seemed of all
women the wisest and the finest, hung like a brilliant curtain across
his doorways, shutting out the light of the sun. In those first years
what he believed bore invariably the stamp of Gloria; he saw the sun
always through the pattern of the curtain.

It was a sort of lassitude that brought them back to Marietta for
another summer. Through a golden enervating spring they had loitered,
restive and lazily extravagant, along the California coast, joining
other parties intermittently and drifting from Pasadena to Coronado,
from Coronado to Santa Barbara, with no purpose more apparent than
Gloria’s desire to dance by different music or catch some
infinitesimal variant among the changing colours of the sea. Out of
the Pacific there rose to greet them savage rocklands and equally
barbaric hostelries built that at tea-time one might drowse into a
languid wicker bazaar glorified by the polo customers of Southhampton
and Lake Forest and Newport and Palm Beach. And, as the waves met
and splashed and glittered in the most placid of the bays, so they joined
this group and that, and with them shifted stations, murmuring ever of
those strange unsubstantial gaieties in wait just over the next green
and fruitful valley.

A simple healthy leisure class it was - the best of the men not
unpleasantly undergraduate - they seemed to be on a perpetual
candidates list for some etherealized ‘Porcellian’ or ‘Skull and
Bones’ extended out indefinitely into the world; the women, of more
than average beauty, fragiley athletic, somewhat idiotic as hostesses
but charming and infinitely decorative as guests. Sedately and
gracefully they danced the steps of their selection in the balmy tea-
hours, accomplishing with a certain dignity the movements so horribly
burlesqued by clerk and chorus girl the country over.

N 7. Wolf 'The Waves'

‘I have won the game’, said Jinny. ‘Now it is your turn. I must
throw myself on the ground and pant. I am out of breath with running,
with triumph. Everything in my body seems thinned out with running
and triumph. My blood must be bright red, whipped up, slapping
against my rib. My soles tingle, as if wine rings opened and shut in
my feet. I see every blade of grass very clear. But the pulse drums
so in my forehead, behind my eyes, that everything dances - the net,
the grass; your faces leap like butterflies; the trees seem to jump up
and down. There is nothing staid, nothing settled in this universe.
All is rippling, all is dancing, all is quickness and triumph. Only,
when I have lain alone on the hard ground, watching you play your
game, I begin to feel the wish to be singled out, to be summoned, to
be called away by one person who comes to find me, who is attracted
towards me, who cannot keep himself from me, but comes to where I sit
on my gilt chair, with my frock billowing round me like a flower. And
withdrawing into an alcove, sitting alone on a balcony we talk
together.

‘Now the tide sinks. Now the trees come to earth, the brisk
waves that slap my ribs rock more gently, and my heart rides at
anchor, like a sailing-boat whose sails slide slowly down to the white
deck. The game is over. We must go to tea now."

*

"The boasting boys", said Louis, "have gone now in a vast team to play cricket. They have driven off in their great brake, singing in chorus. All their heads turn simultaneously at the corner by the laurel bushes. Now they are boasting.

N 8. Lawrence 'The Rainbow'

Tom Brangwen never loved his own son as he loved his step-child Anna. When they told him it was a boy, he had a thrill of pleasure. He liked the confirmation of fatherhood. It gave him satisfaction to know he had a son. But he felt not very much outgoing to the baby itself. He was its father, that was enough.

He was glad that his wife was mother of his child. She was serene, a little bit shadowy, as if she were transplanted. In the birth of the child she seemed to lose connexion with her former self. She became now really English, really Mrs Brangwen. Her vitality, however, seemed lowered.

She was still, to Brangwen, immeasurably beautiful. She was still passionate, with a flame of being. But the flame was not robust and present. Her eyes shone, her face glowed for him, but like some flower opened in the shade, that could not bear the full light. She loved the baby. But even this, with a sort of dimness, a faint absence about her, a shadowiness even in her mother-love. When Brangwen saw her nursing his child, happy, absorbed in it, a pain went over him like a thin flame. For he perceived how he must subdue himself in his approach to her. And he wanted again the robust, mortal exchange of love and passion such as he had had at first with her, at one time and another, when they were matched at their highest intensity. This was the one experience for him now. And he wanted it, always, with remorseless craving.

She came to him again, with the same lifting of her mouth as had driven him almost mad with trammelled passion at first. She came to him again, and, his heart delirious in delight and readiness, he took her.

N 9. Joyce 'A Portrait of the Artist as a Young Man'

He turned away from her suddenly and set off across the strand. His cheeks were aflame; his body was aglow; his limbs were trembling. On and on and on he strode, far out over the sands, singing wildly to the sea, crying to greet the advent of the life that had cried to him.

Her image had passed into his soul for ever and no word had broken the holy silence of his ecstasy. Her eyes had called him and his soul had leaped at the call. To live, to err, to fall, to triumph, to recreate life out of life! A wild angel had appeared to him, the angel of mortal youth and beauty, an envoy from the fair courts of life, to throw open before him in an instant of ecstasy the gates of all the ways of error and glory. On and on and on and on!

He halted suddenly and heard his heart in the silence. How far
had he walked? What hour was it?

There was no human figure near him nor any sound borne to him over the air. But the tide was near the turn and already the day was on the wane. He turned landward and ran towards the shore and, running up the sloping beach, reckless of the sharp shingle, found a sandy nook amid a ring of tufted sandknolls and lay down there that the peace and silence of the evening might still the riot of his blood.

He felt above him the vast indifferent dome and the calm processes of the heavenly bodies; and the earth beneath him, the earth that had borne him, had taken him to her breast.

He closed his eyes in the languor of sleep. His eyelids trembled as if they felt the vast cyclic movement of the earth.

N 10. Green `The Power and the Glory`

He had been walking all day and he was very tired; he found a dry spot and sat down. When the lightning struck he could see the clearing. All around was the gentle noise of the dripping water. It was nearly like peace, but not quite. For peace you needed human company - his aloneness was like a threat of things to come. Suddenly he remembered - for no apparent reason - a day of rain at the American seminary, the glass windows of the library steamed over with the central heating, the tall shelves of sedate books, and a young man - a stranger from Tuscon - drawing his initials on the pane with his finger - that was peace. He looked at it from the outside; he couldn't believe that he would ever again get in. He had made his own world, and this was it - the empty broken huts, the storm going by, and fear again - fear because he was not alone after all.

Somebody was moving outside, cautiously. The footsteps would come a little way and then stop. He waited apathetically, and the roof dripped behind him. He thought of the mestizo padding around the city, seeking a really cast-iron occasion for his betrayal. A face peered round the hut door at him and quickly withdrew - an old woman's face, but you could never tell with Indians - she mightn't have been more than twenty. He got up and went outside. She scampered back from before him in her heavy sack-like skirt, her black plaits swinging heavily. Apparently his loneliness was only to be broken by these evasive faces, creatures who looked as if they had come out of the Stone Age, who withdrew again quickly.

He was stirred by a sort of sullen anger - this one should not withdraw.
NE 1. The Observer - 26/6/1983

PEOPLE speak and write for and against 'the Western alliance.' But is there any such thing as a Western alliance?

When NATO first came into being, Secretary of State Dean Acheson, NATO's architect, assured the relevant congressional committees that the treaty did not commit the United States to any particular course of action: the United States would decide in its own good time whether, when, and how to do anything in support of the treaty. Acheson had to give these assurances or Congress would not have ratified the treaty. So there is a treaty all right. But what the treaty may require, in any particular conjuncture remains a matter to be decided by the leading signatory of the treaty, as far as its own action, or inaction is concerned.

In public statements on the treaty relationship, this non-committedness is generally carefully ignored, and often implicitly denied. Thus Mr Denis Healey, writing with the authority of a former Defence Secretary, told the readers of Fortune in August, 1980: 'The bedrock of allied security is the commitment of America's strategic nuclear forces to retaliation against the Soviet Union if it attacks western Europe.'

Some bedrock! Mr Healey assumes - note the word 'strategic' - that the United States is not only prepared, but committed, to bring down certain nuclear destruction on its own cities, by way of responding to a Soviet incursion in Europe. No Secretary of State could have carried that version of NATO through congress, that's for sure.

It is true that Robert McNamara, as Kennedy's Secretary of Defence did make public statements which, if accepted as true, might justify Mr Healey's confidence. The United States, according to Mr McNamara in 1963, was prepared 'to back up our commitments (in western Europe) with our strategic nuclear power, no matter what degree of damage might result, should the deterrent aspect of this policy fail.'

NE 2. Herald International Tribune - 25/10/1985

Do we need the United Nations? If it had not been around for 40 years, would the world now invent it? Can a case be made, without humbug, for an organisation that thrives on humbug? The answer is three times yes.

The UN Charter, which came into effect 40 years ago Thursday, did not outlaw wars or create a world government. It spoke instead of establishing "conditions under which justice and respect for obligations arising from treaties and other sources of international law can be maintained." The UN has improved conditions for ending or containing violent quarrels between its members. They may sometimes scorn its appeals and spurn the good offices of the secretary-general, as in the Iran-Iraq war. But the record is otherwise in most flash-fire conflicts. Belligerents willing to be rescued can find face-saving salvation in appeals by the Security council for cease-fires.

That was the case in successive Arab-Israeli wars, and in clashes between India and Pakistan. Without a United Nations, Turkey's invasion of Cyprus could have ended in a war with Greece instead of a cold truce monitored by UN peacekeepers. When swords are drawn, the
United Nations can blunt the edges of conflict and slow the rush to calamity.

It did so most memorably in the 1962 Cuban missile crisis, providing the open forum at which Soviet and American diplomats argued, as well as backstage facilities for vital soundings. When the secretary-general called on Moscow and Washington to avert a confrontation at sea, both found it expedient to comply. The shot that was fired echoed around the world as a gasp of relief.

Those who deplore the United Nations because it provides a stage for nations hostile to the United States miss the point. The organisation’s strength is its universality. It reflects the real world.


The decision to raise mortgage rates by 1.4 per cent points has left Mrs Thatcher "disappointed" and the Opposition parties crying "We told you so." So they did, for the signs of growing mortgage queues were there aplenty. At some point, the building societies had to bow to the inevitable and move their interest rate structure back into line with the general drift upwards in interest rates over the past few months. The rise could have been even worse, with some people making a respectable case for a 1.5 per cent point rise. Nevertheless, it seems likely that the easing in bank base rates will staunch any further pressure for a rise, at least in the immediate future. The real surprise, though, is that interest rates at these sort of levels are not causing far greater cries of anguish than they are. "Real" interest rates - the interest rates after allowing for inflation - look sharply higher than, say, they did when Sir Terence Beckett and his CBI brethren were promising a bare-knuckle fight. And it should be real rather than nominal interest rates which rationally influence decisions to stock or invest - or buy a home.

Part of the explanation for quiescence is that things are not all they seem to be. Home-owners, for example, have been protected from the steady rise in real interest rates (caused by stable or rising nominal rates with falling inflation) by their rising real incomes and their tax relief. Nor does the position for business look quite as harsh as the contrast between an interest rate of 9.4 per cent on three month Treasury bills and a rise in retail prices of only 3.7 per cent over the last year, while the prices of non-oil exports have increased by 9 per cent.

**NE 4. Financial Times – 10/10/1983**

SWITZERLAND will hold a general election on October 23, but the real upheaval in the country’s government this year will be caused not by the voters, but by the passing of time. The electorate, almost beyond doubt, will confirm the four-party coalition in power since 1959. But two Ministers last week handed in their resignations, pleading age and their wish for a change after 10 years in office. The event is not unprecedented: 10 years ago as many as three vacancies needed to be filled on the seven-member Federal Council or Government. Yet to appreciate its import one needs to know that since 1848, when modern
Switzerland was founded, only 91 men (and no women) have served as Ministers.

The two men to go are M Georges-Andre Cheballaz, 67, a member of the Radical or Free Democratic party, who runs defence; and Herr Willi Ritschard, 64, a socialist in charge of finance. Losing them will not upset the Swiss political system, but their departure could leave a serious hole. Both men are popular, and it is an acknowledged weakness of Swiss public life that well-developed democratic machinery, complete with referendums on all matters of substance, has not prevented the political elite losing touch with the grass roots. Herr Ritschard especially appeared to be the exception to that rule. He was known for salty sayings and for a political pragmatism that often left him at loggerheads with his own party.

Sufficient evidence of the existing divide between electorate and elite is provided by the fact that the turnout at the last election in 1979 dipped below 50 per cent. As a rule even fewer voters bother to turn up for the referendums. This isolation of the leadership could, one day, become internationally embarrassing when a referendum is held on whether to join the United Nations. The majority of the political elite wants to go in.

NE 5. Financial Times - 25/10/1985

PRESIDENT REAGAN’S speech before the United Nations General Assembly yesterday is a profound let-down. Mr Mikhail Gorbachev has seized the high ground with his projection of a dynamic image, with the appearance of a willingness to engage in a new approach to East-West relations, and with his dramatic-sounding offer of radical cuts in nuclear weapons. These appearances of hope may turn out, when tested to be illusory. But the world, and especially the west, expected President Reagan to respond in kind, at least to regain the initiative. It has been disappointed.

As far as the world is concerned, the central issue for next month’s Reagan-Gorbachev summit in Geneva is nuclear arms control, and in particular the Soviet proposal submitted to the on-going Geneva negotiations. Mr Reagan yesterday again welcomed these proposals which, he said, contained “seeds we should nurture.” But he gave no clue as to how the U.S. would reply to them; more surprisingly, he did not even mention the proposals which Washington has had on the table for several years, which would also lead to deep cuts in nuclear weapons.

Since the Soviet proposals do contain constructive elements, there is no absolute reason why they should not be the basis of negotiation. But the outcome is likely to be less favourable for the U.S., and for the west as a whole, if they appear to be the only item on the agenda. President Reagan’s silence on the U.S. position, apart from a reiteration of the hopes he reposes in his Star Wars anti-missile defence programme strongly suggests that Washington has been too distracted and too divided to settle on a counter-offer of its own.

The most recent distraction has been the U.S. flip-flop over the 1972 Anti-Ballistic Missile (ABM) treaty, which severely restricts or bans testing or deployment of anti-missile defences.
Senator Edward M. Kennedy, Democrat of Massachusetts, a favourite foil of the Moral Majority in its crusade against liberals and big government, came to the bastion of the Rev. Jerry Falwell’s conservative fundamentalist empire to warn of the dangers of mixing religion and politics.

In remarks Monday night that his staff billed as his most significant since he spoke to the 1980 Democratic National Convention, Mr Kennedy advised that "people of conscience should be careful how they deal in the word of their Lord."

"I respectfully suggest," he said in a pointed reference to the lobbying efforts of the Moral Majority and other conservative groups, "that God has taken no position on the Department of Education - and that a balanced-budget constitutional amendment is a matter for economic analysis, not heavenly appeals."

Conservative groups favor abolishing the Department of Education and support a balanced-budget amendment to the Constitution.

Mr Kennedy said there is a temptation for men and women of faith "to misuse government in order to impose a value which they cannot persuade others to accept. But once we succumb to that temptation, we step onto a slippery slope where everyone's freedom is at risk."

"The real transgression occurs when religion wants government to tell citizens how to live uniquely personal parts of their lives," he said, citing abortion and prohibition as examples where "the proper role of religion is to appeal to the conscience of the individual, not the coercive power of the state."

The senator homed in on several issues, including abortion, the Equal Rights Amendment and, most prominently, the nuclear freeze, all frequent targets of Mr. Falwell’s sermons and mailings to the three million members of the Moral Majority.

On the nuclear freeze, which he supports and whose supporters have been branded by Mr. Falwell as "freezeniks,"

With three months to go before the breakup of the American Telephone and Telegraph Co., Americans have little understanding of the reorganisation and considerable doubt about its benefits, according to a new York Times-CBS News poll.

Only 29 percent of the respondents to the national survey said they had heard or read enough to understand what is going to happen in the divestiture, which takes effect Jan. 1 and which will change the way telephone service is provided.

Of those who said they did understand change, 41 percent said they thought it would make telephone service worse; only 25 percent said service would get better. Sixteen percent said service would remain the same and 18 percent did not know.

With the divestiture, different operating companies will supply local service and AT&T will face more competition in supplying long-distance service.

The breakup is expected to mean that local rates will go up, long-distance rates will continue to fall, customers may receive
multiple bills and the telephone-equipment market will become more competitive.

Nevertheless, 55 percent said they did not favor subsidizing local telephone rates so that everyone could afford to have a phone. Only 34 percent favoured such subsidies.

The survey of 1,587 people was taken in late September as Congress began work on legislation that would attempt to retain subsidies of local rates to maintain the 50-year-old policy of universal telephone service.

Gary L. Schmermund, division manager of public relations research for AT&T, said the result showing that people did not favor subsidies "certainly suggests to me that Congress doesn’t have the support it thinks it does."

But Samuel A. Simon, executive director of the Telecommunications Research and Action Center, a consumer group, said the question about subsidies would have been answered differently if people knew that local rates were now being subsidized.

**NE 8. The Observer - 28/10/1984**

TEN YEARS AGO next week Dr Henry Kissinger, then at the height of his powers as US Secretary of State, proclaimed ‘a bold objective: that within a decade no child will go to bed hungry’. Ten years on, those words spoken at the UN World Food Conference ring hollow indeed. As we watch the horrifying footage from Ethiopia, it is clear that another, darker prophecy – by C.P. Snow in 1969 – is being fulfilled. ‘Many millions of people in the poor countries are going to starve to death before our eyes,’ he said. ‘We will see them doing so on our television sets.

This week’s film from Ethiopia is just the beginning. Most of Africa is heading into what the World Bank calls a ‘nightmare’ of famine and economic collapse. This year’s drought, the worst for 15 years, has yet to take its full toll, and next year’s harvest is expected to be even worse. Even this disaster is no more than a small downward turn in a steady decreasing trend. One-fifth less food is produced for every African now than in 1960, and if the trend continues the crop in 1988 will be no better than this year’s terrible harvest, even if the weather is good.

In the world as a whole there are twice as many hungry people as when Dr Kissinger spoke. Even in years of good crops, 15 million children die of malnutrition, a figure equivalent to the casualties of two Hiroshimas a week. And more than a third of the world’s land surface is being turned to desert through bad agricultural practice.

And yet, as Dr Kissinger noted in that illfated speech: ‘For the first time we have the technical capacity to free mankind from the scourge of hunger.’ More than enough is produced each year to feed everyone on earth. World food supplies are at record levels.

**NE 9. Sunday Telegraph - 7/10/1984**

In normal times the lastest dismal unemployment figures would have cast gloom over the Tory conference this week. As these are hardly normal times, they will to some extent be overshadowed by the more
immediate anxieties of the miners’ strike and the memory of Labour’s Blackpool antics; and in this way what should be a guarantee against complacency may prove ineffective. There is a danger here for the conservatives.

The general impression created by Labour at Blackpool was of a party unqualified for government, a party with an ineffectual leader at the mercy of a rising tide of extremism, a party frequently scornful of parliamentary democracy and happy to express distaste for the rule of law. It is almost inconceivable that such a party should be elected to office. Its defeats at the last two elections have evidently taught it, or a large section of it, not the humility proper to those who seek the public’s trust, but contempt for the electorate and rage against "the system." It makes an unappetising spectacle and it is difficult to believe that all the arts of political cosmetics can render it otherwise in the eyes of the public.

But Governments lose elections as often as Oppositions, even good ones, win them. Hitherto the people have substantially backed the Government in its efforts to make the country able to hold its own in a ruthlessly competitive world: there has developed a sense that, as the scourge of inflation has been tamed, a new realism is prevailing. But already the waste and hatred engendered by the Scargill Strike have to some extent diminished that notion of a country struggling, under determined leadership, towards a healthier and more prosperous condition. The greater danger now is that the chilling prospect of the unemployment figures moving apparently inexorably upward will complete the disillusion.

NE 10. The Guardian - 19/10/1983

For the second time, Brent health authorities has voted to defy the government and refuse to implement some £250,000 of health service cuts with the loss of 110 jobs. In so doing, it has highlighted not only the inherent absurdity and unacceptable consequences of what the government is requiring it to do but also an ugly, new dictatorial strain in the health service which runs entirely counter to its traditions and to the declared policy of this government. Brent is a health authority which has tried hard to do the government’s bidding in the past by making savings in its budget. So successful has it been in fact, that so far from breaching its cash limit it has money to spare. Yet the government is insisting nevertheless that it cuts manpower by 110 jobs and makes further savings of £250,000. Not surprisingly, the authority finally baulked at this instruction, which would pile upon the damage to Brent’s health services the absurdity of cutting facilities when there was the money to pay for them, not to mention the intrusiveness of central government usurping the functions and duties of the authority.

But as if this wasn’t bad enough, the behaviour of Brent’s parent body, the North West Thames Regional Authority, was the last straw. The region’s chairman, Dame Betty Patterson, wrote to authority members asking how they would vote and telling them that if they didn’t support the cuts, she would sack them. So far from being bullied into submission, however, members were so infuriated by this threat that they sought a High Court ruling that Dame Betty had improperly exercised her statutory powers.
On Monday, however, the High Court ruled that Dame Betty had not exceeded her powers and that the regulations permitted her to act in this way.
Patterns are made slightly larger than the required casting, to allow for the contraction of the molten metal that takes place on cooling. Patterns are also invariably made in more than one piece, to facilitate the removal of the pattern from the mould and help minimise any damage to the mould that may be caused during this skilled operation.

The simple casting shown in Fig. 1.4 requires a two-piece split pattern and a two-piece moulding box, sometimes called a moulding flask. To prepare the mould required to produce such a casting, half the pattern is placed on a turnover board and the bottom half of the moulding box, called the drag, is positioned around it. The half pattern is then covered with a facing sand - a special mixture of sand and clay that will withstand the high temperatures involved without breaking down and giving a poor surface to the finished casting. The drag is then filled with green sand (a sand containing moisture and clay), which is rammed up and levelled off. The ramming allows the drag to be turned over without the sand falling out. When this has been done, the top half of the moulding box, called the cope, is placed on the drag and is aligned by means of locating pins. The other half of the pattern is then located by its dowels, and a dry layer of parting sand is sprinkled over the green-sand surface to enable the two halves of the moulding box to be easily separated. A similar procedure with facing sand and green sand is then carried out.

If a casting is required to have a hole or some other form of internal cavity (as in the case shown), then provision for a core must be made. The core will require its own moulding box.

In the preceding paragraphs a reference was made to the collapse of a structure as design data. Collapse may be due to many causes: it may be partial, confined to certain building elements without affecting the entire structure; it may be due to local overloading or vibration; or it may be caused by very unusual circumstances, such as hurricane wind forces which may only occur once in a century. Engineers are already using their discretion when they assess certain loading conditions and to give up the concept of the maximum permissible fibre-stress as the only design criterion, wherever it might occur, was the first step in this direction.

The next step was to design beam and column sections on the plastic basis, utilizing the entire section rather than only the extreme fibres.

The latest approach to design attempts to meet all the conditions which can lead to the limit state, either in the form of collapse or extreme strain (which in practice would lead to excessive deflection), by codifying the loads and stresses which would lead to these limiting states.

Instead of laying down hard and fast values, the latest limit state codes are based on statistics, for example, the frequencies of certain windloads or variations in tests. These are called characteristic loads, and are augmented by factors allowing for
possible deviations from such values. This leads to even higher local stress allowances called characteristic stresses, in certain situations reduced by certain safety factors and higher deflections for entire building types. So limit state design takes into account the structural behaviour of entire buildings and the interrelation of their elements.

Generally speaking the limit state approach represents a far more realistic attitude to structural design than the elastic theory, in which not only substantial parts of sections, but even whole parts of the building, remain understressed.


All the major phases in commercial Portland cement clinker exist as multi-component solid solutions. Examples are numerous and both major and minor constituent elements are involved. In addition polymorphism (that is the existence of different crystalline forms or phases with the same nominal chemical composition) is exhibited by the silicates, for example, and the stability of polymorphs is influenced by relatively low levels of solid solution. Before giving a brief account of the structures of the clinker compounds, it is useful to recall the main features of solid solution relevant to cement.

The term solid solution does not encompass inclusions which are observed in clinker by optical microscopy, for example of C₄S in C₃S. It involves a distribution of the solute ions EITHER by substitution of them for those of the host (solvent) crystal structure OR by location of them at normally unoccupied or interstitial sites (Frenkel defects). These processes may also produce vacancies at normally occupied sites (Schottky defects) to maintain electroneutrality as, for example, when substitution of a cation M⁺³ for M⁺² occurs.

The total defect concentration of a solid is made up of point defects (substitutional, Frenkel, Schottky) and line defects such as edge and screw dislocations and, apart from substitutional defects, they all exist in pure solids. The number of defects per unit volume of a solid depends on its chemical composition and the thermal and mechanical treatment it has received. The nature and concentration of defects is known to influence the chemical reactivity of a solid but the detailed study of defects in the crystals of cement clinker compounds is a relatively new one. Timashev (1980) reported Russian work in which micro-scopic observation of each pit density showed that one-third to half of the surface of C₃S and one-sixth to one-third of that of C₄S was occupied by dislocations.

Solid solution often produces a change in the unit cell size of a crystal lattice.

S.4. M.S. Goromosov

The area of the source of radiant heat is naturally of great importance; the larger the area, the greater is the sensation of heat.

The high sensitivity of the body to radiant heat is explained by the fact that, although human skin (irrespective of its colour) has a very high absorption coefficient in the infra-red region of the spectrum, nevertheless, a proportion of radiant heat passes through it
(Galanin, 1952); Malyseva, 1963). If the surroundings are at a low temperature, heat is lost, not only from the skin surface, but also directly from the deeper tissues, principally the muscles and blood vessels. At a low level of heat exchange, little radiant heat penetrates the skin and it has not appreciable physiological action, but the greater the proportion of heat exchange by radiation, the greater is the physiological effect. When heat exchange is very high, skin temperature is no longer the principal index of thermal comfort, because a proportion of the radiant heat penetrates the skin; in this situation, there is no longer a correlation between the skin temperature and the thermal condition of the individual.

It is important to remember that, when the body is cooled by radiation, the compensating increase in the metabolic rate develops much later than in the case of cooling by convention, with the result that, for a certain time, the body is no longer in thermal equilibrium (Slonim, 1952, 1961). In observations on human subjects under conditions of approximately equal cooling at a rate of 6-7 cal/sec, the heat loss, primarily from radiation, caused a reduction of 3°C in the temperature of the skin of the trunk, where it is usually comparatively stable. (With convection cooling at the same rate, there was no change in the skin temperature throughout an observation period of 1.5 hours.) Despite this marked fall in skin temperature and a clear subjective sensation of cold, there was no increase in the metabolic rate throughout the period of observation.

S.5. J.A. Harrison

Electricity is not itself a source of primary energy, but it is by far the most versatile and convenient form into which the primary energy of coal and oil, nuclear energy and the potential energy of stored water, can be transformed. Electricity can be converted into heat with 100 per cent efficiency and into mechanical motion with very high efficiency. This is done without producing any pollution or waste product of any kind. Electricity is also the only possible source of power for a wide range of electronic goods.

For any equipment, electricity generated in power stations is a much cheaper source of energy than primary batteries (dry cells). Secondary batteries offer a convenient way of making this energy available to portable equipment. If even better secondary batteries could be developed they would provide a very attractive way of powering small motor vehicles, particularly private cars. What is needed is a battery which is lighter, cheaper and longer lasting than present commercial batteries. The cost of running a car on electricity as compared with the cost of running it on petrol (gasoline), depends on the various efficiencies involved as well as the current prices of the fuels, but the cost of electricity to run a car is likely to be much less than the cost of petrol. There would be an additional advantage, if cars were charged overnight, in that the charging load would help to improve the power system load factor. The meaning of the system load factor is explained in Chapter 7.

In the USA a fairly large number of independent companies are responsible for generation, transmission and distribution of electricity, a notable exception being the Tennessee Valley Authority which is owned by the Federal Government. Although independent as
electricity undertakings, their power systems are interconnected and the Government maintains a certain amount of control over their activities.

S 6. NASA SP-5072

The existence of nitrogen oxides is determined by dye formation using the nitrite ion \((\text{NO}_2^-)\) as part of the reaction (ref.5). The sensitivity of this method ranges from a few parts per billion to about 5 ppm. Sample sizes up to .5 cubic foot produce sufficient color change for meaningful results. The analytical time is approximately 1 hour. Photometric readout is obtained, but no automated instruments have yet been developed for this procedure.

Oxidizing gases, such as ozone, are analysed by observing color change after absorption in potassium iodide (KI) (ref.6). The oxidants can be analyzed in the range of a few parts per hundred million to about 10 ppm. A sample size of approximately 2 cubic feet of air is suitable, and analytical time of up to 1 hour is required. The photometric readout produces analog data, but the overall procedure is manual.

Hydrogen fluoride (HF) and other volatile fluorides are analyzed colorimetrically after titration or spectrophotometrically (ref.7). Concentrations below 1/100 ug/cu ft. can be analyzed. An air sample size of approximately 10 cubic feet is the minimum and, in some cases, 100 cubic feet is required. Analytical time is approximately 7 hours because a detailed procedure is required to eliminate interferences that are caused by a large variety of materials. These are removed by double distillation with perchloric acid \((\text{HClO}_4)\). Analog data are produced by the photometer or colorimeter, but the method is manual.

A number of materials including \(\text{SO}_2\), nitrogen oxides, oxidants, chlorine \((\text{Cl}_2)\) or chlorides, and fluorides or cyanides may be measured by modified wet-chemical procedures in a system of gas absorption followed by colorimetric analysis. Continuous analyzers using programmed sampling values, proportioning pumps for reagent delivery, heating baths, distillation columns, temperature control, colorimeters, and so forth, can be purchased (ref.8). Sensitivities and sample sizes for these colorimetric instruments are equivalent to those given for the manual methods, and analytical time is of the same order as that for the manual methods.

S 7. E.W. Parkes

In all our work in Chapter 2 so far, we have assumed that the structures with which we were concerned were statically determinate. We must now investigate formally the conditions that this shall be so. As we have previously noted in §1.6, no structure is truly statically determinate, since this would imply no deformation under load, but many structures can be regarded as being statically determinate with sufficient accuracy for engineering purposes.

The first essential condition is geometrical: the shape of the framework must not change significantly throughout the range of its environment. Provided the changes of shape are small, we can still use the original angles when considering equilibrium at the joints; if
the changes in the angles are significant, the bar forces are dependent on the deformations and the framework is no longer statically determinate. Knowing whether the geometrical changes in a given framework are likely to be significant is largely a matter of experience, although once the bar forces have been determined it is always possible to check one's assumptions. For frames composed of well-conditioned triangles (angles 20\(^\circ\) - 140\(^\circ\)) made of the usual structural materials (in which the direct strains under load do not exceed 0.5 per cent) the changes in geometry of the structure are not likely to cause significant errors in values of the bar forces determined by using the original geometry. If the structure is ill-conditioned, or the material unusually extensible, it may be necessary to consider the effects of the changes in geometry more carefully (see Fig 9(c) and Example 9(i)). An interesting means of determining whether a framework is ill-conditioned is given by Mobius (1837). Remove one member (say AB) from a statically determinate framework. Then the resultant assembly is a mechanism. If the configuration of the mechanism is such that distance AB is a maximum or minimum, then for small movements of the mechanism distance AB will not change.


I consider biology a natural science. I consider biotechnology an engineering science. In my mind, the finality of biology as a natural science has been, and is, to arrive at a theory of living matter. The finality of biotechnology as an engineering science is to utilize living matter for producing or degrading large quantities of matter. Of course, both biologists and biotechnologists use techniques. But the biologist uses a technique for understanding a biological phenomenon, the biotechnologist for applying the phenomenon to an industrial and economic process.

A key factor in the distinction between biology and biotechnology is their scale. The biologist on his way towards understanding life works in the range between nanogram and milligram, perhaps. The biotechnologist working on the production of vaccines may be satisfied with milligram yields; but in most other projects, he aims at kilograms or tons. One of his main activities then, consists of scaling up biological processes. A typical technique of biotechnology is large scale culture of cells or organisms. In such cultures, ways must be found to make use of the enormous kinetic potential of biocatalysis.

In most of your cells and mine, enzymes convert substrates into products in amounts so small that sensitive fluorometric instruments are needed for their detection. When the biotechnologist decides to take advantage of biocatalysts he isolates enzymes from cells and processes them with the aim of converting substrates into products that can be weighed with a crude balance. The biologist engaged in the study of regulation of protein synthesis at the molecular level, in his work on the interaction of regulatory proteins and DNA observes effects so small, that he needs sensitive radionisotope techniques for following them. But the biotechnologist whose aim is to use particularly well suited bacteria for producing proteins would like to see amounts of protein that can be loaded onto trucks or poured into
S 9. K. Leech and B. Jordan

There is an old and very true saying that 'prevention is better than cure'. Prevention means doing something about a difficulty before it becomes a problem. In medicine it means taking precautions or inoculation against contracting a disease. As a young child you were probably given vaccinations against smallpox and poliomyelitis and inoculations against diphtheria and tuberculosis. This is preventive medicine, ensuring that you will not suffer from a disease, by taking steps to prevent your having it. It is much cheaper and better to prevent disease than to try and treat it after it has been contracted, because often unpleasant side effects arise alongside the main illness. For example weakening of the eyesight or even blindness, can accompany the common disease of measles. It is better, therefore, to prevent the person getting measles and so avoid the risk of being blind than to treat him after he has contracted measles. It is particularly relevant in mental illness because unlike, say, chickenpox which is over and done with in a few weeks, mental illness takes much longer to cure. So it is of utmost importance to prevent mental illness and one way of doing this is to deal with difficulties before they become burdensome problems.

Knowledge is a very good inoculation against things going wrong, especially against fear and confusion. As babies we thought that mother had gone forever every time she went out of the room, and we cried loudly in protest and fear at being left alone. As we grew a little older we gained the knowledge that mother came back again - and this prevented our fear when she left the room. As young children we all probably experienced fear of the dark, but when we could manage to turn on the light we lost our fear of the dark.

S 10. J.F. Crawford and P.G. Smith

The ability of free water to move within a landfill depends on a number of aspects. Intermediate cover placed between the layers of refuse may sometimes be capable of providing an aquiclude. However, uneven settlement in the landfill can cause fractures which would then give free water a pathway down into the lower layer.

A strategy for leachate control and treatment must be prepared. In some parts of the world, leachate from landfill sites is pumped to a municipal sewerage system and eventually passes through the sewage treatment works. The leachate may cause few additional problems in sewage treatment works apart from an increase in the total volume of liquid for treatment. However, if the municipal authorities refuse to accept leachate into the sewerage system or there is no sewerage system within easy access of the landfill site, then treatment proposals must be prepared, including an assessment of feasibility, performance and cost. Treatment of leachates is discussed in Chapter 6, but among the factors which will affect the choice of treatment are the quality of treatment desired by the operator, or desired by the governing agency (e.g. a Central Government Department) and the nature and quantity of leachate produced.
In general terms, cost of leachate treatment tends to rise with the desired final reduction in the polluting attributes of the leachate. The evaluation of the cost of treating leachate may result in alternative proposals becoming more feasible. For example, a Class 2 site may be estimated to produce quantities of leachate of such a nature that serious groundwater pollution may occur. The cost of isolating the leachate and treating it to an acceptable standard may be so high that it becomes economical to provide a liner in the site and change its category to Class 1. Alternatively, where leachate treatment is expensive it may be cheaper to divert loads of less absorbent waste to other sites.
(1) طبب الحسين

لكن الشهر مضى، ورجع الأزهر إلى القاهرة، وظل صاحباً حديث هو كما هو، لم يفارق إلى الأزهر، ولم يبتعد المعلمة، ولم يدخل في جماعة أو شتات.

كان لا يزال صغيراً، ولم يكن من السير إسلامى إلى القاهرة، ولم يكن أخوه يجب أن يحتله، فأغار بأن يكون حيث هو سنة أخرى، فقتلى.

لم يفصل أحد برضا أو غضبه.

على أن حياته تغيرت بعض الشيء، فقد أغار أخوه الأزهر بأن يختبئ هذه السنة في الاستعداد للأزهر، ودفع إليه كتابين يحفظ أحدهما جملة.

يستظهر من الآخر صفحات مختلفة.

أضى الكتاب الذي لم يكن بدأ من حفظه الفعلي عبد الله، وأضى الكتاب الآخر فصوبه المحتوى. ورمى الأزهر قبل سفره بأن بدأ بحفظ الألفية، حتى إذا فرغ منها وأغتتها اتفاناً، حفظ من الكتاب الآخر أميناً، غيرها، يعود بها الجوهرة، ويعود بها الحكمة، ويعود بها السراجة، ويعود بها الربيعة، ويعود بها لبيتها الأبدان.

كانت هذه الأسماء تكون من نفس الصفحات مثبته وامربح، لأنه لا ينفع لها مبنى، ولأنه يقتصر أنها تدل على العلم، لأنه يعلم أن آثار الأزهر قد حافظها، وفهمها، تأصيله عالماً، ونظر بهذه الكتاتب السائرة في نفس أمه، وأخوته.

أهل القرية جميعاً، لم يكونوا جميعاً يحدثون يقولون أن يعود بشهر.

حتى إذا جاء أقبلوا عليه فرحين متبرجين متحمسين.

(2) نجيب محفوظ

دمرت السيارة جلبي في المعدان الأمامي ركب وسارة وأحمد نصر على حين تكسد المايين في المعدان الغليظ يكسد يلطم ذه خسفة رؤوس، أتجهت نحو غارب الأزهر في غبار خلاء من السارة والسيارات، وأتجر ركب طريق صغيرة.

مجال السفرة فللا اقتحامه استحاسات من عرف الطريق ومن لم يعرفه.

أما أليس فتقفع في جلبيه سامعاً، وله ضيف في جانب السيارة الأيمن، قطعواً
طريق البحرين في دقائق ثم انطلقنا نحو طريق سفرة. ونهاك، انسحب السيارات في سرعة غريبة في طريق تطير ومشتركة مع المركبات الأخرى. على ضوء السيارة إذاً نجد في الظلام بلا نهاية، محولًا على الجانبين بلغاريا. الطرق تتنتمي إلى أفلامها في الأفق. ويكشف عن الناحية عرضًا.

هذا الطريق الم 않는 والجهة. ونجد الفجوة بين محاورها النافذة، ووجدت السيارات سرعة وتدفقها دون الأزمنة.

بصفة مشابهًا بالخلال النباتات، وفجتل سيدة كامل لرجب.

هـدـئ السرعة.

وتلال عادل مـسنـز.

لا كبار السرعة اللائقة بساعات.

ساعة مـسـاـرة.

أين من هؤلاء السرعة؟

نحن陌生 الآن قوة نروبة قوية تمثل النافذة.

بسرة ما استغرقت السيارة سرعتها الأولى. فاتجر خالد أن يقفوا، طلبت ليتهجولوا في الظلام. رحبوا جميعًا بالاقتراح. فتحت السيارة تدريجيًا من سرعتها.

ثم جاء بعده رجب إلى رقصة متبقة بين شجرتين.

(2) الأسئلة:

الآن، فقط، مرح، نسرأ ذلك الشعور بالراحة والاستمتاع الذي لم يكن بوسعه قبل دقائق. أن يكتشفي، أنه يفتح أمام مينه بكل أتسامه. بليس الهدوء، بعكس راحل، كل سرعة الجبال التي حالت بينهما معرفته.

وها هو الآن يرمح من جديد بسحابة. لا شبه لها فذ. كان أول شيء تفعله ذلك الصباح الباكر هو كتابة رسالة طويلة إلى أمه. إنه يشعر الآن بعيدًا من الراحة لأنه كتب تلك الرسالة قبل أن يغيب. ألم كتبها في مكان الرجلين السمين في شبع الفرح الذي سمعه في تلك الرسالة. لقد كان بدمـساـ...

أن يعيش بعده ساحة مع أمه.

نيج بكراً جداً ذلك الصباح، كان الخادم قد رفع السير إلى سطح الفندق لأن النوم داخل الغرفة في مثل ذلك القسط يقطع الرضي أثناء مسـحـيل. وحينها أشرف النشط فتح عينيه. كان الجو رئيما هادئاً. وكانت السماء مزلاً تلبس وترى، تدور فيها حمامات سود على طول منخفض ويسع رفيف أجنحتها كلاً اقتربت في دورتها الواصلة. من ساء الفندق. كان الصمت
الطبيب ساحب

(4)

بيَّدُ الأطفَّال نِشَتْبِيلن الحَيَاةِ بالصِّرْحَةِ، هذا هو المُعَرِّف، اللَّكَن
يُنَبِّي أن النَّزِيحَ، والعَمْدَةُ عَلَى ُهُم وَالْعَمْدَةُ اللَّا يَحْسِنُ لَهُمَا، أَوْلَمْ سَأَلَتْ أَنْ قَدْ حَلَّتْ فِي نَفْسِهِ، وَلَا إِلَى أَنْ قَدْ حَلَّتْ فِي نَفْسِهِ، وَلَا إِلَى أَنْ قَدْ حَلَّتْ فِي نَفْسِهِ.

كَانَ يَبْلِدُهُ، وَكَانَ يَبْلِدُهُ، وَكَانَ يَبْلِدُهُ. وَكَانَ يَبْلِدُهُ، وَكَانَ يَبْلِدُهُ.

(5)

ذَاتِ يَامُ كانَ مِنَ النَّفَّى، فَانْفُدَى، وَلْحَتَّى حَامِرَ، فِي سَرَّ، وَكَانَ الدَّهْرَاءَا، صِيْفًا، وَمِنَ النَّفَّى أَنْفُدَى بِجُبُورِ الأَمَأَةِ يُمَجَّدُها، دَيْنُهُ اِثْنُ يُمَجَّدُها، وَلَكِهْ ذَلِكَ النَّدَوَن مِنَ الْعَلَى الَّذِي لَا بَيْدُ وَلَهُ مَرْضٌ، فَلَا سَحَةُ تُبْرَحُهُ، لَا أَكْتَفَ.
ميشوتك نسيك رنه، ولا شباب هاكمان ضيرومان تتخلق طيبيها سترى نه،
كأنها معلقة على شامخة، ثم أنه كان يرتدي بديلاً. إلا أنك تستطيع أن تدرك أن التدخل الذي لم يحدث أرداها، فقد كان يخترق فيها كأنها لا يزال يخترق فيها. من فضله، والكاهن، ويبدو وكأنها لا زالت طليقة في اللم راون النياه، وكنت تستطيع أن تعلم أن النار الكبرى لم تغيب بدلتها منسدة أن وجدت وكذلك لا تقدر أن تخسر متي وجدت. ومع ذلك فالمحاذية طيني
اللبان كانت في دم عديد من أنداد، بل هذا كان يضع تمديده الثور، يضع عليه الثور، حتى يصنع موضعها المعرق الذي يضعه نفسه الأيسر، وكذلك كان يفعل في طوره، والغير يبدو هذا أن بابسونه،
وحتى الطرود، كنتا دائماً من أغلى الأحكن التي يحلوها للجر والتراب البقا،
فيها واستمرها...

والتقياس إلى وجه الديب انفاذ الذي نداع متحته حتى أسود،
وتنافر أذاعها في طيبي قيحة لكلها طيبيه والسلام، بالقياس إلى وجه،
كأن يعتر一笔ه الغاية بجوهرا، حلوا أذاع فيه اذكر، ليس هذا فقط، بل
كنتا كانت تزدى فيها الحipelines الأحمر.

المصادر:

عملت القطيعة ولم تشعر الراية من نتخته.
عملت ولم يرد لها أحد، ولم يرغم بها أحد، كأنها مخلوق تائه،
بالمثل من أبزه: تريد له بديه السكتة ما تريد ولا يريد لنفسه أو يريد له
أبزه: يعرض يناد ناموت وهو لا يريد الموت ولا يريد له اللجوء عليه، بل
كان الجنين الذي استمر جلته فلاده لكي من الظهر ولو فيأته عليه ولانظر
قلب أبزه.

أو لم يقل هامه أنه لن يخترف في هوى سارة ولن ينفصل عنها إلا وهو
واقن كل الوثيق من خدمتها، وماء كل البكر من صحتها.
أو لم يقل أنها حليبة موقعة أن قلت سوم يكون الأش وذ خائر البحار،
واقن رخص هانت من السواد والشماعة
أو لم يقل ذلك ويستعم المزور وكل يستعمين كلها انى على أن لا نايراق
ولا قطيعة، إلا وقد أرى ما عساوي من قبالة وما استؤن من غيره وضمن.
بل، لمال كل ذلك، وترى كل ذلك، ولكن الحب الذي أوجاه كدل
ذلك قد ندد وانحل وات، ولم يبق إلا أن يدقن، لر ان يحله إلى الدنيا.
أبواء ٤ وعمر آخر من يرود له الموت، وعطفه إلى ذلول المحر..

لوكانت الساحة فقية تتفر وحضا يعد بعد نظرها لكان هتجا أن تثبت القطيعة قبل شوث الفياءان وأن تقع العمقية قبل وضع الجبالة.

لكن من هو التاجغي هذا؟ ومن الباني؟ ومن الفرحة! ومن صاحب الفصل وسائر القلوب.

(٧)

١٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠_
ربط السلطان هراثا للعالم الجليل الذي أصبى الآن حديث القاهرة،
وبيناه، أشعار طائفة
وكأثار أشعاره قد عبرت الساحة الشاسعة التي كانت تفصل الغرب عن مصر، ووصلت إلى ضفاف النيل قبل عيد النطرون عام 643 هـ وهو اليوم الذي ذكر فيه ابن خلدون إلى ماضي الاستكرارية.
وبيَّر الطريق إلى مصر، نسبة من نقيمة عبد الرحمن، يا لابن أن تعددت
سيرة، وانتشارنا في القاهرة.
وفي القاهرة، كانت ثمة مواقع للنجر ومضيق الخانق، والزينة في أحمد
سيرة، وانتشارنا في القاهرة.
وكأثار في القاهرة مواقع أخرى، ظاهرة، زينة، محاولة إلى العلم،
والفن، ومن المواقع الزينة، كانت حجرة صغيرة تقابل باواريا في الحي الحسني يحييها محارون غمزة رحمة محمد السباعي، الذي دُعي إيله للأزهر، وكان أبوه تلامساً من الصعيد لا ينتمون من دنيا، بل أن الراحة لا يمكن أن تتم على هذه الأرض دقيقة في حين ولد له محمد، ألا يكون حاضرًا، محضرًا وضعًا في الأزهر، ففلان، أسلمه للاهلين ذاهبين بخلال النسيان، ليعود، ومعهم إلى الأزهر، وهناك سوف تبتلواDAC المعبدي
وقد بلغ محمد محمد مقدم عبد الرحمن بن خلدون من الثلاثة من عمره،
أصبح عليه، وأصبح له أشعار، وأما بقية هذه الجماعة من شعراء التجاريين، فكادوا
عذالا ضغيل الجسم معاذ، ونا.

(9)

لمرجع المكيّم:

سيرة واضح كالنهر والعمال الذي تحموا إلى ذلك كبيرة، وهي نافعة
مفردة، من ذلك ساكنة البالغة وما في تنقبتها من شدة المكرونة. وصن
ذلك أن الأتام إذا كثر، كثر البطش على ظهر السطح، والصعود مغلي
الدجل، فينتحر الصبي وينكر العصب، وإذا كثر الدخول والخروج، والنسح
والإلقاب، وذبابة الأقال، فأصبحت الأشياء، وتتلمت الرويات، نناك الدارد
هو الخصي، والمضمون مراقبًا، وهو الذي يقي يدته، يعده القمر، ينحو
به، يدبر، يبناء بنيس أن المالك ما أمكن دارا، إلا بعد أن كسبه وتهبطه
لتصبح في مشتة جر، فإذا خرج هو ترك فيها مزيلة وخراجا لا تسحبها
النفتة الموجزة، ثم لا يد بعد ذلك مسا إلا سيره، ولا سببا إلا حمله،
وإذا أراد الدق في الهان، كر الصفرة المجملة لذلك، ورد في الأغذاء.
حيث جلس بابانا وقُصْوَه وَفَهَا هذا فلا ما يَهْدِه من الشَّغْب سَعَ الَّيْجْرَان يَتَعرّض لَهُم وَاصْطْبَاد طَيْرُهُم وَتَعْرَسِيَّة لَكِيْ يُبْتَغَيْنَا. فَأَرْدَأْ أَنْ نَجْعَل الْفَرْمَ بِالْفَنْمُ، فَأَن تَقْبَل بِضَعْة دِرَاهَم لِإِلَاصِحِ النَّفْسَادَ المَنْتَظِرُ سَمَتَا عُبْاَرَة الْحَاجِّ وَطَلَتْنا بِأَنْبَاء الأَمْدَارِ وَالأَسْبَابٍ".

واستك "كلدی" ابتاءٍ، فنهجتنا عِنْكِ الْخَاتَمٌ سَعَ الَّيْجْرَان، فَنَعْهَد هَنا
قد انتهى فَرْضَة اعْتِفَاتِه بِالْكَلام، فأَنَا هَا نِي حوَار أَرْثَ الخِيْرِ وَالسَّمْك
الآن "غَلْبَة" كان قد نهج في مَعْضَب بين بَديه.

(10) مصطفى ممسود

كان الرجل البشّار الشابذ ذو الوجه الغربي يُثْلُو هذَا التَّرْكِيّة
على البوحّة التي يضعبها على النار وَجَز، بها مَعْتَرَف مَعْقَب من التَّرْك
المرأة، بِحَلِزها من البوتليّة يُدْخَل البَيْها (21) فَقَهُهَا من المَلْعَبَيْن
التاليٌّ، أما كما يعرف في كتاب "سَمْر الكَبِان في تَحْمِل الجَبَان".
في باب صناعة الْجَبَان، وبعد كل تقُبّل لِلْمَرْحِيح كان يَمْرَح بأَحلى ترْحَب،
كِرْم ١٠٠٠ جوَاد كَيْهَمَانُداد . . .

وتزيدنا كِرَمًا بِالْرَجَل نَقْلُ كِلّه "مَحَمَّد عِبْد المَقْصُود السَّيْد
المَبَّادِي" ليس شيئاً كَلّا يَتَبَثُر إلى الْذَّهْنَ، ولكنّه أَنْفِد١٠٠٠ بِشَكْبُب
في ارْشِفِ زِرَاعَة الآوْتَاف ١٠٠٠ رَجَل كَالْحُجّة البَيْضاء، ١٠٠٠ تَراْبِيْ اللُّحْنِ في لُسْى
الدَّوِيَّات المَيْوَاءيَة، يَكْسَمُها كِلّي بَيْنَ يَدٍ مَّيْوَاء جَاهِظًا، عَلَى
الْدَوَامِ وَ٨٠٠ عَامٌ، ومع ذلك، نَبْوُهُدُ وَفِي السَّمِيعين رَمَّ بِسِبْب
شَمْر لْحِيَتهُ الّذِي يَنوِمُ مَرْسَالًا بِفِيّر نَزَايمٌ وَرَبَّمَا بِسِبْب الْلُّحْنِ وَالْفَيْر وَكُشْرَة
الْعِمَالِ، ١٠٠٠ نُهْوَب لَسَتَةٌ مِنْ الْعِمَالِ مَعْطَمُهُم، ١٠٠٠ أَقْبَل أَبَاهُ الْسَّنَةٌ،
والذِّي نُحْرِنَهُ الْآنُ مِنْ تَأْريخِ حَيَاةِهِ أَنْهُ مَنْ أَكْثَر مِنْ ٨٥ سَنَةٍ كَبَّان
طَالِبًا نِجِيَبًا وَأَنَّهُ دَخَلْ كَلِبَةَ الْحَقُوق، ١٠٠٠ وَكَانَتْ لِحَيْنَاذُ أَحْلَامُ عَمْرَة
فِي سَفَقِل بَاهرَهُ فِي المَحْمَاةٍ يَشْقُهُ بِطَرَيْقَهُ إِلَى الْأَسْمَ السَّمِيرِ.
ولَكِنَّا كَانَتْ مَجْرَدٌ أَحْلَامٌ لَمْ تَقْدَمَ أَكْثَر مِنْ سَنَةٍ أَقْتَرِ بَعْدَهَا أَنْ يَبْجُر
دَرَاسَتِهِلِبِحَاتِهِم مُنْ عُلِّم، ١٠٠٠ فَأَهْوَهُ الْشَّيْخُ عِبْد المَقْصُود السَّيْد
مَبَّادِي مَمْدُودٌ مِنْ ظَهْرَ الصُّنأة فِي الأَرْهُ سَقَط مَخْلَى١٠٠٠ دُنْيَتُ مِنْهُ
الْحُقَوق كَأَنْ يِقْبِل الْحُوَامَا نَتَرَكْتُ مَكْتِبَه.
لا تستطيع الولايات المتحدة الامتحانBackdropBerry ميلوز الوسطية نفسها لشيوخ شرق وشمال، ولا هي محاذاة اتفاقية مسماة ولد الامير. اقترحت أجزاء حوار مع وفد اردني فلسطيني مشترك بل فشلت. منذ ذلك، شروع الرئيس ريفان للسلام وسطاً بسياسته في لبنان أن تقع جوانب الحراك والانصياع والحزن والترد على استعداد الخلافات مع التجاوزات في المنطقة من أجل دفن سيطرة الخلافة لكنها لا تقدم إلا على عطوة. وأي سداول في الإدارة الأمريكية أن هذه السياسة نجحت في دفع الانتفاضات الايطالية، ولا سيما منهم المعينين بانتقائي منازل إلى الحركات لذلك تنظر إلى هذه الإدارة الآن إلى هؤلاء وقد وقوفت في الأصل وبدأت أصابع فصالة، وليست أصابعه تقترب من النفاير فصاعداً ما نحن، والإردن ومنطقة التحصيبر لا يمنعان كيف يرغبان من انتقائي 11 شبات، أو يمنعان ستقبل اللاقات بمنها في حالات طي الانتفاضات نسبياً ولا يمنعان كيف يعودان إلى الاجتماع العربي بعد تعصر تجربة الأكثرة العربية أو سياسة التفرد والانفراد كما يقولوه.

وأيضاً كانت السياسة الأمريكية تجنب إدارة ريفان مزيداً من الفشل في المنطقة نان أو اسطزاً مدة في واشنطن. وفي المنطقة تعتبر أن الاصمري في هذه السياسة في هذه المرحلة بالذات قد تكون نتائج سلبية غيرت بالمصالح الأمريكية لذلك حذرت هذه افست أو الجزء من عمقي في هذه الالامبيلة وترى أن على وإغتنى هذه المره الحركات لانتقادتها أو حلقها العربي الإسرائيليين.

وبعدها فهم على تخطي إرائه

ليس في لبنان حرب واحدة حولشي واحد لكي تكون هناك تسويه واحدة أو حتى هدنة واحدة ففي بريبر وردها ثلاث حروب مماثلة بها حرب غمر، التناس وحرب المختيرات وحرب الحلفات أو انتقائي الصفر الواحد وكلها مؤسسات عاصمة، أو انتقائي عاصمة أو إنتقائي الانتفال أو لجنة تنسيق أو لجنةントيغمة خاصة ود. يمكنه خاصة ولو أن هناك طفلاً أو أكثر يشتركون في الحرب الثلاث ويفتعل أو أكثر يجمع بينها فضلاً من الحروب الأخرى التي لا يعرف بها أحد ولا

قد يكون لها اتفاقات ولجان فيها، أو التي لا اتفاقات حولها ولا لجان.
والواقع أن التقسيم التقليدي للحرب في الوطن الصفوي إلى حرب مسلحة وقليلة رداً وردلاً لم يعد يكفي لتفسير كل شيء وضيق في إطار الصحافة خلال الوجود الحضري للحرب.

الحرب هي الآن فقط الانقسامات أو الخلافات أو الصراعات الأهلي الدامي بين المسلمين والسياسيين في النظام ولا الوجه الدامي هو فقط الصراع العربي الإسرائيلي ولا الوجه الدولي هو فقط التنافس الاقتصادي الصوفي من ناحية أو من خلال الحلفاء.

ذلك أن سحب الانتقاب بين حرب طرابلس معقل الحرب إلى غطاء النزاع في بريتانيا وبلجيكا إذا كانت اللعبة الحقيقية هي إصلاح النظام أو حتى تعليمة مع الخلافات وحيدة الأمرين...

والعمل كذلك الأمر بالنسبة إلى الحرب الأخرى داخل غطاء النزاع ومن الصعب تدارك ما جرى ويجري في الجنوب إلى الصراع العربي.

وزراء الدفاع لحلف شمال الاطلس أكدوا على أهمية البلدان الأعضاء في الحلف ضد نشر ممارسة أمريكا في القارة الأوروبية ما لم يتم تحقيق إصلاحات جنرالية للعدم من الاستعمار دعماً واضحاً رسمًا لدول الصراع الكلي الذي اجتمعت في ليبيريا اتفقنا على أن الأمر الغربي واحد لا يتجزأ وفي هذا الاتفاق انتصار واضح للرئيس رحيل الذي يرى أن الاتحاد الصوفي يحاول الفصل بين الولايات المتحدة وحلفائها الأوروبيين وبين الزعماء الغربيين من يعتقد أن الرؤى الأولى الأمريكية غير راغب فعلاً التوصل إلى اتفاق مع الاتحاد الصوفي في موضوع السلام.

وإن الاتفاقات التي يطرحها مع وقت آخر وتغيرها، إدارته ببرهنا، في هذا الاتفاق إلى الحلفاء جنرالية الموقف الغربي من الحلفاء أكثر ما تهدف إلى الاتفاق مع السوفيتيين. وفي الإدارة الأمريكية من يعتقد أن وقت التوصل إلى اتفاق مع السوفيتيين لم يكن بعد وأن التحديد بمساحة التسلسل يكون على الأرجح منه، ولكنه يجب أن يستمر، ويناخير الرئيس رحيل بأنه منذ وصوله إلى البيت الأبيض لم يسعى للاتحاد العالمي بحثياً. اتفاقيات التي اتفق عليها الأمركية السابق واستطاع في النقلة يكوء المسؤولين السوفيتيان أن نشر ممارسة أمريكا في أوروبا الصاخبة انتخاب الاتحاد الصوفي إلى نشر المزيد من الموازنة ولا يبدو الاتحاد السوفيتي مستعداً لتقدم المنازل والتوصيل إلى اتفاق، فالزعماء السوفيتيين مرت升高 ومدى، وظل سلم برجينيف ونشا سوفيتياً صعباً في الشرق الأوسط.

ن. إ. أ. 1983/2/6

(3)
لا ساعة في وجهنا ونسقط في أذاننا نقول (آخذ فرصة السلام).
لا يمكن أن يكون لنا أحد لم توجد هذه الكلمات أو بنية هذه التحديد، ولكن...
وما نقول في مدينة صدق: هل العران تجد الولايات المتحدة مشكلة؟
إذا كانت واعظًا في المهمة بهذا التحديد فإن المعركة مفيدة ويجعل الأشياء حقيقة إن الولايات المتحدة لا تعني في كثير أو في أقل، بالولايات العربية.
والأعمال العربية والإعلام العربية، فالكلام الذي تسمعه واعظًا على لوحة
الإجابة لملكة هو في هذا الكلام الذي تسمعه تهن، والإعلام العربية لا تعني بالنسبة لواصقًا شيئا لا تعرف أن المعرفة (القرار الديوي) تسمع من (الجمعهم) ولكنها لا ترى للجيم، ولكن واعظًا، وهذا لا هو الإلوم، ليـ ميمهم الأول أو الآخرين أن يسود السلام الحقيقي الأرض العربية أو يفاجأ الفراغ العربي، الإسرائيلي، نواية جادة نمو، فالولايات المتحدة، كما قال السيد/ عادل الحمدين بالعكس، (تحلى من الاستقرار من السلام) والفارق.
بين الاستقرار والسلام كبير لأن الاستقرار يمكن أن يكون على البيض وليس هناك شيء آخر، أما السلام فيقوم على العدل، أو الاستقلال، ونحتاج للاستقرار بالنسبة لامريكا، العدل مستحيل لأنها لا تنظر إلى القضية العربية على أنهم العدل أو العدل، أو السعودية، أن تكون رتبة دينشية، لدى البعض ما، ولكن لا مستحيل الآخر.

وبعد أن الحكومة المصرية الجديدة لم تتعلق فيها إلا أن هي وجها حددت، وملاحظاً أو تلفظها، وبصرف النظر من الأمور المزج، فأن الرسالة تعتبر إعادة من متونها، وسراً، الحكومة الجديدة، هناك بأغتالة، الدكتور على طول، وموضوع الاتصال.
وهؤلاء الناس الذين يطيعون صفحة مهمة الحكومة الجديدة، إذ أنها ليست لتصريف الأعمال بقدر ما هي لانتقاء الأعمال، وقد تكون بداية لاندماج الأعمال، بالموضوع الاجتماعي بمرتكب، ثم إن إعادة طرح الموضوع الاجتماعي، لا يعني أن حكومة السيد كال حسن، التي فشلت في طرحها الاتحاد، ومعالجاتها، في هذا الفن، وكي الإشارة إلى أن نقطة الحسية الأخيرة في بعض كانت استخدم انغاجاً اتحادًا، سلاني، تاريخ صرع الحديث، وهي التي استمر من الفن، مليون جنيه ولفظ في مشاريع تنتهي شملت معظم العراق في نسختها الأولى.
وصعد انعكاز معظم نقطة الخسارة الطويلة، فإن الاتحاد العرقي ظل يعاني من الاضطراب، وإن كان انتظامه يتم ببطء، شديد، حيث الخطوات صعبة.
وعلاوة على الخروج إلى مرحلة الازدهار، وإصابة المستويات المتفقة بين اسابع عديد، ومصالح الاستعداد لل 어떻 من حالة المجازة في مجال الأنتماء والتعاون.

والملفات الأخوية لمؤسسات النقد العالمية ودورة الاقتصاد الدولية، وتشاند:

الاقتصاد المغربي وميزان المداولات، كانت مشغولة بالفعل والعمل في نفس الوقت، لكن

المشكلات ظل تتراكم طوال السنوات الأخيرة.

الروس: 1985/9/10

في صراع الأمة العربية مع التحديات الداخلية والخارجية، كان الانفصال
هو الطريق الوحيد، حتى لو كانت الهدف رئيسة في بعض الأحيان موقعة منتصراً،
ولكن الأثار الخفيفة كثيرا ما جعلتنا في مأزق لا يستطيع حل رؤوها، وهي المسألة
التي يأت منها الكثير من دول العالم حين حديث الاستقلال في فترة الخمسينيات واتلاها،
فالتصعيد بالعنف، وسفرات الانتفاضة، كما كانت تعتبر أكثر تلك الدول،
كلفها عواصف ضاغطة، حين جملت العوامل والمداخلات التي راتب تركيز
للاستقلال والشرعية، دون البحث عن الأرض التي تغطي طلبا حكومات تلك الشعوب،
وكيف أن الاستقلال الحقيقي لا يعني بالتصريف الإيقاع ولا باللجوء إلى
الاحترام بكل القوى دون معرفة الحقائق التي تتعامل بها سياسة القوة استماس
الأمني منها، وراء

على هذا النهج، كان القرار المفاد في أوساط الأمة العربية توزيع
المصالحة، والمصالحة على سبيل المثال الذي يعتقد أنها نافذ، أو صادرة،
في حين كان أولئك الأساند يتأسسون على الكتلة الدولية من مفاوضات أكثر وضوحًا
كثيرة للتفاهمات، وهو ما وفر دور استخدام القوى محصية، إما من العرب
الباردة بين أحلام الشرق والغرب كنتيجة لمرض العزة أمام الضغوط.

خاض هذه المعركة الصعبة، وتزويج الادوار والزعامات - كانت دول الخليج
العربي تحت في ظل اكتنازها - وتحدث عن ضوء وسط النظام الكبير، مركزه طليق
بناء شخصيتها دون افتراض للتحديات.

السياسة: 1985/9/4

أن دول مجلس التعاون الخليجي دول ملحة بالمناصب الدولية، ولعمل
اهم هذه المصالح هو التنطه،
الى جانب ذلك فان هذه الدول تجاه الآن نحو التكامل الاقتصادي
وهذا يعني قيام صناعات مشتركة، وأراضيات استثنائية موحدة، وحدات سوقية
ملقبة عالمية واحدة.

284
كل هذه الإنجازات الموجودة منها والمعترض عليها الثوابات التنظيمية الكامنة تحتاج إلى مواجهة انتي قوى حربها، ويعنيها، وبورض لها أجهزة الهـدوء.
لازمة للتطور والتقدم.

من هنا تناول ان انعقاد المؤتمر السادس عشر للمجلس الوزاري لدول مجلس التعاون الخليجي في الرياض، الذي انهى أعماله أخيرًا، جاء هذا القرار المعاقدًا يتميزًا في امتهانه حصرًا وأن (وضع الإرهاب) كان من أولويات جدول أعماله، لماذا؟

لان الإرهاب سفاح، وسحتار وسحتار جديد، وذلك بشهادات كيـدار مسؤولي دول مجلس التعاون وفي مقترحات الشيخ صباح الأميد الذي تحدث بأسم الكوـيت في اقتحام أعمال المجلس الوزاري في الرياض، اول انسحبت إلى (إيجاب تشاطر
الإرهاب) وعدد اعماله ونهب ونهب وانعكست من برمجًا لشعبه في الخراب.

ونضيف نحن إلى هذا الكلام كلاما آخر، وهو أن الإرهاب سيستمر ليس فقط في
صالح دول مجلس التعاون بل وفي صالات العالم كله، لذلك يحكم علينا
دول المجتمع، ان تستجيب أدبياً الوسائل لمكافحته أو تجاوزه أو تخفيف من حدة
أعماله بدرجة مقبلة.

في فترة من الفترات استمرت الاكراهات في الدنيا العربية لمكافحة الإرهاب.


لا يختلف اللبنانيين على طبيعة العلاقة الدائرة في لبنان الآن حيث
تصدف القطريدات العربية والشبيبة الفلسطينية. كما كانت داخلاً فلبيني
خانقًا واحد؛ ليس فقط اللبناني، عنصر، بل ضد القرى الدائرة له
ويقى شبيبة وإسلامية.

ومن الواقع ان قوى الشبيبة اللبناني ركبت الموجة الصهيونية والإمبريالية
والقومية في محاولة لفتح لبنان أمام الغزاة الإسرائيليين الذين (تبعوا)
من اداؤه فعّال ومذاق للقوى الوطنية اللبنانية الفلسطينية.

ومن الواقع أن قوى الشبيبة اللبناني لم تستجيب حتى المحافظة طلسي
المعادلة (لا غالب ولا مغلوب) لا يحرز الإسرائيلى وومعاجم.. هذه
المعادلة التي تغلب على ملامح الواقع الذي يلعبه القوى الوطنى في لبنان
وباناد (لا غالب ولا مغلوب) معادلة عارضة بالأساس لا تتجاهل قيمة
الشعب اللبناني بجمهوته الفخيرة وانطلاقة الوطنية والقومية والثنائية، ولقد
صمت المعاشر كالجبلاء ضحية تجاه هذه المعادلة ومعنى آخر تصبح
المعادلة الوطنية اللبنانية لمصلحة شعب لبنان وأرتباطاته الطيبة
والقومية بما تعود منه من طلبات على سيّد المسألة الديمقراطية لبنانيًا وعليه
صعيد التحالف الطبيعي مع المقاومة الفلسطينية.

285
لا يختلف الوطنيين على طبيعة المعركة الدائرة في لبنان من حيث أنهم يصعب في الصراع الدائم لتحل محل ما أطلقهказалосьpine. ولم يختلفوا أيضاً من حيث أن هذه المعركة تنتج لقوى المناوئة الفلسطينية
الفرصة لكسب طرقيها من جديد إلى ميدان القتال

(9) أخبار الاخبار : 2006م

9/11/2006

اغاد التقرير السنوي لوزارة الخارجية الأمريكية حول حقوق الإنسان في العالم

خلال سنة 2006م - بعمر - باعتبارها أحد دول الشرق الأوسط التي تتعرض

 невозможно تحاول حقوق الإنسان وكرامته. واضاف التقرير: (إن حماية جميع مصادر

 فيها السلطة السياسية المؤثرة وإسقاط الرئيس حسني مبارك وحزب حكم قوى وهمية

 من نواب الاحزاب المعارضة الذين يشاركون بشكل كامل في مناقشات مجلس الشعب

 إلى جانب أعضاء الحزب الوطني الديمقراطي، والذي ينتمون إلى الحزب الحكومية

 كما أن حملة المعارضة المصرية تمارس الآن حواراتها حول القضايا الثورية، وغالباً

 يا تانتنت سياسات وشخصيات الحكومة بقسط)

وما أخذت تقرير وزارة الخارجية الأمريكية من احترام حقوق الإنسان في مصر

 يحضره كل مواطن في بلادنا، ويسعد به، ويعتبره له، تغيير الفرد هي التنزيل

 ما يمكن، واعتق ما يتسكع به حريته في أن يعلن رائعه، فلا يكون له ولا يفرد من

 وظائفه، ولا يهدد في رقته، بحيث هذا الرواء الذي يعفج الحب عام، حريته في

 ممارسة نشاط السياسي، فلا يضطهد ولا يجبر من يطرفها. (لا نعني

 إلا أن نشاطه السياسي يتمتع بين الحزب الحاكم، حريته في الانتماء إلى الحزب

 الذي يؤمن بأهدافه ومبادئه، فلا يضطهد عليه ويملأه به، ولا يضطهد

 بعد أن اختفت الحكومة مع هذا الحزب الحاكم، وحريته في أن يكن ما يراه محتفا لأجل الشمعه

 وممارضاً لسياسات الحكومة.

(10) الشرق الأوسط 

اغاد الماهل السعودي الملك فيله بن عبد العزيز في الكلمة التي قاله

 بوصفه أمام مؤتمر الفتية الإسلامي المعقد حالياً في دولة الفردوس، إلى الاستجابة الراهنة

 التي تشددها الأمة الإسلامية في فلسطين وأفغانستان والآن، (الاعتراف الامام

 شعب ورجال ما كان ليصيبها لو أنها تسكع بهدف كابالله الكريم وسنة نبيه

 الهادي الامين)

واكد الماهل السعودي أن البداية السلمية لبناء وحدة الأمة الإسلامية تشمل

 في نبذ الخلافات بين المسلمين ويصفها عملاً بحالة عامة (وتعتبره بحيل الله

 جميعه ولا تتعقب) وجعل الملك يشير إلى روح التماسك وصفها بأنها مصدقة

 بشاعر الإسلام حيث أنها تكسر الخنف وتدفع بالتماسك والتزمر الفكري ، للاستحالة

 المعاهدي كي محقيق إذا لفاغة الاضطرار إلى خروبة روح التماسك، فالتماسك

 الإلهي هو الذي أدى إلى تلك الحرب الدامية بين شرقي باكستان وأسفر عن تحطيمها

286
الشطرين، والتعبض الآمى هو الذي سبب ارادة دماء عشائر الآلى من الآخرة.
والتعبض الآمى هو في الحقيقة شر البلاء وهو الذي يعتقد كل خلاف بسيط
حتى يصبح مشكلة مستمرة.

هذا وقد اشار العاهل السعودي إلى مشكلة أخرى عقبه. إذ قال: اننا
نلاحظ ان تفقا للسلامين قد ادى إلى تربوت العلامة من مواجهة الكثير مما جد من
مشكلات الحب، ورأى يجتمع حب طالب المسلمين، لذا تراكم المشكلات بالفهم من وفسرة
العلامة والتفقيه المجتهدين.
النصوص العلمية

ابراهيم دياب معدود

أوجب أن يعني بالطلاق عنيدة خاصة تتضمن في بركات من جرعات مختلفة تدخلها العش واستخلصيا إليها، وتفتح من ناحية على أجواد ضعية كمكية ضحلة، يكون للطلاق فيها حرية الحركة والانطلاق من وضع إلى آخر، وتعزز أوراق البركوات بقية الأرز فلا تتأثر فاحلها وأقدامها من شلابة الأرض، وقدم لها هذا، سبيل اللاهم، عني بالفيتامينات والأملاح المعدنية، صنعت براعتها البوسية كل صباح رساء، كما يعني بظلم أطالتها في دورات شبكة تنظيمية والحد من بحل الأطلال والأفتادا إذا سارت بعد البلل على الأرض المطلبة أو الوصل فان الأطلال تتناثع وتحترق وتصاب بالحما والهدر، لذلك يجب أن تكون الأطلال على الدوام جافة وأن تنطف وتحترق من القطران، ما بين وقت آخر.

ويفض أن لا يزيد عدد الوحدات الطبيعية التي يقوم بها الطلبة كل حيف تسليط على ثامينية وثابتة، ويفضل التقلص الصناعي أخصاب أضعاف مضاعها هذا المقدار بأقل عدد من الدقائق النهية فلا تتعرض الطلاء للإجهاد الجنسي، بل تظل على الدوام مستمرة بنشاطها الجنسي سنوات عدة.

وينظم الطلبة أن بدأ حياته التقلصية منذ ما سبقه عام، أو حتىقبل ذلك بعدة أسابيع، والطلاق التي تستعمل للتقلص الطبيعي لا يجب أن تستعمل للإخصاص حتى لا تتعرض الحيوانات للتقلص صناعيا للأمراض التقلصية.

ويفض أن يعني بنفس الطلاق.
ют الميلوئ عند البنات بكثرة الطبي وذكرت النفايات العصبية للجنس
يحدث عند جميع البنات في السنة الثانية عشرة إلى الرابعة
عشرة، وتتظهر في السنة الثالثة عشرة، وينتقل إلى ذلك
ركل ما استمرنا على السائلة العصبية كما تأخر البلع إذ يكتم
في القلب الشعبي في حوالي سن 22 سنة.
وقبل ظهور البلع تحت تأثر تغيرات في المجموع العصبي والنفساني
والجسدي للبنة، فتبني الحالة عندما تتأكد اختلاط باخر الصبان
وتتكرر الردة النسائية. وتتم هذه التغيرات كل أعلاها
وطبيعة، وفي هذه السن يجب الانتباه بأن تكون قابعة
كثيراً ما تتراوح الأمراض العصبية والبصريات في ضوء هذا
التغيرات النفسية، وأما شكل جسمها فيأخذ في التغير ليحتل
تحدياً في شكل المرأة الذاتي، وأول ما يلاحظ بوضوح هو نمو
الشعر في الأبطين وعلى جنب الركبة، ويركز البحث واتدارة،
وبعد ذلك بقليل حدث الارتشاطات بحثية في بعض أجزاء الجسم.
ومن هذا المنعك والمغناطيس وجلب الركبة والتنفس والحنان والمتنمء
ويكون تحت ملام الاستمرارية والحسن في كل أجزاء الجسم.
رد على ذلك أنه يحدث أيضاً نمو وظاهر في أجزاء الإنسال فينر الرحم
وبعد شكل البلع، أي أن الجسم يصبح حتى يمكن أن تكون
مست肉体 ظهرة حسية جزء من الجسم، ويفترض أن ظاهرة
البليسم قد تحدد هذا ككل ظهور البلع.


3

شاكا منصحة حضان

في حضرة في حوض التشريح على الجهة البطنية كالمتعدد وافتتح من
على جانبيها وأنعز الالترجا كما فعلت البراء السابقة ارتفاع بارتفاع
الجهاز البنكي، وأقطعه بالمنع في مدة هجذ الأذن من نهاية
من هذه المرحلة، وتثبيت أن الفتق العصبي للبشرة تحت المطر
من السطح السفلي، ويصبح مدمراً على مفترس صهري، هذا الغشاء
هو الحجاب الحاجز السفلي، انعز هذا الغشاء من الجوانب بتحراش
وانظر في الخط الوسطي للمشرة تحت المطر العصبي البطن

"Ventral nerve cord"

تتحج هذا المطر العصبي من الفتق للأمام لأنه يسهم العثور عليه
في منطقة البطن القليلة العضلات.
بلاحتظ أن الشحنات السالبة الموجودة على الأيونات المدارسة صاحبة في جميعها للشحنات الموجبة الموجودة على البروتونات داخل النواة، وذلك يحصل بينهما تصادم ولا تظهر أي قوة كهربائية خارج الذرة، وعدد الشحنات السالبة الموجودة خارج النواة يساوي عدد نواة الشحنات الموجودة في النواة، وقد زيدت المناصر حسب عدد الإلكترونات المدارية في الذرة من (1 إلى 92) في جدول عام يسمى الترتيب الدوري للعناصر.

وتحتوى كافة الذرات عدا الهيدروجين على نوترونات، فمثلا تحتوي ذرة البلهوم على 2 نوترون، وتحتوي ذرة النيترن على (186) نوترون، ولا يحمل النوترون أيّة شحنة.

وبالنسبة للإلكترونات في ذرات المناصر الواحد إلا أن بعض ذرات هذا المناصر قد يحتوي على أعداد مختلفة من نوترونات وذلك يختلف في أوزانها الذرية، فمثلا يوجد ثلاثة أنواع من ذرات الهيدروجين، يكون عددها الذري واحد آي أن عدد البروتونات مضان وهو بروتون واحد.
أما النوع الأول وهو النوع المتميز من الهيد روجين فلا يوجد
في نواة ذره في البروتون ولا يوجد مع نيوترونات.
ومن هنا نوع ثان من الهيد روجين وذره الذري / 2 / وتحتوي نواة
ذره على بروتون واحد ونيوترون واحد، ونوع ثالث من الهيد روجين
وهذته الذري / 3 / وتحتوي نواة على بروتون واحد ونيوترونين
وبالرغم من أن الأنواع الثلاثة مختلفة في أوزانها الذرية إلا أنهما
متشابهان في كل الخواص الأخرى للهيد روجين.
ويطلق على الذرات المختلفة نفس العنصر بالنظام
ISOTOPES

منظمة الأقطار العربية الصادرة للجرير

تبين وحدات إنتاج المنتجات البترولية عادة بخصائص الانتاج حتى
تصبح اقتصادية، وكثيرا ما يحدث حد أدنى للإنتاج الاقتصادي
للمادة.

يمكن تقسيم المنتجات البترولية التي تنتج من الغاز ومقطوعات
البرميل إلى ثلاث مجموعات:

1. مجموعة الإلنيفات والاستيلين ومصطلحها
2. مجموعة المطيرات ومشتقاتها
3. مجموعة المركبات غير المحسوبة مثل الأوزن وأسود

الكرسيين

ويجب أن يشير هذا إلى أن هذه الصناعة تعتبر من أبرز الصناعات
ذات تأثير كبير في الولايات المتحدة إلا في العقود الأخيرة استخدام
البروبيلين الناتج من عدد الكيميا لانتاج بعض السيرات وذلك
بتصنيع كميات كبيرة من البولي بيريلين.

وقد جرى الترتص الكبير في هذه الصناعة بعد الحرب العالمية
الثانية لغزة الطلبة على الكيميايات وخاصة أن مساحة التدريجية
مثل الفحم وكربن كالكرسيم كانت محدودة إذا ما قررت بالبرموشول
الذي يتميز بسهولة نقله وتمثل نسبة الشونية في انتاج مصرف
وطفلا أما أوجهه هذا إلى تأثير الغازات الطبيعية وترتيب على هذه
العوامل ان تطورت كيمياء الإلنيفات والمثبطات والأنواع تطوير
سريعًا لحل ألغام الانتاجات الجديدة التي زادت الحاجة للبترول
زيادة مضطردة وخاصة في انتاج مواد البلاستيك والآليات الصناعية
والطوابصن الصناعي والنظقات الصناعية... الخ.
كذلك بلاحظ التطور السريع في عدد المنتجات البروكسيمية، حيث أصبحت طرق الإنتاج تتقدم بمغازه السرعة وحل الأسئلة حول الاستدامة في كثير من المنتجات، وقد أدى التنافس المنفي بين شركات الأنتاج العالمية إلى تطوير طرق جديدة للإنتاج ووحدات اكنا تساعدنا على تخفيف تأثيرها
الانتقائي.

فتشي إبراهيم

وفي هذه الحالة، نحن يجب أتباع أساليب خاصة في الزراعة والترفيه على هذه الخلاص ولقد وجد أن بعض الأدوات حول الجذور تساعدنا على الاستفادة من العناصر الغذائية والأساس السابع اضافته، ونشر ذلك على أساس تحسين الاتصال بين الذئب وال험ول الأرضي. هذا وتم ليكون لثاني الأثر الصارم لندن ماج الأرض على نمو الجذور بحد شبه مدى درجة طوية مناسبة ومنحدر هذه الطبقات المُدبة أو تكسيبها واستخدام نباتات ذات مجمع جذري شعري كبذور أخرى، وقيد نبات
يفضل تحريض مثل هذه الأذواق لدوات من البرم وتفحص خواصها.

Fertility الخصوبة

تؤثر الخصوبة ويرفع العناصر الغذائية بالأرض في نمو الجذور كما تظهر في نمو أجزاء النبات الأخرى، ويؤدي ضعف الخصوبة في الطبقات السطحية على عدم قدرة الجذور على التعميق حتى وإن كانت الظروف الطبيعية الأخرى بذلك، كما يؤدي التحسين في هذه الحالة إلى رفع قدرة الجذور التحريضية وبالتالي استفادة بها من المواد الغذائية والغذائية المناسبة للنضج، ويمكن للنباتات المتضئة بتسديدة الت Tiểu في الظروف الصعبة لمجرى بالطوان كأنراج الأرض إذ أن كُن لها اعتراق في هذه الطبقات مع زيادة الخصوبة.

من حيث استجابة نمو المجموع الجذري للعناصر الغذائية المختلفة، فلم يساند ذلك ما يستدعى من الرعاية علاوة على التحريض في الأزهار، ومع ما فان المجموع الشمسي للنباتات يتأثر بدرجة أخرى من مجموعة
الجذري.
تلعب وظائف التخزين واسترجاع البيانات دورًا هاماً في نظم الحاسبات الإلكترونية، وذلك بسبب العديد من وسائل التخزين المتاحة، لذا استخدم في تلك النظم، وانطلاقاً من أن تستخدم النشأة أو كيفية التخزين في الطاقة التطبيقية، بمجرد التفوري أن تعكس بعض من التخزين معلومات وسائل التخزين، واسترجاع البيانات لم يكن للفارق أن يفلح بين الأنواع المختلفة، ولكن كيف يمكن للحاسوب أن يوجد مرونة البيانات التي يتم تخصيصها في الذاكرة الرئيسية مثل 2 وكيف يمكن لوحدة التنظيم أن تنظم البيانات لتخزينها واسترجاعها في الوقت المناسب؟ وعمر الشكل المناسب 2 ماهي الوسائل المختلفة لتخزين الأجهزة الإلكترونية بالبيانات ولاسترجاع البيانات التي تم تخزينها ما هي أوجه النافذة بين أنواع ووسائل الدخول؟

هكذا هي أسئلة المناظرات التي قد تكون في ذهننا، عند هذه المرحلة من دراسة نظم الحاسبات الإلكترونية، لهذا تتضمن الناحية في هذا الفصل حول النظام الترجمة التالية:

- دراسة نماذج البيانات التي تشكّل الركيزة الأساسية لقاعدة البيانات في الوحدة التنظيمية، ووضع اهتمامنا هو نمط النماذج المعمول بها، والدراسة إعداد التصنيف الأنواعية في البيانات الإلكترونية
- دراسة التخزينات الفورية في الحاسبات الإلكترونية (أونلاين أو على الوسائط الرسالية أو غيرها)
- تفسير الكيفية التي يتم توجيه ودفع البيانات في الذاكرة، أي دراسة ما هي نماذج هيئة المحاسبة

الصيغة لأساليب تنظيم التخزين في الحاسبات الإلكترونية.
The Lead Acid Accumulator

The lead acid accumulator is composed of more lead plates, diluted sulfuric acid, and an active charge and discharge process. The plates are made of lead and lead oxide. The sulfuric acid solution is used to store electrical energy as an electrochemical reaction. When the accumulator is charged, the electrolyte is converted into lead sulfate, and when discharged, it changes back to lead dioxide and sulfuric acid. The active material in the plates is lead and lead dioxide, which undergoes a redox reaction to store and release energy.
كانت الجراحة - في بداية الأزمنة - عند الأطباء المسلمين تسمى "صيانة البد". ولم تكن طلعتها، حيث كانت من جملة صناعات الحجاج الذين يقومون بالقياس والقياس، ولكن عندما تقدم الطب الإسلامي، تقدمت معه الجراحة حتى وصلت أوجها على إليها بأعلى القسم الزهري في الأندلس في القرن العاشر الميلادي. في وقت لم شكل أيها تعرف عن الجراحة شيئاً، بلغ الأمر مسن تحفيز ثمانية الجراحة أخذت بها. في حين أن بعض الأطباء الفرنسيين وأخرى أخذوا قرأ كتاب الزهري وأعجب به، لم كتب أعجوبة الذي نشير فيه كل أطباء فرنسا بالمجلة والتاريخ.

وأشار أنه لا يوجد فيهم جراح واحد عم بمنحه، وبحث أن أجزاء الجراحات تحتاج لتخفير المصاب أو المبتخصوص بنجاح الأندلس، فقد قام الأطباء المسلمون الكثيرون في القراء والرسائل المبكرة لتخفيز المصاب، وقد استخدموا الأدوات في التشغيل بعد أن كان من سقيمة من الأطباء يستخدم، في الغرض من جراحة النيزك، ثم تجاوزوا هذه المرحلة ووصلوا إلى الإكثاف مزيد من النماذج المفيدة، ثم اكتسبوا لأول مرة في العالم طرقاً التخدير بالاستشراق، حيث كان الطبيب الأندلسي ابن زهر بعد معرفة بالاستشراق الذي كان يغوص دوماً بحريسة وشبة مثل الزوائد والأقمشة والكامل والسيكاز.

 Hannes مسورةً: 

ان الفقارة بأن تعرف اليوم من وظيفة التنفس وذلك من دون أن يتعزق في عنصل الكيمياء والفيزيولوجيا الدقيقة، ستتطرقنا على اصطالة صورة واضحة تعلم الإنسان عن فسيولوجيا التنفس، كما يشرح لنا ابن سينا...

يقول ابن سينا بعد عزوته لتشريح الزرة وأجزاء السددرة المتصقلة بها، ينتمي (جسم الوردة) إلى قسم ثم ينتمي إلى أقسام تخبر في الرئة مقارنة لشعب العروق القارية والمائية وبنيتها توزيعها إلى نومات في أشياء جدا من نومات ما بالشكل...
ثم يفسر ذلك بقوله، أما شغبها مع العرق السهلك فليأخذ منها الغذاء، وأما شغب نومها فلا يكون بقدر ما يخذ فيها التسمي إلى الهرابين المؤدية إلى القلب.

أو من الدورة الدموية القلبية الرئوية فيقول: أول ما ي одной من التجزيف الأيسر شرايين أحدها يأتي الرئة وينقص فيها باستنشاق النسيم وإياض الدم الذي يغمر الرئة إلى الرئة من القلب، وهو ذو طبقة واحدة بخلاف سائر الهرابين ولهذا يسمى الهرابين السوريد.

( ق. ٤٣٩٩ ) يقول من الزرب الذي يسمى بالباب، ينقص إلى قسم قمة بها يأتي القلب فإنه فيها منذ الهراب الأيمن.

وهذا الزرب يغمر من محاذاة القلب الذي لنا ثانيا تحصر منه إلى الرئة، ناتئاً من نبض الهرابين بقرب الأيسر، ثم هنا في التجزيف الأيمن إلى الرئة، وقد علق ذا نفسيين كالشرابين، فلهذا يسمى السوريد.

الشرابين... أما دور هذه العرق في وضعه في تول...
Appendix C  Texts used in Experimental Study

1. Narrative Text

**CONTROL GROUP TEXT**

There were two things which Annette had wanted very much to do ever since she had arrived. One was to carve her name on a wooden bust by Grinling Gibbons. It was in the common-room. There was something solemn and florid about this work. This made her itch for a blade. The wood was soft and inviting. However, she rejected this idea, because she had mislaid her pocket-knife. The other was to swing on the chandelier in the dining-room. She turned in that direction and bounded in. Tables and chairs stood by there, silent with disapproval. She looked at the thing which fascinated her and her heart beat violently. The thing seemed enormously high up and far away. It hung from a stout chain; she had noticed this carefully when she had studied it in the past. Annette had also remarked a strong metal bar, right in the centre of it, on which she had always planned to put her hands. All about and above it were suspended tiny drops of crystal. Each was glowing with a drop of pure light tinier still, as if a beautiful wave had been arrested in the act of breaking while the sun was shining on it. The girl had felt sure that if she could swing upon that thing the music which was hidden in them would break out into a great peal of bells. But now it seemed to be hard to get at.

In her imagination Annette had always reached her objective by a flying leap from the High Table; but she could see now that this was not a very practical idea. Grimly she began to pull one of the tables into the centre of the room. On top of that she placed one of the chairs. Then she began to climp up. By the time she was on the table she was already beginning to feel rather far away from the ground. Annette was afraid of heights. However, she mounted on to the chair. Here, by standing on tiptoe, she could get her hands over the metal thing. She paused breathlessly. Then with a quick movement she kicked the chair away and hung stiffly in mid-air.

She kept her feet neatly together and her toes pointed. Then she began to swing very gently to and from. The thing began to ring, not with a deafening peal but with a very high and sweet tinkling sound.

At that moment the door opened and Miss Walpole came in. Annette who was at the end of her swings, let go abruptly of the chandelier and, missing the table, fell to the floor with a crash at the lady's feet. The lady looked down at her with a silent frown. She was never sure which she disliked most, adolescent girls or small children; the latter made more noise, it was true. But they were often in the long run easier to handle.

**EXPERIMENTAL GROUP TEXT**

There were two things which Annette had wanted very much to do ever since she had arrived. One of these things was to carve her name on a wooden bust by Grinling Gibbons. The bust was in the
common-room. There was something solemn and florid about this bust. This solemn thing made her itch for a blade. The wood was soft and inviting. However, she rejected this idea of carving her name on the bust, because she had mislaid her pocket-knife. The other thing was to swing on the chandelier in the dining-room. Annette turned in the direction of the dining-room and bounded in. Tables and chairs stood by in the dining-room, silent with disapproval. She looked up at the chandelier which facetted her and her heart beat violently. The chandelier seemed enormously high up and far away. The chandelier hung from a stout chain; she had noticed that the chandelier hung from a stout chain when she had studied it in the past. She had also remarked a strong metal bar, right in the centre of the chandelier, on which she had always planned to put her hands. All about and above the bar were suspended tiny drops of crystal. Each drop of crystal was glowing with a drop of pure light tinier still, as if a beautiful wave had been arrested in the act of breaking while the sun was shining on it. Annette had felt sure that if she could swing upon the chandelier the music which was hidden in the drops would break out into a great peal of bells. But now it seemed to be hard to get at the chandelier.

In her imagination Annette had always reached her objective which was to swing on the chandelier by a flying leap from the High Table; but she could see now that flying from the table was not a practical idea. Grimly she began to pull one of the tables into the centre of the dining-room. On top of that table she placed one of the chairs. Then she began to climp up. By the time she was on the table she was already beginning to feel rather far away from the ground. Annette was afraid of heights. However, she mounted on to the chair. Standing on tiptoe on the chair, she could get her hands over the metal bar. She paused breathlessly. Then with a quick movement she kicked the chair away and hung stiffly in mid-air.

She kept her feet neatly together and her toes pointed. Then she began to swing very gently to and fro. The chandelier began to ring, not with a deafening peal but with a very high and sweet tinkling sound.

At that moment the door opened and Miss Walpole came in. Annette, who was at the end of her swings, let go abruptly of the chandelier and, missing the table, fell to the floor with a crash at the Miss Walpole's feet. Miss Walpole looked down at Annette with a silent frown. Miss Walpole was never sure which she disliked most, adolescent girls or small children; small children made more noise, it was true. But the children were often in the long run easier than adolescent girls to handle.
1. What was the first thing Annette wanted to do?
   a. to put the bust in the common-room
   b. to carve her name on the bust
   c. to carve the name of Gibbons on the bust
   d. to look for a blade.

2. Why did she want to do that?
   a. because there was something solemn about the bust
   b. because there was something solemn about the name 'Gibbons'
   c. because she had a sharp blade
   d. because the bust was soft and inviting

3. What made her change her mind?
   a. the blade was not sharp enough
   b. she hated 'Gibbons'
   c. she mislaid the blade
   d. she mislaid her pocket-knife.

4. What was the second thing she wanted to do?
   a. to swing in the common-room
   b. to swing on the chandelier
   c. to swing on the bust
   d. to wing in the dining-room

5. What fascinated her?
   a. the bust
   b. the tables and chairs
   c. the beating of her heart
   d. the chandelier

6. What was unusual about the chandelier?
   a. being high
   b. being in the dining-room
   c. being so far from the tables and chairs
   d. being far from the bust

7. Where did the crystal drops hang?
   a. around the chandelier
   b. around the chair
   c. around the dining-room
   d. around the bar
8. According to Annette, where was the music hidden?
   a. in the chandelier
   b. in the metal thing
   c. in the drops
   d. in the chain

9. How did she usually realize her aim?
   a. by swinging on the chandelier
   b. by jumping from the High Table
   c. by pulling one of the chairs
   d. by climbing on the bar

10. How did she reach the bar?
    a. by climbing from the chairs
    b. by climbing from the High Table
    c. by swinging on the chandelier
    d. by climbing up the bar

11. What began to ring as she swung?
    a. the doorbell
    b. the telephone
    c. the swing
    d. the chandelier

12. What did Annette do when Miss Walpole entered the room?
    a. she climbed higher on the chandelier
    b. she fell on the table
    c. she fell on Miss Walpole’s feet
    d. she missed the table

13. Who was not sure whether she disliked adolescent girls or children?
    a. Annette
    b. Annette’s little sister
    c. the lady
    d. Miss Walpole’s children.

14. Who made more noise?
    a. children
    b. adolescent girls
    c. Annette
    d. Miss Walpole
15. Who was eventually easier to handle?
   a. adolescent girls
   b. Annette
   c. the lady
   d. children
Electric Fish

The idea of a fish being able to generate electricity strong enough to light lamp bulbs or even to run a small electric motor is almost unbelievable. Several kinds are able to do so. Even more strangely, this has been acquired in different ways by fish belonging to very different families.

Perhaps the best known are the electric rays, the electric eel, and the electric catfish. Several kinds of the first, often called torpedoes, live in warm seas. They possess on each side of the head, behind the eyes, a large organ consisting of a number of hexagonal-shaped cells rather like a honeycomb. These are filled with a jelly-like substance, and contain a series of flat electric plates. The negative side of each is supplied with very fine nerves, connected with a main nerve coming from a special part of the brain. Current passes from the upper positive side of the organ downwards to the negative, lower one. Generally, it is necessary to touch the fish in two places, completing the circuit in order to receive a shock. Its strength depends on the size of the fish. Newly born ones only about 5 centimeters across can be made to light the bulb of a pocket flash light, for a few moments. On the other hand, a fully grown one gives a shock capable of knocking a man down, and, if suitable wires are connected, will operate a small electric motor for several minutes.

The second gives an even more powerful shock. The system is different from that of the torpedo in that the electric plates run longitudinally and are supplied with nerves from the spinal cord. Consequently, the current passes along the fish from head to tail. Their electric organs are really altered muscles and like all muscles are apt to tire; so they are not able to produce electricity for very long. People in some parts of South America, who value the fish as food, take advantage of this by driving horses into the water against which the fish discharge their electricity. Those are less affected than a man would be, and when the electric eels have exhausted themselves, they can be caught without danger.

The third which can be found in the Nile and in other African fresh waters has a different system again by which current passes over the whole body. The shock given by this arrangement is not so strong as the other two, but is nonetheless unpleasant. It is a slow, lazy fish, fond of gloomy places and grows to about 1 metre in length. The power of producing electricity may serve these fish both for defence and attack. If a large enemy attacks them, the shock will drive it away; but it appears that the second and the third use their current most often against smaller fish, stunning them so that they can be easily overpowered.
The idea of a fish being able to generate electricity strong enough to light lamp bulbs- or even to run a small electric motor- is almost unbelievable. Several kinds are able to generate this amount of electricity to light these lamp bulbs or run the small electric motor. Even more strangely, the power of generating electricity has been acquired in different ways by fish belonging to very different families.

Perhaps the best known fish are the electric rays, the electric eel, and the electric catfish. Several kinds of the electric rays, often called torpedoes, live in warm seas. The electric rays, or torpedoes, possess on each side of the head, behind the eyes, a large organ consisting of a number of hexagonal-shaped cells rather like a honeycomb. These cells are filled with a jelly-like substance, and they contain a series of flat electric plates. One side, the negative side of each, is supplied with very fine nerves, connected with a main nerve coming from a special part of the brain. Current passes from the upper, positive side of the organ downwards to the negative, lower side. Generally, it is necessary that the current touches the positive and the negative sides of the fish, completing the circuit, in order to receive a shock. The strength of this shock depends on the size of the fish. The shock of the newly born electric rays or torpedoes only about 5 centimeters across can be made to light the bulb of a pocket flash light, for a few moments. On the other hand, a fully grown electric ray or torpedo gives a shock capable of knocking a man down, and, if suitable wires are connected, fully grown torpedo will operate a small electric motor for several minutes.

The second kind of fish is the electric eel. This fish gives an even more powerful shock than the electric ray. The system of the electric eel is different from that of the torpedo in that the electric plates run longitudinally and are supplied with nerves from the spinal cord. Consequently, the current passes along the electric eel from head to tail. The electric organs of the electric eel are really altered muscles and like all muscles are apt to tire; so they are not able to produce electricity for very long. People in some parts of South America, who value the electric eel as food, take advantage of that fact that the electric eel do not produce electricity for very long by driving horses into the water against which the fish discharge their electricity. The horses are less affected than a man would be, and when the electric eel have exhausted themselves, they can be caught without danger.

The third kind is the catfish. The catfish can be found in the Nile and in other African fresh waters and its system is different from the electric rays, or torpedos, and the electric eels in that current passes over the whole body from tail to head. The shock given by this arrangement is not so strong as the electric ray and the electric eel. The electric catfish is a slow lazy fish, fond of gloomy places and grows to about 1 metre in length.

The power of producing electricity may serve these three kinds of fish both for defence and attack. If a large enemy attacks these fish, their shock will drive it away; but it appears that the catfish and the electric eel use their current most often against smaller fish, stunning them so that they can easily be overpowered.
Circle a, b, c or d which best answers the question

1. What are several kinds of fish able to do?
   a. to run electric motors
   b. to generate electricity
   c. to light lamp bulbs
   d. to swim skillfully

2. Torpedoes belong to:
   a. the electric eel
   b. the electric catfish
   c. the electric motors
   d. the electric ray

3. Where is the jelly-like substance found?
   a. in the electric plates
   b. in the electric rays
   c. in the eyes
   d. in the cells

4. How is the electric current generated?
   a. by passing from the positive side to the negative side of the organ.
   b. by passing through the fine nerves
   c. by passing from the main nerve downwards
   d. by passing from the honeycomb downwards

5. When does the fish receive a shock?
   a. when the current touches any two places in the fish
   b. when the current passes through the fine nerves
   c. when the current touches two fish
   d. when the current touches the positive and negative side of the fish

6. Whose shock is capable of knocking a man down?
   a. the shock of a newly-born torpedo
   b. the shock of a fully grown electric eel
   c. the shock of a fully grown electric ray
   d. the shock of a fully grown electric catfish

7. Which is capable of giving a more powerful shock?
   a. the electric ray
   b. the electric eel
   c. the electric catfish
   d. the fully grown torpedo
8. How are the systems of the electric eel and the torpedoes different?
   a. the plates of a torpedo run longitudinally and are connected with nerves from the spinal cord
   b. the plates of an eel run longitudinally and connected with nerves from the brain
   c. the plates of an eel run longitudinally and are connected with nerves from the spinal cord
   d. the plates of a torpedo run longitudinally and are filled with a jelly-like substance

9. Why are electric eels incapable of producing electricity for very long?
   a. because their electric organs tire
   b. because their electric current passes from head to tail
   c. because their muscles are not very strong
   d. because torpedoes attack them

10. What fact do some South Americans take advantage of?
    a. that the fish can be eaten
    b. that the fish scare horses
    c. that the fish can be caught easily
    d. that the fish do not produce electricity for very long

11. Why do South Americans use horses to discharge the fish's electricity?
    a. because they can run quickly
    b. because they can swim
    c. because they are less affected by electricity than man
    d. because they are less affected by electricity than the fish

12. Which fish live in the Nile?
    a. the electric ray
    b. the electric catfish
    c. the electric eel
    d. the torpedo

13. Whose shock is stronger than that of the third kind of fish?
    a. the electric ray's
    b. the electric eel's
    c. a. and b.
    d. the torpedo's

14. Which fish is slow and fond of gloomy places?
    a. the catfish
    b. the torpedo
    c. the eel
    d. the ray

305
15. Which fish use their current against smaller fish?
   
a. the catfish  
b. the eel  
c. a. and b.  
d. the eel and the ray.
CONTROL GROUP TEXT

The falcon and the hawk are long-winged birds of prey found in many parts of the world. The second is smaller and with rounded wings. Both feed on live prey which they kill by striking or catching in the air. If it is on the ground, they dive at it. They are generally considered to be the most perfectly developed of all birds, beautifully symmetrical in shape and incredibly fast in flight. They all have sharp, hooked peaks for tearing flesh, and wonderfully keen eyes. The legs are short but sturdy. These have large curved claws called talons. In almost all species the female is larger and the one used in falconry.

This is the pursuit of game by means of falcons. It has been popular in the Middle East, especially in Arabia, for over two thousand years. It was not only a pastime, but was a practical way of hunting small game before the development of firearms. The latter are, unfortunately, replacing it nowadays; and although a few people are still interested in this sport, it has virtually died out, and the new generations in Saudi Arabia and Kuwait actually know very little about it. This is one reason why it deserves special mention.

The training of the bird requires much care and patience, especially if it is caught while very young. In most parts of Arabia hunters prefer to catch it when it is fully grown. In Kuwait a special falcon-trapper called a taruh catches it. Briefly, this is how he captures one.

He hides in a hole in the sand that has a mud roof with several holes in it. Through these he can look out in all directions. Two ropes lead out of this dug-out: a thin rope and a thick one. To the end of the first a live pigeon is tied and hidden in a hole under a piece of canvas. The thicker one is attached to a special net-trap. A false bait of a few fluttering feathers attracts the attention of a hunting bird. The trapper then pulls the rope connected to the real bait, uncovering the pigeon and allowing it to fly. The wild, hungry bird does not give it time to fly high, but at once kills it and begins to eat its flesh. The taruh very slowly and carefully starts to pull the thin rope until both the bait and the hunting bird are under the net-trap. With one quick snap he pulls the thick one and the net falls over the bird.

Later, it is given a name and taught to answer the call. Most of the time it is hooded with a piece of leather, leaving an aperture for the peak, and it is trained to sit on the hand (usually gloved) and to eat from the lure. This is a piece of wood or leather covered with wings and feathers and attached to a cord. To this a piece of meat is fastened.

The trainer (or falconer) swings the device round and round his head, accompanying the action by some call. When it has been taught to obey the lure, it is trained to catch live birds. In Kuwait and many other parts of Arabia this is usually the bustard, or hubara.
The falcon and the hawk are long-winged birds of prey found in many parts of the world. The hawk is smaller and with rounded wings. The falcon and the hawk feed on live prey which they kill by striking or catching in the air. If the prey is on the ground, the falcon and the hawk dive at it. The falcon and the hawk are generally considered to be the most perfectly developed of all birds, beautifully symmetrical in shape and incredibly fast in flight. The falcon and hawk have sharp, hooked peaks for tearing flesh, and wonderfully keen eyes. The legs of the falcon and the hawk are short but sturdy. These legs have large curved claws called talons. In almost all species the female is larger than the male and it is the one used in falconry.

Falconry, or hawking, is the pursuit of game by means of falcons. Falconry has been popular in the Middle East, especially in Arabia, for over two thousand years. Falconry was not only a pastime, but was a practical way of hunting small game before the development of firearms. Firearms are, unfortunately, replacing falconry nowadays; and although a few people are still interested in falconry, it has virtually died out, and the new generations in Saudi Arabia and Kuwait actually know very little about falconry. This is one reason why falconry deserves special mention.

The training of falcons requires much care and patience, especially if the falcon is caught very young. In most parts of Arabia hunters prefer to catch falcons when they are fully grown. In Kuwait a special falcon-trapper called a taruh catches falcons. Briefly, this is how the taruh captures a falcon.

The hunter, or taruh, hides in the sand that has a mud roof with several holes in it. Through these holes the hunter can look out in all directions. Two ropes lead out of this hiding place: a thin rope and a thick rope. To the end of the thin rope a live pigeon is tied and hidden in a hole under a piece of canvas. The thicker rope is attached to a special net-trap. A false bait of a few fluttering feathers attracts the attention of a hunting falcon. The trapper then pulls the thin rope which is connected to the real bait, uncovering the pigeon and allowing it to fly. The wild, hungry falcon does not give the pigeon time to fly high, but at once kills it and begins to eat its flesh. The hunter, or taruh very slowly and carefully starts to pull the thin rope until the pigeon and the hunting falcon are under the net-trap. With one quick snap he pulls the thick rope and the net-trap falls over the falcon.

Later, the falcon is given a name and taught to answer the call. Most of the time the falcon is hooded with a piece of leather, leaving an aperture for the peak, and the falcon is trained to sit on the hand (usually gloved) and to eat from the lure. The lure is a device made of wood or leather covered with wings and feathers of a bird and attached to a cord. To this cord a piece of meat is fastened.

The trainer (or falconer) swings the lure, or device round and round his head, accompanying the action by some call. When the falcon has been taught to obey the lure, it is trained to catch live birds. In Kuwait and many other parts of Arabia, the bird to be caught is usually the bustard, or hubara.
Circle a, b, c or d which best answers the question

1. How are the falcon and the hawk different?
   a. the falcon is smaller and has rounded wings
   b. the hawk is smaller and has rounded wings
   c. the falcon has longer wings
   d. they are not different

2. Which strikes and catches live prey in the air?
   a. the falcon
   b. the hawk
   c. a and b
   d. round-winged birds

3. Whose female is larger than the male?
   a. the falcon
   b. the hawk
   c. the prey
   d. the round-winged birds

4. Where are the falcons?
   a. on the peaks
   b. on the eyes
   c. on the legs
   d. on the claws

5. What is falconry?
   a. hunting by falcons
   b. hunting hawks
   c. hunting by game
   d. hunting falcons

6. What was the favourite pastime in Arabia before firearms?
   a. hunting falcons
   b. hunting games
   c. hunting hawks
   d. hunting long-winged birds

7. What is replacing falconry nowadays?
   a. hawks
   b. games
   c. falcons
   d. firearms
8. Why does falconry deserve special mention?
   a. because it died out
   b. because the new generations in Arabia are still interested in it.
   c. because the new generations do not know much about it
   d. because it is replaced by firearms

9. What does a taruh catch?
   a. a fully grown falcon
   b. a fully grown game
   c. a fully grown hawk
   d. a fully grown bird

10. How can a taruh look in all directions?
    a. through the hole where he hides
    b. through the mud
    c. through the holes in the roof
    d. through the roof

11. Where is the live pigeon tied?
    a. to the end of the thin rope
    b. to the end of the thick rope
    c. to the end of the piece of canvas
    d. to the end of the dug-out

12. Whose attention do the fluttering feathers attract?
    a. the taruh's
    b. the pigeon's
    c. the falcon's
    d. the bird's

13. What is given a name and taught to answer the call?
    a. the taruh
    b. the bird
    c. the game
    d. the falcon

14. What is a lure?
    a. the real bait
    b. the piece of cord
    c. the piece of wood
    d. the piece of meat

15. What does the taruh swing round his head?
    a. the falcon
    b. the lure
    c. the real bait
    d. the cord
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321


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