THE ROLE OF LEXICAL COHESION IN L2 READING COMPREHENSION

A THESIS SUBMITTED TO
THE GRADUATE SCHOOL OF SOCIAL SCIENCES
OF
MIDDLE EAST TECHNICAL UNIVERSITY

BY

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IN PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR
THE DEGREE OF DOCTOR OF PHILOSOPHY
IN
THE DEPARTMENT OF FOREIGN LANGUAGE EDUCATION

APRIL 2011

Approval of the Graduate School of Social Sciences

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ABSTRACT

THE ROLE OF LEXICAL COHESION IN
L2 READING COMPREHENSION

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April 2011, 227 pages

This study aimed at discovering the role of lexical cohesive links in L2 reading comprehension. For this purpose, the researcher carried out lexical cohesion analysis of two TOEFL reading tests consisting of six texts. First, prior to the reading comprehension tests, the students were administered "a vocabulary familiarity task". Second, the TOEFL reading tests were administered to fifty upper-intermediate and advanced level EFL students at Middle East Technical University, Ankara, Turkey. Third, after each test, a post-reading "Lexical links recognition task" was given. Finally, the data were analyzed comparing reader performance on each item, both within and across the groups. The researcher analyzed the reading test results besides the results of the accompanying lexical cohesive links tasks to see if there is a "significant relationship" between the three factors: vocabulary knowledge, reading comprehension level and recognition of lexical cohesive links. The results have indicated that awareness of lexical cohesive links noticeably contributes to reading test scores in L2 and that recognition-level vocabulary knowledge alone may not guarantee better reading comprehension scores. Finally, it is suggested that reading and writing teachers can develop some pedagogic exercises to teach lexical cohesive devices and in this way improve students' knowledge of lexical cohesive sub-types, thus enhancing their reading performance.

Keywords: L2 reading, Lexical Cohesion, Lexical Cohesive Links

ÖZ

KELİMELER ARASI SEMANTİK BAĞLANTILARIN(SÖZCÜKSEL BAĞDAŞIKLIK) YABANCI DİLDE OKUMA ÜZERİNDEKİ ETKİSİ

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Doktora, Yabancı Diller Eğitimi Bölümü

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Nisan 2011, 227 sayfa

Bu çalışmanın amacı, yabancı dilde okuduğunu anlama sürecinde; kelimeler arası semantik bağlantıları(sözcüksel bağdaşıklık) farkedebilme yeteneğinin metni anlama yeteneği üzerindeki etkisini araştırmaktır. Bu amaçla, araştırmacı TOEFL sınavından 6 farklı metinden oluşan 2 adet test seçerek okuma parçalarının ve soruların metin analizini yapmış ve kelimeler arası semantik bağlantıları çözümlemiştir. İlk olarak, metindeki kelimelerin bilinirliğini tespit etmek üzere "Okuma Öncesi Kelime Tanıma Testi" orta-ileri ve ileri düzeyde İngilizce bilgisine sahip 50 öğrenci üzerinde uygulanmıştır. İkinci basamak olarak ise bu 2 okuma testi aynı grup öğrencilere uygulanmıştır. Bu okuma sınavı sonrası ise metin analizi sırasında ilişkili olduğu tespit edilen kelimeler arasındaki bağlantıları öğrencilerin farkedip etmediklerini bulmaya yarayan bir "kelimeler arası semantik bağlantılar farkındalık testi" uygulanmıştır. Böylelikle araştırmacı bir öğrencinin okuma yetenegi, kelime bilgisi ve kelimeler arası bağlantıların farkedilmesi etkenleri arasında kayda değer bir etkileşim olup olmadığını incelemiştir. Bulunan sonuçlara göre, kelimeler arasındaki bağlantıların farkında olma, okuma becerisini doğrudan etkilemektedir ve tanıma düzeyinde kelime bilgisine sahip olmak okuma testlerinde yüksek puan alabilmeyi garanti edememektedir. Eğitsel bir öneri olarak, yabanci dilde okuma ve yazma okutmanlarının öğrencilerine kelimeler arası bağlantılar hakkında farkındalıklarını artırıcı etkinlikler sunmaları ve böylelikle de öğrencilerin okuma becerilerini geliştirmeleri önerilmektedir.

Anahtar Kelimeler: Yabancı Dilde Okuma Becerileri, Sözcüksel Bağdaşıklık, Kelimeler Arası Semantik Bağlantılar

To

My wife, Nuray, and our son, Kağan

ACKNOWLEDGMENTS

There are many people to whom I would like to express my gratitude during my doctoral work.

First of all, my deepest appreciation would go to my supervisor, Prof. Dr. Hüsnü Enginarlar, for his linguistic expertise, his experience in research design and language testing, as well as his kind assistance and valuable comments. I greatly appreciate his insightful and timely supervision at various stages of the dissertation process.

I am also indebted to the members of my doctoral committee Assoc. Prof. Dr. Joshua Bear, Prof. Dr. Gulsev Pakkan, Assoc. Prof. Dr. Paşa Tevfik Cephe, Assist. Prof. Dr. Çiğdem Sağın Şimşek and finally Assist. Prof. Dr. Bilal Kırkıcı, who took part in the thesis follow-up committee and provided priceless feedback, for their valuable comments and suggestions throughout the study.

My grateful thanks go to the instructors and the staff in the METU School of Foreign Languages, for their cooperation and their kind help.

My special gratitude goes to my dearest friends Deniz Şalli Çopur and Mustafa Kurt, who have supported me spiritually all along the way. My special thanks also go to my friends in the department, who always encouraged me and helped me when I was in difficulties.

I would express my deepest thanks to my family: my mother and father, my father-in-law and mother-in-law, for their emotional support and encouragement.

Last but not the least, I would like to express my heartfelt and utmost appreciation to my wife and my son, who have always been there to cheer me up and provide me with their generous help and moral support in different aspects.

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Cohesion:

Cohesion may be crudely defined as the way certain words or grammatical features of a sentence can connect that sentence to its predecessors (and successors) in a text (Hoey 1991, p.3). A text is in part organized, in part created, by the presence in each sentence of these elements that require the reader to look to the surrounding sentences for their interpretation.

In Halliday and Hasan's (1976: 4) influential work Cohesion in English, the authors explain that cohesion is a semantic concept, referring to meaning relations in text. They state that 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. Cohesion occurs where the interpretation of some element in the discourse is dependent on that of another. For Halliday and Hasan, the organization of text (which they term texture) is made up (in large part) of relationships amongst items in the text, some semantic, some grammatical, which they refer to as cohesive ties.

They divide cohesion into two broad areas: grammatical cohesion and lexical cohesion. The former includes reference (for example *three blind mice . . . they*), substitution (for example *My axe is too blunt. I must get a sharper one*.), ellipsis (for example *Which hat will you wear? This is the best*.), and conjunction (for example use of the words but, yet, so, etc.).

Grammatical Cohesion:

Grammatical cohesion is the typically much larger inventory of connectors which link clauses in discourse, referred to as conjunction**.** For Halliday and Hasan (1976) this resource comprises linkers which connect sentences to each other, but excludes coordinating and subordinating linkers within sentences, which are considered structural by Halliday. Gutwinski, however, includes all connectors,

whether or not they link clauses within or between sentences. This difference reflects in part a territorial dispute over how much work the grammar is expected to do in discourse analysis.

Lexical cohesion:

Lexical cohesion refers to the connections of vocabulary in a text formed by the use of repetition, synonyms, antonyms, superordinates/hyponyms, related words (Salkie 1995:28–31), and/or text-structuring words (Carter and McCarthy 1988:206–210; Winter, 1978).

Lexical Cohesive Links (Lexical Repetition):

In his book *Patterns of Lexis in Text*, Hoey (1991) claims that special textual patterns, or a set of repetitions, synonyms or near-synonyms of certain groups of words in the text, which he names 'link[s]' (Hoey 1991, p.51) and 'bond[s]' (Hoey 1991, p.265) can be seen in non-narrative English texts. A link is established when a word in a sentence is repeated later or paraphrased in another sentence. A bond, on the other hand, is a "connection that exists between a pair of sentences" (Hoey, 1991, p.265), where the sentences share three or more links.

Hoey (1991) claims that lexical links are an important characteristic of coherent texts and contribute significantly to the creation and organization of text. Hoey (1991, 1994) classifies lexical cohesion into the following categories: simple lexical repetition (e.g. *a bear—bears*); complex lexical repetition (e.g. *a drug—drugging*); simple paraphrase (e.g. *to sedate—to drug*); complex paraphrase (e.g. *heat—cold*); superordinate, hyponymic (*bears—animals*), and co-reference repetition (e.g. *Mrs. Thatcher—The Prime Minister*); membership of a closed (lexical) set (e.g. *March—April*); personal pronouns (e.g. *canal—it*); deixis, i.e. demonstrative pronouns (*the works of Plato and Aristotle—these writers*); ellipsis (*a work of art—the work*); substitution (*tennis balls—ones*).

Hoey (1991) analyses the different types of lexical and non-lexical repetition in non-narrative texts. According to him cohesion is to a great extent the product of lexical relations rather than grammatical ones. He describes the different types of lexical repetition, and under this heading he includes the following: simple lexical

repetition, complex lexical repetition, simple paraphrase, complex paraphrase, superordinate, hyponymic and coreference repetition and other non-lexical ways of repeating. Only open-set lexical items should be considered repetitions in this kind of analysis. Grammatical items are not considered as lexical cohesive links although they can and do play a role in the overall cohesion of a text.

Discourse analysis:

Discourse analysis is the study of how stretches of language used in communication assume meaning, purpose and unity for their users: the quality of coherence. There is now a general consensus that coherence does not derive solely from the linguistic forms and propositional content of a text, though these may contribute to it. Coherence derives from an interaction of text with given participants, and is thus not an absolute property, but relative to context. Context includes participants' knowledge and perception of paralanguage, other texts, the situation, the culture, the world in general and the role, intentions and relationships of participants. Early attempts to find linguistic rules operating across sentence boundaries, or to create text grammars specifying rules for generating possible sequences of propositions, have generally been replaced or supplemented by theories and techniques allowing the examination of text in context.

The study of cohesive devices, the overt textual signals of semantic and pragmatic links between clauses, is usually considered an element of discourse analysis. Cohesive devices include such features as pronouns, ellipsis and conjunctions. Taxonomies of cohesive devices and discussion of their role in creating cohesion can be found in Quirk and others (1985, p. 1423) and Halliday (1985, pp. 287-314). Knowing how cohesive devices function in a given language, and being able both to understand and use them appropriately, is an important but until recently neglected element in language learning.

Discourse Competence:

Discourse competence involves the knowledge of written discourse features such as markers, cohesion and coherence as well as formal schemata (i.e., knowledge

of how different discourse types are organized) with reference to the particular communicative goal and context of the written text. In other words, if readers are to be able to interpret a written piece of discourse, they need to understand how discourse features are used and why, as well as to relate them to the purposes and contextual features of the particular text. Thus, during the process of interpreting a given text at the discourse level, the reader plays an active role in which knowledge activation of other components of the proposed model (namely, linguistic, pragmatic, intercultural and strategic competencies) is necessary to develop overall communicative ability when reading a piece of text.

Lexico-grammatical Ability:

Lexico-grammar approach views lexicon and grammar as two inherently connected parts of a single entity, challenging the traditional "wisdom of postulating separate domains of lexis and syntax" (Sinclair, 1991, p. 104). In this view, "a grammatical structure may be lexically restricted" (Francis, 1993, p. 142) and, conversely, lexical items are often grammatical in nature, for the use of a lexical item often has grammatical implications (Biber, Conrad, & Reppen, 1998; Conrad, 2000; Hunston & Francis, 2000). Many corpus studies have exhibited this close lexical and grammatical connection (Biber et al., 1998; Biber, Johansson, Leech, Conrad, & Finegan, 1999; Francis, Hunston, & Manning, 1996, 1998; Hunston & Francis). There also has been increasing evidence in applied linguistics showing the importance of contextual patterns in language use and learning (Hunston & Francis, 1998). In light of these findings, many scholars have argued for the use of a lexicogrammatical approach in language instruction (Aston, 2001; Clear, 2000; Schmitt, 2004, 2005; Sinclair, 1991). They base their argument on the fact that:

> insofar as different words appear to have distinctive collocational, colligational, semantic, pragmatic and generic associations, . . . every word may have its own grammar in these respects, a grammar which can only be acquired through experience of its typical contextual patternings. (Aston, p. 15)

It thus follows that vocabulary learning and grammar learning often take place simultaneously and that the teaching of the two should be conducted jointly.

CHAPTER 1

INTRODUCTION

1.1 Background to the Study

Although research in the field of L2 reading has come a long way in finding answers to problems and deficiencies of L2 readers, scores in the reading sections of proficiency tests or other high-stake entrance examinations in L2 indicate, as some second language readers also admit, that many L2 readers still continue to experience problems while reading authentic texts, in spite of their knowledge of grammar and vocabulary. What this hints at is the claim that mastering individual grammar structures and word meanings seems to be of only limited help in the process of making sense out of a real text: what is necessary could be the ability to see how words in a text combine to create texture, or web of ideas. After briefly visiting recent research findings and a variety of reading theories and models, sometimes with specific references to lexical cohesive links, this hypothesis will be discussed in greater detail before the research design is introduced.

A good reading proficiency is a vital quality for learners studying English for academic and occupational purposes and many curricula, even in L2 settings, therefore, assign large amounts of time to intensive and extensive reading lessons in order to promote such competence (Tomlinson, 1990; Dzau, 1990, for example). Yet despite years of instruction and practice in reading skills, many learners have difficulty in making sense of texts they want to read, and the Turkish context is no exception. Several writers have suggested (Cook, 1989; Grellet, 1981; Mackay, 1979; Nuttall, 1982) and some have demonstrated (Connor & Johns, 1990) that one of the reasons for this is the failure to interpret the writer's “cohesive signals” as intended and so to understand correctly the functional value of individual sentences and thus their relationship to each other and the whole. There are a number of possible reasons for this: lack of practice in applying "grammatical" knowledge when reading; lack of practice with texts containing a variety of cohesive features; the tradition of teaching such features as part of the grammatical system and practicing them in isolation and at single sentence level in grammar and/or writing lessons; lack of text attack skills generally.

In the TOEFL® monograph *TOEFL 2000 Reading Framework: A Working Paper,* Enright et al. (2000) outline three main points of view for understanding the nature of reading comprehension: the task perspective, the processing perspective, and the reader purpose perspective. In reviewing these three perspectives, Enright and Schedl (2000), in their ETS report *Reading for a Reason: Using Reader Purpose to Guide Test Design*, consider the reader purpose perspective, which "describes reading in terms of the coordinated application of knowledge and processes to a text or texts in the service of a goal or purpose," as representing the best model for assessment design (p. 4).

The reader purpose perspective admits that the reading process is very much an individual, cognitive process—what Bernhardt (1991) has called "an intrapersonal problem-solving task" (p. 6). From this perspective, task-dependent features as well as reader's knowledge and personal capabilities play a role in the extent of reading success. Performance variation in reading comprehension occurs due, to a large extent, to individual differences in linguistic knowledge and general and domain-specific background knowledge. The use of linguistic knowledge, often referred to as *bottom-up skills*, includes the ability to decode phonological, orthographic, lexical, syntactic, and discourse features of a text (Birch, 2002). There is little question that many struggling readers are lacking in bottom-up abilities such as rapid, automatic word recognition. General and domain-specific background knowledge, often referred to as *top-down skills*, represents the content, social, and implicit knowledge that readers bring to a text (Bernhardt, 1991).

Although linguistic and background knowledge seem to be major sources for individual differences in reading skills, there are clearly numerous other variables (of unequal and variable importance) that can have an effect on how first-language (L1) readers go about trying to understand an academic text and how successful those efforts will be. Enright et al. (2000) assert that these variables involve: cognitive abilities for language-processing, text type (e.g., expository vs. narrative), reading task, strategy use, affect (e.g., motivation, anxiety), topic, and L1, among others. It is the close interaction between all these variables that determine how individual readers perform on certain reading tasks as they strive to achieve a particular goal or purpose.

Another crucial point which is at work during reading comprehension is the manipulation of vocabulary knowledge: What do readers do when they face

unknown words during the comprehension process? How do they deal with the less common words they have not been familiar earlier? Here the question boils down to what it actually means to know a word. Many researchers have attempted to characterize the multi-dimensional aspects of what is involved in knowing a word and how this knowledge is in fact used during the reading process. Richards (1976) was one of the first to try to define what knowing a word means. He identified seven aspects of word knowledge (e.g. syntactic behavior, associations, semantic value, different meanings, underlying form and derivations).The multi-dimensional model for word knowledge he described has also been used in describing the learning of L2 vocabulary (Read, 2000). According to Richard's descriptions, knowing a word involves more than simply memorizing its form and meaning(s). According his early work, a knowing a word means knowing:

- The probability of encountering that word in speech or print
- The limitations on the use of the word
- The syntactic behavior associated with the word
- The underlying form of a word and its derivations
- The network associations between that word and other words in the language
- The semantic value of a word
- Many of the different meanings associated with the word

Nation (1990) identified eight types of word knowledge (e.g. form, grammatical pattern, meaning, function, relation with other words), which were specified both for receptive and productive knowledge. Chapelle (1998) claimed that a definition of word knowledge should contain at least four aspects: (a) vocabulary size, (b) knowledge of word characteristics, (c) lexicon organization, and (d) processes of lexical access. According to Hulstijn (1998), a lexical item in literate adult native speakers' lexicons consists of "semantic, pragmatic, stylistic, collocational, syntactic, categorical, morphological, phonological, articulatory, and orthographic features" (p.1). Henrickson (1999) says that knowing a word involves learning different intentional and sense relations to other words such as paradigmatic relations, antonomy, synonymy, hyponymy, and gradation. Her findings point at the importance of raising awareness of the students in recognizing the lexical cohesive relations among the words in a text. From the above mentioned studies, it is clear that an in-depth or full vocabulary knowledge should help readers

better comprehend a text. By the same token, any deficiency in one of these dimensions may cause failure in the accuracy of the comprehension.

Many research studies have pointed at the importance of the role that cohesive links play in the comprehension of a text (Bridge & Winograd, 1982; Chapman, 1982; Rogers, 1974; Staddord, 1991; Nunan, 1993, Nunan, 2004; McCarthy, 1991, Wang, 1998, as cited in Yeh, et al., 2010). Nunan (1993) stresses the fact that the ability to recognize the cohesive links across sentences is crucial for students to comprehend a text. When the sequence of sentences are mixed or altered, the meaning of the text is surely distorted or even radically changed. According to the results of Bensoussan and Laufer's study (1984), the main difficulty in reading that English as a Second Language (ESL) or English as a Foreign Language (EFL) university students encountered was their inability in identifying the connections among the sentences in a text. Along the same line of research, Chu, Swaffar, and Charney (2002) found out that most Taiwanese EFL students were found to be less aware of cohesive links when reading English texts, as they occur less often in Chinese. In other words, Taiwanese EFL students rarely use cohesive devices for integrating textual information (Chen, 2003; Sharp, 2003, as cited in Yeh, et al, 2010). Their difficulty in identifying cohesive ties and finding out the relationships among these devices in a text lowers their English proficiency.

Olshtain and Celce-Murcia (2001), in *The Handbook of Discourse Analysis*, also state that

> …. cohesion is realized linguistically by devices and ties which are elements or units of language used to form the larger text. Since cohesion relies heavily on grammatical and lexical devices, deficiencies in the reader's linguistic competence may cause the reader to miss important cohesive links and, as a result, to have difficulties in the interpretation process. The language learner needs to develop good strategies of combining linguistic knowledge with the other types of knowledge in order to apply them all simultaneously in the interpretation or "comprehension and text-decoding" process.

Many studies on first (L1) and second language (L2) acquisition have shown a strong relationship between cohesion, in general, and reading comprehension. In a study with 1355 children, ages 8, 10, and 13, Chapman (1982) found that children's perception of cohesion was a significant element in reading comprehension in L1. Another study by Hadley (1987) found a strong relationship

between elementary school children's understanding of specific cohesive items and general reading comprehension ability. In L2 research, results of a study by Bensoussan (1984) showed that difficulties in processing reading texts by ESL college students are not limited to lexical items but are related to connections between ideas in sentences and paragraphs.

Furthermore, the relationship between reading comprehension in L1 and L2 and processing of specific cohesive ties, such as anaphora has been investigated by many researchers. Anaphoric expressions (pronouns) were found to interfere with the reading comprehension of eighth-grade students (Gottsdanker-Willekens, 1981, as cited in Al-Jarf, 2001). In L2 research, Berkemeyer (1994, as cited in Al-Jarf, 2001) found a positive relationship between the ability to resolve anaphoric references and text comprehension for readers of German as second language. A study by Demel (1990) examined the relationship between overall reading comprehension and comprehension of coreferential ties for ESL readers and native speaking students. Results indicated that misunderstanding of co-referential ties by both ESL and native speaking students reflected a misunderstanding of the descriptive phrases to which the pronouns referred.

The main study which triggered the present study was carried out by Macmillan (2007). She has argued that lexical cohesion plays a fundamental role in the concept of reading reflected on a widely accepted English proficiency test, the Test of English as a Foreign language (TOEFL®). Macmillan (2007) proposes a framework for classifying multiple choice reading comprehension items by analyzing the link between the task and the source text in terms of lexical cohesion. She posits a typology of links ranging from simple repetition (where the same word forms occur in text and task) to complex relations involving synonymy, hyponymy and ellipsis. Results stemming from the lexical cohesive analysis of a corpus of 608 fixed-response TOEFL® reading comprehension test items indicate that all question types on the test involve the identification of different instances of lexical repetition, or 'lexical links' (Hoey, 1991), connecting question stems and/or correct options to specific sentences in the related passages. Equivalent results found for TOEFL ® PBT (paper-based test), CBT (computer-based test), and IBT (internet-based test) items suggest that lexical links are observed across different versions of the test, even though these editions may, in certain instances, test certain reading skills by means of different question types. Macmillan has proved that there are

always lexical links that connect the texts with correct options and the question stems. From this finding, it was hypothesized by the researcher that awareness of these lexical cohesive links should significantly increase a reader's reading test performance.

Considering that sentences central to the topic of a text are likely to contain a larger number of lexical links (Hoey, 1991), awareness of lexical connections that contribute to the cohesiveness of the text should help students recognize the links between the concepts and identify important information in the text. A more cohesive representation of a text is expected to make discourse comprehension easier for readers, enabling them to redirect their attention resources to unfamiliar words in the text, which again should promote vocabulary development. In other words, identifying the lexical cohesive links in the text may facilitate not only learning of items reiterated by the author, but also implicit learning of novel words in the text.

The concept of lexical cohesion put forth by Halliday and Hasan (1976) and Bloor and Bloor (1995) can be effective pedagogical tools to demonstrate the relevance of the cohesive elements that are present in texts which contribute to the overall meaning of the text. A text is not simply a haphazard collection of sentences but a unified whole. As we read a text, we are aware that the sentences do not stand on their own and do not sound logical unless they are related to sentences surrounding them. There are referential elements that give text that unity. Thus, understanding how cohesion functions within text to create semantic links could be beneficial to students of English as a second or foreign language to help "decode" meaning. From an instructional point of view, this could mean that readers should learn to pay close attention to and rapidly recognize the lexical cohesive devices to be able to answer reading comprehension questions.

As a teacher of L2 reading for ten years, the researcher himself has also frequently observed that readers of English as a foreign language might know meanings of almost all the words in a text and can recognize the grammatical structures used, but still may not figure out the real intention of an author or cannot differentiate the main idea from the supportive statements, or at times they cannot see the overarching pattern in a text. Some may not even recognize the relationship between two consecutive paragraphs. They are not good at linking semantically related lexical elements. (Bayraktar, 2005). This suggests that there should be some

other variables to be explored and studies if L2 reading instructors are to get a better view of the reading difficulties of their EFL/ESL students.

If a reader's low performance does not only stem from his/her imperfect knowledge of grammar or the lexicon, then, whether awareness of lexical cohesive links contributes to text comprehension should be the focus of a research study. The hypothesis driving the present study ahead is that a sound knowledge of lexical cohesive links and the ability to identify or recognize these lexical devices may significantly contribute to a reader's performance in reading authentic texts.

This study builds on the assumption that readers' increased awareness of lexical repetition that exploits lexical links in the text can make a discernible increase in reading comprehension test scores in the TOEFL and other multiple choice tests of reading. The results of the current study, triggered by the above mentioned research studies, might help reading professionals and teachers develop the student's ability to interpret lexical cohesive links better, thus increase their performance in tests of reading comprehension.

1.2 Purpose and Scope of the Study

It has been known for long that "reading is characterized by active engagement through which meaning is created" (Zamel, 1992, p. 463). Most foreign language reading experts also view reading as an "interactive language process" focused on comprehension rather than on a set of sub-skills learned in isolation with decoding as the focus. The readers go into an interaction with the text to create a new meaning (Bernhardt, 1986; Carrell, Devine, and Eskey, 1988; Rumelhart, 1977, as cited in Barnett, 1989). Barnett (1988) adds that the level of comprehension of the text is influenced by how successfully the readers (their preexisting knowledge of the text, their interest in it, their purpose for reading it, and their foreign language abilities) interact with the text (the text type, the grammar, and the vocabulary). For L2 readers, who have been reading for long in the target language and have been familiar with text types, topics, textual patterns and the relevant literacy skills in L2, reading is dominated by more top-down processes, unless there is a perceived comprehension problem. However, with less experienced L2 readers, the process is less smooth: they usually look for concrete linguistic cues or devices that guide them during the comprehension process.

Whether in a person's native language or in a second language, this interactive process accommodates three different kinds of interaction. The first

interaction occurs on a linguistic level; linguistic elements (words, phrases, and sentences) in a discourse or text interact with each other to create textuality (Halliday and Hasan, 1976). The second interaction takes place on a cognitive level within the reader's mind. A successful comprehension of a text requires the interaction between bottom-up processing and top-down processing (Eskey, 1988) or between linguistic knowledge and background knowledge (Grabe and Stoller, 2002). The third interaction takes place on an interpretative level between the reader and a text (Nuttall, 1996, p. 129), or ultimately between the reader and the writer through a text. Taking university level Turkish EFL students as the subjects for experimentation, the present study focuses on lexical cohesive links as comprehension facilitators during this kind of interactive reading, and aims to examine how the proper processing of these lexical cohesive links may influence the accurate comprehension of a text by the reader. This may, in turn, have implications for the teaching of reading.

To put it differently, this doctoral thesis aims at discovering whether a sound knowledge of lexical cohesive links and the ability to identify or recognize the lexical cohesive devices during reading comprehension contributes to a reader's performance in reading authentic texts. With this study, the researcher plans to test the claim that a reader's low performance not only stems from his/her imperfect knowledge of grammar or the lexicon, but also fro lack of awareness of how lexical cohesive items contributes to texture. If the claim is proved to be correct, from an instructional point of view, this may mean that readers should be taught to pay close attention to and rapidly recognize the lexical cohesive devices to be able to answer reading comprehension questions.

1.3 Research Questions

During the course of this study, the following research questions were investigated:

1. Is there a statistically significant correlation between the number of cohesive links correctly recognized and the reading comprehension scores in the TOEFL test?
2. Does awareness of lexical cohesive links contribute to L2 reading comprehension during a reading test? If so, to what extent?
3. Does vocabulary knowledge [at recognition level] guarantee that L2 readers will recognize the "lexical cohesive links" in L2 texts during a reading comprehension

test? In other words, does L2 readers' knowledge of vocabulary items in a text facilitate their recognition of lexical cohesive links?

4. Is there any statistically significant difference between upper-intermediate and advanced level groups in recognizing lexical cohesive links?

5. Which types of comprehension questions are more challenging for the readers?

6. What are the factors that result in failure in the comprehension questions that are more challenging for L2 readers?

1.4 Significance of the Study

The present study might yield results which may have implications for both practical test-solving skills and pedagogical techniques in the field of L2 reading. Students who are intending to take high-stake examinations such as TOEFL, KPDS (English Language Test for Turkish State Employees) and UDS (English Language Test for Turkish Academicians) might find the implications of the study useful and inspiring to get higher scores on these tests.

On the other hand, material developers might get some relevant ideas as to how to develop appropriate teaching materials containing lexical cohesive devices for different proficiency levels and different linguistic backgrounds because production of suitable teaching materials is an important part of every teaching program. They can also use these devices in designing specific reading activities and exercises.

Finally, English teachers also can use these lexical cohesive devices as part of their classroom practices and teach them to their students and explain how lexical cohesive links add to the cohesion of texts. This might help students understand the text better because awareness of cohesive devices is claimed to have a positive effect on reading comprehension.

CHAPTER 2

REVIEW OF LITERATURE AND RATIONALE FOR THE STUDY

2.0. Overview of the Chapter

This chapter will first present a general historical development of the reading comprehension research, from past to the present day. Second, the role of vocabulary knowledge in L2 reading comprehension will be discussed through some sample studies carried out earlier. Third, "lexical inferencing" and readers' awareness of contextual clues will be dealt with briefly. Fourth, the concepts of cohesion and coherence will be discussed in relation to the process of reading comprehension. Fifth, the role of lexical cohesive links in L2 reading comprehension will be examined, which will include a discussion of the nature of lexical cohesive links accompanied by sample analyses of texts. Sixth, the issues of testing academic reading comprehension in the well-known TOEFL test will be examined and the last, reading comprehension question types employed in the reading section of the TOEFL will be presented briefly.

2.1. A Historical Look on L2 Reading Research and the Theoretical Models of the L2 reading Process

Since the history of language learning has had an enormous influence on how "reading as a language skill" has been viewed over the past decades, the task of describing trends in the learning and teaching of reading in L2 can be accomplished by placing the ability to read in L2 within each of the three main approaches to language learning, as described in Usó-Juan and Martínez-Flor (2006), namely those of the environmentalist, the innatist and the interactionist approaches.

Reading within an environmentalist approach:

Until the end of the 1960s, the disciplines involved in language learning were dominated by environmentalist ideas that ignored thoughts about the workings of the human mind and concentrated only on observable phenomena outside the person. Moreover, modeling and practicing the correct structures time after time were highly frequent.

Under such an influence, reading was viewed primarily as a passive, perceptual process. During the 1950s and 1960s, under the influence of behaviorism

and audio-lingualism, reading was seen as a written mechanical decoding of speech (Bloomfield, 1942 cited in Silberstein, 1987). The main focus of L2/FL reading was to develop "automatic, habit-induced responses to written texts" (p. 30). Like the grammar/translation method, little attention was given to what the reader could bring to reading. Reading was not treated as an essential or active skill, and it was used as a vehicle to reinforce the spoken language patterns and provide a cultural context in which spoken language patterns could be practiced (p. 28). A weak emphasis on reading resulted in dissatisfaction with this approach among L2 advanced learners and L2 reading researchers.

Readers were seen as decoders of graphic symbols on a page and they converted these symbols into the corresponding word sounds before they could decipher the author's intended meaning from them (Carrell, Devine, and Eskey, 1988). Comprehension of printed material was merely comprehension of speech produced by the reader since the ability to comprehend was regarded as an abstract act that was difficult to grasp. Environmentalist ideas shaped not just the theoretical conceptions of what reading was but also research (Venezky, 2002). Yet early reading research focused mainly on the nature of perception during reading and it became mainly restricted to the relation between stimuli as words and responses as word recognition.

Out of such a conjuncture, most language programs handled reading comprehension by focusing on the development of basic decoding skills, and their major instructional priority was to teach readers to differentiate among the visual symbols they saw on a printed page before they could transform them into word sounds (Pearson and Stephens 1994). Moreover, error was prevented in order to achieve oral correctness. Consequently, the reading methods used to help learners to build fluent decoding relied mainly on the phonic method of teaching reading by *sounding-out* routines or the *look-and-say* method of whole-word teaching (Bielby 1994, as cited in Usó-Juan and Martínez-Flor, 2006). The main reason behind this teaching practice was that mastery of decoding skills had to come before the development of reading comprehension. This perspective of the nature of reading, however, was to be questioned by many researchers in an attempt to identify comprehension skills.

Reading within an innatist approach:

The earlier view of reading as a passive, perceptual process was first opposed by the 1960s by Chomsky (1957, 1965, as cited in Usó-Juan and Martínez-Flor, 2006) with his theory of language and language development, which weakened the behaviourist models of language learning that had become dominant throughout the 1950s. Chomsky's (1957, 1965) theory of language provided the basis for the innatist theory of language learning, which claims that children are born with a predisposition, a natural talent, to language acquisition. Thus, together with the advent of the discipline of psycholinguistics which attempted to test Chomsky's strong claims of language and language development, cognitive processes began to receive more attention. By the mid-1960s reading practitioners wanted to discover how an innatist position would work in studying the acquisition of reading and a new generation of reading research began to test that idea. This research came mainly from the work carried out in psycholinguistics and in particular from the work of Goodman (1965, 1967) and Smith (1971).

Goodman (1965) carried out one of the first studies to discover the role of errors or *miscues* made by readers when reading aloud and his experiment resulted in two significant findings. First, learners were able to read a far greater number of words when they are in context than without a context (i.e., word lists). Second, miscues resulted from the reader's intention to make sense of the written text. Goodman's application of the *miscue* concept gave a new meaning to oral reading errors, as they became positive aspects in the understanding of the reading process. Later, in a seminal work, Goodman (1967) made his famous claim that reading was a *psycholinguistic guessing game* in which readers guess or predict the text's meaning on the basis of textual information and activation of background knowledge, then confirm or correct their guesses, and thereby reconstruct the message. In addition, he described the three sources of information (what he called *cue* systems) that readers make use of to reconstruct text meaning: 1) *graphophonic cues* (or knowledge of the visual and phonemic features); 2) *syntactic cues* (or knowledge of syntactic constrains); and 3) *semantic cues* (or knowledge of the meaning of words). Moreover, he added that semantic knowledge is refined by background knowledge. Goodman (1967) regarded readers as having a natural desire to make sense of the reading texts and established clear parallelisms between learning a language and learning to read. This approach to reading was strengthened

by Smith (1971), who said that reading was not something one was taught but rather something one learned to do by reading. Smith believed that the accomplishment of learning to read should be considered as any other *natural* comprehensible aspect of existence. The hypothesis put forthd by Goodman and Smith that people learn to read by reading was later supported by Krashen (1988) in his research on the relationship between the amount of free voluntary reading, named as extensive reading, and reading ability.

With the arrival of communicative language teaching in the scene, developed out of dissatisfaction with the audiolingual and grammar/translation methods, other types of competence, such as strategic competence, sociolinguistic competence and discourse competence, have been connected to grammatical competence as factors in improving language proficiency, including the development of effective reading skills (Scarcella & Oxford, 1992*).* This was traken to imply that understanding a text requires more than knowledge of grammar and vocabulary of the foreign language. The sociolinguistic dimension of the text including genre, register, topic and the author's purpose is taken into consideration. In addition, cohesive links in a text should be used to develop the reader's discourse competence (p. 94). On the part of the reader, the importance of strategic competence was accentuated to facilitate his/her comprehension. For example, if a particular strategy failed, other strategies needed to be used to compensate for that failure. This approach embraces both differences in types of reader knowledge and differences in text types in reading.

As a result of such a view of reading, learners were taught to become active meaning searchers (Reid, 1993), that is, to infer meaning from the text by predicting and guessing its meaning by using both their linguistic knowledge and their background knowledge. Most importantly, errors were no longer considered to be negative aspects that should be prevented in advance. On the contrary, they were viewed as a path to better understand the reading process (Pearson and Stephens 1994).

The research conducted by Goodman (1965, 1969) and Smith (1971) represented the first movement of a transition toward an increasing concentration on what goes on in the reader’s mind during the reading act. Reading comprehension research began to concentrate more on the reader as a text processor

and to move away from the text itself. However, this shift was gradual and, in fact, it was not until the late 1970s that comprehension started to be developed.

Reading within an interactionist approach:

By the late 1970s, researchers were attempting to classify comprehension skills. In fact, this significant change developed out of the interactionist approach to language learning and, particularly, from the work done mainly in the fields of cognitive psychology and sociolinguistics.

In the cognitive psychology field, researchers began to conduct studies on basic processes in reading. They intended to learn what happened during the reading performance and they integrated notions of how readers represented text in memory. A noteworthy development within this field was the introduction of story grammars. A story grammar is a structural description of narrative stories that readers develop, based on acquisition of knowledge about human interactions and repeated exposure to stories. Story grammarians (Rumelhart 1975; Thorndyke 1977; Stein and Glenn 1979, as cited in Usó-Juan and Martínez-Flor, 2006) started to analyze the structure of narrative episodes and claimed that certain categories seem to be universal in well-formed stories, regardless of the language in which they were written. For instance, the story grammar categories for Stein and Glenn (1979) were: 1) *setting*, which consists of characters and surroundings; 2) *initiating event*, which marks a change in the story environment; 3) *internal response*, which represents the goal; 4) *attempt*, which is the effort to achieve the goal; 5) *consequence*, the attainment or non-attainment of the goal, and 6) *reaction*, which is the outcome of the consequence. These research endeavors represented an enthusiasm to formulate some interaction between the structure of the story or text and the processing properties involved in the reading process and its effect on comprehension (Rumelhart, 1975). However, it did not get to the heart of comprehension because, by being so structural (that is, form was considered more important than content) they tended to ignore non-textual factors of the reading act (Pearson and Stephens 1994). The task of considering the non-textual factors involved in the reading process gave rise to the most influential theory of the 1980s: schema theory.

Schema theory in reading comprehension (Rumelhart 1980; Anderson and Pearson, 1984) came on the scene during the end of the 1970s and continued up to early 1980s to deal with the relationship between the background knowledge that

readers bring to the reading act and text comprehension. A schema theory, in Rumelhart's words (1980, 34), "is a theory about how knowledge is represented and about how that representation facilitates the use of the knowledge in particular ways." One of its underlying claims is that any given text, whether it be spoken or written, does not carry any meaning in itself: it presents the directions for readers so that they can create meaning from their own cognitive framework, that is to say, from their own previously acquired knowledge (Anderson and Pearson 1984). On applying this theory to reading, researchers (Grabe 1988; Rosenblatt, 1988; Swaffar, 1988) found that reading was an *interactive* process, i.e., it was a dynamic interaction between the writer and the reader in which the reader creates meaning from the text by activating his stored knowledge and extending it with the new information supplied by the text (Grabe, 1988). This direction in reading research concentrated on the text-reader interaction. Indeed, that appears to be the current direction, with the added dimension of the social context, which came from the work of sociolinguists.

Research conducted in the field of sociolinguistics contributed to re-conceptualize the notion of context (Pearson and Stephens, 1994). Whereas prior to the advent of sociolinguistics *context* in reading meant the relationship between the graphic symbols that surrounded a word on a page, the work of sociolinguistics extended the meaning of context not only to the immediate context of the situation in which a text was encountered (i.e., the institutional context), but also to a larger social context with its values, beliefs and norms. Bloom and Green (1984), for instance, proposed viewing reading as a social process focusing on author-reader interaction:

> As a social process, reading is used to establish, structure, and maintain social relationships between and among peoples… a sociolinguistic perspective on reading requires exploring how reading is used to establish a social context while simultaneously exploring how the social context influences reading praxis and the communication of meaning (pp. 395-396).

This approach to reading was rooted in the belief that readers construct the meaning of the texts within a culture. More important, this approach further emphasized the context of the reading event since different cultural contexts may provide different readings of the text. Therefore, this sociolinguistics view of reading as a constructed process enhanced the interactionist views of reading

emerging from psycholinguistics and cognitive psychology by incorporating the social dimension of reading.

This social understanding of reading was maintained by the classic studies of Heath (1983) and Wells (1986). The study of Heath (1983) described the strong influence of family and cultural values on schooling, and the work of Wells (1986) assisted the field to reinforce the contention that being literate in general and reading ability in particular is intrinsically a social act. On the whole, perhaps the most important consequence from the sociolinguistics view of reading was that it underscored the invaluable role that institutions and the socio-cultural environment play in the reading act.

Contributions from the fields of cognitive psychology and sociolinguistics were very much useful in helping both researchers and practitioners to see the process of reading as an interactive, constructive and contextualized process through which individuals create meaning. The major pedagogical implications derived such a view of reading were twofold. On the one hand, teachers should move away from what learners do not know about the text and put more emphasis on what they do know about it. There was general consensus on the idea that learners do not need to understand every single word in a text, but rather they should be able to read fluently and selectively in order to construct text meaning with confidence. On the other hand, different interpretations of text should be expected and welcomed in the classroom. This approach to reading laid the foundation for current work in teaching reading as a communicative act, which is the focus of the next section.

As discussed above, the different approaches to language teaching have influenced views of L2/FL reading. With improvements in views of reading, the focus of L2/FL reading research has shifted from text to reader, and has more recently attempted to consider individual reader factors in reading. This evolution is mostly due to developments in L1 reading models, which have contributed significantly to the development and the focus shift in L2/FL reading theories.

Teaching reading within a communicative competence framework

Communicative approaches to language teaching have undergone many changes over the past few decades. An important background influence is linked with the work of Hymes (1971), who was the first to argue that Chomsky's (1965) competence-performance distinction did not include any reference to aspects of

language use as a social practice. Hymes (1971) was the first to point out that what was needed was a depiction of not just how language is structured internally but also an explanation of language behavior for given communicative objectives. Therefore, he proposed the notion of *communicative competence,* which included both grammatical competence as well as the rules of language use in social context and the norms of appropriacy. From the 1980s on, various models of communicative competence have set out specifications of the different components which should integrate the communicative competence construct in order to make the process of L2 teaching more effective (Canale and Swain 1980; Canale 1983; Savignon 1983; Bachman 1987, 1990; Celce-Murcia, Dörnyei, and Thurrell 1995, and Alcón 2000, as cited in Usó-Juan and Martínez-Flor, 2006).

With the communicative teaching methods coming into prominence in the 1970s, reading became a more central component of L2 teaching. At that time, very little research was available on the differences between first-language (L1) and L2 reading processes. As a result, when L1 reading theorists began to focus on the role of the reader (i.e., reader-response theory), many L2 teachers felt as though something they had intuitively known—that students read differently due to differences in language background, prior knowledge, available schemata, and reading strategies—was given academic attention. This shift in L1 reading theory provided a justified path for multiple studies on how L2 readers might read differently than L1 readers. This emphasis on top-down processes was influenced not only by teachers' need for knowledge about how L2 readers read, but also by their interest in motivating their students. The research on top-down processes further reinforced instructional and motivational justifications for the meaning-centered reading activities advocated by the newly embraced communicative language teaching methodology.

Although these higher level processes are still of importance to L2 reading researchers, many now accept that the gap in knowledge concerning lower level processes and the interaction of higher and lower level processes need to be dealt with in order to better grasp the process of reading in a second language. More recently, L2 researchers have begun to conceptualize the reading process across a wider spectrum of skills (Bernhardt, 1991; Eskey, 1988; Eskey & Grabe 1988; Grabe, 1991; Hornberger, 1989, as cited in Carlo & Sylvester, 1996). This trend may be due, in part, to the effects of the research and the theoretical work that has

been done in the field of first language reading. This work characterizes the reading process as consisting of component skills in interaction (Grabe, 1991). The consideration of L2 reading in terms of a wider spectrum of skills might also be due to the understanding that the cognitive processes underlying reading performance may change during the course of the development of L2 reading skills. Finally, the potential influence of differences between mother tongue and L2 scripts on reading performance has also moved researchers' attention toward levels of the reading process (e.g., word identification) that were previously left unexamined (Brown & Haynes, 1985; Koda, 1989).

After the 1980s, teaching of reading has received increased attention in terms of both research endeavors and the practical applications in the second language (L2) classroom. A good deal of research has concluded that readers depend on different sets of capabilities during reading (Barnett, 1990; Brantmeier, 2002; Carrell, 1988; Saricoban, 2002; Singhal, 2001; Scarcella & Oxford, 1992; Shrum & Glisan, 2000; Swaffar, Arens & Byrnes, 1991). Commonly identified sets of competencies include:

1. grammatical competence: knowledge of morphology, syntax, vocabulary, and mechanics;

2. sociolinguistic competence: knowing what is expected socially and culturally by the composers of the target language (TL) text;

3. discourse competence: the ability to understand cohesive devices such as pronouns, conjunctions, and transitional phrases to link meaning within and across sentences, as well as the ability to recognize how coherence is used to maintain the message's unity; and

4. strategic competence: the ability to use a number of strategies to compensate for missing knowledge (Scarcella & Oxford, 1992).

These competencies helps readers execute a multitude of different strategies and tasks (from determining tense from verb endings to anticipating outcomes based upon personal experience and world knowledge) in order to provide accurate comprehension. Study and explanation of the effects of reader competencies and strategies on reading comprehension can be aided by the development of theoretical models of the reading process, which can provide an informed yet hypothesized representation of the reading process. These models provoke new ideas about

reading and provide a paradigm against which aspects of the reading process may be tested (Barnett, 1989, p. 10).

This historical development of the components included in the various models of communicative competence is summarized in Figure 1 below.

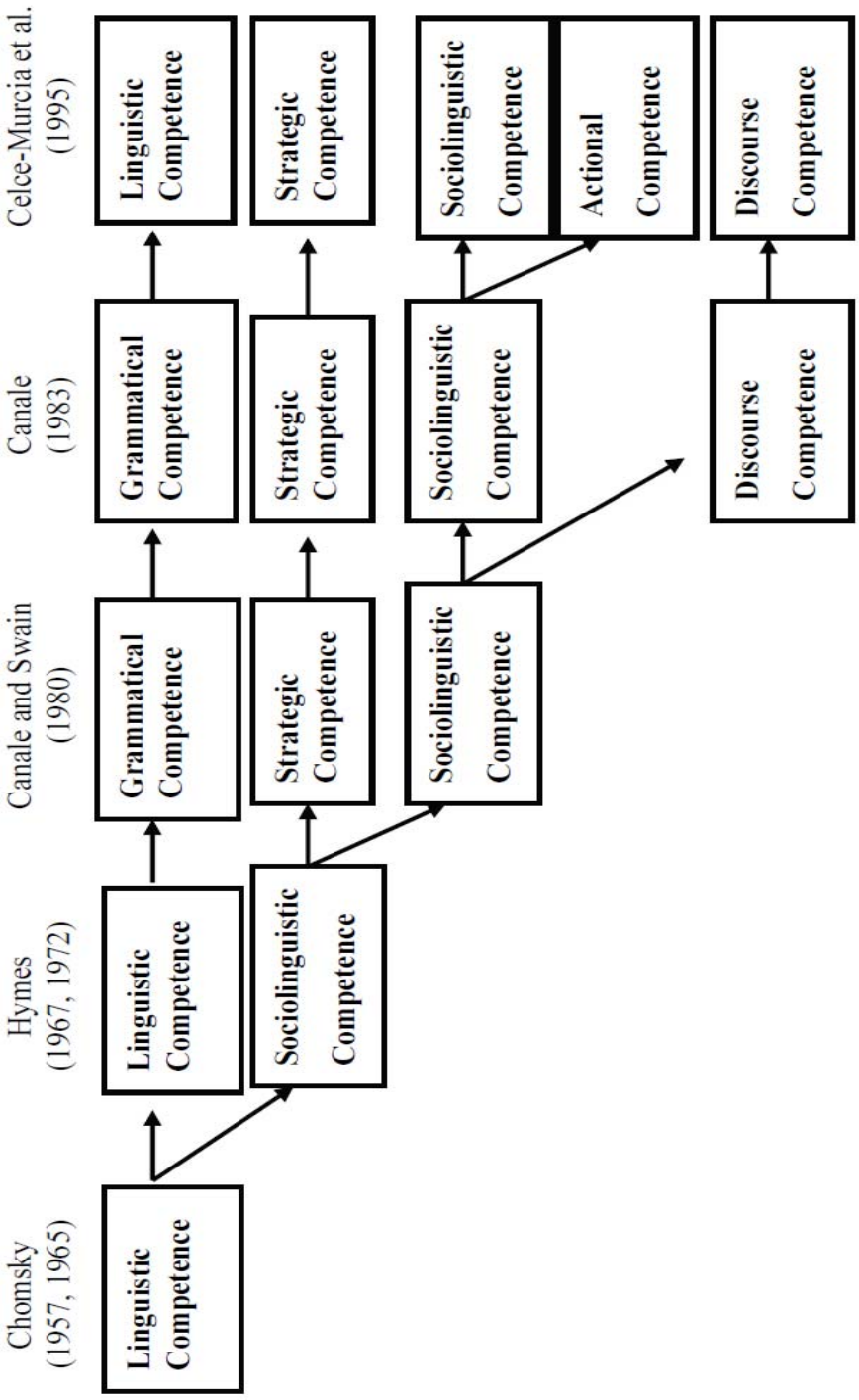


Figure 1: Historical Development of Communicative Competence. Adapted from Celce-Murcia, M. (2007). Rethinking the Role of Communicative Competence in language teaching in *E. Alcón Soler and M.P. Safont Jordà (eds.), Intercultural Language Use and Language Learning*, 41–57.

In such a communicative framework, the reading skill plays an essential role in facilitating the acquisition of communicative competence. Usó-Juan and Martínez-Flor (2007) state that:

> if readers are to be able to interpret a written piece of discourse, they need to understand how discourse features are used and why, as well as to relate them to the purposes and contextual features of the particular text. Thus, during the process of interpreting a given text at the discourse level, the reader plays an active role in which knowledge activation of other components of the communicative competence model (namely, linguistic, pragmatic, intercultural and strategic competencies) is **necessary** to develop overall communicative ability when reading a piece of text (p.269).

Therefore, the figure below aims to show where the reading skill fits into the bigger picture of the proposed communicative competence framework presented by Usó-Juan and Martínez-Flor. They also offer, in their chapter, a description of how the different components influence the development of this particular skill in order to increase learners' overall communicative ability in the L2. Figure 2 shows the diagram representing the framework with reading occupying a central position.

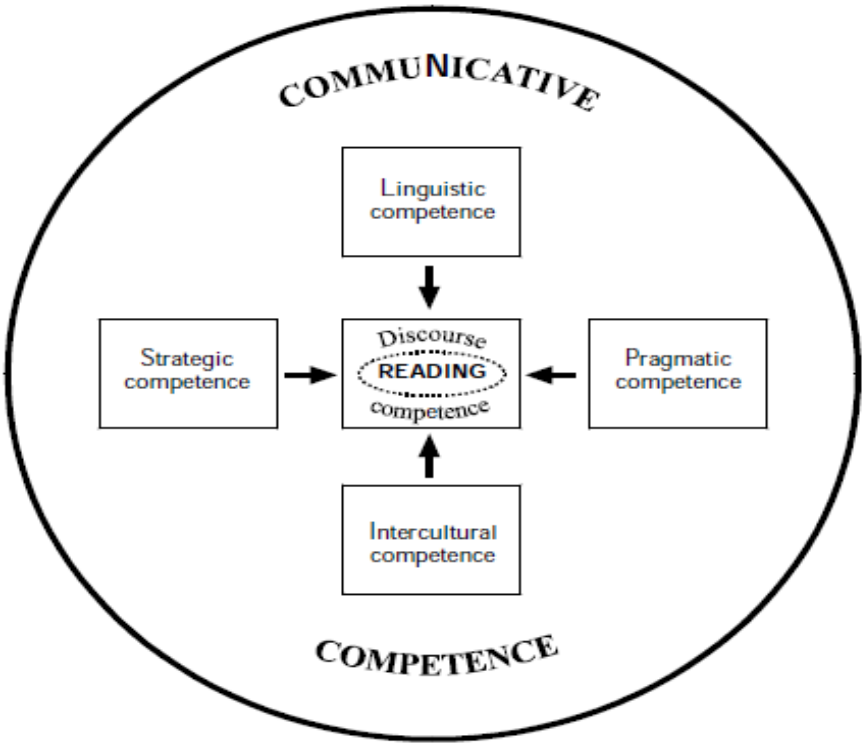


Figure 2: Integrating reading within the communicative competence framework (Usó-Juan and Martínez-Flor, 2007, p.268)

2.2. Evolution of the Theoretical Models of Reading In L2: From Past To The Present

Attempts to throw light on the blackbox of the L2 reading have relied primarily upon explanatory models borrowed from first language (L1) research and theory that have evolved from those placing an emphasis on text-based variables to those emphasizing the importance of the reader variables (e.g., reader schema, strategy use, reading purpose, interest in the topic). These models can largely be put into one of three main categories: bottom-up, top-down, and interactive.

Bottom-up Models

In bottom-up theories of reading, the reading process is taken to be a text-driven decoding process where the sole role of the reader is to rebuild the meaning encoded in the smallest units of text (Carrell, 1988; McKoon & Radcliff, 1992). Text-driven models claim that the reader understands the writer's intended meaning by recognizing words as meaningful units. According to Martinez-Lang (1995), it views the text as a "chain of isolated words, each of which is to be deciphered individually" and the reader as someone who "approaches the text by concentrating exclusively on the combination of letters and words in a purely linear manner" (p. 70). According to Shrum & Glisan (2000), meaning is understood through elaboration on individual parts of the language and the reader processes language in a sequential manner, "combining sounds or letters to form words, then combining words to form phrases, clauses, and sentences of the text" (p. 123). For them, crucial skills include discriminating between sounds and letters, recognizing word order and supra-segmental patterns or structures, and translating individual words. The bottom-up claims were well-matched to the audiolingual method of second language instruction in the 1960s and 1970s, which viewed the decoding of sound-symbol relationships as an essential component of the language learning routine. In a strict bottom-up model, the graphemic, syntactic, lexical, semantic, and pragmatic codes were considered consonant with the meaning of the text.

Eskey (1988) puts emphasis on the importance of "holding in the bottom" (p. 97). For example, Eskey expresses a concern that the development of higher-order strategies, such as predicting from context and the activation of schemata, may be too strong and warns that we "must not lose sight of the fact that language is a major problem in second language reading, and that even educated guessing at meaning is no substitute for accurate decoding" (1988, p. 97). To make his point

clearer, Eskey gives the following sentence pair, employing the nonsensical invented term “stiggle”: *Take three stiggles. Stick them in your ear*. Given that no one knows what a *stiggle* is, and that there is no contextual information or extra-linguistic cues to suggest that *them* refers to *stiggles*, it must be the bottom-up textual structure of the language that allows readers to make sense of the anaphoric reference. At this point, recognizing the meaning-based relationship or dependence among lexical links seems quite a relevant strategy that may bridge the bottom-up tendency with the top-down approach, which is more meaning-based and prediction-driven.

The problem with bottom-up

When learners get stuck on a word, they can refer to what Nuttall (1996) calls an informant, or a dictionary, teacher or student in order to clear up any ambiguity (p.62). In doing so, reading is completely interrupted and reading becomes dependent on informants. In addition, words themselves can present difficulties. Idiomatic phrases like "it's raining cats and dogs", while containing relatively simple words, can cause misunderstanding because the meaning is culture-bound. Conversely, L2 readers can transfer L1 meanings to words (known as false cognates) that seem to be similar in the L2 (Gairns and Redman 1986, p. 67). Similarly, words in the L2 may have the same or similar written forms and can be falsely assumed to be connected in meaning.

Top-down Models

While bottom-up models view the reading process as a decoding activity with an emphasis put on the structure of the text, top-down models take the opposite position and regard the reader and his/her interests, knowledge of the world, and reading skills as the driving force behind reading comprehension (Goodman, 1968; Barnett, 1989). According to more radical views, the text has little or no meaning in and of itself. Rather, it gives direction to readers as to how they should retrieve and construct meaning from their own previous experience and knowledge (Rumelhart, 1980; Carrell & Eisterhold, 1988). A more moderate top-down position is found in the oft-cited explanation offered by Goodman (1968), who depicts the reading process as a “psycholinguistic guessing game” (p. 126) where the reader reduces his or her dependence upon the text itself by employing strategies such as predicting and sampling. In other words the reader uses “general knowledge of the world or of particular text components to make intelligent guesses

about what might come next in the text [and] samples only enough of the text to confirm or reject these guesses" (Barnett, 1989, p. 13).

The role of background knowledge in the reading process can be explained and operationalized in the theoretical model of the schema theory (Anderson & Pearson, 1988; Rumelhart, 1980). According to Anderson and Pearson (1988), schemata are the abstract structures of knowledge that represent information among component parts and is comprised of a collection of previously acquired and integrated patterns of information. The store is also referred to as the reader's background knowledge and represents general concepts of a given object, event, or situation. To demonstrate the power of schemata, Carrell and Eisterhold (1988) give the following example: "The man held up his hand and stopped the car" (p. 77). While there are several potential schemata related to this sentence, readers could make the following assumption: the car has a driver, the man (a policeman) signals for the driver to stop, the driver applies his breaks and stops the car. However, given different background knowledge and/or activation of a different schema, interpretation of this text could be quite different. For instance, imagine that the man is Superman and that the car has no driver. In the Superman schema, the holding up of the hand is no longer considered to be a signal to a driver to stop the car, but rather as a physical stopping of a driverless car by Superman's hand.

The problem with top-down processes

Most foreign language teaching approaches ask L2 readers to focus more on getting as much meaning from a text using top-down strategies. This generally involves activation of schemata as a pre-reading task and asks the student to bring his or her own experiences into the picture in order to predict the possible message the text contains. However, one of the main reasons that top down processing and associated strategies can fail is that the schemata itself can become a stumbling block. Comprehension can fail due to the fact that schemata is often tied to a culture and there is a likelihood that the reader's schemata will be so different from the writer's that the reader will not be able to relate (Carrell and Eisterhold 1983, p.562). So, while these strategies have been proven to aid students with retaining information, it still leaves students dependant on top-down approaches, like skimming and scanning in order to get meaning from texts. The disadvantage of these two techniques is that they don't ask students to engage areas of difficulty,

resulting in missed opportunities to improve their vocabulary, and leaving them wondering if they could have understood more.

Interactive Models

Clearly, reading is such a cognitively demanding and complex process that an emphasis on only higher levels or only lower levels in reading cannot fully explain what occurs in a variety of reading situations. Considering different stages of L2/FL acquisition, various expectations for L2/FL reading and differences between L1 and L2/FL reading, interactive models may present a better and more accurate understanding of each stage and the different factors involved. For example, within the framework of interactive models, it seems that the differences between L1 and L2/FL reading play a bigger role at earlier stages of L2/FL acquisition than at more advanced stages (Eskey & Grabe, 1988, p. 226).

The most recent set of reading models is the interactive group, in which comprehension is considered the result of the interaction between bottom-up and top-down elements complementarily working together in good harmony; an interaction between the reader and the text (Bernhardt, 1991; Eskey, 1988; Grabe, 1991; Rumelhart, 1980). Although interactive models admit the effect of textual information on the reader's mental activities, many assign slight importance to top-down factors such as metacognition (Bernhardt, 1986), the compensatory capacity of interest and background knowledge (Coady, 1979), and schemata (Anderson & Pearson, 1988). According to most strains of schemata theory, comprehension is the result of a union of the text and the reader's background knowledge. Specifically, every input is mapped against some existing schema and all aspects of that schema must be compatible with the input information (Carrell & Eisterhold, 1988). Bottom-up processing "is evoked by the incoming data [and] the features of data enter the system through the best fitting, bottom level schemata" (p. 76). Top-down processing occurs as the reader "makes inferences based on schemata and scans the input for information to match the partially satisfied, higher order schemata" (Lally, 1998, p. 271).

Various research studies have been conducted to better understand the reading process in general and the nature of reading models in particular. Many of these studies have looked into the role and effect of reading strategies and contain a catalogue of characteristics now commonly attributed to either more or less skilled readers (Barnett, 1989; 1990; Block, 1986; Brantmeier, 2002; Carrell, 1988;

Garner, 1987; Hosenfeld, 1977, 1984: Kintsch & van Dijk, 1978; Laufer & Sim, 1989; Saricoban, 2002; Singhal, 2001; Swaffar, Arens & Byrnes, 1991; Munby, 1979; Pressley & Afflerbach, 1995; Waxman & Padron, 1987, as cited in Gascoigne, 2005).

Similar to the typical features and strategies of the bottom up/top-down continuum of reading models, the ones ascribed to more and less skilled readers also seem to follow a binary set characterized by text-focused and reader-focused branches. "Good" or successful readers, for example, have been found to rely primarily upon top-down strategies. Using think-aloud protocols to identify relationships between reading strategies and successful or unsuccessful L2 reading, Hosenfeld (1977) found that successful L2 readers at the junior high level kept the meaning of the passage in mind, skipped words that they believe to be unimportant to the meaning of the sentence or text, read in "broad phrases," and used context to determine the meaning of unknown words.

Readers with weaker skills, on the other hand, translated sentences on a word-for-word basis, almost never skipped words, and looked up unknown words in a dictionary. While analyzing think-aloud protocols produced by native English speakers and ESL students on two expository passages, Block (1986) realized that more successful readers use "general" strategies such as anticipation of content, recognizing text structure, finding out main ideas, using background knowledge, monitoring comprehension, and responding to the text as a whole. On the other hand, less successful readers depend heavily on "local" strategies such as questioning the meaning of individual words and sentences, seldom integrating background knowledge with the text, and not focusing on main ideas.

Barnett (1989) examined the reading strategies employed by native English speakers studying French and found that the effective reader tends to read the entire passage then returns to reread, thinks about what he/she knows about the topic, hypothesizes about what might come next, and guesses the meaning of unknown words. Less effective readers focus on the meaning of individual words, pay attention to text structure, reread isolated difficult passages only, never or rarely hypothesize, and resist skipping unknown words.

Recent studies tend to support the findings of investigations of strategy use conducted in the 1980s and 90s. Using a reading strategy inventory questionnaire, Saricoban (2002) examined the strategy use of post-secondary EFL students and

found that the successful readers were involved in predicting and guessing activities, made use of their background knowledge related to the text's topic, guessed the meaning of unknown words, and skimmed and scanned the text. Less successful readers focused on individual words, verbs in particular. The less successful readers were concerned with the types of verbs used, their purpose in the text and the meaning they conveyed. (p. 9). Singhal (2001) summarizes fourteen reading strategy studies and concludes that it is "clear that there are indeed differences between successful or good readers, and less successful or poor readers in terms of strategy use (p. 4). Specifically, good readers tend to use cognitive, memory, metacognitive, and compensation strategies far more than less proficient readers. Poor readers generally focus on local concerns such as grammatical structure, sound-letter correspondence, word meaning, and text details. Less proficient readers' strategies tend to be more "local or bottom-up" reflecting a desire to treat reading as a decoding process rather than as a meaning-making process (p. 5).

Strategy research in the realm of L2 reading has produced surprisingly consistent descriptions of the tools readers use to manage their interaction with written texts. In short, poor, novice, or less successful readers attempt to process language in a "word-for-word" fashion, drawing on one type of background knowledge--their fledged knowledge of the language code (Omaggio Hadley, 2001). Skilled readers tend to avoid processing at the word level, and instead center on meaningful and logical relations to and within the material, "even to the point of disregarding, in a certain sense, the actual printed text" (Anderson, Reynolds, Schallert & Goetz, 1997, p. 46).

The next part deals with how vocabulary knowledge contributes to or hinders accurate comprehension by L2 readers.

2.3. L2 Reader's Vocabulary Knowledge and Reading in EFL

The importance assigned to reading proficiency in academic settings at university level has greatly increased for the last few decades. It has been widely acknowledged that academic achievement in many fields depends largely on learners' reading skills, making them one of the essential, determining factors in predicting learners' future success. Despite its crucial role, sufficient reading ability to respond to the rigorous demand of university study is often lacking among the

freshmen (Simpson and Rush, 2003). In Turkey, a typical EFL context, the challenges facing the undergraduate students who learn English as a foreign language seem to transcend those of their monolingual counterparts in English-speaking countries. For these students, mastering effective reading skills in the foreign language has become an indispensable matter for two reasons. For one thing, they begin to be introduced to some academic content materials written in English, occasionally as early as the first semester of their study. Second, they are expected to not only comprehend concepts in these materials literally as they used to in high school but also apply critical thinking while reading. Critical reading is definitely essential to ensure optimum intellectual development among this community of learners in the universities, but their effort to gain content knowledge by reading critically is frequently impeded by inadequate mastery of the lexicon in the foreign language. It has been a widely common understanding nowadays that the difficulty levels of vocabulary substantially affect the readability of reading texts and—sequentially—comprehension (Nation, 2001; Alderson, 2000; Coady, 1993; Stoller and Grabe, 1993) and abundant research has also provided empirical support to this.

Vocabulary knowledge, another factor influencing reading success, is usually regarded to be the most important component of second language (L2) reading comprehension, even more so than background knowledge and syntax (Laufer, 1997). However, on the basis of empirical studies focusing on the relationship between size of vocabulary and reading performance in L2 (Liu and Nation, 1985; Koda, 2005; Nassaji, 2003; Tozcu and Coady, 2004), experts in the areas of reading comprehension and vocabulary have argued that vocabulary knowledge is instrumental in reading comprehension but essential for the application of certain reading strategies, such as inferring meaning from context (Nation and Coady, 1988; Nation, 1990, 2001; Laufer, 1997; Alderson, 2000; Tozcu and Coady, 2004).

A large number of research studies attempting to explore the relationship between vocabulary knowledge and reading comprehension in English as a Foreign Language (EFL) have usually found a strong link between the two (Laufer and Sim, 1985; Laufer, 1992, Hu and Nation, 2000). They have concluded that the most significant obstacle for readers of EFL is neither the lack of adequate reading strategies nor of grammatical knowledge, but rather the lack of sufficient

vocabulary. However, they added that "the nature and depth of vocabulary knowledge" may also have an influence on the effectiveness of reading comprehension. Thus, it can be claimed that readers' knowledge of certain lexical items at recognition level may not always guarantee accurate comprehension, especially in test situations, where learners' anxiety level is assumed to be relatively higher than usual.

The threshold hypothesis in reading comprehension posits that there exists a minimum level of lexical knowledge readers in an L2 must possess in order to be able to achieve sufficient level of comprehension (Laufer and Sim, 1985; Laufer, 1997; Nation, 2001). The nature of the threshold is usually investigated from two points of view: one that deals with the number of words at the threshold level and their characteristics, and another that studies the types of knowledge necessary for comprehension. With regard to the former view, Laufer (1992) assumes that the threshold consists of around 3,000 word families (approximately 5,000 lexical items). This provides the 95% text coverage necessary for minimum acceptable comprehension (55%). Based on analysis of the coverage of text provided by words in different frequency bands, Nation (2001) states:

> To reach 95% coverage of academic text, a vocabulary size of around 4,000 word families would be needed, consisting of 2,000 high-frequency general service words, about 570 general academic words (the *Academic Word List*) and 1,000 or more technical words, proper nouns and low-frequency words (p. 147).

When learners encounter an unknown word that they cannot guess from the context, they can either ignore and skip the word or look it up in a dictionary. Pressley and Afflerbach (1995) compiled a comprehensive list of strategies that a reader may employ during text comprehension, and therefore showed that reading comprehension is highly strategic. Among these reading strategies, they specifically mention the ones that a reader applies when finding words whose meaning they do not know. They argue that when dealing with an unfamiliar word or phrase, the reader generally makes a decision, at first, about the significance of the lexical item to the comprehension of the text or the particular comprehension question at hand. Little or no significance of knowing its meaning will result in ignorance and s/he will continue to read the rest of the passage; however, if this word or phrase turns out to play a major role in understanding of the text, s/he will make a quick attempt to figure out its meaning. This lexical item then receives greater attention, and the

reader either uses a dictionary to select the relevant meaning there or applies various types of context clues in order to attack the unfamiliar word or phrase, resulting in a possible meaning. This meaning is evaluated further for the conformity to the meaning of the entire passage: failure to construct the appropriate meaning can induce another attempt or desistance on the part of the reader.

Although it is often stated that learners tend to depend on dictionary use excessively, research indicates that learners' strategy use varies depending on a number of variables (Hulstijin, 1993; Zhang, 2001). L2 instructors often carry different assumptions about the effectiveness of using a dictionary while reading. Instructors following traditional grammar-translation methods have a tendency to focus on decoding text and thus have encouraged the extensive use of dictionaries. However, current communicative practices in the field focus on strategic reading and inferring the meaning of unknown words from context (Grabe & Stoller, 2002; Laufer, 1997), and many teachers discourage the use of dictionaries altogether in the reading classroom.

Another issue closely related to vocabulary knowledge and reading comprehension is the depth versus breadth of vocabulary knowledge. In research on vocabulary learning, a distinction has often been made between two aspects of vocabulary knowledge: depth of knowledge and size, or breadth, of knowledge (Haastrup & Henriksen, 2000; Read, 2000). Breadth of vocabulary knowledge has been described as the amount or number of words learners know at a particular point on the language proficiency continuum (Nation, 2001). Researchers have used various types of assessment tools to measure this dimension of vocabulary knowledge, including tests that ask the learner to identify a synonym for a word in a multiple-choice test, match words with their definitions, translate a word into their L1, or use checklists (Wesche & Paribakht, 1996). One tool that has been widely employed to assess size of vocabulary knowledge, for example, is Nation's Vocabulary Level test (1990), which has a word-meaning matching format and is comprised of words representing different word frequency levels, ranging from high-frequency (2,000 word level) to low-frequency words (10,000 word level).

Depth of vocabulary knowledge, on the other hand, has been used to refer to the quality of learners' lexical knowledge, or how well the learner knows a word (Meara, 1996; Read, 2000). Researchers have noted the complexity and multidimensionality of word knowledge and have suggested that knowing a word

well should mean more than knowing its individual meanings in particular contexts. Various kinds of knowledge are associated with a word that a learner must know, ranging from knowledge related to its pronunciation, spelling, register, stylistic, and morphological features (Haastrup & Henriksen, 2000; Meara, 1996; Nation, 1990) to knowledge of the word's syntactic and semantic relationships with other words in the language, including collocational meanings and knowledge of antonymy, synonymy, and hyponymy (Chapelle, 1994; Read, 2000).

Thus, for the purposes of the current study, it was assumed that EFL readers with an increased awareness of lexical cohesive links such as antonymy, synonymy, and hyponymy would be at an advantage while trying to infer the meaning of unknown words from contextual clues.

The next part deals with how and when L2 readers make lexical inferences and make use of contextual clues in the text.

2.4. The Use of Context While Making Lexical Inferences

One of the essential cognitive undertakings for reading comprehension is inferencing (Anderson & Pearson, 1984; Kintsch, 1998; Nassaji, 2002, 2003a, 2003b). Inferencing has been defined as the connections that people make when they try to interpret texts (Brown & Yule, 1983). Inferencing occurs at all levels of the reading comprehension process, ranging from connecting the text with previous world knowledge (Kintsch, 1988), to linking the different parts of the text together, to associating known with unknown elements in the text in order to arrive at a coherent representation of the information presented in the text (Garrod & Sanford, 1990; Graesser & Bower, 1990; Graesser & Zwaan, 1995, as cited in Nassaji, 2006). Such processes are believed to require prediction and interpretation of the text for meaning; thus, they are considered essential practices by theories of cognitive psychology that perceive reading as an active meaning-construction process and a creation of a mental structure of the text (Kintsch, 1998). It is considered to be a compensation strategy essential for skilled first language (L1) as well as second language (L2) reading comprehension (Bialystok, 1983). Furthermore, it is recognized as an essential component of the process of reading comprehension according to the psycholinguistic theories of reading comprehension, which claim that reading is the result of an interaction between textual information and prior knowledge of the reader.

As one sub-type of inferencing, lexical inferencing "involves making informed guesses as to the meaning of a word in light of all the available linguistic cues in combination with the learner's general knowledge of the world, her/his awareness of textual context and relevant linguistic knowledge" (Haastrup, 1987, p. 197). If successful, it can serve for purposes of immediate comprehension in a conversation, or reading context, and under normal conditions, it may lead to retention of the word form as well as semantic and other lexical information (Paribakht & Wesche, 1999). Moreover, lexical inferencing is frequently recommended by writers on second language pedagogy, researchers, and authors of reading textbooks (Moran, 1991). Moran (1991) added that the great majority of reading textbooks at all levels published for English as a Foreign Language (EFL) learners since the early 1980's feature tasks which require the reader to guess the meaning of unknown words.

Studies in L2 reading has shown that lexical inferencing is widely used by second language (L2) learners when they, usually as readers, attempt to guess the meanings of unknown words (de Bot, Paribakht, & Wesche, 1997). Lexical inferencing has also been claimed to be closely related with incidental vocabulary learning, that is, through reading authentic texts without a pedagogical agenda (Huckin & Coady, 1999; Nagy, 1997). Thus, Wesche and Paribakht (1999) argue that much -if not most- lexical development in both L1 and L2 appears to occur as learners deal with new words they are exposed to in authentic texts. (p. 176).

> Several factors have been claimed to influence performance in lexical inferencing, including the features of the target word and the paragraph or passage that contains the word (Paribakht & Wesche, 1999); the degree of context-based information presented in the surrounding sentences (Dubin & Olshtain, 1993), the learner's ability to benefit from of extra-textual clues (Haastrup, 1991); the significance of the word to comprehension of the text; the degree of cognitive and mental effort involved in the task (Fraser, 1999; Joe, 1995); and the learner's attention to the details in the text as well as his or her preconceptions about the possible meaning of the word (Frantzen, 2003), as cited in Nassaji, 2006.

The importance of making lexical inferences is obviously emphasized in top-down reading models, too (Goodman, 1976). These models highlight the crucial role played by the reader as the sampler of text, who uses his or her knowledge to read better and who takes short-cuts in bottom-up processing of letters and words. In the last few decades, the development of interactive models of reading has revived the interest

in research into lower-order reading skills (Morrison, 1996). These models recognize a great deal of interaction taking place between the bottom-up and top-down models (Hudson, 1998). For the interactive model, "if word recognition upon sight is successful then this information can be transferred to higher level skills that make connections between the incoming lexical items and hence help the lower level skills by reducing the possible new pieces of information that would be acceptable to complete a coherent message" (Hudson, 1998, p. 48). The reader employs reading strategies and pays attention to text structure.

Bensoussan and Laufer (1984) also conducted a study that examined lexical guessing on the part of L2 learners. The participants were first-year university students enrolled in an English-as-a-foreign-language course. The first task required that students translate a list of 70 words into their native language. One week later, they were asked to read a text that contained all 70 of the words from the original list. They were also asked to translate the target words when they appeared in the context of the passage and to answer comprehension questions about the passage. A control group, who had not seen the original list, also read this same text. The performance of this group was found to be no different than that of the experimental group in terms of their translations for the words in context. The target words were divided into those that had clear contextual clues for guessing (41 of 70 words) and those that did not. The first research question examined the "guessability" of words from context. The authors reported that students were able to generate correct guesses (correct guesses from context were calculated in terms of words that had not been translated correctly in isolation and that were translated correctly in context) for slightly less than half of the words that had clear contextual clues. Thus, context generally did not facilitate lexical guessing for these students. There are two possible explanations made by the authors for the failure of context to facilitate guessing. Either there were no contextual clues that could be used, or the students did not fully exploit the clues that were available.

Analyses of the strategies used by the students when dealing with the target words in context indicated that the most frequent strategy was to ignore the word. The next most common strategy—which actually resulted in errors—was to guess the context-inappropriate meaning of a polysemous word (e.g., *bank* and *bat*). This strategy was followed by one in which the students applied partial knowledge of a morpheme or an idiom in the word, often resulting in wrong deductions about

the meaning of the word unit. Another problematic strategy was to associate the word with the meaning of a similar sounding word or to apply the native language meaning of non-cognate homophones (e.g., *mantel*, which means tablecloth in Spanish). The strategies that were used the least included wild guesses, use of context to guess the word, approximations, and translations of the opposite meaning.

The reader should keep in mind that the infrequent use of contextual strategies may be related to the fact that the text itself may not have been particularly suited for this type of strategy. Nevertheless, the study raises questions about the appropriateness of teaching students to rely solely on contextual guessing strategies, considering that not all texts render such strategies useful.

Bensoussan and Laufer's (1984) next research question inquired whether more proficient learners were any better than lower proficiency students at guessing the meanings of unknown words. They found that the more proficient students were no better at guessing the meanings of unknown lexical items from context than were their lower proficiency counterparts.

Adams (1982) worked with groups of tertiary level students reading in either French or English to look into the effects of script activation on vocabulary learning during text comprehension. The students doing the activity in French were registered in a Foreign Language French course at the university level; those reading in English were enrolled in a psychology course. The activity required subjects to read six texts (each containing five parts) that were presented on an overhead projector for 30 seconds. A target word was selected for each passage. In each section, the target word was replaced by a nonsense word (either English legal or French legal) that was related to the activity described in the passage (e.g., playing tennis, grocery shopping, doing laundry, washing dishes, a wedding). Half of the groups in each language received a script activator—a statement reflecting the main point of the passage. Unfortunately, the article contained no information describing how the measure of vocabulary learning was obtained.

Adams arrived at the hypothesis that, on measures of unknown lexical items, learners who were presented with the script activator would get higher scores than those who did not receive the script activator. Adams also hypothesized a language effect. That is, in the native language, vocabulary-learning performance was predicted to be superior to L2 performance.

The results indicated both a language effect and a script effect. Those students who read either the native or second language passages with the support of a script activator showed a better performance than those students who read without script support. As Adams hypothesized, the group who read in English (the native language) outperformed the group who read the passages in French. Adams did not find evidence for an interaction between language and script.

Perkins and Brutten (1983) studied the contribution of word frequency and contextual variety to the word identification skills of L2 readers. To examine this issue, the participants were told to guess a word that would fit the context of a sentence. If they did not find the correct answer in the first trial, they were given one letter of the word as a clue. The students went on guessing until they came up with the correct answer. The researchers hypothesized that higher proficiency learners would be able to identify the target word using fewer cues(letters) than lower proficiency learners. They also argued that high-frequency words could be identified using a smaller portion of a word than low-frequency words. Moreover, they predicted that words which appeared in rich contexts would require fewer letter cues than words in poor contexts. The learners were ESL students from two different proficiency levels in a university language center. The experimenter read each sentence aloud and provided the letter cues as needed. The results of the study were consistent with the authors' predictions. Fewer letter clues were required for high-frequency words and for words in context-rich environments. Additionally, high-proficiency students required fewer letter clues than low-proficiency students.

Li (1988) showed that, for contextual clues to be supportive of a lexical inference, they must (a) be "perceptually and conceptually familiar" to the text-receiver and (b) contain the information available for the readers to find the relevant schemata in order to account for the oncoming input in the text and identify unfamiliar stimuli in context. In the absence such cues, inferencing may lead to faulty guesses (Bensoussan & Laufer, 1984). Bensoussan and Laufer (1984) concluded:

> lexical guessing is a very difficult task either because of the complexity of the text or because of the limitations of the reader, or both. Some words do not have clues in the text in which they appear; when there are clues for such words foreign language learners will not necessarily look for them; and when readers do look for these clues very often they cannot locate or understand them (p. 27).

The evidence from these studies suggests that, when L2 readers are provided with cues as to the general topic of a text, they are better able to learn

the meaning of unfamiliar words in the text than students who do not have this information. Thus, the evidence suggests that when L2 readers encounter unfamiliar words, they are able to use their prior knowledge to deduce the meaning of these words. However, the results also suggest that the ease and accuracy with which learners are able to deduce the meaning of unfamiliar words also depends on characteristics of the text, namely the presence of immediate contextual clues. In this context, it seems possible that awareness of lexical cohesive links may facilitate the readers' guessing ability.

The last study to review here is the one carried out by Paribakht and Wesche (1999) and it was an introspective study of lexical inferencing with 10 intermediate-level ESL students carried out in order to see the knowledge sources and contextual cues they used when they tried to understand the meaning of unknown words in the text. They employed a summary task in which they asked the readers to summarize the passage using their own words and gave a question task in which they wanted students to answer the questions about the passage. The results of their study suggested that inferencing was the most frequently used strategy (80%), so they decided to find the sources of knowledge students used during inferencing. They divided these knowledge sources into two parts such as extra-linguistic and linguistic sources (see Figure 1 below). According to their findings, students mostly used sentence-level grammatical knowledge in both tasks.

Figure 3: **Knowledge sources used in inferencing (Paribakht &Wesche, 1999)**

Extralinguistic source	Linguistic sources	
	Major	Minor
World knowledge	Sentence-level grammatical	Discourse/text
	Knowledge	Homonymy
	Word morphology	Word associations
	Punctuation	Cognates

Although researchers have attributed an important role to lexical inferencing, the nature of this process has not been well understood in second language acquisition (SLA) and particularly, reading comprehension (Paribakht & Wesche, 1999). To this end, and given the important role currently attributed to L2 learners' lexical inferencing ability in L2 reading comprehension (Laufer, 1996,

1997; Nassaji, 2002, 2003a; Nation, 2001; Read, 2000), the present study has also aimed to bring a partial explanation to the particular role that "learners' noticing of the interaction between lexical items" plays in lexical inferencing. The question addressed was: How does L2 learners' ability to follow lexical cohesive links during L2 reading comprehension (e.g. success in deriving word meaning from context) relate to their reading comprehension performance in a test situation?

The next section looks at how lexical cohesive links interact with text comprehension in L2.

2.5. The Nature of Cohesive Relationships and Their Relation to Reading Comprehension

Cohesive relationships are defined as those relations that link one sentence to another without reference to a higher level of analysis. Cohesion occurs when the interpretation of some element in the discourse is dependent on that of another. Grimes (1975) discusses cohesion as the relationship of the new information in the text to information that is already available. Halliday and Hassan (1976) define cohesive ties as instances in which two words are linked by one of five types of relationships:

(a) referential; (b) substitution of one word with another; (c) ellipsis; (d) conjunction, additive, adversative, causal, and temporal; and (e) lexical, including reiterations and collocation.

Many studies on first (L1) and second language (L2) acquisition have shown a strong relationship between cohesion, in general, and reading comprehension. Studies of cohesion in reading show that cohesion makes a substantial contribution to readability, and this is the reason cohesion studies are of interest to L2 researchers (Irwin, 1986c, p.38). Two important studies, one by British scholar L. John Chapman and one by Judith Irwin, make clear the importance of cohesion to reading and comprehending. The findings demonstrate, first, that the perception of cohesive relations in text develops over time as students mature as readers. Moreover, increasing the level of cohesion in text improves reading comprehension as measured by reading time and recall of content.

The study conducted by Chapman (1982) with 1355 children, ages 8, 10, and 13 demonstrated that readers show growth in their ability to perceive cohesion in text and to use it to support comprehension as they get older. Chapman used a specialized version of the Cloze procedure (wherein a text is prepared with every

~th word deleted, and readers are asked to fill in the resulting blanks) called the GAP technique. In the GAP technique, only a few words are deleted from a text, and those chosen play a key role in the cohesive ties of the passage. The subjects in his research showed a clear developmental pattern, such that beginning readers were unable to fill in the blanks, those in the middle stages could produce fill-ins somewhat acceptable in the passage, and fluent readers could fill in the blanks with the same words the author used or very close synonyms. Chapman concludes that readers develop an awareness of cohesion over time and make major use of it to get meaning from print.

Judith Irwin's (1986) study shows how mature readers make use of cohesion in text, and it shows that increasing the numbers of cohesive ties can improve readers' comprehension. Irwin designed two versions of a passage (differing in the number of cohesive ties) and then used reading time and recall as measures of comprehension. In terms of both measures, the version with more cohesive ties produced significantly better comprehension. Cohesion plays a central role in reading comprehension, and if writers increase the number of ties, readers will understand a text more fully and easily.

Irwin (1986) also asserts that referential relationships influence text comprehension, and that cohesive devices such as conjunctions and conjunctive adverbs help comprehension and reading pace. However, cohesion is different from coherence. Cohesion helps create coherence. Van Dijk (1977) claims that many aspects of language lead to coherence. Connectives, implications, verb frames, property relations, condition-consequence relations, general-particular relations, and other semantic relations which connect sentences are all assumed to contribute to the coherence of a text. Not surprisingly, studies have shown that readers presented with more and less coherent versions of a text indicate better comprehension in the more coherent versions (McKeown, et al, 1992). Several areas associated with coherence have shown negative effects on comprehension: (a) ambiguous, distant, or indirect references; (b) indistinct relationships between events; and (e) the inclusion of irrelevant events or ideas (Beck & McKeown, 1989).

It seems that coherence of ideas in text is not sufficient to enable the L2 reader to make sense of what s/he reads. There must be some other "tangible" factor that makes connected sentences meaningful texts. This factor is cohesion (Yule, 1985; Garnham, 1985; Widdowson, 1978). Many L2 readers rely merely on formal

markers of cohesion to understand a text and that explicit realization of cohesive ties is crucial in interpreting a text. Use of top-down processing in the form of schemata-activation is also valuable for more professional readers. On the other hand, especially for inexperienced L2 readers, who are dealing with authentic texts while still improving their language, recognition of lexical cohesive ties play an undeniably crucial role in the accurate comprehension of texts in the target language.

Besides cohesive relationships, structure of a text and its organizational pattern have an important role in reading comprehension. Research has shown that awareness of text structure has an influence on comprehension (Carrell, 1985). For example, text structures with a strong and consistent internal logic are more conducive to fast-processing than are those with weak internal logic (Carroll, 1984). Narratives have a hierarchical schematic structure and when that structure is used to guide comprehension and recall, both are facilitated. Similarly, research with different structures in expository texts has shown effects on reading comprehension due to the location of information within the structures. Specifically, information located high, or at top levels, in the hierarchical organization of a passage is recalled better than information at lower levels. Tightly organized patterns of comparison, causation, and problem/solution facilitate the recall of specific ideas from a text better than do less constrained text structures such as description (Carrell, 1984).

While we can rely on visual and oral clues to understand spoken language, the clues for written texts are not so self-evident, requiring an understanding of the relations between paragraphs, sentences and clauses. Connections between sentences and ideas are made possible through the organizational structure. This structure is created through an overall textual pattern, lexical signals, inter-clause relations, and lexical and grammatical cohesive links (Cook, 1989). However, recognizing this structure and the relations found within the text can be not so easy for second language (L2) readers, having a negative effect on their reading comprehension performance. The ability to see how the coherent use of vocabulary items contributes to the semantic linking of sentences and ideas not only helps in their comprehension of the language, but also helps them to develop the ability to use the language in a more fluid manner.

Advancing from studying grammar and vocabulary in non-contextualized settings to dealing with lexical items in context and understanding longer texts can be frustrating for the L2 learners, some of whom usually end up developing anxiety towards reading (Matsuda and Gobel 2001; Holland, 2001). The incorrect use, overuse or lack of cohesive links can lead to misunderstanding for the reader; either because of ideas being connected incorrectly ('Because I went to the supermarket, I wanted to by some milk.') or the wrong ideas being joined, creating incoherent text ('I went to his home but he wasn't there. I wanted to talk to Peter'.

Cohesive links have been found to be challenging for EFL readers (Zamel, 1983). So far, different language problems of EFL readers have been investigated by researchers but little attention has been paid to the impact of lexical cohesion on EFL reading comprehension. As Halliday and Hasan put it, there is a great deal of interest in cohesion in terms of theoretical insights and pedagogical applications that it provides. To Schiffrin (1987), cohesive ties show the existing relationships among elements in a text and "help readers in the process of text interpretation by enabling them to read between the lines", to fill in the gaps, to make references to preceding text and to figure out the links in a chain.

Kai (2008) compared lexical cohesion patterns in dissertation abstracts written by native vs. non-native speakers of English. Using Halliday and Hasan's 1976 theory of text cohesion and coherence and Hoey's 1991 lexical cohesion patterns, she analyses 15 abstracts written by native speakers of English and 15 abstracts written by Chinese speakers of English to examine the similarities and differences. In particular, she focuses on the characteristics of lexical cohesion patterns in mature native English speaker abstract writing, and how the similarities and differences between these and non-native English speaker writing can be interpreted. Her findings show that native English speakers are inclined towards variety and tend to use more complex repetitions, whereas non-native English speakers compensate for their lack of vocabulary and limited ability to think in English by using a higher number of simple repetitions. Jin Kai concludes her paper by discussing the pedagogical implications of her findings for EFL abstract writing.

As can be seen in the review of literature above, a reader discovers meaning in text through not only the activation and use of background knowledge (schemata), but also deciphers meaning through analyzing the semantic (lexical) links between contextually relevant words, phrases, sentences and even paragraphs,

which requires both top-down and bottom-up processing, as claimed by the interactive approach to reading. Thus, recognition of cohesive links in text should add up to the perceived coherence of ideas and propositions (content), resulting in detailed and more accurate overall comprehension, which is the main hypothesis to be tested in the present research study.

2.6. The Role of Lexical Cohesion in L2 Reading Comprehension

Some studies have confirmed the importance of the role that lexical cohesive links have in the comprehension of a text (Bridge & Winograd, 1982; Chapman, 1982; Nunan, 1993, Nunan, 2004; McCarthy, 1991, Wang, 1998). Nunan (1993) stresses the fact that the ability to recognize the lexical cohesive links across sentences and paragraphs is crucial for students to accurately understand the meaning in a text. When the sequence of sentences is scrambled or changed on purpose, the meaning of the text is surely distorted or even radically changed. According to the results of Bensoussan and Laufer's study (1984), the main reading difficulty that English as a Second Language (ESL) or English as a Foreign Language (EFL) college students experienced was their failure in recognizing the lexical links among the sentences in a text. Along the same line of research, Chu, Swaffar, and Charney (2002) found out that many Taiwanese EFL learners were found to be less aware of cohesive elements when reading English texts, as they are less often encountered in Chinese. In other words, Taiwanese EFL students rarely use cohesive links for integrating textual information (Chen, 2003; Sharp, 2003). Their difficulty in identifying cohesive ties and finding out the relationships among these devices in a text lowers their English proficiency.

Baten (1981) explains why the repetition of lexical items or chains can facilitate reading:

> It may mean that the words used in one text, which form lexical chains, can be perceived by the reader as 'belonging' together and therefore do not require from the reader that they be processed as completely new lexical items. Thus, if more words of one text belong to the same lexical chain(s), then less processing demands occur. This implies that less long term memory searches are necessary, and/or less load is laid on the short term memory activity. (Baten, 1981, p. 68)

In his book *Patterns of Lexis in Text*, Hoey (1991) claims that special textual patterns, or a set of repetitions, synonyms or near-synonyms of certain groups of words in the text, which he names 'link[s]' (Hoey 1991, p.51) and 'bond[s]' (Hoey

1991, p.265) can be seen in non-narrative English texts. A link is established when a word in a sentence is repeated later or paraphrased in another sentence. A bond, on the other hand, is a "connection that exists between a pair of sentences" (Hoey, 1991, p.265), where the sentences share three or more links. Hoey says that the advantages of teaching lexical patterns to English language learners is that even 'beginners in a language' (Hoey 1991, p.231) can identify such patterns to a certain extent and 'get good sense from a text' (Hoey 199, p.231) and that '[i]f a learner has acquired or is shown the vocabulary used in the central sentences of the text, then he or she should be able to follow an intelligible path through unabridged authentic text' (Hoey, 1991, p.231). Moreover, at the end of his book, he presents various pedagogical implications of these patterns in English language classrooms.

Hoey (1991) claims that lexical links are an important characteristic of coherent texts and contribute significantly to the creation and organization of text. Hoey (1991, 1994) classifies lexical cohesion into the following categories: simple lexical repetition (e.g. *a bear—bears*); complex lexical repetition (e.g. *a drug—drugging*); simple paraphrase (e.g. *to sedate—to drug*); complex paraphrase (e.g. *heat—cold*); superordinate, hyponymic (*bears—animals*), and co-reference repetition (e.g. *Mrs. Thatcher—The Prime Minister*); membership of a closed (lexical) set (e.g. *March—April*); personal pronouns (e.g. *canal—it*); deixis, i.e. demonstrative pronouns (*the works of Plato and Aristotle—these writers*); ellipsis (*a work of art—the work*); substitution (*tennis balls—ones*).

Hoey pays closer attention to lexical repetition which is crucial to the organization of written discourse. He, therefore, focuses on sentences that show an above-average number of connections (with three or more links—three is regarded as the minimum number necessary for the analysis to create a connection between sentences). Sentences, according to the model he developed, are categorized into two types: *marginal* and *central*. Marginal sentences show no signs of connection with other sentences in a text. Nor do they contribute to the development of the text's theme. Central sentences have a great number of bonds with the rest of the text, and are definitely significant for the development of the theme. Central sentences can then be used to create summaries of texts.

His research has provided evidence that instances of lexical cohesion mark points of reference, or 'links', between sentences in a text. This kind of research has also indicated that the presence of lexical repetition patterns in text allows for,

among other things, the identification of both adjacent and non-adjacent sentences with a noteworthy semantic connection.

In a corpus-analysis study on university entrance examinations in Brazil, Batista (2002) proposed that the principles put forth by Hoey's (1991) lexical model may be used in the analysis of multiple-choice reading comprehension tests. In the present study, a modified version of Hoey's categories of cohesion has been devised and applied to the identification of lexical cohesive links in the passages taken from the TOEFL's IBT version. The resulting taxonomy (Table 2.1) involves seven types of lexical relations, as well as one set of cohesive devices which are not lexical in nature but which also make it possible for repetition to take place.

Hoey (1991, 2001) also claims that his analysis of lexical repetition in texts can be employed in the teaching of reading. He suggests that students be trained to search for lexical cohesive items, particularly those that share three or more repetition links, and to recognize semantic connections linking sentences in a text. The recognition of lexical links can be a useful exercise because it provides clues for finding the relevant sentences, and gives faster access to the text content, providing the reader with a bird's eye view of the text. The approach, then, may provide EFL students with a more concrete means of grasping the most important information of a piece of text. Hoey's (1991) concept of lexical cohesion as related to the teaching of ESL/EFL reading, however, has not been investigated in much detail thus far. Therefore, this study was conducted to examine Hoey's framework on lexical cohesion by stressing the role of this type of cohesion as a way to increase reading performance in a test situation.

Table 2.1 A simplified summary of Hoey's (1991) lexical links

LINK TAXONOMY	
Lexical Relations	
Lexical Repetition	• Simple
	• Complex
Synonymy	• Simple
	• Complex
Antonymy	• Simple
	• Complex
Superordinate Repetition	
Hyponymic Repetition	
Co-Reference	
Labeling	
Non-lexical Relations	
Substitution	• By pro-forms
	• By ∅ (Ellipsis)

A simplified summary of Hoey's (1991) lexical categories is provided in Table 2.1 above. For the purposes of this thesis, however, a combination of works by both Halliday and Hasan (1976) and Hoey (1991) will be considered in identifying the sub-categories or types of lexical cohesive links available in texts.

Although Haliday and Hasan's taxonomy openly differentiated between lexical and grammatical cohesive links, Hoey's taxonomy does not clearly draw an obvious line between the two types of cohesion. But it is clear from his definitions of the terms that co-reference and substitution (including ellipsis) categories would go under grammatical cohesion. What Hoey didn't include in his book is only the category of conjunctions, which were studied by Haliday and Hasan in great detail.

The manner in which each of these types of links contributes to the identification of semantic bonds between test items and passages are discussed below. Sentences have been assigned numbers for ease of reference.

Lexical Cohesive Links

In *Patterns of Lexis in Text* (1991), Hoey analyses the different types of lexical and non-lexical repetition in non-narrative texts. According to him cohesion is to a great extent the product of lexical relations rather than grammatical ones. He describes the different types of lexical repetition, and under this heading he includes the following: simple lexical repetition, complex lexical repetition, simple paraphrase, complex paraphrase, superordinate, hyponymic and coreference repetition and other non-lexical ways of repeating. Only open-set lexical items should be considered repetitions in this analysis. Grammatical items will not be considered here, although they can and do play a role in the overall cohesion of a text.

According to Hoey's taxonomy, the first type of link, "Lexical Repetition", may be classified as either simple or complex. Simple Lexical Repetition involves items which Hoey (1991) defined as "formally identical" (p. 55), i.e., items sharing the exact same form or the same morpheme with minimum alterations, such as those marking the plural form of a noun, or those marking the 3rd person singular, simple past, past participle or gerund forms of a verb. Complex Lexical Repetition (henceforth Complex Repetition), on the other hand, occurs "either when two lexical items share a lexical morpheme, but are not formally identical, or when they are formally identical, but have different grammatical functions" (Hoey, 1991, p.

55). The following are examples of Simple Repetition and Complex Repetition. All examples have been drawn from the sample text in Hoey (1991, p. 52).

Simple Repetition

Simple repetition occurs when an item is repeated in its identical form or a lexical item that has already occurred in a text is repeated with minor alteration and here the only changes are grammatical features: plurals or verb endings. For example: *substance - substances, move - moving*. One difficulty we can encounter here is the cases of polysemy and homonymy where the words do not retain the same meaning when they are repeated.

> **[1]** A drug known to produce violent reactions in humans has been used for sedating grizzly **bears** *Ursus arctos* in Montana, USA, according to a report in *The New York Times*.
> **[3]** Many wild **bears** have become 'garbage junkies', feeding from dumps around human developments.

Complex Repetition

This is when two lexical items share a lexical morpheme, but are not formally identical, as for example in the case of some antonyms, or when they are formally identical, but have different grammatical functions. Examples: *compose - decompose, change* (verb) - *change* (noun).

> **[4]** To avoid potentially dangerous clashes between them and humans, scientists are trying to rehabilitate the animals by **drugging** them and releasing them in uninhabited areas.
> **[5]** Although some biologists deny that the mind-altering **drug** was responsible for uncharacteristic behaviour of this particular bear, no research has been done into the effects of giving grizzly bears or other mammals repeated doses of phencyclidine.

The second category of repetition, **Synonymy**, involves the repetition of the idea represented by a given lexical item, rather than its form. In common with lexical repetition, instances of synonymy may be either simple or complex. **Simple Synonymy** occurs whenever "a lexical item may substitute for another in context without loss or gain in specificity and with no discernible change in meaning" (Hoey, 1991, p. 62). One example of **Simple Synonymy** is:

Simple Synonymy

> **[1]** A drug known to produce violent reactions in humans has been used for **sedating** grizzly bears *Ursus arctos* in Montana, USA, according to a report in *The New York Times*.
> **[4]** To avoid potentially dangerous clashes between them and humans, scientists are trying to rehabilitate the animals by **drugging** them and releasing them in uninhabited areas.

Complex Synonymy involves synonyms which are not part of the same part of speech, as can be seen in the following example:

Complex Synonymy

> **[1]** A drug known to produce violent reactions in humans has been used for **sedating** grizzly bears *Ursus arctos* in Montana, USA, according to a report in *The New York Times*.
> **[2]** After one bear, known to be a peaceable animal, killed and ate a camper in an unprovoked attack, scientists discovered it had been **tranquillized** 11 times with phencyclidine, or 'angel dust', which causes hallucinations and sometimes gives the user an irritational feeling of destructive power.

The third type of lexical relation, **Antonymy**, is also classified as either simple or complex. **Simple Antonymy** involves the repetition of the concept of a given item by means of an antonymous term which is part of the same word class.

Following Jones (2002), the term *antonymy* is here used in "its broader sense, referring to any pair of words which could intuitively be recognized as 'opposites'" (p.1). Therefore, the antonymy category should comprise not only gradable pairs, such as *cheap/expensive*, but also non-gradable pairs, such as *dead/alive,* the latter being a category which is also termed as *opposites* in many linguistic contexts.

An example of this is:

Simple Antonymy

> **[1]** A drug known to produce **violent** reactions in humans has been used for sedating grizzly bears *Ursus arctos* in Montana, USA, according to a report in *The New York Times*.
> **[2]** After one bear, known to be a **peaceable** animal, killed and ate a camper in an unprovoked attack, scientists discovered it had been tranquillized 11 times with phencyclidine, or 'angel dust', which causes hallucinations and sometimes gives the user an irritational feeling of destructive power.

Complex Antonymy involves antonymous terms which are part of different word classes, as in the following example:

Complex Antonymy

> **[2]** After one bear, known to be a peaceable animal, killed and ate a camper in an unprovoked attack, scientists discovered it had been tranquillized 11 times with phencyclidine, or 'angel dust', which **causes** hallucinations and sometimes gives the user an irritational feeling of destructive power.
> **[5]** Although some biologists deny that the mind-altering drug was responsible for uncharacteristic behaviour of this particular bear, no research has been done into the **effects** of giving grizzly bears or other mammals repeated doses of phencyclidine.

Superordinate and **Hyponymic Repetition** account for cases when two items are positioned to have identical referents. These links occur when the items sharing the same referent are connected by a lexical relation of class membership. Superordinate Repetition involves a general term which may be said to designate a class of which the earlier item is a member, as in the following example:

Superordinate Repetition

> **[2]** After one bear, known to be a peaceable animal, killed and ate a camper in an unprovoked **attack**, scientists discovered it had been tranquillized 11 times with phencyclidine, or 'angel dust', which causes hallucinations and sometimes gives the user an irritational feeling of destructive power.
> **[5]** Although some biologists deny that the mind-altering drug was responsible for uncharacteristic **behaviour** of this particular bear, no research has been done into the effects of giving grizzly bears or other mammals repeated doses of phencyclidine.

Conversely, hyponymic repetition involves a specific term which could be a member of, categorized into, the class pointed by the earlier item forming the link. The following is an example of a hyponymic link:

Hyponymic Repetition

> **[4]** To avoid potentially dangerous clashes between them and humans, scientists are trying to rehabilitate the **animals** by drugging them and releasing them in uninhabited areas.
> **[5]** Although some biologists deny that the mind-altering drug was responsible for uncharacteristic behaviour of this particular bear, no research has been done into the effects of giving **grizzly bears** or other mammals repeated doses of phencyclidine.

The **Labeling** category is based on Francis' (1994) description of 'retrospective labels'. The term 'retrospective label' refers to a nominal group which encapsulates a stretch of discourse and indicates to the reader how it should be interpreted. The same author pointed out that these labels are more often than not formed by deictics, such as *this, that* or *such*, followed by a head noun, which is

unspecific in nature, such as Halliday and Hasan's (1976) 'general nouns' (p. 27). Francis (1994) added that a large number of retrospective label head nouns are "metalinguistic in the sense that they label a stretch of discourse as being a particular type of language" (p. 89). The following is an example of a labeling link drawn from the sample text in Hoey (1991), p. 94:

Labeling

> **[17]** What, then, is the advantage which we may hope to derive from a study of the political writers of the past?
> **[18]** A view prevalent in earlier ages would have provided a simple answer to **this question**.

The link taxonomy introduced above is actually a simplified version of an analytical system originally devised by Hoey (1991) for the identification of semantic bonds between both adjacent and non-adjacent sentences in expository texts.

As it can be seen in the above discussion, meaning can be reiterated in different ways in a text. Repetition not only contributes to the cohesion, but also gives the reader important clues as to what the main information is and where we can find it. All these types of repetition are used to establish links. *Link*s, then, are connections by repetition between items in a text; they are both lexical and non-lexical cohesive relations. A *bond* is a connection that exists between a pair of sentences by virtue of there being an above-average number of links relating them. Usually, the requisite number of links is three, and it is never less than three; but sometimes for texts in which there are a great number of repetitions, the threshold may be four links or more. As an example, let us consider two sentences taken from the text *A chemical classification of matter* (Pottenger and Bowes, 1976, p.40):

> • ***Matter** that does not fit the description of a pure **substance** is classified as a **mixture.***
> • *A **mixture** is **matter** that is composed of two or more **substances**, each of which retains its own characteristic properties within the **mixture.***

The words *matter*, *substance(s)* and *mixture* are repeated in both sentences, so we can consider that there are three links connecting these sentences. Therefore, we say that they create a bond between the two sentences.

Then, what is the importance of the identification of links and bonds in a text? Hoey (1991, pp. 125-126) makes two points about this issue. In the first one, which he calls the *weak claim*, he says that "each bond marks a pair of sentences

that is semantically related in a manner not entirely accounted for in terms of its shared lexis". The second or strong claim states that "because of the semantic relation referred to in the weak claim, each bond forms an intelligible pair in its context". What these claims say is that two bonded sentences make sense when read together, even if in the text they appear quite far apart, and that their meaning together agrees with the meaning they have where they belong in the text. What Hoey says, and what we are trying to show is that it is possible to get good sense out of a text by reading mutually relevant sentences, as long as these sentences are bonded. What a reader needs to be told is to look for sentences with the same or closely related words in them. The ability to recognize repetitions influences the way in which a text is interpreted. If the reader does not recognize some of the links, for example in the form of synonymy, hyponymy or co-reference, he might fail to make important semantic relations between sentences. Therefore, text-based grammar should be emphasized so that students recognize lexical semantic relations between sentences.

2.7. Testing of Academic Reading Comprehension in the TOEFL IBT

Because of its worldwide reputation as one of the most widely accepted proficiency tests of English, it was felt that the Test of English as a Foreign Language (henceforth, the TOEFL) would be a trustworthy source of material representative of standard assessment of effective reading skills in English.

The passages in the test are excerpts taken from college-level textbooks that would be used in introductions to a discipline or topic. They cover a range of very general academic topics broadly classified as related to the Arts, Humanities, Social Sciences, Physical Sciences, or Life Sciences. The ETS (2002a) explains that the subject matter of the passages is general in nature "so as not to give an advantage to specialists in particular fields of study, or to people with particular kinds of background knowledge," thus contributing to the fairness of the test (p. 56). The TOEFL® IBT edition tests in this study have been taken from *The Official Guide to the New TOEFL iBT* (ETS, 2006).

The section below briefly introduces the reading component of the well-known TOEFL IBT test and provides relevant information on the question types and formats.

An Overview of the TOEFL IBT Reading Test

The Reading section measures the test taker's ability to understand university-level academic texts and passages. In many academic settings around the world, students are expected to read and understand information from textbooks and other academic materials written in English. The reading section of this test is designed to simulate the types of reading tasks that students are expected to do in university- level academic settings. Consequently, it was originally proposed that the new TOEFL should evaluate academic reading comprehension and focus on three main purposes "identified as likely to be important in academic contexts" (Enright & Schedl, 2000, p. 5):

1. Reading for basic comprehension

- understanding the general topic or main idea, major points, important facts and details, vocabulary in context, and pronoun references
- making inferences about what is implied in a passage

2. Inferencing

- Inferencing tasks share some characteristics with both basic comprehension tasks and reading to learn tasks. While they can still be used to test sentence-level information, as basic comprehension items do, they can also be used to test information across multiple parts of the text.
- They may also require abilities related to connecting information and recognizing the organization and purpose of the text

3. Reading to learn

- recognizing the organization and purpose of a passage
- understanding relationships between ideas
- organizing information into a category chart or a summary in order to recall major points and important details
- inferring how ideas throughout the passage connect

The Reading to Learn items were designed to assess an examinee's ability to form a more comprehensive and coherent representation of the whole text rather than focusing on discrete points in the text. These three categories of items are further broken down into subtypes, with Basic Comprehension items including vocabulary, pronoun reference, sentence simplification, factual information, and negative fact items. Inferencing items deal with inference in general, rhetorical purpose, and the insertion of text. As already noted, Reading to Learn items include both what is referred to as "prose summary" and also schematic table items.

The most recently available new TOEFL reading task specifications (ETS, 2003), which were derived from the work of Enright et al. (2000) and Enright and

Schedl (2000), evolved somewhat with the resulting reading tasks designed specifically to focus on "reading for basic comprehension tasks, reading to learn tasks, and a third group of tasks, inferencing tasks, that have elements of both of the other types" (p. 2). According to the task specifications (ETS, 2003, as cited in Cohen and Upton, 2006):

> Basic comprehension questions are used to assess lexical, syntactic, and semantic abilities and the ability to understand important information presented in sentence-level propositions. . . . Reading to learn is seen as requiring additional abilities beyond those required for basic comprehension. Reading to learn questions assess specific abilities that contribute to learning including the ability to recognize the organization and purpose of a text, to distinguish major from minor ideas and essential from none essential information, to conceptualize and organize text information into a mental framework, and to understand rhetorical functions such as cause-effect relationships, compare-contrast relationships, arguments, and so on. Inferencing tasks share some characteristics with basic comprehension tasks and some characteristics of reading to learn tasks. Inference questions, insert text questions, and rhetorical purpose questions were originally considered basic comprehension tasks because they were item types associated with the old TOEFL test, where the focus of the items was primarily on lexical, syntactic, and semantic abilities and they were usually based on single sentences or small portions of the text. However, after redefining these tasks for the Next Generation TOEFL . . . they are now characterized by some important reading to learn features. While they can still be used to test sentence-level information, as basic comprehension items do, they can also be used to test information across larger areas of the text. They may also require the abilities associated with reading to learn, including connecting information and recognizing the organization and purpose of the text. (pp. 2–3)

It is these three general categories of reading tasks (basic comprehension, reading to learn, and inferencing)—each with multiple types—that form the basis for the reading portion of the new TOEFL. The new TOEFL draws on a total of ten item types (described in more detail below and shown in 2.2) representing five Basic Comprehension tasks, three Inferencing tasks, and two Reading to Learn tasks.

In addition, text length and text type are important considerations in the assessment of reading comprehension, especially when the goal is to specifically assess academic reading ability. The Reading section of the new TOEFL incorporates fewer but longer (600–700 vs. 300–400 words) texts than used in previous TOEFL test designs (i.e., the traditional paper-based TOEFL and the newer, computer-based test, TOEFL CBT). The reasons given for this are that longer texts better represent the academic experiences of students and that they better facilitate the development of reading to learn purposes in the test design. With regard to text type, previous TOEFL reading passages "consisted primarily of

a particular type of expository text in which a number of discrete facts are loosely integrated and developed" (ETS, 2003, p. 1). Along with expanded length, the texts in the Reading section of the new TOEFL (each test has three texts on different general academic topics) include a broader selection of academic text types, classified by author purpose: (a) exposition, (b) argumentation, and (c) historical biographical/autobiographical narrative. Each of these has at least one structure, such as classification, comparison/contrast, cause/effect, and problem/solution, with information presented from more than one perspective or point of view (ETS, 2003).

Some Practical Considerations in the Application of the TOEFL IBT Test

As it is administered by ETS and its collaborating affiliates, the entire TOEFL IBT takes approximately four hours to complete and all test sections are completed in one day. The test is not computer-adaptive. In other words, each test taker receives the same range of questions. The test is worth a total of 120 points. The first test section is Reading, followed by Listening, Speaking, and Writing. There is a ten-minute break after the Listening section. After completing a section of the test, test takers will not be able to return to that section to finish or change their answers. For the purposes of the current study, only the reading sections were used in the form of a paper and pencil test.

Finally, the types of reading comprehension questions employed in the TOEFL IBT reading section is presented below in Table 2.2.

Table 2.2: Question Types and Tasks in the Reading Section of TOEFL IBT (Adapted from ETS, 2002)

READING SECTION

(approximately 60–100 minutes) 30 total points

This section contains 3–5 reading passages, each followed by 12–14 questions.

Question Types	Language Skills Used	Topics	Source for Response
Factual information • 3–6 per set • 4 answer choices each • worth 1 point each	**Reading for basic information**	Identify information from text	Reading passage
Negative factual informa • 2 per set at most • 4 answer choices each • worth 1 point each	**Reading for basic information**	Identify information in the text that is not true	Reading passage
Inference • 2 per set at most • 4 answer choices each • worth 1 point each	**Inferencing**	Identify information that is strongly suggested but not stated	Reading passage
Rhetorical purpose • 2 per set at most • 4 answer choices each • worth 1 point each	**Inferencing**	Identify why author makes a statement	Reading passage
Vocabulary • 3–5 per set • 4 answer choices each • worth 1 point each	**Reading for basic information**	Identify the meaning of a word in the text	Reading passage

Table 2. 2 CONTINUED

Question Types	Language Skills Used	Topics	Source for Response
Reference • 2 per set at most • 4 answer choices each • worth 1 point each	**Reading for basic information**	Identify the grammatical relationship between two words in the text	Reading passage
Sentence simplification • 1 per set at most • 4 answer choices each • worth 1 point each	**Reading for basic information**	Identify the choice that restates the sentence indicated	Reading passage
Insert text • 1 per set at most • 4 answer choices each • worth 1 point each	**Inferencing**	Insert a sentence in the most appropriate place in a passage	Reading passage
Prose summary • 1 per set at most • 6 answer choices each • worth 2 points each	**Reading to Learn**	Choose the three most important ideas in the passage	Reading passage
Fill in a table • 1 per set at most • multiple answer choices • worth 3–4 points each	**Reading to Learn**	Complete a table organizing the main ideas	Reading passage

Reading passages: The TOEFL IBT uses reading passages from university-level textbooks that introduce a discipline or topic. The excerpts are changed as little as possible so the TOEFL IBT can measure how well students can read academic material. The passages cover a variety of different subjects. Test takers should not be concerned if they are unfamiliar with a topic. The passage contains all the information needed to answer the questions.

All passages are classified into three basic categories:

- Exposition

- Argumentation
- Historical

Reading Question Formats

There are basically three question formats in the Reading section of the TOEFL IBT:

- questions with four choices and a single answer in traditional multiple-choice format
- questions with four choices and a single answer that ask test takers to "insert a sentence" where it fits best in a passage
- newly introduced "reading to learn" questions with more than four choices and more than one possible correct answer.

This chapter has reviewed the literature on L2 reading comprehension, models of reading in L2, reading strategies, role of vocabulary knowledge in L2 reading and the testing of reading skills in the TOEFL IBT. Here, many theoretical works have particularly been reviewed in a pedagogical fashion so that the reader should have a solid understanding of the basic principles in lexical cohesion analysis and its influence on L2 reading performance. This chapter has also outlined the theoretical ground for the design of the study, analysis of texts and the statistical results, describing and exploring the theoretical constructs upon which the current study was built.

The next chapter will introduce and explore the methods and instruments that were used in the study to reach answers to the questions posed at the beginning of the research process.

CHAPTER 3

METHODOLOGY

3.0 Overview of the Chapter

This chapter introduces the participants, data collection instruments, materials and procedures, data analysis methods and all the other relevant steps that formed the research design as a whole.

After briefly reviewing the research questions once more, the participants, data collection instruments (vocabulary familiarity tasks, reading comprehension tests, and lexical links recognition tasks) together with the data gathering procedures as well as the data analysis techniques will be discussed. In addition, some statistical data will be provided as to the reliability and validity of the TOEFL test items, which formed the basis of the materials used in the study. The chapter will conclude with a brief summary of the research methods and the steps of the data collection process.

This research study investigates the following research questions:

3.1 Research Questions

During the course of this study, the following research questions were investigated:

1. Is there a statistically significant correlation between the number of cohesive links correctly recognized and the reading comprehension scores in the TOEFL test?
2. Does awareness of lexical cohesive links contribute to L2 reading comprehension during a reading test? If so, to what extent?
3. Does vocabulary knowledge [at recognition level] guarantee that L2 readers will recognize the "lexical cohesive links" in L2 texts during a reading comprehension test? In other words, does L2 readers' knowledge of vocabulary items in a text facilitate their recognition of lexical cohesive links?
4. Is there any statistically significant difference between upper-intermediate and advanced level groups in recognizing lexical cohesive links?
5. Which types of reading comprehension questions in the TOEFL IBT are more challenging for the readers?

6. What are the factors that result in failure in the comprehension questions that are more challenging for L2 readers?

To be able to study and explore these questions, the following research design was pursued during the course of the study.

3.2 Participants

This study was conducted in the Department of Foreign Language Education (FLE, METU) and the Department of Basic English (DBE) at Middle East Technical University (METU), Ankara, Turkey. The FLE department offers a four-year BA program in English language teaching. The Department of Basic English functions as a language school where a one-year-long English language program is implemented to prepare incoming students for their departmental studies in English. The department aims to provide the students whose level of English is below proficiency level with basic language skills so that they can pursue their undergraduate studies at our university without major difficulty. To achieve this aim, the department runs a two-semester intensive program placing emphasis on reading, writing, listening and speaking. Students are placed in four groups according to their levels of English and the upper-intermediate groups have 20 class hours per week all through the academic year. To be a freshman, they are required not only to reach a certain level of yearly achievement but also to be successful in the English Proficiency Exam at the end of the year.

The study was carried out on fifty (50) university students who achieved a certain level of proficiency in English and who were likely to take a high-stakes test such as METU EPE (METU English Proficiency Exam), the TOEFL test or the KPDS (English Language Test for Turkish State Employees). Seventeen (17) upper-intermediate students were from DBE and 33 advanced ones were from FLE departments. Within the groups, the proficiency levels of the subjects were close to each other as measured by the METU English Proficiency Exam (METU EPE). Their proficiency scores ranged from 37 to 89, with mean scores of 69.5 and 53.2 for the advanced and upper-intermediate groups, respectively. Table 3.1a below shows the statistical analysis of proficiency scores of the groups and table 3.1b shows the t-test results for the equality of means between the groups.

Table 3.1a A Comparison of the Proficiency Scores of the Participant Groups

	group	N	Mean	Std. Deviation	Std. Error Mean
Proficiency Test Scores	advanced	33	69.5758	9.80443	1.70673
	upper-intermediate	17	53.2353	11.19447	2.71506

As can be seen in Table 3.1a above, the mean proficiency score of the advanced group is 69.5 with a standard deviation of 9.80 whereas the mean score of the upper-intermediate group is 53.23 with a standard deviation of 11.19.

Table 3.1b below indicates that there is a statistically significant difference between the groups in proficiency level, as manifested by the t-test results. Therefore, it can be said that there is an observable difference between the groups in terms of language proficiency.

Table 3.1b T-test Results of the Proficiency Scores of the Participant Groups

		t-test for Equality of Means						
		t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
							Lower	Upper
Proficiency	Equal variances assumed	5.320	48	.000	16.34	3.071	10.16	22.51
	Equal variances not assumed	5.095	28.8	.000	16.34	3.206	9.78	22.90

The advanced students in the study had already taken a reading skills course in the FLE department coded as FLE 125 whereas the upper-intermediate students were attending an academic English course at upper-intermediate level, preparing for the METU English Proficiency Exam (METU EPE).

Since the students needed to commit a lot of effort and time to the study, they were offered a small of amount bonus points (5 %) and refreshments as an appreciation of their contribution. The step-by-step results of the study were shared with the participants who completed the study. Moreover, upon the completion of the study, they were given training as to how they could improve their reading scores through the recognition and identification of lexical cohesive devices in reading passages.

3.3 Data Collection Instruments

The instruments used in the study to collect data are introduced below.

3.3.1 Two Sets of Reading Comprehension Tests from the TOEFL IBT Test

The tests were drawn from the book titled "*The Official Guide to the New TOEFL IBT*", which was prepared by The Educational Testing Service Co. (ETS) in 2006. The reading passages can be seen in Appendix D.

The passages in the test are excerpts taken from college-level textbooks that would be used in introductions to a discipline or topic. They cover a range of very general academic topics broadly classified as related to the Arts, Humanities, Social Sciences, Physical Sciences, or Life Sciences. The ETS (2002) explains that the subject matter of the passages is general in nature "so as not to give an advantage to specialists in particular fields of study, or to people with particular kinds of background knowledge," thus contributing to the fairness of the test (p. 56). In the new TOEFL IBT, the passages are about twice as long in comparison with the earlier versions, with an average of 700 words each. In all cases, the ETS (2002) maintains that "sufficient context is provided by the passages so that examinees who read and understand them can answer the questions without relying on subject-specific knowledge outside the passage" (p. 56).

There were 39 reading comprehension questions based on three different passages in each set of the TOEFL IBT reading tests. So, there were a total of 78 questions in two sets of reading tests, each of which consisted of three different passages. Each text, consisting of around 700 words, was followed by 13 questions which can be categorized into 10 main question types, which are exemplified below with sample questions.

1. Factual information

Factual information questions are often phrased in one of these ways:

- According to the paragraph, which of the following is true of X?
- The author's description of X mentions which of the following?
- According to the paragraph, X occurred because . . .
- According to the paragraph, X did Y because . . .
- According to the paragraph, why did X do Y?
- The author's description of X mentions which of the following?

An example question is provided below, with the excerpt the question is based on:

> **Passage Excerpt:** ". .. Sculptures must, for example, be stable, which requires an understanding of the properties of mass, weight distribution, and stress. Paintings must have rigid stretchers so that the canvas will be taut, and

the paint must not deteriorate, crack, or discolor. These are problems that must be overcome by the artist because they tend to intrude upon his or her conception of the work. For example, in the early Italian Renaissance, bronze statues of horses with a raised foreleg usually had a cannonball under that hoof. This was done because the cannonball was needed to support the weight of the leg. In other words, the demands of the laws of physics, not the sculptor's aesthetic intentions, placed the ball there. That this device was a necessary structural compromise is clear from the fact that the cannonball quickly disappeared when sculptors learned how to strengthen the internal structure of a statue with iron braces (iron being much stronger than bronze) ..."

According to paragraph 2, sculptors in the Italian Renaissance stopped using cannonballs in bronze statues of horses because

O they began using a material that made the statues weigh less
O they found a way to strengthen the statues internally
O the aesthetic tastes of the public had changed over time
O the cannonballs added too much weight to the statues

2. Negative factual information

These questions ask the reader to verify what information is true and what information is NOT true or not included in the passage based on information that is explicitly stated in the passage. To answer this kind of question, readers have to first locate the relevant information in the passage. Then verify that three of the four answer choices are true and that the remaining choice is false. Remember, for this type of question, the correct answer is the one that is NOT true, a crucial point which is sometimes missed by many readers. Readers can recognize negative fact items because either the word "NOT" or "EXCEPT" appears in the question in capital letters.

Negative Factual Information questions are often phrased in one of these ways:

- According to the passage, which of the following is NOT true of X?
- The author s description of X mentions all of the following EXCEPT

An example question is provided below, with the excerpt the question is based on:

Example

Passage Excerpt: ". .. Sculptures must, for example, be stable, which requires an understanding of the properties of mass, weight distribution, and stress. Paintings must have rigid stretchers so that the canvas will be taut, and the paint must not deteriorate, crack, or discolor. These are problems that must be overcome by the artist because they tend to intrude upon his or

her conception of the work. For example, in the early Italian Renaissance, bronze statues of horses with a raised foreleg usually had a cannonball under that hoof. This was done because the cannonball was needed to support the weight of the leg. In other words, the demands of the laws of physics, not the sculptor's aesthetic intentions, placed the ball there. That this device was a necessary structural compromise is clear from the fact that the cannonball quickly disappeared when sculptors learned how to strengthen the internal structure of a statue with iron braces (iron being much stronger than bronze) ..."
According to paragraph 2, sculptors in the Italian Renaissance stopped using cannonballs in bronze statues of horses because

O they began using a material that made the statues weigh less
O they found a way to strengthen the statues internally
O the aesthetic tastes of the public had changed over time
O the cannonballs added too much weight to the statues

3. Inference

These questions measure the readers' ability to comprehend an argument or an idea that is strongly implied but not explicitly stated in the text. For example, if an effect is cited in the passage, an Inference question might ask about its cause. If a comparison is made, an Inference question might ask for the basis of the comparison. Test takers should think about not only the explicit meaning of the author's words, but the logical implications of those words.

Inference questions will usually include the word *infer, suggest,* or *imply.* These questions are often phrased in one of these ways:

- Which of the following can be inferred about X?
- The author of the passage implies that X . . .
- Which of the following can be inferred from paragraph 1 about X?

An example question is provided below, with the excerpt the question is based on:

Example
Passage Excerpt: ", . . The nineteenth century brought with it a burst of new discoveries and inventions that revolutionized the candle industry and made lighting available to all. In the early-to-mid-nineteenth century, a process was developed to refine tallow (fat from animals) with alkali and sulfuric acid. The result was a product called stearin. Stearin is harder and burns longer than unrefined tallow. This breakthrough meant that it was possible to make tallow candles that would not produce the usual smoke and rancid odor. Stearins were also derived from palm oils, so vegetable waxes as well as animal fats could be used to make candles ..."
Which of the following can be inferred from paragraph 1 about candles before the nineteenth century?

O They did not smoke when they were burned.
O They produced a pleasant odor as they burned.
O They were not available to all.
O They contained sulfuric acid.

4. Vocabulary

Vocabulary questions ask the readers to identify the meanings of individual words and phrases as they are used in the reading passage (a word might have more than one meaning, but *in the reading passage*, only one of those meanings is relevant.) Vocabulary is chosen as it actually occurs in the passage. There is no "list of words" that must be tested. Usually a word or phrase is chosen to be tested as a vocabulary item because understanding that word or phrase is important to understanding a large or important part of the passage. Vocabulary questions are usually easy to identify. Readers should be alert to the fact that the question is not just asking the meaning of a word; it is asking for the meaning *as it is used in passage*. Some readers may choose an answer just because it can be a correct meaning of the word, without understanding which meaning the author is using in the passage.

The readers will see one word or phrase highlighted in the passage. They are then asked a question like this:

- The word X in the passage is closest in meaning to

In the case of a phrase, the question might be:

- In stating X, the author means that

Examples
Passage Excerpt: "In the animal world the task of moving about is fulfilled in many ways. For some animals locomotion is accomplished by changes in body shape ..."

The word locomotion in the passage is closest in meaning to
O evolution
O movement
O survival
O escape

Passage Excerpt: "Some poisonous snake bites need to be treated immediately or the victim will suffer paralysis ..."
In stating that the victim will suffer paralysis the author means that the victim will
O lose the ability to move
O become unconscious

O undergo shock
O feel great pain

5. Reference

Reference questions ask the readers to identify referential relationships between the words in the passage. Often, the relationship is between a pronoun and its antecedent (the word to which the pronoun refers). Sometimes other kinds of grammatical reference are tested (like which or this). Reference questions look similar to vocabulary questions. In the passage, one word or phrase is highlighted. Usually the word is a pronoun. Then the readers are asked

- The word X in the passage refers to

The four answer choices will be words or phrases from the passage. Only one choice is the word to which the highlighted word refers.

Example
Passage Excerpt: ". . . These laws are universal in their application, regardless of cultural beliefs, geography, or climate. If pots have no bottoms or have large openings in their sides, they could hardly be considered containers in any traditional sense. Since the laws of physics, not some arbitrary decision, have determined the general form of applied-art objects, they follow basic patterns, so much so that functional forms can vary only within certain limits ..."

The word “they” in the passage refers to
O applied-art objects
O the laws of physics
O containers
O the sides of pots

6. Rhetorical purpose

Rhetoric is the art of speaking or writing effectively. While in the Factual Information questions the readers are asked what information an author has presented, in Rhetorical Purpose questions, they are asked why the author has presented a particular piece of information in a particular place or manner. Rhetorical Purpose questions ask the readers to show that they understand the rhetorical function of a statement or paragraph as it relates to the rest of the passage. Sometimes they will be asked to identify how one paragraph relates to another. For instance, the second paragraph may give examples to support a statement in the first paragraph. The answer choices may be expressed in general terms, (for example, "a theory is explained and then illustrated") or in terms that are specific to the passage.

("The author explains the categories of adaptation to deserts by mammals and then gives an example.")

A Rhetorical Purpose question may also ask why the author mentions a particular piece of information {Example: Why does the author mention "the ability to grasp a pencil"? Correct answer: It is an example of a motor skill developed by children at 10 to 11 months of age) or why the author quotes a certain person.

Rhetorical Purpose questions usually do not ask about the overall organization of the reading passage. Instead, they typically focus on the logical links between sentences and paragraphs

Below are the examples of the way Rhetorical Purpose questions are typically worded:

- The author discusses X in paragraph 2 in order to . . .
- Why does the author mention X?
- The author uses X as an example of . . .

Example

Passage Excerpt: "... Sensitivity to physical laws is thus an important consideration for the maker of applied-art objects. It is often taken for granted that this is also true for the maker of fine-art objects. This assumption misses a significant difference between the two disciplines. Fine-art objects are not constrained by the laws of physics in the same way that applied-art objects are. Because their primary purpose is not functional, they are only limited in terms of the materials used to make them. Sculptures must, for example, be stable, which requires an understanding of the properties of mass, weight distribution, and stress. Paintings must have rigid stretchers so that the canvas will be taut, and the paint must not deteriorate, crack, or discolor. These are problems that must be overcome by the artist because they tend to intrude upon his or her conception of the work. For example, in the early Italian Renaissance, bronze statues of horses with a raised foreleg usually had a cannonball under that hoof. This was done because the cannonball was needed to support the weight of the leg ..."

Why does the author discuss the bronze statues of horses created by artists in the early Italian Renaissance?

O To provide an example of a problem related to the laws of physics that a fine artist must overcome

O To argue that fine artists are unconcerned with the laws of physics

O To contrast the relative sophistication of modern artists in solving problems related to the laws of physics

O To note an exceptional piece of art constructed without the aid of technology

7. Insert text

In this type of question, readers are given a new sentence and are asked where in the passage it would best fit. They need to understand the logic of the passage, as well as the grammatical connections (like pronoun reference) and

lexical cohesive links between sentences. Not every set includes an Insert Text question. There is never more than one in a set.

In the passage test takers will see four black squares. The squares are located at the beginnings or ends of sentences. Sometimes all four squares appear in one paragraph. Sometimes they are spread across the end of one paragraph and the beginning of another.

Readers are then asked this question:

Look at the four squares [■] that indicate where the following sentence could be added to the passage.

[They will see a sentence in bold.]

Where would the sentence best fit?

Their job is to choose one of the squares and insert the sentence in the text.

Example

Passage Excerpt with example squares: "Scholars offer three related but different opinions about this puzzle. ■ One opinion is that the paintings were a record of the seasonal migrations made by herds. ■ Because some paintings were made directly over others, obliterating them, it is probable that a painting's value ended with the migration it pictured. ■ Unfortunately, this explanation fails to explain the hidden locations, unless the migrations were celebrated with secret ceremonies. ■"

Look at the four squares [■] that indicate where the following sentence could be added to the passage.

Alt three of them have strengths and weaknesses, but none adequately answers all of the questions the paintings present.

Where would the sentence best fit?

O Scholars offer three related but different opinions about this puzzle. AH three of them have strengths and weaknesses, but none adequately answers all of the questions the paintings present. One opinion is that the paintings were a record of the seasonal migrations made by herds. ■ Because some paintings were made directly over others, obliterating them, it is probable that a painting's value ended with the migration it pictured. ■ Unfortunately, this explanation fails to explain the hidden locations, unless the migrations were celebrated with secret ceremonies. ■

O Scholars offer three related but different opinions about this puzzle. ■ One opinion is that the paintings were a record of the seasonal migrations made by herds. All three of them have strengths and weaknesses, but none adequately answers all of the questions the paintings present. Because some paintings were made directly over others, obliterating them, it is probable that a painting's value ended with the migration it pictured. ■ Unfortunately, this explanation fails to explain the hidden locations, unless the migrations were celebrated with secret ceremonies. ■

O Scholars offer three related but different opinions about this puzzle. ■ One opinion is that the paintings were a record of the seasonal migrations made by herds. ■ Because some paintings were made directly over others, obliterating them, it is probable that a painting's value ended with the migration it pictured. All three of them have strengths and weaknesses, but none adequately answers all of the

questions the paintings present. Unfortunately, this explanation fails to explain the hidden locations, unless the migrations were celebrated with secret ceremonies. ■
O Scholars offer three related but different opinions about this puzzle. ■ One opinion is that the paintings were a record of the seasonal migrations made by herds. ■ Because some paintings were made directly over others, obliterating them, it is probable that a painting's value ended with the migration it pictured. ■ Unfortunately, this explanation fails to explain the hidden locations, unless the migrations were celebrated with secret ceremonies. All three of them have strengths and weaknesses, but none adequately answers all of the questions the paintings present.

8. Sentence simplification

In this type of question readers are asked to choose a sentence that has the same essential meaning as a sentence that occurs in the passage. Not every reading set includes a Sentence Simplification question. There is never more than one in a set.

Sentence Simplification questions always look the same. A single sentence in the passage is highlighted. They are then asked

- Which of the following best expresses the essential information in the highlighted sentence? Incorrect answer choices change the meaning in important ways or leave out essential information.

Here readers have to make sure their answer does not contradict the main argument of the paragraph in which the sentence occurs, or the passage as a whole.

Example
Passage Excerpt: "... Although we now tend to refer to the various crafts according to the materials used to construct them—clay, glass, wood, fiber, and metal—it was once common to think of crafts in terms of function, which led to their being known as the "applied arts." Approaching crafts from the point of view of function, we can divide them into simple categories: containers, shelters, and supports. There is no way around the fact that containers, shelters, and supports must be functional. The applied arts are thus bound by the laws of physics, which pertain to both the materials used in their making and the substances and things to be contained, supported, and sheltered. These laws are universal in their application, regardless of cultural beliefs, geography, or climate. If a pot has no bottom or has large openings in its sides, it could hardly be considered a container in any traditional sense. Since the laws of physics, not some arbitrary decision, have determined the general form of applied-art objects, they follow basic patterns, so much so that functional forms can vary only within certain limits. Buildings without roofs, for example, are unusual because they depart from the norm. However, not all functional objects are exactly alike; that is why we recognize a Shang Dynasty vase as being different from an Inca vase. What varies is not the basic form but the incidental details that do not obstruct the object's primary function ..."

Which of the following best expresses the essential information in the highlighted sentence? Incorrect answer choices change the meaning in important ways or leave out essential information.
O Functional applied-art objects cannot vary much from the basic patterns determined by the laws of physics.
O The function of applied-art objects is determined by basic patterns in the laws of physics.
O Since functional applied-art objects vary only within certain limits, arbitrary decisions cannot have determined their general form.
O The general form of applied-art objects is limited by some arbitrary decision that is not determined by the laws of physics.

Up to this point we have looked at the more general and classical “Basic Information” and “Inferencing” question types, as has already been shown towards the end of Chapter 2. The last two question types go into a different category: Reading to Learn questions. There are two types of Reading to Learn questions: "Prose Summary" and "Fill in a Table."

The Reading to Learn questions involve

- recognizing the organization and purpose of the passage
- organizing the information in the passage into a mental framework
- distinguishing major from minor ideas and essential from nonessential information
- understanding rhetorical functions such as cause-effect relationships, compare- contrast relationships, arguments, and the like

In other words, these questions will require you to demonstrate an understanding of the passage as a whole, not just specific information within it.

Reading to Learn questions require you to show that you are able not only to comprehend individual points, but also to place the major ideas and supporting information from the passage into an organizational framework or structure such as a prose summary or a table. By answering correctly, you will demonstrate that you can recognize the major points of a text, how and why the text has been organized, and the nature of the relationships within the text. Having an organized mental representation of a text is critical to learning because it allows you to remember important information from the text and apply it in new situations. If you have such a mental framework, you should be able to reconstruct the major ideas and supporting information from the text. By doing so, you will demonstrate a global understanding of the text as a whole. On the TOEFL iBT, each reading passage will have one

Reading to Learn item. It will be either a Prose Summary or a Fill in a Table item, never both.

9. Prose summary

These items measure the readers' ability to understand and recognize the major ideas and the relative importance of information in a passage. They will be asked to select the major ideas in the passage by distinguishing them from minor ideas or ideas that are not in the passage. The correct answer choice will synthesize major ideas in the passage. Because the correct answer represents a synthesis of ideas, it will not match any particular sentence from the passage. To select the correct answer, they will need to create a mental framework to organize and remember major ideas and other important information. Understanding the relative importance of information in a passage is critical to this ability.

In a Prose Summary question, readers will be given six answer choices and asked to pick the three that express the most important ideas in the passage.

Sample Question (Taken from the text titled "The Expression of Emotions")

13. Directions: An introductory sentence for a brief summary of the passage is provided below. Complete the summary by selecting the **THREE** answer choices that express the most important ideas in the passage. Some sentences do not belong in the summary because they express ideas that are not presented in the passage or are minor ideas in the passage. This question is worth 2 points

Psychological research seems to confirm that people associate particular facial expressions with the same emotions across cultures.

Answer Choices

1. Artificially producing the Duchenne smile can cause a person to have pleasant feelings.
2. Facial expressions and emotional states interact with each other through a variety of feedback mechanisms.
3. People commonly believe that they can control their facial expressions so that their true emotions remain hidden
4. A person's facial expression may reflect the person's emotional state.
5. Ekman argued that the ability to accurately recognize the emotional content of facial expressions was valuable for human beings.
6. Facial expressions that occur as a result of an individual's emotional state may themselves feed back information that influences the person's emotions.

10. Fill-in-the table

In this kind of item, the readers are given a partially completed classification table based on information in the passage. Their job is to complete the table by

choosing the correct answer choices and putting them into their correct locations in the table. Fill in a Table items measure a reader's ability to conceptualize and organize major ideas and other important information from across the passage and then to place them in appropriate categories. This means that they must first recognize and identify the major points from the passage, and then place those points in their proper context.

Just as for Prose Summary questions, the able reader will create a mental framework to organize and remember major ideas and other important information. Doing so requires the ability to understand rhetorical functions such as cause-effect relationships, compare-contrast relationships, arguments, and the like. When building their mental framework, they need to keep in mind that the major ideas in the passage are the ones they would include if they were making a fairly high-level outline of the passage. The correct answer choices are usually ideas that would be included in a slightly more detailed outline. Minor details and examples are generally not included in such an outline because they are used only to support the more important, higher-level themes. The distinction between major ideas/important information and less important information can also be thought of as a distinction between essential and nonessential information.

Passages used with Fill in a Table items have more than one focus of development in that they include more than one point of view or perspective. Typical passages have the following types of organization: compare/contrast, problem/solution, cause/effect, alternative arguments (such as theories, hypotheses), and the like.

Correct answers represent major ideas and important supporting information in the passage. Generally these answers will not match specific phrases in the passage. They are more likely to be abstract concepts based on passage information or paraphrases of passage information.

Correct answers will be easy to confirm by able readers who can remember or easily locate relevant text information. Incorrect answers may include information about the topic that is not mentioned in the passage or that is not directly relevant to the classification categories in the table. They may also be obviously incorrect generalizations or conclusions based on what is stated in the passage. Readers need to be aware of the fact that incorrect answers may include words and phrases that match or resemble words or phrases in the passage.

Tables can have 2 or 3 columns/rows containing bullets representing either 5 or 7 correct answer choices. So there are four possible types of tables, as follow:

Type 1: 2-column/row table with 5 correct answer choices Type 2: 3-column/row table with 5 correct answer choices Type 3: 2-column/row table with 7 correct answer choices Type 4: 3-column/row table with 7 correct answer choices

There will always be more options than correct answer choices. Some answer choices will not be used.

Sample Question (taken from the text titled "Aggression")

13. Directions: Complete the table below by matching five of the six answer choices with the approach to aggression that they exemplify. This question is worth 3 points.

Biological Approach	
Psychodynamic Approach	
Cognitive Approach	

Answer Choices

1- Aggressive impulses toward people are sometimes expressed in direct ways.
2- Aggressiveness is often useful for individuals in the struggle for survival.
3- Aggressive behavior may involve a misunderstanding of other people's intentions.
4- The need to express aggressive impulses declines with age.
5- Acting aggressively is the result of a choice influenced by a person's values and beliefs.
6- Repressing aggressive impulses can result in aggressive behavior

Now that we are familiar with the ten question types that are used in TOEFL IBT Reading section, it is time to look into the reliability and validity of the reading test items. All the comprehension questions used in this study have been taken from an official test preparation course that was prepared the Educational Testing Service, which has always been committed to the quality of its test scores through their strict adherence to validity and reliability issues. As an ETS assessment program, TOEFL® (Test of English as a Foreign Language™) strives to ensure score reliability and comparability through strict adherence to guidelines and practices established for the development and operational implementation of its products and services. Evidence of score reliability and comparability is important because it suggests that test scores will have the same meaning across test forms. ETS, it is claimed, strives to ensure that the test scores of the TOEFL Internet-based

test (IBT) are reliable and comparable. In TOEFL IBT, the reliability estimation for the Reading and Listening sections that contain selected response questions is carried out using a method based on item response theory (IRT) (Lord, 1980).

Reliability and generalizability analyses are conducted for every test form. Table 3.2, taken from ETS (2008) presents the average section and total score reliability estimates and standard errors of measurement based on operational data from 2007.

Table 3.2 Reliability of TOEFL IBT Scores (Educational Testing Service, 2008)

Score	Scale	Reliability Estimate	SEM
Reading	0 - 30	0.85	3.35
Listening	0 – 30	0.85	3.20
Speaking	0 – 30	0.88	1.62
Writing	0 - 30	0.74	2.76
Total	0 - 120	0.94	5.64

ETS also makes the following explanation on the reliability of their TOEFL tests:

> The reliability estimates in Table 3.1 are what are used for the TOEFL IBT operational test scores. Other types of reliability estimates also exist that take into account other sources of variability such as differences in test forms or changes in examinees' performances from day to day. Alternate form reliability, for example, is calculated based on examinees' scores on two different forms of a test. This requires examinees to take two different test forms, something only a few examinees would volunteer to do. But some examinees do take the test twice during a period of time too short for much learning to occur, for reasons of their own. An analysis of the scores of these repeat test takers on the two test forms provides an approximation of alternate form reliability. Zhang (February 2008) compared the test scores of more than 12,000 examinees who were identified as having taken two TOEFL iBT tests within a period of one month. The correlations of their scores on the two test forms were 0.77 for the listening and writing sections, 0.78 for reading, 0.84 for speaking, and 0.91 for the total test score. Because these measures of reliability take into account additional sources of variability, they are typically lower than internal consistency measures. Nevertheless, they indicate a high degree of consistency in the rank ordering of the scores of these test repeaters (ETS, 2008, p.4).

Since the reading tests were prepared by ETS itself, which is the creator of well-known tests such as TOEFL, GRE, TSE and TWE, the test items used in the present study are also assumed to be both valid and reliable.

3.3.2 Vocabulary-Familiarity Tasks

The aim of the vocabulary-familiarity tasks was to see how many of the words in a text were not known to the readers prior to the reading tests. Vocabulary selection for the study was based on two important criteria. First, the researcher and the co-rater worked together to choose the words that were vital for the successful comprehension of the passage. These words were determined during the discourse

analysis stage. Then, words with the largest number of lexical links were selected by the researcher from each of the six articles. Eventually, from each text, fifteen (15) content words which had lexical links to other words and thus, were critical for the comprehension of the passage, were taken and put into the vocabulary familiarity task. However, very high frequency words that were considered to be already known by the majority of the students were not included in the vocabulary familiarity tasks. Priority was given to words that are lexically linked to relatively higher frequency words. The vocabulary familiarity tasks can be seen in Appendix D.

3.3.3 Lexical Links Recognition Tasks

These tasks require the readers to indicate their awareness of the lexical cohesive links spread over the passages. After the researcher had carried out discourse analysis of the texts to be used in the study, he also prepared lexical cohesive links tasks for the students to indicate whether they had recognized the lexical cohesive links during the test. The tasks require the readers to recognize words that are lexically, or sometimes semantically or conceptually or even collocation-wise, related to one another and the readers were required to identify these lexical links in the form of opposites, synonyms, collocations or semantic sets. Below is an extract from the Lexical Links Task for the first text. It shows only three (3) of the seven (7) items in the task sheet. All the other tasks can be seen in the Appendix D at the end of the thesis.

Extract 3.1 Sample Extract from the Lexical Links Task for Text 1

Text Title: THE EXPRESSION OF EMOTIONS

1. In the first pragraph, find a **synonym** for each of the following words:

   Joyful (adj.): …… sad (adj.): ……

2. In the first paragraph, the expression "baring the teeth in a hostile way" means the **opposite** of

a) aproval b) smiling c) sadness d) anger

7. According to the 4th paragraph, if "smiling" is related to "…….." , then "being agressive" is related to "…….." .

3.4 Data Collection Procedures and Data Analysis

As mentioned earlier, data were collected mainly through three basic stages and tools:

- Pre-reading "vocabulary-knowingness" tasks
- Reading comprehension tests, followed by
- Lexical links recognition tasks.

The stages in the study will be explained in a chronological manner and the instruments will be referred back to at the appropriate points in these explanations.

3.4.1 Piloting of the Tests

The First Set from the TOEFL reading tests was piloted on a smaller group of fifteen (15) students and all the relevant analyses were carried out to be able to foresee any potential drawbacks and weaknesses and, the results were quite satisfying in terms of reliability. Table 3.3 shows the overall reliability statistics of the items used in the piloting study. The piloting study included 114 different items and a Cronbach's Alpha reliability test was run, which indicated the reliability proved to be quite satisfactory: $\alpha = .893$, as it is shown in table below. This suggests that the items have relatively high internal consistency and thus 89 % reliable.

Table 3.3 Reliability Statistics for the Items Used in the Pilot Study

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.893	.888	114

3.4.2 Discourse Analysis of the Texts Used in the TOEFL IBT Reading Section

The researcher and the co-rater carried out a discourse analysis of all the six passages that are used in the reading comprehension tests and identified all the lexical cohesive links according to the taxonomy given in the second chapter. The lexical cohesion analysis of all the texts can be seen in Appendix D. The discourse analysis process provided the researcher with the data that showed types of lexical cohesive links available. Since it is impossible to provide a written description and analysis of all the links in a narrative format, the lexical cohesion analyses of the texts are presented in the form of hierarchical lists so that a reader can easily see all

the links with minimum effort and that the reader can get a rough idea about the cohesion features of the reading test materials. All the cohesive links belonging to each text are presented in Appendix D. Also, a sample lexical cohesion analysis of a paragraph from a reading test is presented in Appendix F. During this stage, the lexical cohesive links tasks were also developed in cooperation with the co-rater and final editing of the advisors. Meanwhile, the words to be asked in the Vocabulary Familiarity Tasks were also determined.

3.4.3 Co-rater

A co-rater, a colleague of the researcher's, who is also a reading teacher with a PhD in ELT, was trained to do the same analysis so that the reliability of the discourse analysis was ensured. A seventy-five percent (75%) agreement between the two raters was observed, which was deemed high enough for reliability purposes. Since the TOEFL tests have a "multiple choice-single answer" format, there was no need for a co-rater for the grading of the reading and vocabulary tests. However, the same co-rater helped with the marking of the lexical links task and again 79 percent inter-rater agreement was observed between the researcher and the co-rater.

3.5 Data Analysis: Statistical Analysis of Tests and Tasks in the Study

For all the tests and tasks, reliability analyses were run to see how reliable the instruments were. Descriptive statistics for all the instruments were also calculated. Then, using SPSS software program, a correlational analysis was run to see the relationship among the three factors in the study: namely, reading ability as measured by the TOEFL reading test, the vocabulary familiarity tasks and the lexical links recognition tasks. Finally, a multiple regression analysis was run to see what percentage of the reading ability could be accounted for by vocabulary knowledge and the ability to follow lexical cohesive links.

a. Item Difficulty Analysis

The difficult items in the reading comprehension test were determined through running an item difficulty analysis for all the questions in the three instruments. As the cut-off point for difficulty level, questions that could not be answered correctly by at least 30 percent of all the total population (15 out of 50 students) were included in the analysis. Those items that proved to be difficult were closely analyzed by the researcher to explore whether the students failed due to the

fact that they could not detect and recognize the cohesive links in the texts. During the discourse analysis of the text, the researcher was able to determine the lexical links (phrases and words) which are vital for readers to choose the correct choices on the tests. Thus, after seeing the test results and the item difficulty indices for the questions, the researcher was able to predict the role of cohesive links on the reading comprehension of L2 readers as reflected through the test scores. Due to limitations of space for an exploratory qualitative discussion of each item, for each reading passage in the study, the most challenging 3 reading comprehension questions and 3 items from the lexical links tasks were thoroughly discussed with regard to lexical cohesive links.

b. Analysis of the Test Results

The scores of the students on each test and task were calculated and entered into the SPSS program to see the descriptive statistics for each item on the test. Then item difficulty analysis was run for each question and thus questions that were relatively more difficult were identified.

c. Analysis of "The Vocabulary-Familiarity Tasks"

This task allowed the researcher to determine which words were already in the readers' mental lexicon. This task, together with the "lexical links recognition" task, helped to clarify the question whether some students failed to identify the correct options due to their limited lexical knowledge or their inability to recognize cohesive links among the lexical items in the texts.

d. Analysis of "The Lexical Links Recognition Tasks"

The task aims at investigating whether the readers are able to recognize the grammatical and lexical cohesive links in the text. Looking at the percentage of correctly identified links, the researcher was able to calculate the average scores for each text in all the three tests.

e. Analysis of Test Items Below The Designated the Cut-off Point (.70)

The researcher focused particularly on the reading comprehension items that had proved difficult for the students by identifying which lexical cohesive links and the meanings of vocabulary items that the students had failed to recognize during the tests and tasks. Then, he also checked the connection between lexical tasks and the comprehension level of students as indicated by the test scores.

CHAPTER 4

DATA ANALYSIS AND THE RESULTS OF THE STUDY

4.0 Overview of the Chapter

This chapter will discuss the results of the study under two main headings, namely, quantitative and qualitative sections, where the relevant research questions are answered one by one. First, in the quantitative section, descriptive statistics will be provided along with the results of the reliability analysis. Afterwards, the research questions raised in the earlier chapters will be discussed with supporting evidence from the statistical procedures. In the rest of the chapter, namely the qualitative section, other relevant points, insights and emerging issues related to the readers' recognition of lexical cohesive links and their reading test performance will be revealed in a detailed manner.

During the course of this study, the following research questions were investigated:

1. Is there a statistically significant correlation between the number of cohesive links correctly recognized and the reading comprehension scores in the TOEFL test?
2. Does awareness of lexical cohesive links contribute to L2 reading comprehension during a reading test? If so, to what extent?
3. Does vocabulary knowledge [at recognition level] guarantee that L2 readers will recognize the "lexical cohesive links" in L2 texts during a reading comprehension test? In other words, does L2 readers' knowledge of vocabulary items in a text facilitate their recognition of lexical cohesive links?
4. Is there any statistically significant difference between upper-intermediate and advanced level groups in recognizing lexical cohesive links?
5. Which types of comprehension questions are more challenging for the readers?
6. What are the factors that result in failure in the comprehension questions that are more challenging for L2 readers?

Part A: QUANTITATIVE SECTION

4.1- Descriptive statistics

The mean scores for all of the three instruments (vocabulary familiarity tasks coded as "vocabulary", reading comprehension tests coded as "comprehension" and lexical cohesive links tasks coded as "Lexical Links") in the study are provided below in Table 4.1a. All the mean scores are out of one hundred. (For ease of understanding and comparison, all the average scores were converted to a hundred.) Table 4.1a shows the means scores and the standard deviations. The detailed descriptive statistics for each instrument (with ascending mean scores per item) is presented in Appendix E.

Table 4.1a Descriptive Statistics for the Three Instruments in the Study

	N	Mean	Std. Error Mean	Std Deviation
COMPREHENSION	50	73.3560	1.62999	11.52575
LEXICAL LINKS	50	76.8683	1.84664	13.05769
VOCABULARY	50	69.0420	1.96245	13.87659
Valid N (listwise)	50			

As can be seen in the Table 4.1a above, in the reading comprehension tests, the readers were able to answer 73.35% of the questions correctly although they knew only 69% of the vocabulary items asked in the vocabulary familiarity tasks. In the lexical links tasks, the subjects were able to identify 76% of the lexical links correctly. It seems that the students on average scored highest in the Lexical Cohesive Links Tasks followed by the reading comprehension questions although they were not familiar with 31 % of the key vocabulary items in the texts. Group-based comparisons of the mean scores are shown in Table 4.1b.

Table 4.1b Group-wise Descriptive Statistics for the Three Instruments in the Study

	group	N	Mean	Std. Deviation	Std. Error Mean
COMPREHENSION	advanced	33	79.7948	6.32961	1.10184
	upper-intermediate	17	60.8572	8.67268	2.10343
LEXICAL LINKS	advanced	33	83.9757	7.45270	1.29734
	upper-intermediate	17	63.0716	10.22976	2.48108
VOCABULARY	advanced	33	74.2354	9.26516	1.61285
	upper-intermediate	17	58.9605	15.95025	3.86850

As can be seen in Table 4.1b, the mean difference between the groups in the reading comprehension tests and the lexical links tasks goes parallel with a proportional increase:

- Reading Comprehension: advanced, 79.79 and upper-intermediate, 60.85
- Lexical Links Tasks: advanced, 83.97 and upper-intermediate, 63.07

However, when it comes to vocabulary knowledge, the difference between the two groups gets narrower: The vocabulary knowledge gap between the groups is not as large as the gap between their mean scores in the reading comprehension and lexical links tasks. This may indicate a crucial point: as the proficiency level increases, skills and strategies added to the repertoire of an L2 learner increases and thus pure vocabulary knowledge does not suffice to account for the difference (in the reading performance) between the two different proficiency levels. To put it differently, vocabulary knowledge in itself is not a good indicator of readers' comprehension and lexical association abilities as measured in this study.

Let's now look at each instrument in a greater detail. The specific results of the three instruments are discussed below in the order they appeared in the actual study; that is, first come the vocabulary familiarity tasks followed by the reading comprehension questions and then, finally the lexical cohesive links tasks appear.

The results of the "vocabulary-familiarity tasks" applied to the students prior to the reading comprehension tests (which consisted of 15x6=90 vocabulary items from 6 texts) have revealed that the participants (as a single group) in this experiment were, on average, unfamiliar with 31% of the lexical items (28 words out 90 items) that appeared in the vocabulary familiarity tasks, as shown in Table 4.2. The vocabulary familiarity task scores ranged from 38% percent correct (35 items) to 93 percent correct (84 items), with an overall average of 69.04 % correct and a standard deviation of 13.87.

Table 4.2 Descriptive Statistics for the Vocabulary Familiarity Tasks in the Study

	Upper-Intermediate Group	Advanced Group	Total Mean		
Mean Scores for the VOCABULARY FAMILIARITY TASKS	58.96	74.23	69.04		
Std. Deviation	15.95	9.26	13.87		
Lowest Total score	38.85	65.49			
Highest Total score	84.36	91.50			
	Upper-Intermediate group Mean	**Advanced group Mean**	**Total Mean**	**Std. Deviation**	
				Upper Group	**Adv. Group**
TASK/TEXT 1	66.30	75.39	72.2	16.753	13.899
TASK/TEXT 2	58.46	78.42	71.4	21.030	15.556
TASK/TEXT 3	58.06	63.26	61.4	20.115	15.741
TASK/TEXT 4	57.67	84.68	75.19	23.926	15.417
TASK/TEXT 5	68.66	82.86	77.90	20.928	12.919
TASK/TEXT 6	45.12	61.44	55.71	21.552	17.389

One crucial point to note in Table 4.2 is that the mean differences between the groups in Vocabulary Tasks 3 seems relatively smaller: upper-intermediate group 58.06 versus advanced group 63.26 It seems that the both groups experienced problems dealing with difficult vocabulary in Text 3. It should also be noted that Text 3 was the second highest in the density of unknown words after Text 4: the total mean scores for vocabulary tasks in Text 3 and 4 were 61.4 and 55.71, respectively, which are significantly lower than scores in the rest of the texts. However, in terms of comprehension of the same text, the advanced group performed unexpectedly as compared to the upper-intermediate group: in comprehension tests based on texts 3 and 4, upper-intermediate group scored 58.42 and 60.69 whereas advanced group scored 73.26 and 84.23, respectively. This shows that the advanced level students were able to compensate for the insufficiency of their vocabulary knowledge through their enriched repertoire of skills/strategies and processing mechanisms during the comprehension tests.

The results of the "TOEFL reading comprehension" tests, as shown in Table 4.3, have revealed that the participants were able to answer, on average, 73.35 % of the reading comprehension questions correctly, with average scores of 64.32 and 78 % for the upper-intermediate and advanced groups, respectively. The individual scores range between 49.9 percent and 85.8 for the upper-intermediate group whereas the range is between 61.5 percent and 93.5 percent for the advanced group.

Table 4.3 Descriptive Statistics for the Reading Comprehension Tests in the Study

	Upper-Intermediate Group Mean	**Advanced Group Mean**	**Total Mean**		
Mean Scores for the READING COMPREHENSION TESTS	60.85	79.79	73.35		
Std. Deviation	8.67	6.32	11.52		
Lowest Total score	49.99	67.94			
Highest Total score	76.92	93.50			
	Upper-Intermediate Group Mean	**Advanced Group Mean**	**Total Mean**	**Std. Deviation**	
				Upper Group	**Adv. Group**
TEXT 1	67.48	83.99	78.17	14.793	10.252
TEXT 2	63.41	83.53	76.50	18.964	12.193
TEXT 3	58.42	73.26	68.12	12.192	14.420
TEXT 4	60.69	84.23	76.80	15.694	11.378
TEXT 5	59.78	78.16	71.7	13.483	12.640
TEXT 6	55.71	76.06	68.9	13.483	9.578

Another crucial point to pay attention to in Table 4.3 is the mean difference between the groups in comprehension tests based on Text 4: Upper-intermediate group, 60.69 versus advanced group, 84.23, which is the largest mean difference among the comprehension tests. This wide gap could be attributed to the technical nature of the text as well as the high density of unknown vocabulary. However, these features did not prevent the advanced group from getting higher scores.

The results of the "lexical links tasks" tests applied to the students upon the completion of the reading comprehension tests have revealed that the participants in this experiment were able to answer, on average, 76.86 percent of the questions in the

test, with average scores of 67.11 percent and 81.89 percent for the upper-intermediate and advanced groups, respectively. The individual percentile scores range between 40.6 and 76.58 for the upper-intermediate group whereas the range is between 70.33 and 95.3 for the advanced group.

Table 4.4 Descriptive Statistics for the Lexical Links Tasks in the Study

	Upper-Intermediate Group Mean	Advanced Group Mean	Total Mean		
Mean Scores for the LEXICAL LINKS TASKS	63.07	83.97	76.86		
Std. Deviation	10.229	7.452	13.05		
Lowest Total score	40.60	70.33			
Highest Total score	76.58	95.3			
	Upper-Intermediate Group Mean	**Advanced Group Mean**	**Total Mean**	**Std. Deviation**	
				Upper Group	**Adv. Group**
TASK/TEXT 1	71.76	83.33	79.34	14.677	11.902
TASK/TEXT 2	56.20	82.72	73.38	18.266	13.718
TASK/TEXT 3	59.41	83.93	75.43	18.190	17.842
TASK/TEXT 4	62.09	81.07	74.45	16.790	12.484
TASK/TEXT 5	73.87	93.20	86.45	9.452	7.469
TASK/TEXT 6	55.67	79.69	71.28	16.368	11.827

4.2- Reliability Analysis of the Reading Comprehension Tests and the Accompanying Tasks

All the statistical data and tables regarding the tests and tasks are given in the Appendix so as not to occupy a large space in the chapter. Only the relevant statistical results are discussed in the chapter and important statistics are given in tables.

Before drawing any conclusions from the results of the tests and tasks employed in the study, it was deemed necessary to determine reliability levels of all the tests and tasks. Table 4.5 below shows the overall reliability statistics of the items used in the study. The study included 229 different items and a Cronbach's Alpha reliability test was run which indicated the reliability proved to be quite

satisfactory: α = .950, as it is shown in table below. This shows that all the items are reliable and have internal consistency.

Table 4.5 Reliability Statistics of the Items in the Study

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.950	.948	229

4.3- The Relationship between Vocabulary Knowledge and Reading Test Performance

Among the different approaches to research in reading, componential approaches are concerned with identifying possible explanatory skill factors or components involved in the reading process, as opposed to explaining how those components function and interact during the comprehension process. Carr and Levy (1990, p.xi) see value in such an approach: "Many investigators believe that the kind of full characterization that results from component skills analysis is the only way to get an accurate picture of reading ability, how it changes developmentally, and what creates individual differences among readers. . .."

The literature on componential analyses of L1 reading suggests individual differences in reading ability may be accounted for by such factors as vocabulary knowledge, word recognition skills, phonological awareness, and working memory span (Baddeley *et al*., 1985; Cunningham *et al*., 1990; Jackson and McClelland, 1979; Palmer *et al*., 1985, as cited in Shiotsu and Weir, 2007).

There are few other published studies involving separate measures of syntax, vocabulary, and reading skills in L2. Barnett's (1986) data led her to conclude that both syntactic and vocabulary knowledge influence reading comprehension, as increases in the levels of syntactic and vocabulary knowledge of her students seemed almost symmetrical in their effects on reading recall performance. Haynes and Carr (1990) found their students' reading comprehension performance correlating better with vocabulary than grammar but the students' reading speed showed the reverse pattern. In his study of the reading performance of L2 learners of Dutch, Bossers's data (1992) indicated that vocabulary and grammar were both significant predictors, with vocabulary achieving a slightly stronger prediction. On the other hand, Yamashita

(1999) claimed on the basis of her regression results that the contribution of vocabulary was much larger than that of grammar.

In order to determine the extent to which vocabulary knowledge is likely to contribute to reading comprehension of L2 readers, the correlation between vocabulary knowledge and comprehension test scores is needed. In the current study, to test the hypothesis whether there is a correlation between readers' vocabulary knowledge and their performance in reading comprehension section of the TOEFL IBT test, the Pearson correlation was run and the results indicate that there is a moderate correlation between the two: $r = .662$, $p = .000$, as shown in Table 4.6 below. This level of correlation seems to be consistent with the previous studies, which will be reviewed in the next section. Some of these studies also found similar correlations between vocabulary knowledge and performance in reading comprehension tests.

Table 4.6 Correlation between the Vocabulary Familiarity Tasks and the Reading Tests

		VOCABULARY	COMPREHENSION
VOCABULARY	Pearson Correlation	1	.662(**)
	Sig. (2-tailed)		.000
	N	50	50
COMPREHENSION	Pearson Correlation	.662(**)	1
	Sig. (2-tailed)	.000	
	N	50	50

** Correlation is significant at the 0.01 level (2-tailed).

A correlation of .662 between vocabulary knowledge and reading comprehension ability seems to be consistent with the studies done earlier, which will be reviewed in the next section. Some of these studies also found similar correlations between vocabulary knowledge and performance in reading comprehension tests.

4.4- The Relationship Between the Ability to Recognize Lexical Cohesive Links and Reading Test Performance

One of the research questions in the study specifically deals with whether there is a correlation between readers' awareness of lexical cohesive links and their performance in reading comprehension section of the TOEFL IBT test. For this purpose, the Pearson correlation was run for the reading tests and lexical cohesive links task. Table 4.7 below shows the correlation between these two instruments.

Table 4.7 Correlation between the TOEFL Reading Comprehension Tests and the Lexical Cohesive Links Tasks

		COMPREHENSION	LEXICAL LINKS
COMPREHENSION	Pearson Correlation	1	**.902(**)**
	Sig. (2-tailed)		**.000**
	N	50	50
LEXICAL LINKS	Pearson Correlation	.902(**)	1
	Sig. (2-tailed)	.000	
	N	50	50

** Correlation is significant at the 0.01 level (2-tailed).

To test the hypothesis whether there is a correlation between readers' awareness of lexical cohesive links and their performance in reading comprehension section of the TOEFL IBT test, the Pearson correlation was run and the results indicate that there is a strong correlation between the two: r = .902, p = .000. This high level of correlation might seem to be too high at first glance (as compared to the correlation between vocabulary knowledge and reading test performance, which is r = .662, p = .000.), but previous studies also found very strong correlations between vocabulary knowledge coupled with syntactic knowledge, termed as "**lexico-grammatical ability**" (Purpura, 1999) and performance in reading comprehension tests. Therefore, it is reasonable for awareness of lexical cohesive links, which is one step further than mere word knowledge, to correlate with reading test performance even more strongly.

For example, In Shiotsu and Weir's study (2007) on the relative significance of vocabulary knowledge and syntactic knowledge in the prediction of reading test performance, vocabulary did correlate significantly with reading (r = .79) but not as strongly as did syntactic knowledge (r = .85), and the inter-predictor correlation was high (r = .84), which means that syntactic knowledge has taken away a large portion of the reading variance, much of which vocabulary would have accounted for if put into the equation alone. They also make the following claim regarding the indivisibility of these two factors:

> The high correlation between syntax and vocabulary found in Studies 2 and 3 (r=.84 in both) raises a question regarding the (in)divisibility of the two competencies. It is quite possible that the developments of these putatively distinct elements of linguistic knowledge overlap to a substantial extent such that factor analyses would produce a common underlying variable capable of explaining much of their variances. In fact, a subset of the data for Study 3 has been factor-analysed in Shiotsu (2003), and a common factor indeed accounted for the variances in not only syntactic knowledge and vocabulary breadth but also in the passage reading comprehension measure (Shiotsu and Weir, 2007, p.122).

In a larger study, Purpura (1999) carried out a factor-analysis of his test data and reported that a common "**lexico-grammatical ability**" accounted for the variances in his "vocabulary", "grammar", "word formation", and "sentence formation" measures as well. It is also notable that his Structural equation modeling *(*SEM*)*analysis showed his lexico-grammatical ability variable to almost perfectly predict his latent reading ability variable (beta = .985). Previous factor analytic studies thus tend to support the factorial *indivisibility* of not only grammar/syntactic and lexical knowledge but also reading ability.

It is always an oversimplification to divide language up into categories when all the elements of natural language use are interdependent. Reiteration of lexical items cannot be divorced from the grammatical context in which they occur. In the present study, the recognition of lexical cohesive links requires not only word knowledge but also some level of syntactic knowledge necessary to do the reading and detect the various types of reiterations and paraphrases. A large number of the lexical repetitions fall into what Batista (2006) calls "repetition-based paraphrases" and "inference-based paraphrases". Since paraphrasing is a skill that certainly requires syntactic ability, recognition of lexical cohesive links is partially dependent on, or incorporates, the readers' knowledge of syntax, too.

4.5- Predicting the Reading Comprehension Scores through Lexical Cohesive Links and Vocabulary Knowledge

One of the research questions aimed to discover how well awareness of lexical cohesive links predicts reader test performance in the reading comprehension section of the TOEFL IBT. For this aim, a regression analysis was run, which indicated a strong predictive value of the awareness of lexical cohesive links: R^2 = .813, adjusted R^2 = .809, F (1, 48) = 208,422, p < .000. Typically, values of R^2 below *0.2* are considered weak, between *0.2* and *0.4*, moderate, and above *0.4*, strong. Table 4.8a indicates the regression results.

Table 4.8 a Linear Regression: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.902(a)	**.813**	.809	3.93008	.813	208.422	1	48	**.000**

a Predictors: (Constant), LEXICALtotal

The ANOVA results are given in Table 4.8b, which indicates that the effect of lexical cohesive links on the reading comprehension of the test takers was significant: F (1,48)= 208.422, p<.000. This test is like a test of significance of the R^2 mentioned above. Therefore, we can say that this model predicts reading test performance significantly well.

Table 4.8b ANOVA: the effect of lexical cohesive links on the reading comprehension

Model		Sum of Squares	df	Mean Square	F	Sig.
1	**Regression**	3219.194	1	3219.194	208.422	**.000**(a)
	Residual	741.386	48	15.446		
	Total	3960.580	49			

a Predictors: (Constant), LEXICAL LINKS
b Dependent Variable: COMPREHENSION

As can also be seen in the tables 4.9 a and b, the vocabulary factor alone can predict up to 43 percent of the variance in TOEFL reading comprehension scores: R^2 = .438, adjusted R^2 = .427, F (1, 48) = 37,482, p < .000.

Table 4.9a Linear Regression: The effect of vocabulary on comprehension

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.662(a)	**.438**	.427	6.80678	.438	37.482	1	48	**.000**

a Predictors: (Constant), VOCABULARY

Table 4.9b ANOVA test

Model		Sum of Squares	df	Mean Square	F	Sig.
1	**Regression**	1736.635	1	1736.635	37.482	**.000**(a)
	Residual	2223.945	48	46.332		
	Total	3960.580	49			

a Predictors: (Constant), VOCABULARY
b Dependent Variable: COMPREHENSION

On the other hand, awareness of lexical cohesive links *together* with vocabulary knowledge can explain up to 83 percent of the variance in the reading comprehension test scores: and R^2 = .837, adjusted R^2 = .830, F (2, 47) = 120,466 p < .000, as seen in the tables below (4.10a and 4.10b).

Table 4.10a Linear Regression: The effect of lexical cohesive links and vocabulary knowledge on reading comprehension

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics		
					R Square Change	F Change	Sig. F Change
1	.915(a)	.837	**.830**	3.70880	.837	120.466	**.000**

a Predictors: (Constant), LEXICAL LINKS, VOCABULARY

The ANOVA output (Table 4.10b) reports whether the model results in statistically significant prediction. In this case, Significance level (p) = .000, so the outcome is statistically significant.

Table 4.10b ANOVA test

Model		Sum of Squares	df	Mean Square	F	Sig.
1	**Regression**	3314.084	2	1657.042	120.466	**.000**(a)
	Residual	646.496	47	13.755		
	Total	3960.580	49			

a Predictors: (Constant), LEXICAL LINKS, VOCABULARY
b Dependent Variable: COMPREHENSION

What all these regression analyses indicate is that readers' awareness of lexical cohesive links coupled with their knowledge of vocabulary can predict up to 83 percent of the variance in TOEFL reading comprehension scores, as it is predicted by the adjusted R^2. Again, this predictive value seems to be very high but considering the above mentioned studies on the indivisibility of the so-called lexico-grammatical ability, the regression analysis results make even more sense.

Dwaik (1997) carried out a research study to investigate the contribution of learners' knowledge of linguistic factors, namely, vocabulary and syntax to English as a foreign language reading comprehension. Four research questions were addressed: a) Is there a correlation between lexical knowledge and reading comprehension of English as a foreign language (EFL)?, b) Does lexical knowledge predict EFL reading comprehension?, c) Is there a correlation between syntactic knowledge and EFL reading comprehension?, and d) Does syntactic knowledge predict EFL reading comprehension? The results showed significant correlations between lexical and syntactic knowledge with reading comprehension. Syntactic knowledge, however, turned out to be a much stronger predictor of reading comprehension than lexical knowledge. When entered into the regression model,

syntactic knowledge accounted for 64% of the variance in reading while vocabulary knowledge accounted for 21% of the total variance, both accounting for a total of 85% variance in reading comprehension, which is in fact consistent with the results of the present study.

In the present study, vocabulary knowledge alone could account for 43 % of the variance in the reading scores whereas the awareness of lexical cohesive links was able to explain 81% of the variance, the two together, 83%. Here, it should again be noted that recognition lexical cohesive links requires the integration of vocabulary knowledge with syntactic abilities. For instance, sentence-level grammatical knowledge includes knowledge of relationships in the sentence such as word-class information and syntactic category of the word. Finding the lexical cohesive links is an ability that goes parallel to lexical inferencing and there are a few studies indicating that grammar knowledge is involved in L2 lexical processing (e.g., Paribakht and Wesche, 1999; Paribakht, 2004). Concurring with the view that grammar knowledge influences inferencing, Haastrup (1991) notes "lexical inferencing involves making informed guesses as to the meaning of a word in light of *all available linguistic cues* in combination with the learner's general knowledge of the world, his/her awareness of the context, and hid/her relevant *linguistic knowledge*" (p. 40). Explicit instruction of grammatical constructions, for example, helps L2 learners realize whether an unknown word is a verb, noun, or adjective. Implicit instruction of grammar also raises learners' consciousness regarding how words are related in sentences. In this way, through implicit instruction learners understand how to employ grammar knowledge and knowledge of text markers to extract the veiled meaning. That is why vocabulary knowledge together with awareness of lexical cohesive links can explain the variance in reading test performance up to 83%. How knowledge of grammar interacts with finding lexical cohesive links will be shown in the qualitative section of the present study, where the challenging questions are discussed with reference to learner difficulties. The errors learners make while finding lexical cohesive links provide interesting insights into what linguistic difficulties they encounter while inferring the meaning of unknown words from context.

What can be inferred from these results is that vocabulary knowledge at recognition level is in fact a sub-skill or a necessary component of the ability to recognize lexical cohesive links in text, which in turn is partially dependent on

readers' syntactic abilities. Here comes into scene another important question: How well does vocabulary knowledge predict awareness of lexical cohesive links? The following section looks for an answer to this question.

4.6 The Relationship between Vocabulary Knowledge and the Ability to Recognize the "Lexical Cohesive Links"

One of the research questions in the study has asked whether there is a correlation between readers' awareness of lexical cohesive links and their knowledge of the vocabulary items in reading comprehension section of the TOEFL IBT test. For this purpose, the Pearson correlation was run and the results indicate that there is a moderate correlation between the two: $r = .597$, $p = .000$.

Table 4.11 Correlation between Vocabulary Knowledge and Awareness of Lexical Cohesive Links

		LEXICAL LINKS	VOCABULARY
LEXICAL LINKS	Pearson Correlation	1	.597(**)
	Sig. (2-tailed)		.000
	N	50	50
VOCABULARY	Pearson Correlation	.597(**)	1
	Sig. (2-tailed)	.000	
	N	50	50

** Correlation is significant at the 0.01 level (2-tailed).

As can be seen in the table below (Table 4.12a), according to the regression analysis carried out to see the predictive value of the vocabulary knowledge for the lexical cohesive links, the vocabulary factor can predict up to 34.3 percent of the variance in the "Lexical Links Tasks" scores: $R^2 = .356$, adjusted $R^2 = .343$, F (1, 48) = 26,541, $p < .000$. This clearly indicates that a pure knowledge of vocabulary does not guarantee that lexical cohesive links will easily be recognized by readers without any awareness-raising activities and proper training. The rest of the variance in reading test performance may be explained by the readers' knowledge of syntax and the amount of practice in finding the word association patterns in a text.

Table 4.12a Linear Regression: predictive value of the vocabulary knowledge for the lexical cohesive links

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.597(a)	.356	.343	6.77340

a Predictors: (Constant), VOCABULARY

The ANOVA (Table 4.12b) reports whether the model results in statistically significant prediction. In this case, Significance (p) = .000, so the outcome is statistically significant.

Table 4.12b ANOVA test

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1217.692	1	1217.692	26.541	.000(a)
	Residual	2202.188	48	45.879		
	Total	3419.880	49			

a Predictors: (Constant), VOCABULARY
b Dependent Variable: LEXICAL LINKS

What can be inferred from all these results is that vocabulary knowledge alone is clearly a weaker predictor of reading ability than an awareness of how lexical cohesive links operate in text.

4.7 Difficulty Index of the Reading Comprehension Questions in the TOEFL IBT

The Reading section of the TOEFL IBT measures the test taker's ability to understand university-level academic texts and passages. In many academic settings around the world, students are expected to read and understand information from textbooks and other academic materials written in English. The following are three purposes for academic reading and the specific questions types go under one of these categories as shown earlier in chapter 2, Table 2:

Reading to Find Information

- effectively scanning text for key facts and important information
- increasing reading fluency and rate

Basic Comprehension

- understanding the general topic or main idea, major points, important facts and details, vocabulary in context, and pronoun references1
- making inferences2 about what is implied in a passage

Reading to Learn

- recognizing the organization and purpose of a passage
- understanding relationships between ideas
- organizing information into a category chart or a summary in order to recall major points and important details
- inferring how ideas throughout the passage connect

One of the research questions asked, "Which question types are more challenging for the readers? For each question type, the average scores of each test item belonging to the fifty participants were calculated and then the sum of these scores was divided by the total number of items in the question type. Thus an overall difficulty mean was obtained for each question type. The question types in the reading section of the TOEFL IBT are ordered below (Table 4.13) from the most difficult to the least difficult ones, based on the average means scores of the 50 readers participating in the study.

Table 4.13 Question Types in the Reading Section of the TOEFL IBT, Listed From the Most Difficult To the Least Difficult

QUESTION TYPES	Distribution of questions	Average scores	Percentages (%) of correct answers
Fill in table/ Prose Summary	**10 Questions**	**0.574**	**57,4**
Negative Factual Information	**3 Questions**	**0,582**	**58,2**
Inference	**3 Questions**	**0,656**	**65,6**
Factual Information	**21 Questions**	**0.714**	**71,4**
Insert Text	**6 Questions**	**0.728**	**72,8**
Rhetorical Purpose	**4 Questions**	**0.749**	**74,9**
Vocabulary	**20 Questions**	**0.805**	**80,5**
Sentence Simplification	**6 Questions**	**0.807**	**80,7**
Reference	**5 Questions**	**0.854**	**85,4**
Total number of questions/ General average	**78 questions**	**0,735**	**73**

4.8 The Comparison of Upper-Intermediate and Advanced Level Groups

One of the research questions inquired whether there was a statistically significant difference between the upper-intermediate and advanced level groups in terms of achievements levels in vocabulary, lexical tasks and reading comprehension tests. Table 4.14 shows the descriptive statistics regarding the three instruments for both of the groups and Table 4.15 shows the results of the t-Test:

Table 4.14 Comparison of Group-wise Performance through the Mean Scores

	group	N	Mean	Std. Deviation	Std. Error Mean
COMPREHENSION	advanced	33	79.3286	7.07106	1.23091
	upper-intermediate	17	61.7622	9.51011	2.30654
LEXICAL LINKS	advanced	33	83.3363	8.33686	1.45126
	upper-intermediate	17	64.3129	11.37467	2.75876
VOCABULARY	advanced	33	74.8409	8.79299	1.53066
	upper-intermediate	17	57.7853	15.20168	3.68695

According to the results of the t-test shown in Table 4.15 below, there is a statistically significant difference in the overall performance of the two groups in all of the three areas tested in this study.

Table 4.15a Group Differences (T-Test)

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
COMPREHEN-SION	Equal variances assumed	4.10	.048	7.38	48	.000	17.56	2.378	12.78	22.34
LEXICAL LINKS	Equal variances assumed	1.79	.187	6.73	48	.000	19.02	2.823	13.34	24.70
VOCABULARY	Equal variances assumed	3.83	.056	5.03	48	.000	17.05	3.385	10.24	23.86

T-tests were also run for each of the 6 tasks in all three areas, making a total of 18 different tasks. The results showed that there was not any statistically significant difference between the groups only in Vocabulary Tasks 1 and 3. That is, the groups did not differ in their vocabulary knowledge prior to the reading tests in texts 1 and 3. However, they differed significantly in their comprehension scores and the lexical links tasks scores.

As table 4.15b shows, vocabulary knowledge of the advanced level readers correlates significantly neither with reading comprehension performance **(**r = 0.223, ***p*** = .212), nor with the lexical cohesive links tasks (r = 0.129, *p* = .474**).**

Table 4.15b Group Differences: Correlations within the Advanced Group

		COMPREHENSION	LEXICAL	VOCABULARY
COMPREHENSION	Pearson Correlation	1	**.730(**)**	**.223**
	Sig. (2-tailed)		.000	.212
	N	33	33	33
LEXICAL	Pearson Correlation	.730(**)	1	**.129**
	Sig. (2-tailed)	.000		.474
	N	33	33	33

** Correlation is significant at the 0.01 level (2-tailed).

However, within the upper intermediate group, there is a strong relationship between comprehension success and vocabulary (**r = 0.689, *p* < .05.**) and a moderate correlation between lexical cohesive links tasks and vocabulary knowledge (**r = 0.548, *p* < .05.**). Tables 4.14b and 4.15c show the correlations for each variable separately.

Table 4.15c Group Differences: Correlations within the Upper-intermediate Group

		COMPREHENSION	LEXICAL	VOCABULARY
COMPREHENSION	Pearson Correlation	1	**.778(**)**	**.689(**)**
	Sig. (2-tailed)		.000	.002
	N	17	17	17
LEXICAL	Pearson Correlation	.778(**)	1	**.548(*)**
	Sig. (2-tailed)	.000		.023
	N	17	17	17

The above finding might be interpreted as follows: As the proficiency level increases, vocabulary knowledge tends to correlate loosely with both reading comprehension and the recognition of lexical cohesive links. At lower proficiency levels, learners are more dependent on their linguistic credentials such as grammar and vocabulary knowledge whereas at the higher proficiency levels, strategies and skills combined with increased awareness of textual features help learners find their ways more autonomously and with less effort.

PART B: QUALITATIVE SECTION

4.9- Introduction to the Qualitative Analysis

This section will attempt to explore, in a qualitative manner, the possible reasons why some students had difficulty with certain questions in the tests and tasks. All of the instruments that are mentioned in this section can be seen in Appendix D, from D1 to D6. For copyright reasons, the original reading tests as a whole could not be included in the Appendix. Here, some of the challenging questions are reproduced with correct answers for detailed analysis.

4.10- The Challenging Questions in the TOEFL IBT Reading Comprehension Tests and the Accompanying Lexical Links Tasks

Table 4.16 shows the difficult questions that have been chosen to investigate in qualitative terms on the basis of the average mean scores for each question. The designated cut-off point is .70. Put simply, items shown below could not be answered correctly by at least 30 %, or more, of the test takers.

Table 4.16 The most challenging items in the study

Text Number and Title (#1-2-3: 1st set, #4-5-6: 2nd set)	Pre-reading Vocabulary Familiarity Tasks	Reading Comprehension Tests	Lexical Links Recognitions Tasks
1-The expression of Emotions	Q5, q6,q7, q12, q13, q15	Q6, q10, q11	Q3, q4
2-Geology and Landscape	Q3, q7, q8, q12, q15	Q10, q12A, q12B	Q1D, q2, q4, q6, q7
3-Swimming Machines	Q1, q4, q7, q9, q10, q13, q15	Q6, q9, q10, q11, q12A, q12B	Q5, q6
4-Desert Formation	Q3, q4, q5, q9	Q4, q6, q9, q11, q13	Q4, q5, q7, q8
5-Artisans and Industrialization	Q5, q6	Q3, q5, q6, q7, q12A, Q12B	Q2, q4, q8
6- Aggression	Q2, q3, q4, q5, q6, q7, q8, q9, q11, q12, q13, q15	Q1, q2, q7, q9, q10, q11	Q3, q4, q5A, q6A, q6B, q7

As aforementioned, the instrument in the study consisted of mainly three components: pre-reading vocabulary section, reading comprehension section and "The Lexical Links Recognition Tasks" section. All the questions that were answered correctly by less than 70 percent of the students are indicated in Table

4.16. In other words, if a question is answered correctly by more than 35 readers out of 50 participants, then this question is considered to be relatively easier and is not included among the challenging questions. However, to save space and to be able to provide a thorough analysis, at most only nine questions per text will be discussed here. Therefore, for the six texts used in the study, fewer than 54 items will be given priority to be discussed and qualitatively explored.

The following section will analyze all the challenging items per text one by one.

A- Text 1- The Expression of Emotions

Vocabulary items that some of the readers did not know prior to the reading test:

In the text titled "The Expression of Emotions", there were eight vocabulary items that seemed challenging for some of the students. In this text, upper-intermediate students knew only 66.7 percent of the words asked whereas advanced students were familiar with 75.2 percent of the words.

The results of the pre-reading vocabulary task for Text 1 showed that the vast majority of the target items (72.2 percent on average) were known to the students. Of the 15 target items taken from the text, the mean numbers of *unknown* words were as follows: Upper intermediate group; 5/15 and advanced group; 3.7/15. Average mean scores across the two proficiency levels indicated significant differences in the level of difficulty of the passage in terms of vocabulary. The vocabulary items in Text 1 with a mean score below the cut-off point are indicated in Table 4.17.

Table 4.17 Descriptive Statistics of the Vocabulary Familiarity Task 1

	N	Std. Deviation			
Question #		correct	Mean	Std. Error	Std. Deviation
V1Q6: to suggest	50	17.00	.3400	.06767	.47852
V1Q5: to concur	50	23.00	.4600	.07120	.50346
V1Q12: contradiction	50	27.00	.5400	.07120	.50346
V1Q15: tension	50	30.00	.6000	.06999	.49487
V1Q13: to signify	50	31.00	.6200	.06934	.49031
V1Q7: to depict	50	32.00	.6400	.06857	.48487
Valid N (listwise)	50				

Reading Comprehension Questions that posed difficulty for the readers:

The results of the TOEFL reading comprehension test for Text 1 showed that the vast majority of the comprehension questions (78.1 percent on average) were correctly answered by the students. Of the 13 questions from the text, the mean numbers of correctly answered questions were as follows: Upper intermediate group; 8.76/13 and advanced group; 10.90/13. Average mean scores across the two proficiency levels indicated significant differences in the level of difficulty of the passage in terms of comprehension.

On the basis of average mean scores, there are only three reading comprehension questions that proved to be challenging for the readers, as seen in Table 4.18 below. These questions, listed in the order of difficulty, and numbered 10, 11 and 6, were correctly answered by 46 %, 64 % and 66 % of the readers, respectively, as shown in Table 4.18.

Table 4.18

	N	Std. Deviation			
Question #		correct	Mean	Std. Error	Std. Deviation
T1Q10	50	23.00	.4600	.07120	.50346
T1Q11	50	32.00	.6400	.06857	.48487
T1Q6	50	33.00	.6600	.06767	.47852
Valid N (listwise)	50				

Item 10 is a vocabulary question in which the word "relevant" is being tested, and this word is highlighted in the passage. The correct answer choice is 4, "applicable", as seen in the extract below from the actual test. The word "relevant" in this specific context, means that professor Ekman's observation applies (is applicable) to an expression. Here the possible cause of failure on the part of some students may result from a few reasons. First, the word "relevant" is a high frequency word known to almost all of the students. However, among the options, none of the choices fit into the students' prior lexical schemata for this word. So some of them chose "contradictory" possibly just because of the preposition "to", which is used after both of the words. Maybe only a few students could readily associate "relevant" and "applicable". Second, the main problem here in fact comes from the idiomatic expression "keep a stiff upper lip", which none of the students knew before, because understanding of this expression is a prerequisite to reach the correct option, "applicable". Only 23 students out of 50 could correctly interpret the meaning of the expression by analyzing the other sentences around. Those students

who were able to recognize the lexical cohesive links below easily got the question right:

- (Expression) “keep a stiff upper lip”- (recommendation for) Handling stress
- (A stiff lip) suppresses emotional response

The expressions “handling stress” and “suppressing emotional response” in fact refer to the same phenomenon. This can easily be inferred because there is no linguistic signal there showing a meaning shift: the sentence beginning with “it may be that…” is only a pattern that is used for making an explanation or prediction. This means that the paragraph continues to flow in the same direction.

Extract 1: Reading Test 1, Question 10 & Question 11

PARAGRAPH 6

Ekman’s observation may be relevant to the British expression “keep a stiff upper lip” as a recommendation for handling stress. It might be that a “stiff” lip suppresses emotional response—as long as the lip is not quivering with fear or tension. But when the emotion that leads to stiffening the lip is more intense, and involves strong muscle tension, facial feedback may heighten emotional response.

10. The word relevant in the passage is closest in meaning to

- ○ contradictory
- ○ confusing
- ○ dependent
- ○ applicable

11. According to the passage, stiffening the upper lip may have which of the following effects?

- ○ It first suppresses stress, then intensifies it.
- ○ It may cause fear and tension in those who see it.
- ○ It can damage the lip muscles.
- ○ It may either heighten or reduce emotional response.

Item 11, shown in Extract 1, is a “factual information” question “asking for specific information that can be found in the passage, as described by the test maker, ETS. The correct answer choice is 4; stiffening the upper lip may either increase or reduce emotional reaction. This is stated explicitly in the paragraph. However, many students opted for the 1st choice, ignoring the fact that the actions of “suppressing/reducing and heightening/intensifying emotional responses” are not consecutive/chronological events. This is an “either-or” situation, the result being determined by the level of the intensity of the emotion that leads to stiffening. Here the conjunction “but” functions as a signal for shifting the positive flow of the paragraph into a negative one. This conjunction also helps the readers to infer that suppressing and heightening an emotion are antonyms. Perhaps some of the students considered these two verbs as synonymous verbs, following each other.

The lexical cohesion analysis (see the Appendix) also indicates that these phrases occur several times in different shapes:

Extract 2 From The Lexical Cohesion Analysis for Text 1

1. the free **expression** of an emotion
    a. the **repression** of all outward signs (antonym
        i. **suppresses** emotional response (p.6)(synonym)
            1. heighten emotional response (antonym)

If the failing readers had been aware of the lexical reiteration of certain events and concepts through semantically related words, they would have easily found the correct answer. Those who could recognize the semantic relationship between these verbs did not have difficulty understanding the situation.

Item 6 is a sentence simplification question. The sentence below is highlighted in the passage. Here is the question:

Extract 3: Reading Test 1, Question 6

The Fore also displayed familiar facial expressions when asked how they would respond if they were the characters in stories that called for basic emotional responses**.**

Extract 3: Reading Test 1, Question 6, continued

6. Which of the sentences below best expresses the essential information in the highlighted sentence in the passage? *Incorrect* choices change the meaning in important ways or leave out essential information.

- ⬭ The Fore's facial expressions indicated their unwillingness to pretend to be story characters.
- ⬭ The Fore were asked to display familiar facial expressions when they told their stories.
- ⬭ The Fore exhibited the same relationship of facial expressions and basic emotions that is seen in Western culture when they acted out stories.
- ⬭ The Fore were familiar with the facial expressions and basic emotions of characters in stories.

The correct answer choice is 3. It contains all of the essential ideas in the highlighted sentence without changing meaning. The sentence that precedes the highlighted sentence states that in a survey, the Fore (a tribe) agreed with Westerners on how various emotions are portrayed. Then, the highlighted sentence says that in a different situation (that is, story-telling), the Fore's expressions were also familiar for them, and they were the same as those expressed by the Westerners

in the same situation. There are some lexical links that connect the given sentence with the choice 3:

- display- exhibit(synonyms)
- basic emotional responses- basic emotions
- familiar facial expressions (for the researchers) - the same relationship of facial expressions
- characters in stories- acting out stories

In the incorrect options, there are usually some words that have never taken place earlier in the text, which is a lexical clue indicating that this option is irrelevant. For example, here the word "unwillingness" in the first choice has never appeared before in the text in any form. Also, in the last option, the adjective "familiar" is used with the subject "the Fore" and this clearly distorts the original meaning given in the text since it was the researchers who were familiar with the expressions and emotions, not the members of the Fore tribe. Although the question seems to be an easy one for the majority of the readers, 17 readers out 50 could not identify the correct option.

Items in the "Lexical Cohesive Links Tasks" that posed difficulty for the readers:

The results of the post-reading "Lexical Links Recognition Task" for Text 1 showed that the vast majority of the target lexical links (79.3 percent) were correctly identified by the students. Of the 10 different target links taken from the text, the mean numbers of correctly identified links were as follows: Upper intermediate group; 7.64/10 and advanced group; 8.09/10. Average mean scores across the two proficiency levels indicated significant differences in the level of difficulty of the passage in terms of the identification of the lexical cohesive links. The challenging items whose mean scores are below the designated cut-off point (.70) are shown in Table 4.19.

Table 4.19 Descriptive Statistics of the Lexical Cohesive Links Task 1

	N	Std. Deviation			
Question #		correct	Mean	Std. Error	Std. Deviation
L1Q3	50	23.00	.4600	.07120	.50346
L1Q4	50	31.00	.6200	.06934	.49031
Valid N (listwise)	50				

On the basis of average mean scores, there are only two questions in the lexical links recognition task that proved to be challenging for the readers, as seen

in the Table 4.19. These questions, listed in the order of difficulty, questions 3 and 4, were, on average, correctly answered by 46 % and 62 % of the readers, respectively.

Item 3, shown in Extract 4, requires the readers to recognize at least one synonym of the verb "to mean".

Extract 4: Lexical Cohesive Links Task 1, Question 3

L1Q3:

3. Scan the first and second paragraphs in the text and find a verb which has a similar meaning to the verb " to mean or to point at" in the given context.

……to suggest, to signal……

There are two sentences in the passage that include a synonym for this verb and these two verbs are used almost for the same function all over the text:

- …..facial expressions could signal the approach of the enemies….
- ….. certain facial expression suggest the same emotions…

The cohesion analysis clearly indicates the lexical cohesive relationship among these verbs:

1. **signal** (p.1)
   a. suggest (par.2) (synonym)
   b. signifying (fear) (par.5) (synonym)

Also the phrase "to be a sign of (friendliness/anger/approval, etc.)" appears a few times earlier in the text, which should help the readers associate the verbs "to signal" and "to suggest" with the expression of certain emotions in humans. Below are the first two paragraphs of the text (Extract 5):

Extract 5: Two paragraphs from the text titled "The Expression of Emotions"

Joy and sadness are experienced by people in all cultures around the world, but how can we tell when other people are happy or despondent? It turns out that the expression of many emotions may be universal. Smiling is apparently a universal sign of friendliness and approval. Baring the teeth in a hostile way, as noted by Charles Darwin in the nineteenth century, may be a universal sign of anger. As the originator of the theory of evolution, Darwin believed that the universal recognition of facial expressions would have survival value. For example, facial expressions could signal the approach of enemies (or friends) in the absence of language.

Most investigators concur that certain facial expressions suggest the same emotions in all people. Moreover, people in diverse cultures recognize the emotions manifested by the facial expressions. In classic research Paul Ekman took photographs of people exhibiting the emotions of anger, disgust, fear, happiness, and sadness. He then asked people around the world to indicate what emotions were being depicted in them. Those queried ranged from European college students to members of the Fore, a tribe that dwells in the New Guinea highlands. All groups, including the Fore, who had almost no contact with Western culture, agreed on the portrayed emotions. The Fore also displayed familiar facial expressions when asked how they would respond if they were the characters in stories that called for basic emotional responses. Ekman and his colleagues more recently obtained similar results in a study of ten cultures in which participants were permitted to report that multiple emotions were shown by facial expressions. The participants generally agreed on which two emotions were being shown and which emotion was more intense.

Item 4, shown in Extract 6, again asks the readers to identify two synonymous verbs used in the second paragraph.

Extract 6: Lexical Cohesive Links Task 1, Question 4

L1Q4:

4. In the second paragraph, find a synonym for the verb. "(to be) depicted".

…correct answer:… to be portrayed.....……

In the passage (see Extract 5 above), first, the sentence "emotions were being depicted…" appears and then a few sentences later, the sentence "The fore … agreed on the portrayed emotions" appears. A careful reader who just follows the noun "emotions" can easily detect these two synonymous verbs, which are used to express the same meaning. Readers who are aware of the existence of such lexical networks over the text could easily associate the relevant words, and sometimes even regardless of the knowledge of the individual word meanings. Still, 38 percent could not find the answer.

B- Text 2- Geology and Landscape

Vocabulary items that some of the readers did not know prior to the reading test:

There were 5 vocabulary items that seemed challenging for some of the students. In this text, upper-intermediate students knew only 61.2 percent of the words whereas advanced students were familiar with 77 percent of the words asked.

The results of the pre-reading vocabulary task for Text 2 showed that the vast majority of the target items (71.4 percent on average) were known to the students. Of the 15 target items taken from the text, the mean numbers of unknown words were as follows: Upper intermediate group; 5.8/15 and advanced group; 3.5/15. Average mean scores across the two proficiency levels indicated significant differences in the level of difficulty of the passage in terms of vocabulary. The vocabulary items in Text 2 with a mean score below the cut-off point are indicated in Table 4.20.

Table 4.20 Descriptive Statistics of the Vocabulary Familiarity Task 2

	N	Std. Deviation			
Question #		Correct	Mean	Std. Error	Std. Deviation
V2Q7: epitome	50	26.00	.5200	.07137	.50467
V2Q8: terrain	50	27.00	.5400	.07120	.50346
V2Q15: crust	50	28.00	.5600	.07091	.50143
V2Q12: splitting	50	31.00	.6200	.06934	.49031
V2Q3: to seep into	50	33.00	.6600	.06767	.47852
Valid N (listwise)	50				

Reading Comprehension Questions that posed difficulty for the readers:

The results of the TOEFL reading comprehension test for Text 2 showed that the vast majority of the comprehension questions (76.5 percent on average) were correctly answered by the students. Of the 13 questions from the text, the mean numbers of the correctly answered questions were as follows: Upper intermediate group; 8.7/13 and advanced group; 10.6/13. Average mean scores across the two proficiency levels indicated significant differences in the level of difficulty of the passage in terms of comprehension.

On the basis of average mean scores, there are only three reading comprehension questions that proved to be challenging for the readers, as seen in Table 4.21. These questions, listed in the order of difficulty, and numbered 10, 12A and 12B, were correctly answered by 50 %, 54 % and 54 % of the readers, respectively. The challenging items whose mean scores are below the designated cut-off point (.70) are shown in Table 4.21.

Table 4.21 Descriptive Statistics for the Reading Comprehension Test 2

	N	Std. Deviation			
Question #		Correct	Mean	Std. Error	Std. Deviation
T2Q10	50	25.00	.5000	.07143	.50508
T2Q12A	50	27.00	.5400	.07120	.50346
T2Q12B	50	27.00	.5400	.07120	.50346
Valid N (listwise)	50				

Question 10 is a Factual Information question asking for specific information that can be found in paragraph 6, which is given in Extract 7.

Extract 7: Reading Comprehension Test 2, Question 10

PARAGRAPH 6

Under very cold conditions, rocks can be shattered by ice and frost. Glaciers may form in permanently cold areas, and these slowly moving masses of ice cut out valleys, carrying with them huge quantities of eroded rock debris. ■ In dry areas the wind is the principal agent of erosion. ■ It carries fine particles of sand, which bombard exposed rock surfaces, thereby wearing them into yet more sand. ■ Even living things contribute to the formation of landscapes. ■ Tree roots force their way into cracks in rocks and, in so doing, speed their splitting. In contrast, the roots of grasses and other small plants may help to hold loose soil fragments together, thereby helping to prevent erosion by the wind.

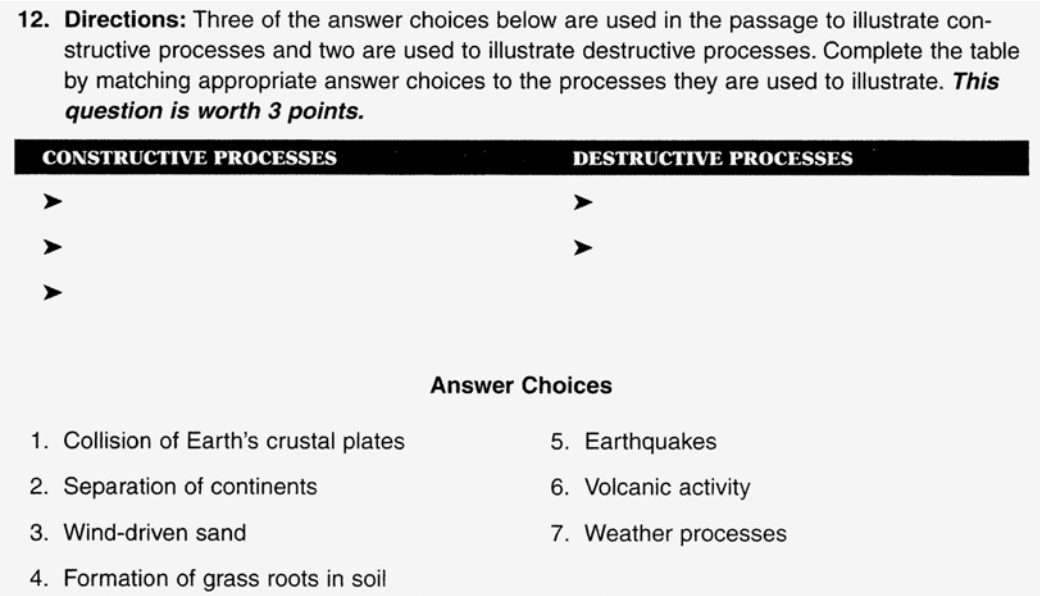
10. According to paragraph 6, which of the following is both a cause and result of erosion?

- ⬭ Glacial activity
- ⬭ Rock debris
- ⬭ Tree roots
- ⬭ Sand

The correct answer is choice 4, "sand." Sentences 3 and 4 of that paragraph describe erosion in dry areas. Our world knowledge and schemata about sand tell us that sand is an active agent in dry areas with wind's physical support. Sand is carried by wind and bombards rock; this bombardment breaks down the rock, and, as a result, more sand is created. Thus sand is both the cause and the result of erosion, so choice 4 is correct. Here the readers may not know the meaning of "wearing them into" but it can easily be inferred: if particles of sand bombard(hit) rock surfaces, then of course as a result of friction, erosion is unavoidable on the surface of the rocks. Another crucial point not to miss here is the fact that, in the text, wind and sand are shown to be the agents (causes) of erosion. The word "thereby", meaning "thus", indicates "result". Readers who could not associate these words with cause and result missed the correct answer. Glacial activity (choice 1) and tree roots (choice 3) are both mentioned only as causes of erosion. Rock debris (choice 2) is mentioned only as a result of erosion, too. This question could not be answered correctly by 50 % of the readers.

Item 12 is a Fill in a Table question. It was divided into two parts as A and B on purpose since the question included two columns. This question required the readers to synthesize all the information in the text and transform it into a table format.

Extract 8: Reading Comprehension Test 2, Question 12



12. Directions: Three of the answer choices below are used in the passage to illustrate constructive processes and two are used to illustrate destructive processes. Complete the table by matching appropriate answer choices to the processes they are used to illustrate. ***This question is worth 3 points.***

CONSTRUCTIVE PROCESSES	DESTRUCTIVE PROCESSES
➤	➤
➤	➤
➤	

Answer Choices

1. Collision of Earth's crustal plates
2. Separation of continents
3. Wind-driven sand
4. Formation of grass roots in soil
5. Earthquakes
6. Volcanic activity
7. Weather processes

The table given in the question is completed correctly below. The correct choices for the "constructive processes" column are 1, 5, and 6. Choices 3 and 7 are the correct choices for the "destructive processes" column. Choices 2 and 4 should not be used in either column.

Constructive processes

- Collision of Earth's crustal plates
- Earthquakes
- Volcanic activity

Destructive processes

- Weather processes
- Wind-driven sand

In this question, readers had to identify whether a specific geological process constructs (builds/creates) a form of land or destroys (damages/erodes) the land. So they had to pay attention to the verbs used such as "deterioration of the surface", "the reduction or loss of vegetation", "Erosion of soil", "blow away", "wind and water erosion" etc. so as to differentiate constructive and destructive events. Important lexical cohesive links are provided below in the extract:

Extract 9: From the Lexical Cohesion Analysis of the Text Titled "Geology and Landscape"

1. **two principal influences**
    a. constructive processes (hyponym)
        i. uplift (hyponym)
            1. forces of uplift (p.4) (simple repetition)
        ii. create new landscape features (hyponym)
    b. destructive processes (hyponym)
        i. erosion (hyponym)
            1. forces of uplift (antonym)
            2. forces of erosion (p.4) (simple repetition)
            3. carried away (complex synonnmy)
                a. (fragments which are) deposited as sediments
                b. wear away exposed landforms
                c. create new landscape features (antonym)
            4. broken down into segments (p.4)(synonym)
                a. shattered (p.6) (synonym)
            5. principal agent of erosion (p.6) (simple repetition)
            6. erosion by the wind (simple repetition)

Items in the "Lexical Links Recognition Tasks" that posed difficulty for the readers:

The results of the post-reading "Lexical Links Recognition Task" for Text 2 indicated that the vast majority of the target lexical links (73.38 percent on average) were correctly identified by the students. Of the 11 target links taken from the text, the mean numbers of correctly identified links were as follows: Upper intermediate group; 6.29/11 and advanced group; 9.03/11. Average mean scores across the two proficiency levels indicated significant differences in the level of difficulty of the passage in terms of lexical links. The challenging items whose mean scores are below the designated cut-off point (.70) are shown in Table 4.22.

Table 4.22 Descriptive Statistics of the Lexical Cohesive Links Task 2

	N	Std. Deviation			
Question #		Correct	Mean	Std. Error	Std. Deviation
L2Q7	50	21.00	.4200	.07051	.49857
L2Q2	50	29.00	.5800	.07051	.49857
L2Q4	50	31.00	.6200	.06934	.49031
L2Q1D	50	33.00	.6600	.06767	.47852
L2Q6	50	33.00	.6600	.06767	.47852
Valid N (listwise)	50				

On the basis of the average mean scores, there are 5 questions in the lexical links recognition task that proved to be challenging for the readers, as seen in Table 4.22 above. These questions, listed in the order of difficulty, 7, 2, 4, 1D and 6,

were, on average, correctly answered by 42 %, 58 %, 62 %, 66 % and 66 % of the readers, respectively.

Extract 10: Lexical Cohesive Links Task 2, Question 7

> 7. What is the common function/role of the following items in relation to landscapes, as it is mentioned in the last paragraph?
>   a. tree roots
>   b. roots of grasses
>   c. (roots of) other small plants
>
> Answer: .....These living things all contribute to the formation of landscapes……

Item 7 required the students to relate some reiterated noun phrases to a general word (superordinate) mentioned a few lines earlier. There is a noun phrase in the text which functions as a general term for all the phrases given as a, b, c in the question: it is "living things". The last part of the last paragraph is reproduced in Extract 11:

Extract 11: A Paragraph from the Text Titled "Geology and Landscape"

> Even living things contribute to the formation of landscapes. Under different climatic conditions, another type of destructive force contributes to erosion. Tree roots force their way into cracks in rocks and, in so doing, speed their splitting. In contrast, the roots of grasses and other small plants may help to hold loose soil fragments together, thereby helping to prevent erosion by the wind.

The answer was clearly given in the paragraph but students with a lower awareness of lexical links were unable to associate the given noun phrases with the subject (a general noun) of the preceding sentence.

Question 2, given in Extract 12, asked the students to find a contextual/lexical clue to be able to correctly predict the meaning of the noun "altitude". Only 21 students out of 50 were able to provide the correct answer.

Extract 12: Lexical Cohesive Links Task, Question 2

> 2. How do you understand the meaning of "altitude" and what are the related words given in the text?
> ……Answer:……**26,000 feet** ……

Some of the readers may not know the meaning of this word but there are apparent clues around in the text that guide the readers as to the meaning of "altitude", as seen in the original paragraph given below in Extract 13. The phrase "**26,000 feet**" is the most salient lexical clue because it includes "feet" used as height measurement and verbs "**folded upwards**" and "**raised**" also indicate up-levels or height.

Extract 13: A Paragraph from the Text Titled "Geology and Landscape"

> The Earth's crust is thought to be divided into huge, movable segments, called plates, which float on a soft plastic layer of rock. Some mountains were formed as a result of these plates crashing into each other and forcing up the rock at the plate margins. In this process, sedimentary rocks that originally formed on the seabed may be **folded upwards to altitudes** of more than **26,000 feet**. Other mountains may be **raised** by earthquakes, which fracture the Earth's crust and can displace enough rock to produce block mountains…….

Only 29 students out of 50 were able to provide the correct answer for question 2.

Item 6, given in Extract 14, required the readers to identify the four contextual synonyms, three of which had already been given. The readers' task was to find the fourth one occurring in one of the last two paragraphs.

Extract 14: Lexical Cohesive Links Task, Question 6

> 6. Read the last two paragraphs of the text, and then find the verb which has a similar meaning to the following verbs taken from the text:
>
> c. …seeps underground (synonym)
> d. …cut through (synonym)
> e. …force their way into cracks
>
> Answer:……penetrate……

The relevant paragraph is reproduced in Extract 15.

Extract 15: A Paragraph from the Text Titled "Geology and Landscape"

> The weather, in its many forms, is the main agent of erosion. Rain washes away loose soil and **penetrates** cracks in the rocks. Carbon dioxide in the air reacts with the rainwater, forming a weak acid (carbonic acid) that may chemically attack the rocks. The rain **seeps underground** and the water may reappear later as springs. These springs are the sources of streams and rivers, which **cut through** the rocks and carry away debris from the mountains to the lowlands.
>
> Under very cold conditions, rocks can be shattered by ice and frost. Glaciers may form in permanently cold areas, and these slowly moving masses of ice cut out valleys, carrying with them huge quantities of eroded rock debris. In dry areas the wind is the principal agent of erosion. It carries fine particles of sand, which bombard exposed rock surfaces, thereby wearing them into yet more sand. Even living things contribute to the formation of landscapes. Tree roots **force their way into cracks** in rocks and. in so doing, speed their **splitting**. **In contrast**, the roots of grasses and other small plants may help to **hold loose soil fragments together**, thereby helping to prevent erosion by the wind.

The bold-faced words in the text indicate how lexical links create a semantic network. It is obvious that the writer used different vocabulary items to refer to the same phenomenon. In this context, all of these verbs have the meaning of "to go through or to enter something and pass or spread through it, especially when this is difficult" as given in the *Longman Dictionary of Contemporary English Online*. Here the conjunction "in contrast" also helps the readers infer that (rocks')

"splitting" is the opposite of "holding loose soil fragments together". 17 students out of 50 weren't able to provide the correct answer for this question.

C- Text 3- "Swimming machines": An Analysis of the Challenging Questions

Vocabulary items that some of the readers did not know prior to the reading test:

In the text titled "Swimming Machines", there were seven vocabulary items that seemed challenging for some of the students. In this text, upper-intermediate students knew only 55.7 percent of the words prior to the reading test whereas advanced students were familiar with 64.5 percent of the words asked.

The results of the pre-reading vocabulary task for Text 3 showed that more than half of the target items (61.4 percent on average) were known to the students. Of the 15 target items taken from the text, the mean numbers of unknown words were as follows: Upper intermediate group; 6.65/15 and advanced group; 5.33/15. Average mean scores across the two proficiency levels indicated significant differences in the level of difficulty of the passage in terms of vocabulary.

The vocabulary items in Text 3 which have a mean score below the cut-off point are indicated in Table 4.23.

Table 4.23 Descriptive Statistics for the Vocabulary Familiarity Task 3

	N	Std. Deviation			
Question #		Correct	Mean	Std. Error	Std. Deviation
V3Q7: drag	50	11.00	.2200	.05918	.41845
V3Q9: thrust	50	14.00	.2800	.06414	.45356
V3Q10: propulsion	50	16.00	.3200	.06664	.47121
V3Q15: to protrude	50	21.00	.4200	.07051	.49857
V3Q13: to remain buoyant	50	30.00	.6000	.06999	.49487
V3Q1: motion	50	34.00	.6800	.06664	.47121
V3Q4: to channel	50	34.00	.6800	.06664	.47121
Valid N (listwise)	50				

Reading Comprehension Questions That Posed Difficulty for the Readers:

The results of the TOEFL reading comprehension test for Text 3 showed that a great number of comprehension questions (68.12 percent on average) were correctly answered by the students. Of the 13 questions from the text, the mean numbers of correctly answered questions were as follows: Upper intermediate group; 8.2/13 and advanced group; 9.1/13. Average mean scores across the two proficiency levels indicated significant differences in the level of difficulty of the

passage in terms of comprehension. The challenging items whose mean scores are below the designated cut-off point (.70) are shown in Table 4.24.

Table 4.24 Descriptive Statistics of the Reading Comprehension Test 3

	N	Std. Deviation			
Question #		Correct	Mean	Std. Error	Std. Deviation
T3Q11	50	16.00	.3200	.06664	.47121
T3Q12B	50	17.00	.3400	.06767	.47852
T3Q12A	50	19.00	.3800	.06934	.49031
T3Q10	50	20.00	.4000	.06999	.49487
T3Q9	50	28.00	.5600	.07091	.50143
T3Q6	50	29.00	.5800	.07051	.49857
Valid N (listwise)	50				

Item 11 is an Insert Text question. You can see the four black squares in paragraph 6 that represent the possible answer choices here. The last sentence of paragraph 5 is also reproduced below in Extract 16.

Extract 16: Reading Comprehension Test 3, Question 11

> Again, supersonic jets have similar features.
> ■ Because they are always swimming, tunas simply have to open their mouths and water is forced in and over their gills. ■ Accordingly, they have lost most of the muscles that other fishes use to suck in water and push it past the gills. ■ In fact, tunas must swim to breathe. ■ They must also keep swimming to keep from sinking, since most have largely or completely lost the swim bladder, the gas-filled sac that helps most other fish remain buoyant.
> 11. Look at the four squares [■] that indicate where the following sentence can be added to the passage.
> **Consequently, tunas do not need to suck in water.**
> Where would the sentence best fit?

The sentence provided, "Consequently, tunas do not need to suck in water," is best inserted at square 2. The sentence provides an explanation for the muscle loss described in the sentence that follows square 2 and is a result of the fact described in the preceding sentence, which says that because the fish are always swimming, they only have to open their mouths to suck in water. Thus if the provided sentence is inserted at square 2, it provides a logical bridge between cause and effect. The adverb “consequently” and the verb “to suck in” are important lexical links connecting the given sentence with the paragraph. The sentence makes no logical sense anywhere else.

Item 12A-B is a Fill in a Table question. The question is reproduced in Extract 17.

Extract 17: Reading Comprehension Test 3, Question 12

12. Directions: Complete the table below by indicating which features of fishes are associated in the passage with reducing water resistance and which are associated with increasing thrust.

REDUCING WATER RESISTANCE	INCREASING THRUST
.....	.....
.....	.....
.....	

1. The absence of scales from most of the body
2. The ability to take advantage of eddies
3. The ability to feed and reproduce while swimming
4. Eyes that do not protrude
5. Fins that are stiff, narrow, and smooth
6. The habit of swimming with the mouth open
7. A high, narrow tail with swept-back tips

The correct choices for the "Reducing water resistance" column are 1, 4, and 5. Choices 2 and 7 belong in the "Increasing thrust" column. Choices 3 and 6 should not be used in either column. The question table is completed correctly below, as shown in Extract 18, taken from the original answer key.

Extract 18: Reading Comprehension Test 3, Answer for Question 11

REDUCING WATER RESISTANCE	INCREASING THRUST
➤ The absence of scales from most of the body	➤ The ability to take advantage of eddies
➤ Eyes that do not protrude	➤ A high, narrow tail with swept-back tips
➤ Fins that are stiff, narrow and smooth	

Incorrect Choices:

Choice 3: "The ability to feed and reproduce while swimming" does not belong in the table because it is not mentioned in the passage in connection with either reducing water resistance or increasing thrust.

Choice 6: "The habit of swimming with the mouth open" does not belong in the table because it is not mentioned in the passage in connection with either reducing water resistance or increasing thrust.

Question 10, shown in Extract 19, is a Factual Information question asking for specific information that can be found in Paragraph 9.

Extract 19: Reading Comprehension Test 3, Question 10

PARAGRAPH 9

The muscles of these fishes and the mechanism that maintains a warm body temperature are also highly efficient. A bluefin tuna in water of 7°C (45°F) can maintain a core temperature of over 25°C (77°F). This warm body temperature may help not only the muscles to work better, but also the brain and the eyes. The billfishes have gone one step further. They have evolved special "heaters" of modified muscle tissue that warm the eyes and brain, maintaining peak performance of these critical organs.

10. According to paragraph 9, which of the following is true of bluefin tunas?

- ⬭ Their eyes and brain are more efficient than those of any other fish.
- ⬭ Their body temperature can change greatly depending on the water temperature.
- ⬭ They can swim in waters that are much colder than their own bodies.
- ⬭ They have special muscle tissue that warms their eyes and brain.

The correct answer is choice 3, "They can swim in waters that are much colder than their own bodies." That paragraph says, "A bluefin tuna in water of 7°C (45°F) can maintain a core temperature of over 25°C (77°F)." So it is clear that choice C is correct. The readers only have to compare the temperatures of the sea and the fish. Choice 1 is not stated in the paragraph and there is no lexical link between this option and the text. Choice 2 is contradicted by the paragraph. Choice 4 is true of billfish, not bluefin tuna.

Items in "Lexical Links Recognition Tasks" that posed difficulty for the readers:

The results of the post-reading "Lexical Links Recognition Task" for Text 3 indicated that a great majority of the target lexical links (75.43 percent on average) were correctly identified by the students. Of the 10 target links taken from the text, the mean numbers of correctly identified links were as follows: Upper intermediate group; 6.70/10 and advanced group; 8/10. Average mean scores across the two proficiency levels indicated significant differences in the level of difficulty of the passage in terms of lexical links. The challenging items whose mean scores are below the designated cut-off point (.70) are shown in Table 4.25.

Table 4.25 Descriptive Statistics for the Lexical Cohesive Links Task 3

	N	Std. Deviation			
Question #		Correct	Mean	Std. Error	Std. Deviation
L3Q5	50	24.00	.4800	.07137	.50467
L3Q6	50	30.00	.6000	.06999	.49487
Valid N (listwise)	50				

On the basis of average mean scores, there are 2 questions in the lexical links recognition task that proved to be challenging for the readers, as seen on the table above. These questions, listed in the order of difficulty, 5 and 6, were, on average, correctly answered by 48 % and 60 % of the readers, respectively.

Item 5 requires the readers to recognize two contextual synonyms that were used interchangeably in the text.

Extract 20: Lexical Cohesive Links Task 3, Question 5

5. The opposite of the concept of "drag [water resistance]" is "……" (as given in the text).

Answer: "propulsion" or "forward thrust"

Looking at the lexical cohesion analysis in Extract 21 below, there are two antonyms pointing at the concept of "water resistance" or "drag", which are both used in the text: "forward thrust" and "propulsion".

Extract 21: From the Lexical Cohesion Analysis for the Text Titled "Swimming Machines"

35. forward thrust

a. reduce **drag** (same lexical set)
b. **propulsion** (synonym)
    i. eddies (same lexical set)
    ii. swirls (same lexical set)
    iii. circular currents (same lexical set)
    iv. **propulsion systems** for ships (simple repetition)
c. glide past eddies
d. gain extra **thrust** (repetition)

All these four concepts are repeated several times throughout the text and are in fact crucial lexical links for the accurate comprehension of the text (see reading comprehension section, Question 12 A-B above). This phrase first occurs in the second paragraph: "Many of the adaptations of these fishes serve to reduce water resistance (drag)." Once more, it reappears in the third paragraph: "Most species lack scales over most of the body, making it smooth and slippery. The eyes

lie flush with the body and do not protrude at all. They are also covered with a slick, transparent lid that reduces drag." It occurs for the third time in the 8th paragraph: "There are adaptations that increase the amount of forward thrust as well as those that reduce drag." This last sentence in fact uses both of the words and it is clear from this sentence and the following explanations that these two phrases (to increase forward thrust-to reduce drag) are used as antonyms. However, 52 percent of the students were unable to associate these two phrases and failed to provide the correct answer.

Item 6 in the lexical links recognition task, shown in Extract 22, required the readers to find lexical clues to be able to predict the meaning of the verb "to remain buoyant", whose meaning was not known to 40 % of the students before.

Extract 22: Lexical Cohesive Links Task 3, Question 6

6. What does the phrase "remain buoyant" mean, in paragraph 6, about tunas? Write a clue phrase from the text.

…Answer:…not to sink, float…….

In the text, towards the end of the 6th paragraph, there are two sentences that make the meaning of this verb phrase clear:

…..In fact, tunas must swim to breathe. They must also keep swimming to keep from sinking, since most have largely or completely lost the swim bladder, the gas-filled sac that helps most other fish remain buoyant.

Here, the first phrase "keep from sinking" helps the readers make an informed guess about the meaning of "to remain buoyant". However, 40 percent of the readers could not recognize the lexical link.

D- Text 4- "Desert Formation": An analysis of the Challenging Questions

Vocabulary items that some of the readers did not know prior to the reading test:

In the text titled "Desert Formation", there were four vocabulary items that seemed challenging for some of the students. In this text, upper-intermediate students knew on average only 59.6 percent of the words whereas advanced students were familiar with 83.6 percent of the words asked.

The results of the pre-reading vocabulary task for Text 4 showed that more than three fourths of the target items (75.1 percent on average) were known to the

students. Of the 15 target items taken from the text, the mean numbers of unknown words were as follows: Upper intermediate group; 6.06/15 and advanced group; 2.5/15. Average mean scores across the two proficiency levels indicated significant differences in the level of difficulty of the passage in terms of vocabulary.

The vocabulary items in Text 4 with a mean score below the cut-off point are indicated in Table 4.26.

Table 4.26 Descriptive Statistics for the Vocabulary Familiarity Task 4

	N	Std. Deviation			
Question #		Correct	Mean	Std. Error	Std. Deviation
V4Q9:irrigation	50	29.00	.5800	.07051	.49857
V4Q3: delicate	50	30.00	.6000	.06999	.49487
V4Q5: devoid of	50	33.00	.6600	.06767	.47852
V4Q4:susceptible	50	34.00	.6800	.06664	.47121
Valid N (listwise)	50				

Reading Comprehension Questions that Posed Difficulty for the Readers:

The results of the TOEFL reading comprehension test for Text 4 showed that a great number of comprehension questions (76.8 percent on average) were correctly answered by the students. Of the 13 questions from the text, the mean numbers of correctly answered questions were as follows: Upper intermediate group; 8.7/13 and advanced group; 10.6/13. Average mean scores across the two proficiency levels indicated significant differences in the level of difficulty of the passage in terms of comprehension.

The challenging items whose mean scores are below the designated cut-off point (.70) are shown in Table 4.27.

Table 4.27 Descriptive Statistics for the Reading Comprehension Test 4

	N	Std. Deviation			
Question #		Correct	Mean	Std. Error	Std. Deviation
T4Q11	50	16.00	.3200	.06664	.47121
T4Q9	50	25.00	.5000	.07143	.50508
T4Q13	50	32.00	.6400	.06857	.48487
T4Q4	50	33.00	.6600	.06767	.47852
T4Q6	50	33.00	.6600	.06767	.47852
Valid N (listwise)	50				

Question 11, given in Extract 23 below, is an Inference question asking for an inference that can be supported by the passage. The correct answer is choice 3; the passage suggests that the author believes "Desertification will continue to increase."

Extract 23: Reading Comprehension Test 4, Question 11

11. It can be inferred from the passage that the author most likely believes which of the following about the future of desertification?

O Governments will act quickly to control further desertification.
O The factors influencing desertification occur in cycles and will change in the future.
O Desertification will continue to increase.
O Desertification will soon occur in all areas of the world.

The last paragraph of the passage says that slowing or reversing the erosion process will be very difficult, but that it **may** occur in those areas that are not too affected already if rigorously enforced anti-erosion processes are implemented. Taken together, this suggests that the author is not confident this will happen; therefore, it can be inferred that he thinks erosion will continue. The passage provides no basis for inferring choices 1, 2, or 4. Paragraph 10 from the text is reproduced below in Extract 24.

Extract 24: Paragraph 10 from the Text Titled "Desert Formation"

PARAGRAPH 10

The extreme seriousness of desertification results from the vast areas of land and the tremendous numbers of people affected, as well as from the great difficulty of reversing or even slowing the process. Once the soil has been removed by erosion, only the passage of centuries or millennia will enable new soil to form. In areas where considerable soil still remains, though, a rigorously enforced program of land protection and cover-crop planting may make it possible to reverse the present deterioration of the surface.

Question 9, given in Extract 25 below, is a Negative Factual Information question asking for specific information that can be found in the passage. Choice 3, "insufficient irrigation," is the correct answer.

Extract 25: Reading Comprehension Test 4, Question 9

9. All of the following are mentioned in the passage as contributing to desertification EXCEPT

O soil erosion
O global warming
O insufficient irrigation
O the raising of livestock

Choice 1, "soil erosion," is explicitly mentioned in paragraph 2 as one of the primary causes of desertification, so it is not the correct answer. Choice 2, "global warming," is mentioned as a cause of desertification in paragraph 4, so it is incorrect. Choice 4, "raising of livestock," is described in paragraph 7 as another cause of desertification, so it is incorrect. The passage includes **excessive** irrigation

as a cause of desertification, but not its opposite, insufficient irrigation, so that is the correct answer. However, 50 % of the readers failed to choose the correct option in this question. The relevant paragraph is reproduced below in Extract 26.

Extract 26: Paragraph 9 from the Text Titled "Desert Formation"

PARAGRAPH 9

The final major human cause of desertification is soil salinization resulting from overirrigation. Excess water from irrigation sinks down into the water table. If no drainage system exists, the water table rises, bringing dissolved salts to the surface. The water evaporates and the salts are left behind, creating a white crustal layer that prevents air and water from reaching the underlying soil.

Question 13 is a Prose Summary question. It is reproduced below in Extract 27:

Extract 27: Reading Comprehension Test 4, Question 13

13- Directions: An introductory sentence for a brief summary of the passage is provided below. Complete the summary by selecting the THREE answer choices that express the most important ideas in the passage. Some answer choices do not belong in the summary because they express ideas that are not presented in the passage or are minor ideas in the passage.

Many factors have contributed to the great increase in desertification in recent decades.

- .....
- .....
- .....

Answer Choices

1. Growing human populations and the agricultural demands that come with such growth have upset the ecological balance in some areas and led to the spread of deserts.
2. As periods of severe dryness have become more common, failures of a number of different crops have increased.
3. Excessive numbers of cattle and the need for firewood for fuel have reduced grasses and trees, leaving the land unprotected and vulnerable.
4. Extensive irrigation with poor drainage brings salt to the surface of the soil, a process that reduces water and air absorption.
5. Animal dung enriches the soil by providing nutrients for plant growth.
6. Grasses are generally the dominant type of natural vegetation in semiarid lands.

The question is completed correctly below. The correct choices are 1, 3, and 4. Choices 2, 5, and 6 are therefore incorrect.

Correct Choices:

Choice 1, "Growing human populations and the agricultural demands that come with such growth have upset the ecological balance in some areas and led to the spread of deserts," is correct because it is a recurring theme in the passage, one

of the main ideas. Paragraphs 5, 6, 7, and 9 all provide details in support of this statement.

Choice 3, "Excessive numbers of cattle and the need for firewood for fuel have reduced grasses and trees, leaving the land unprotected and vulnerable," is correct because these are two of the human activities that are major causes of desertification. The causes of desertification is the main theme of the passage. Paragraphs 6, 7, and 8 are devoted to describing how these activities contribute to desertification.

Choice 4, "Extensive irrigation with poor drainage brings salt to the surface of the soil, a process that reduces water and air absorption," is correct because it is another of the human activities that is a major cause of desertification, the main theme of the passage. Paragraph 6 mentions this first, then all of paragraph 9 is devoted to describing how this activity contributes to desertification.

Incorrect Choices:

Choice 2, "As periods of severe dryness have become more common, failures of a number of different crops have increased," is incorrect because it is a "supporting detail", not a main idea of the passage.

Choice 5, "Animal dung enriches the soil by providing nutrients for plant growth," is incorrect because it is contradicted by paragraph 8 of the passage.

Choice 6, "Grasses are generally the dominant type of natural vegetation in semi- arid lands," is incorrect because it is a minor detail, mentioned once in passing in paragraph 7. 36 % of the readers failed to identify the correct option in this question.

Items in "Lexical Links Recognition Tasks" that Posed Difficulty for the Readers:

The results of the post-reading "Lexical Links Recognition Task" for Text 4 indicated that a great majority of the target lexical links (74.45 percent on average) were correctly identified by the students. Of the 10 target links taken from the text, the mean numbers of correctly identified links were as follows: Upper intermediate group; 7.26/10 and advanced group; 8.68/10. Average mean scores across the two proficiency levels indicated significant differences in the level of difficulty of the

passage in terms of lexical links. The challenging items whose mean scores are below the designated cut-off point (.70) are shown in Table 4.28.

Table 4.28 Descriptive Statistics for the Lexical Cohesive Links Task 4

	N	Std. Deviation			
Question #		Correct	Mean	Std. Error	Std. Deviation
L4Q8	50	22.00	.4400	.07091	.50143
L4Q4	50	26.00	.5200	.07137	.50467
L4Q5	50	28.00	.5600	.07091	.50143
L4Q7	50	31.00	.6200	.06934	.49031
Valid N (listwise)	50				

On the basis of average mean scores, there are 4 questions in the lexical links recognition task that proved to be challenging for the readers, as seen on the table above. These questions, listed in the order of difficulty, 8, 4, 5 and 7, were, on average, correctly answered by 44 %, 52 %, 56 % and 62 % of the readers, respectively.

The question with the lowest mean score in this task is question 8, with a mean score of .44. It is reproduced below in Extract 28, with the relevant paragraph taken from the text, shown in Extract 29.

Extract 28: Lexical Cohesive Links Task 4, Question 8

8- What is the relationship between a "drainage system" and "irrigation".
Answer: …….Whereas irrigation provides water for dry land, a drainage system removes redundant water from wet lands …….

Paragraph 9 from the relevant passage is reproduced below and it explains the relationship between a "drainage system" and "irrigation".

Extract 29: Paragraph 9 from the Text Titled "Desert Formation"

PARAGRAPH 9

The final major human cause of desertification is soil salinization resulting from overirrigation. Excess water from irrigation sinks down into the water table. If no drainage system exists, the water table rises, bringing dissolved salts to the surface. The water evaporates and the salts are left behind, creating a white crustal layer that prevents air and water from reaching the underlying soil.

From the phrase "excess water" in paragraph 9, it is understood that over-irrigation results in excess (redundant) water, which is the cause of salinization, one of the factors causing desertification. The solution lies in a drainage system; "If no drainage system exists, the water table rises, bringing dissolved salts to the surface". So it can easily be said that, without knowing what a drainage system means, one

can infer that a drainage system removes redundant water resulting from over-irrigation (from the land). However, 56 percent (28 students out of 50) could not see the relationship between these two words functioning as contextual antonyms

The question with the third lowest mean score in this task is question 5, with a mean score of .56. It is reproduced below in Extract 30 with the relevant paragraph taken from the text, shown in Extract 31.

Extract 30: Lexical Cohesive Links Task 4, Question 5

5- Considering the meaning of "water penetration" and "water absorbtion" as mentioned in the 3rd paragraph, what does "runoff" mean? Explain very briefly.

……**Answer**: …. ."increased waterflow on the surface"…….

Paragraph 3 from the relevant passage is reproduced in Extract 31 and it gives clues about the meaning of the word "runoff".

Extract 31: Paragraph 3 from the Text Titled "Desert Formation"

PARAGRAPH 3

Even in the areas that retain a soil cover, the reduction of vegetation typically results in the loss of the soil's ability to absorb substantial quantities of water. The impact of rain-drops on the loose soil tends to transfer fine clay particles into the tiniest soil spaces, sealing them and producing a surface that allows very little water penetration. Water absorption is greatly reduced, consequently runoff is increased, resulting in accelerated erosion rates. The gradual drying of the soil caused by its diminished ability to absorb water results in the further loss of vegetation, so that a cycle of progressive surface dete-rioration is established.

In the *Longman Dictionary of Contemporary English Online*, the term "runoff" is defined as "the water flow that occurs when soil is infiltrated to full capacity and excess water from rain, melt-water, or other sources flows over the land." In paragraph 3, the following sentences explain clearly the roles of water absorption and water penetration in the desertification process:

> The impact of raindrops on the loose soil tends to transfer fine clay particles into the tiniest soil spaces, sealing them and producing a surface that allows very little water penetration. Water absorption is greatly reduced, consequently runoff is increased, resulting in accelerated erosion rates.

As raindrops reduce the soil's ability to absorb water (rain), that is water absorption or penetration (used synonymously), runoff increases. Therefore, with no need for technical knowledge on the subject, one can easily infer that runoff means a kind of flooding resulting from loss of the soil's ability to take in water on the surface. However, 44 percent of the readers could not make such an inference despite the lexical links, as shown below in Extract 32 from the lexical cohesion analysis of the text.

Extract 32: From the Lexical Cohesion Analysis of Text 4

6. Wind and **water**

a. blown away (collocation with wind)
b. blown away - retain (antonymy-opposites)
c. substantial quantities of water (repetition)
d. raindrops (hyponym)
e. water penetration (simple repetition)
f. water penetration= water absorbtion (the ability to absorb water) synonymy)
g. run-off=blown away (simple synonymy)
h. accelerated erosion rates (collocations with run off and blown away)
i. wind and water erosion (repetition

Question 7, shown in Extract 33, is related to the identification of lexical clues that help the readers guess the meaning of an (assumingly) unknown word. It is reproduced below.

Extract 33: Lexical Cohesive Links Task 4, Question 5

7- Find a phrase in the text that explains the meaning of "overgrazing".
…**Answer**:…. . "excessive number of livestock"……

The word "overgrazing" is mentioned, along with other causes, as one of the causes of desertification earlier in paragraph 6 (see Extract 34), where the first cause, "overcultivation", is discussed. Later in the seventh paragraph, the relationship between livestock and the consequences of their grazing is explained but only the word "grazing" occurs later in the next paragraph.

Extract 34: Paragraphs 6 & 7 from the Text Titled "Desert Formation"

Four specific activities have been identified as major contributors to the desertification processes: overcultivation, **overgrazing**, firewood gathering, and overirrigation. The cultivation of crops has expanded into progressively drier regions as population densities have grown. These regions are especially likely to have periods of severe dryness, so that crop failures are common. Since the raising of most crops necessitates the prior removal of the natural vegetation, crop failures leave extensive tracts of land devoid of a plant cover and susceptible to wind and water erosion.

The **raising of livestock** is a major economic activity in semiarid lands, where **grasses** are generally the dominant type of natural vegetation. The consequences of **an excessive number of livestock** grazing in an area are **the reduction of the vegetation cover** and the trampling and pulverization of the soil. This is usually followed by the drying of the soil and accelerated erosion.

The bold words in the above paragraphs help the readers figure out the relationship between livestock and grazing: in very simple terms, "animals eating grasses" can easily be inferred. The phrase "an excessive number of livestock" specifically indicates the exact meaning of "overgrazing". Here, recognizing the

function of the prefix "over-" also plays a crucial role: it has earlier been used many times in the text with other words such as overcultivation and overirrigation. Nevertheless, 38 percent of the readers failed to detect any clues as to the meaning of this word.

E- Text 5- "Artisans and Industrialization": An Analysis of the Challenging Questions

Vocabulary items that some of the readers did not know prior to the reading test:

There were only two vocabulary items that seemed challenging for some of the students. In this text, upper-intermediate students knew only 71.4 percent of the words whereas advanced students were familiar with 81.4 percent of the words asked in the task sheet.

The results of the pre-reading vocabulary task for Text 5 showed that a great majority of the target items (71.4 percent on average) were known to the students. Of the 15 target items taken from the text, the mean numbers of unknown words were as follows: Upper intermediate group; 4.30/15 and advanced group; 2.79/15. Average mean scores across the two proficiency levels indicated significant differences in the level of difficulty of the passage in terms of vocabulary. Table 4.29 below shows the words and their means scores.

Table 4.29 Descriptive Statistics for the Vocabulary Familiarity Task 5

	N	Std. Deviation			
Question #		Correct	Mean	Std. Error	Std. Deviation
V5Q6:craftsmanship	50	19.00	.3800	.06934	.49031
V5Q5: trade	50	21.00	.4200	.07051	.49857
Valid N (listwise)	50				

Reading Comprehension Questions that posed difficulty for the readers:

The results of the TOEFL reading comprehension test for Text 5 showed that a great number of comprehension questions (71.7 percent on average) were correctly answered by the students. Of the 13 questions from the text, the mean numbers of correctly answered questions were as follows: Upper intermediate group; 8.3/13 and advanced group; 9.8/13. Average mean scores across the two proficiency levels indicated significant differences in the level of difficulty of the passage in terms of comprehension.

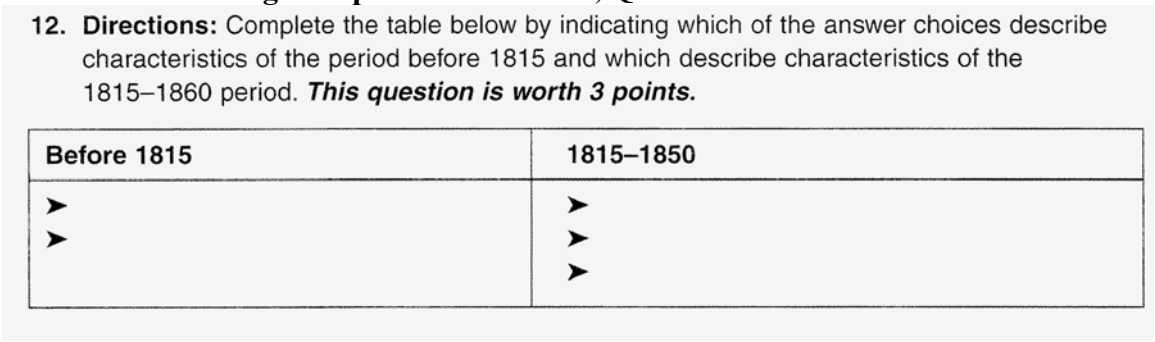
The challenging items whose mean scores are below the designated cut-off point (.70) are shown in Table 4.30.

Table 4.30 Descriptive Statistics for the Reading Comprehension Test 5

	N	Std. Deviation			
Question #		Correct	Mean	Std. Error	Std. Deviation
T5Q12B	50	18.00	.3600	.06857	.48487
T5Q6	50	23.00	.4600	.07120	.50346
T5Q12A	50	28.00	.5600	.07091	.50143
T5Q5	50	32.00	.6400	.06857	.48487
T5Q7	50	32.00	.6400	.06857	.48487
T5Q3	50	34.00	.6800	.06664	.47121
Valid N (listwise)	50				

Item 12A-B, shown in Extract 35, is a Fill in a Table question.

Extract 35: Reading Comprehension Test 5, Question 12 A&B

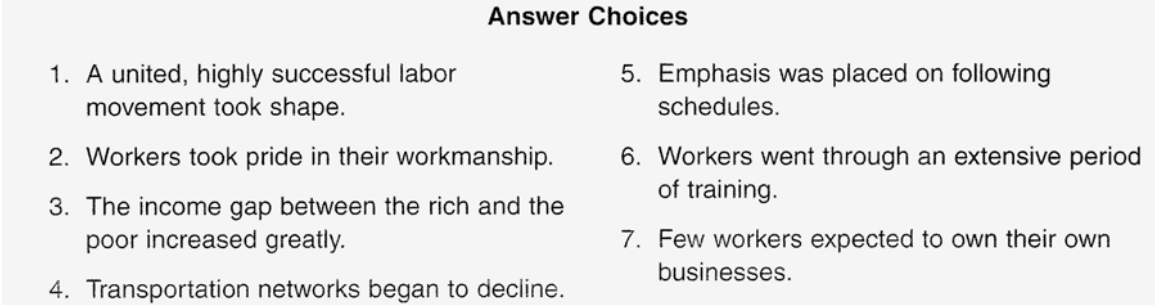


12. Directions: Complete the table below by indicating which of the answer choices describe characteristics of the period before 1815 and which describe characteristics of the 1815–1860 period. ***This question is worth 3 points.***

Before 1815	1815–1850
➤ ➤	➤ ➤ ➤

The following choices are provided for the readers, as shown in Extract 36:

Extract 36: Reading Comprehension Test 5, Question 12 A&B, Answer Choices



Answer Choices

1. A united, highly successful labor movement took shape.
2. Workers took pride in their workmanship.
3. The income gap between the rich and the poor increased greatly.
4. Transportation networks began to decline.
5. Emphasis was placed on following schedules.
6. Workers went through an extensive period of training.
7. Few workers expected to own their own businesses.

The correct choices for the "Before 1815" column are 2 and 6. Choices 3, 5, and 7 belong in the "1815-1850" column. Choices 1 and 4 should not be used in either column.

Correct Choices

Choice 2: "Workers took pride in their workmanship" belongs in the "Before 1815" column because it is mentioned in the passage as one of the characteristics of labor before 1815.

Choice 3: "The income gap between the rich and the poor increased greatly" belongs in the "1815-1850" column because it is mentioned in the passage as one of the characteristics of society that emerged in the period between 1815 and 1850.

Choice 5: "Emphasis was placed on following schedules" belongs in the "1815-1850" column because it is mentioned in the passage as one of the characteristics of labor in the factory system that emerged between 1815 and 1850.

Choice 6: "Workers went through an extensive period of training" belongs in the "Before 1815" column because it is mentioned in the passage as one of the characteristics of labor before 1815.

Choice 7: "Few workers expected to own their own businesses" belongs in the "1815-1850" column because it is mentioned in the passage as one of the characteristics of society that emerged in the period between 1815 and 1850.

Incorrect Choices:

Choice 1: "A united, highly successful labor movement took shape" does not belong in the table because it contradicts the passage.

Choice 4: "Transportation networks began to decline" does not belong in the table because it is not mentioned in the passage in connection with either the period before 1815 or the period between 1815 and 1850.

Another challenging question was the sixth question in the test (Extract 37), which was a Vocabulary question.

Extract 37: Reading Comprehension Test 5, Question 6

6. The phrase gathered some momentum in the passage is closest in meaning to
   - O made progress
   - O became active
   - O caused changes
   - O combined forces

The phrase being tested is "gathered some momentum." It is highlighted in the passage given in Extract 38.

Extract 38: Paragraph 5 from the Text Titled "Artisans and Industrialization"

In this newly emerging economic order, workers sometimes organized to protect their rights and traditional ways of life. Craftworkers such as carpenters, printers, and tailors formed unions, and in 1834 individual unions came together in the National Trades' 2 Union. The labor movement **gathered some momentum** in the decade before the Panic 2 of 1837, but in the depression that followed, labor's strength collapsed. During hard times, few workers were willing to strike or engage in collective action.

The correct answer is choice 1, "made progress." To "gather momentum" means to advance with increasing speed. In the same sentence, the conjunction “but” and the rest of the sentence “labor's strength collapsed” are major clues that help the readers figure out meaning of this word. Nevertheless, 54 percent failed to predict the correct meaning.

Question 5, reproduced in Extract 39, is a Negative Factual Information question asking for specific information that can be found in paragraph 4.

Extract 39: Reading Comprehension Test 5, Question 5

5. All of the following are mentioned in paragraph 4 as consequences of the new system for workers EXCEPT a loss of

- freedom
- status in the community
- opportunities for advancement
- contact among workers who were not managers

Choice 4, "contact among workers who were not managers," is the correct answer. The paragraph explicitly contradicts this by stating that "factories sharply separated workers from management." This choice in fact tests the readers’ ability to paraphrase a sentence accurately, without any distortion in meaning. It is clear in the passage that there was a gap between managers and the workers, but there is no mention of such a gap among the workers themselves. All the other choices are clearly mentioned in the paragraph, of course with minor lexical changes. The paragraph explicitly states that workers lost choice 1 (personal freedom), choice 2 (“loss of standing in the community”-“their decline in status”), and choice 3 (“Few workers rose through the ranks to supervisory positions”, that is, no advancement or promotion). Therefore, those choices are all incorrect, as firmly confirmed by lexical evidence from the text. The relevant paragraph is reproduced below in Extract 40.

Extract 40: Paragraph 4 from the Text Titled “Artisans and Industrialization”

PARAGRAPH 4

The first generation to experience these changes did not adopt the new attitudes easily. The factory clock became the symbol of the new work rules. One mill worker who finally quit complained revealingly about “obedience to the ding-dong of the bell—just as though we are so many living machines.” With the loss of personal freedom also came the loss of standing in the community. Unlike artisan workshops in which apprentices worked closely with the masters supervising them, factories sharply separated workers from management. Few workers rose through the ranks to supervisory positions, and even fewer could achieve the artisan’s dream of setting up one’s own business. Even well-paid workers sensed their decline in status.

Items in the "Lexical Links Recognition Tasks" that posed difficulty for the readers:

The results of the post-reading "Lexical Links Recognition Task" for Text 5 indicated that a great majority of the target lexical links (86.4 percent on average) were correctly identified by the students. Of the 11 target links taken from the text, the mean numbers of correctly identified links were as follows: Upper intermediate group; 8.5/11 and advanced group; 10/11. Average mean scores across the two proficiency levels indicated significant differences in the level of difficulty of the passage in terms of lexical links. The challenging items whose mean scores are below the designated cut-off point (.70) are shown in Table 4.31.

Table 4.31 Descriptive Statistics for the Lexical Cohesive Links Task 5

	N	Std. Deviation			
Question #		Correct	Mean	Std. Error	Std. Deviation
L5Q2	50	30.00	.6000	.06999	.49487
L5Q8	50	32.00	.6400	.06857	.48487
L5Q4	50	34.00	.6800	.06664	.47121
Valid N (listwise)	50				

The second question in this task, which has the lowest mean score, requires the readers to identify the less common meaning of a word in a specific context. Question 2 is reproduced in Extract 41.

Extract 41: Lexical Cohesive Links Task 5, Question 2

> 2. Read again the first and second paragraphs, and explain the meaning of the noun "trade" . Does it mean "the activity of buying, selling, or exchanging goods"? .. **Answer**:..Trade (n.): **…..** a particular job, especially one needing special skill with your hands **……**

The word "trade" usually means "buying and selling goods", that is, commercial activities; however, in the text, it does not refer to this common meaning: it means "a special job or work, one especially requiring skills with hands". For example, in the expression "a salesman who knew all the tricks of the trade (=clever methods used in a particular job)", this meaning is intended. This usage, which occurs twice in two different sentences in the text, is very apparent in the context as well. The relevant paragraphs are reproduced below in Extract 42.

Extract 42: Paragraphs 1&2 from the Text Titled "Artisans and Industrialization"

…Before 1815 manufacturing in the United States had been done in homes or shops by skilled artisans. As master craftworkers, they imparted the knowledge of their **trades** to apprentices and journeymen. In addition, women often worked in their homes part-time, making finished articles from raw material supplied by merchant capitalists…….
……Before the rise of the factory, artisans had worked within the home. Apprentices were considered part of the family, and masters were responsible not only for teaching their apprentices **a trade** but also for providing them some education and for supervising their moral behavior. Journeymen knew that if they perfected their skill, they could become respected master artisans with their own shops…….

Nevertheless, 40 percent of the students did not pay attention to the context-specific meaning of this word and opted for the common meaning of the word, which was irrelevant in the text. The lexical cohesion analysis below also highlights the lexical cohesive links that could be helpful for the readers.

Extract 43: From the Lexical Cohesion Analysis for the Text Titled "Artisans and Industrialization"

3. impart their **trades**
- a. a trade (Synonym)(p.1)
- b. some education (collocation)
  - i. supervising (collocation)
- c. their skill (p.2)
  - i. skilled artisans
- d. (pride in) craftsmanship
  - i. Produced (by hand)(p.2)
  - ii. Productivity (p.3)
  - iii. Productivity (p.3)

Item 8, reproduced in Extract 44, required the readers to recognize two antonyms to reach the correct answer, which was in fact clearly stated in the passage. The question stem, as a lexical clue, included a synonym (to agree) of a verb (to be united) in the text.

Extract 44: Lexical Cohesive Links Task 5, Question 8

8. According to the last paragraph, what are the two issues the workers agreed on?
…. **Answer:** 1…resenting the industrial system…2…their loss of status in the community……

The relevant paragraph, where the lexical clues are embedded, is reproduced below in Extract 45.

Extract 45: Paragraph 6 from the Text Titled "Artisans and Industrialization"

Workers were united in resenting the industrial system and their loss of status, **but they were divided by** ethnic and racial antagonisms, gender, conflicting religious perspectives, occupational differences, political party loyalties, and disagreements over tactics.

What is expected here of the readers is only to recognize two antonyms (united and divided) and two synonyms (to be united in and to agree on) to reach the correct answer. However, 36 percent of students failed to recognize such a lexical link between the words.

Question 4, given in Extract 46, required the readers to differentiate between the types of workers depending on the clues about work division among these worker groups.

Extract 46: Lexical Cohesive Links Task 5, Question 2

4. Reading the whole text, what do you think is the relationship between these three groups of people: "master craftworkers(skilled artisans), aprentices and journeymen"? What differentiates these groups of workers? ……**Answer**:……..…"They have [varying degrees of skill and status]" ……..

Sentences below in Extract 47, taken from the text, clearly illustrate the distinction among the groups: Who has the highest status and who has the lowest?

Extract 47: Paragraphs 1&2 from the Text Titled "Artisans and Industrialization"

Before 1815 manufacturing in the United States had been done in homes or shops by **skilled artisans**. As **master craftworkers**, they imparted the knowledge of their trades to **apprentices and journeymen**…..
….. **Apprentices** were considered part of the family, and **masters** were responsible not only for teaching their **apprentices** a trade but also for providing them some education and for supervising their moral behavior. **Journeymen** knew that if they perfected their skill, they could become respected **master artisans** with their own shops. Also, **skilled artisans** did not work by the clock, at a steady pace, but rather in bursts of intense labor alternating with more leisurely time.

Although these nouns have been used several times throughout the text in rich context, 32 percent of the readers could not identify the lexical semantic relationships among these three groups of workers.

F- Text 6- "Aggression": An Analysis of the Challenging Questions

Vocabulary items that some of the readers did not know prior to the reading test:

There were only two vocabulary items that *did not* seem challenging for the students: All the rest (13 items) proved to be unknown to many learners. The vocabulary items in Text 6 with a mean score below the cut-off point are indicated in Table 4.32.

Table 4.32 Descriptive Statistics for the Vocabulary Familiarity Task 6

	N	Std. Deviation			
Question #		Correct	Mean	Std. Error	Std. Deviation
V6Q5 : to vent	50	16.00	.3200	.06664	.47121
V6Q11: to purge of	50	16.00	.3200	.06664	.47121
V6Q7: to distort	50	18.00	.3600	.06857	.48487
V6Q4: impulse	50	23.00	.4600	.07120	.50346
V6Q13: to gratify	50	25.00	.5000	.07143	.50508
V6Q6: outlet	50	27.00	.5400	.07120	.50346
V6Q3: to reproduce	50	28.00	.5600	.07091	.50143
V6Q9:to assert	50	28.00	.5600	.07091	.50143
V6Q2: to trigger	50	29.00	.5800	.07051	.49857
V6Q12:to relieve	50	30.00	.6000	.06999	.49487
V6Q15: to repress	50	32.00	.6400	.06857	.48487
V6Q8:aggravating	50	33.00	.6600	.06767	.47852
Valid N (listwise)	50				

In this text, which was the most challenging of all the others in terms of vocabulary, upper-intermediate students knew only 46.69 percent of the words on average whereas advanced students, on average, were familiar with 60.63 percent of the words asked. Therefore, this passage seems to have the highest density of unknown vocabulary.

The results of the pre-reading Vocabulary Familiarity Task for Text 6 showed that only around half of the vocabulary items (55.7 percent on average) were known to the students without any group distinction. Of the 15 target items taken from the text, the mean numbers of unknown words were as follows: Upper intermediate group; 8/15 and advanced group; 6/15. Average mean scores across the two proficiency levels indicated significant differences in the level of difficulty of the passage in terms of vocabulary.

Reading Comprehension Questions that posed difficulty for the readers:

The results of the TOEFL reading comprehension test for Text 6 showed that on average 68.9 percent of the comprehension questions were correctly answered by the students. Of the 13 questions from the text, the mean numbers of correctly answered questions were as follows: Upper intermediate group; 7.7/13 and advanced group; 9.6/13. Average mean scores across the two proficiency levels indicated significant differences in the level of difficulty of the passage in terms of comprehension. The challenging items whose mean scores are below the designated cut-off point (.70) are shown in Table 4.33.

Table 4.33 Descriptive Statistics for the Reading Comprehension Test 6

	N	Std. Deviation			
Question #		Correct	Mean	Std. Error	Std. Deviation
T6Q7	50	15.00	.3000	.06547	.46291
T6Q1	50	16.00	.3200	.06664	.47121
T6Q2	50	22.00	.4400	.07091	.50143
T6Q9	50	31.00	.6200	.06934	.49031
T6Q11	50	34.00	.6800	.06664	.47121
T6Q10	50	34.00	.6800	.06664	.47121
Valid N (listwise)	50				

Item 7, which proved to the most challenging question in the test, is a Rhetorical Purpose question. It asks the readers why the author mentions that Freud described people as "steam engines" in the passage. It is reproduced in Extract 48 below.

Extract 48: Reading Comprehension Test 6, Question 7

7. Freud describes people as steam engines in order to make the point that people

- ⬭ deliberately build up their aggression to make themselves stronger
- ⬭ usually release aggression in explosive ways
- ⬭ must vent their aggression to prevent it from building up
- ⬭ typically lose their aggression if they do not express it

The phrase being tested is highlighted in the passage. The correct answer is choice 3, "must vent their aggression to prevent it from building up." Steam engines will explode if their steam builds up indefinitely. The same is true of people, as choice 3 indicates. The other choices are not necessarily true of

both people and steam engines, so they are incorrect. Paragraph 5 from the text is reproduced below in Extract 49.

Extract 49: Paragraph 5 from the Text Titled "Aggression"

PARAGRAPH 5

The Psychodynamic Approach. Theorists adopting the psychodynamic approach hold that inner conflicts are crucial for understanding human behavior, including aggression. Sigmund Freud, for example, believed that aggressive impulses are inevitable reactions to the frustrations of daily life. Children normally desire to vent aggressive impulses on other people, including their parents, because even the most attentive parents cannot gratify all of their demands immediately. Yet children, also fearing their parents' punishment and the loss of parental love, come to repress most aggressive impulses. The Freudian perspective, in a sense, sees us as "steam engines." By holding in rather than venting "steam," we set the stage for future explosions. Pent-up aggressive impulses demand outlets. They may be expressed toward parents in indirect ways such as destroying furniture, or they may be expressed toward strangers later in life.

Item 9, reproduced in Extract 50, is a Negative Factual Information question asking for specific information that can be found in paragraphs 7 and 8. Choice 3 is the correct answer.

Extract 50: Reading Comprehension Test 6, Question 9

9. According to the cognitive approach described in paragraphs 7 and 8, all of the following may influence the decision whether to act aggressively EXCEPT a person's

- ⬭ moral values
- ⬭ previous experiences with aggression
- ⬭ instinct to avoid aggression
- ⬭ beliefs about other people's intentions

Choice 1, "moral values," is explicitly mentioned as one of the influences on aggressive behavior, so it is incorrect. Choices 2 ("previous experiences") and 4 ("beliefs about other people") are both explicitly mentioned in this context. The sentence in paragraph 8 says, "People *decide* whether they will act aggressively or not on the basis of factors such as their experiences with aggression and their interpretation of other people's motives." Choice 3, the "instinct to avoid aggression," is not mentioned, so it is the correct answer here. Seventh and eighth paragraphs from the text are reproduced below in Extract 51.

Extract 51: Paragraphs 7&8 from the Text Titled "Aggression"

PARAGRAPH 7

The Cognitive Approach. Cognitive psychologists assert that our behavior is influenced by our values, by the ways in which we interpret our situations, and by choice. For example, people who believe that aggression is necessary and justified–as during wartime—are likely to act aggressively, whereas people who believe that a particular war or act of aggression is unjust, or who think that aggression is never justified, are less likely to behave aggressively.

PARAGRAPH 8

One cognitive theory suggests that aggravating and painful events trigger unpleasant feelings. These feelings, in turn, can lead to aggressive action, but *not* automatically. Cognitive factors intervene. People *decide* whether they will act aggressively or not on the basis of factors such as their experiences with aggression and their interpretation of other people's motives. Supporting evidence comes from research showing that aggressive people often distort other people's motives. For example, they assume that other people mean them harm when they do not.

Item 10, shown in Extract 52, is a Vocabulary question. The word being tested is *to distort.* It is underlined in the passage (See paragraph 8 above).

Extract 52: Reading Comprehension Test 6, Question 10

10. The word distort in the passage is closest in meaning to

- ⬭ mistrust
- ⬭ misinterpret
- ⬭ criticize
- ⬭ resent

The correct answer is choice 2, "misinterpret." To distort other people's motives is to twist them, or view them incorrectly and thereby not understand them properly. Something that is not understood properly is misinterpreted. The relevant lexical links are indicated in Extract 53, taken from the Lexical Cohesion Analysis of the text.

Extract 53: From the Lexical Cohesion Analysis for the Text "Aggression"

28. **cognitive** factors
    a. experiences with aggression (hyponym)
    b. **interpretation** of other people's motives (hyponym)
        i. **distort** other people's motives (hyponym)
        ii. **assume** (same semantic set)

Items in "Lexical Links Recognition Tasks" that posed difficulty for the readers:

The results of the post-reading "Lexical Links Recognition Task" for Text 6 indicated that 71.28 percent of the target lexical links were, on average, correctly identified by the students. Of the 11 target links taken from the text, the mean numbers of correctly identified links were as follows: Upper intermediate group; 6.5/11 and advanced group; 8.5/11. Average mean scores across the two proficiency

levels indicated significant differences in the level of difficulty of the passage in terms of lexical links. Table 4.34 indicates the descriptive statistics for the task.

Table 4.34 Descriptive Statistics for the Lexical Cohesive Links Task 6

	N	Std. Deviation			
Question #		Correct	Mean	Std. Error	Std. Deviation
L6Q6A	50	31.00	.6200	.06934	.49031
L6Q6B	50	31.00	.6200	.06934	.49031
L6Q4	50	32.00	.6400	.06857	.48487
L6Q7	50	32.00	.6400	.06857	.48487
L6Q3	50	34.00	.6800	.06664	.47121
L6Q5A	50	34.00	.6800	.06664	.47121
Valid N (listwise)	50				

Question 6, given in Extract 54, asks the readers to determine the binary relationship between two sets of words used in relation to an analogy made in the text.

Extract 54: Lexical Cohesive Links Task 6, Question 6 A-B

6. Fill in the blanks by referring to the text:
   In the steam engine analogy, "steam" represents (A)…….. in real life and expression of repressed impulses is called (B)"……..…." .

   Answer: (A)……repressive /aggressive impulses
   (B)"…outlet/catharsis….."

The author uses the steam engine analogy to describe the process of the repression of and letting out the aggressive impulses in humans. Here, the pent-up steam in the engine is the aggressive impulses that demand letting off and the process of releasing such impulses (venting out the steam) is called outlet or catharsis. Therefore, venting steam means letting out/venting off the repressed impulses(desires), which is labeled as "a safety valve" by the author. The phrase "venting off" is also reiterated as "explosion" in the later sentences. The relevant paragraph is reproduced in Extract 55.

Extract 55: Paragraphs 5&6 from the Text Titled "Aggression"

The Psychodynamic Approach. Theorists adopting the psychodynamic approach hold that inner conflicts are crucial for understanding human behavior, including aggression. Sigmund Freud, for example, believed that aggressive impulses are inevitable reactions to the frustrations of daily life. Children normally desire to vent aggressive impulses on other people, including their parents, because even the most attentive parents cannot gratify all of their demands immediately. Yet children, also fearing their parents' punishment and the loss of parental love, come to repress most aggressive impulses. The Freudian perspective, in a sense, sees us as "steam engines." By holding in rather than venting "steam," we set the stage for future explosions. Pent-up aggressive impulses demand outlets. They may be expressed toward parents in indirect ways such as destroying furniture, or they may be expressed toward strangers later in life.

According to psychodynamic theory, the best ways to prevent harmful aggression may be to encourage less harmful aggression. In the steam-engine analogy, verbal aggression may vent some of the aggressive steam. So might cheering on one's favorite sports team. Psychoanalysts, therapists adopting a psychodynamic approach, refer to the venting of aggressive impulses as "catharsis." Catharsis is theorized to be a safety valve. But research findings on the usefulness of catharsis are mixed. Some studies suggest that catharsis leads to reductions in tension and a lowered likelihood of future aggression. Other studies, however, suggest that letting some steam escape actually encourages more aggression later on.

The lexical cohesive links between relevant words from the Lexical Cohesion Analysis for Text 6 are given in Extract 56:

Extract 56: From Lexical Cohesion Analysis for the Text Titled "Aggression"

19. steam engines
- c. holding in steam (collocation)
  - i. **venting steam** (antonym)
  - ii. **agressive impulses** (synonym)
    1. **venting off agressive impulses** (repetition)
    2. **venting off agressive impulses** = catharsis (labeling)
    3. a safety valve (labeling)
  - iii. explosion (complex synonymy)
    1. outlet = (synonym)
       - a. destroying furniture (hyponym)
       - b. **purging of strong emotions** (last sentence)(synonym)
- d. steam engine **analogy** (labeling)

Despite all these lexical links and repetitions, 38 percent of the readers (19 students out of 50) were unable to fill in the blanks correctly, suggesting that they have failed to recognize the lexical cohesive signals available in the passage.

Question 4 is a vocabulary question requiring the readers to guess the meaning of a lexical item from the context. It is reproduced in Extract 57.

Extract 57: Lexical Cohesive Links Task 6, Question 4

4. In paragraph 5, the word "impulses" probably means

a. spontaneous behavior or desires
b. inner conflicts
c. instincts
d. explosions

In Extract 58, the paragraph where the answer to the question is embedded is reproduced.

Extract 58: Paragraph 5 from the Text Titled "Aggression"

PARAGRAPH 5

The Psychodynamic Approach. Theorists adopting the psychodynamic approach hold that inner conflicts are crucial for understanding human behavior, including aggression. Sigmund Freud, for example, believed that aggressive impulses are inevitable reactions to the frustrations of daily life. Children normally desire to vent aggressive impulses on other people, including their parents, because even the most attentive parents cannot gratify all of their demands immediately. Yet children, also fearing their parents' punishment and the loss of parental love, come to repress most aggressive impulses. The Freudian perspective, in a sense, sees us as "steam engines." By holding in rather than venting "steam," we set the stage for future explosions. Pent-up aggressive impulses demand outlets. They may be expressed toward parents in indirect ways such as destroying furniture, or they may be expressed toward strangers later in life.

The word (impulse) is defined in the *Longman Dictionary of Contemporary English Online* as "a sudden strong desire to do something without thinking about whether it is a sensible thing to do [= urge]". There are many lexical clues in the text that point at the meaning of this word. Extract 59 from the Lexical Cohesion Analysis for Text 6 shows all the lexical cohesive links available to make an informed guess about the meaning of the word. The links, especially the bold ones, make a great contribution to the readers' efforts. Also, the phrases "venting off aggressive impulses" and "purging of strong emotions through catharsis", occurring in the fifth and sixth paragraphs, function as strong lexical clues that help the readers.

Extract 59: From the Lexical Cohesion Analysis for the Text Titled "Aggression"

2. Attack
    f. **Agressive behaviour** (hyponym)
        i. **Agressive behaviour** in people (hyponym)
        ii. Agressiveness (par.3) (hypernym)
        iii. Agressive impulses (par.4) (synonym)
        iv. Agressive impulses ((par.5) (synonym))
        v. Aggravating (par.8) (synonym)
            1. painful events (co-hyponym)
        vi. **agressive reaction** (par.8) (synonym)
    g. Agression (par.2) (complex repetition)
    h. **instinctive aggressive reaction** (synonymy) reaction=behavior
    i. inborn reaction pattern (parahphrase) inborn = instinctive (synonymy)
    j. **inevitable reactions** (par.5) (synonym)
    k. stereotypical agressive behaviors (hyponym)
    l. agression (par.3) = agressive behavior (complex repetition)
    m. much social behavior – agression (hypernym)
    n. **genetically determined behavior = instinctive agressive reaction** (paraphrase)

Question 5 requires the readers to identify the meaning relationships between two sets of antonymous words, one synonymous group focusing on "releasing aggression" and the other "keeping/repressing aggression". These words occur several times in the text, especially in the 5th paragraph where the Freudian psychodynamic approach is discussed. Identification of the lexical cohesive links among the words in this question is also crucial to be able to answer the comprehension questions such as the 7th question in the reading comprehension section of the test. Question 5 is reproduced in Extract 60:

Extract 60: Lexical Cohesive Links Task 6, Question 5

5. Consider the steam engine analogy mentioned in the text and categorize the following words into two groups based on their meaning. (Write only the letters, not the whole words!)
    a. To vent (v.)
    b. Pent-up (adj.)
    c. To hold in (v.)
    d. To repress (v.)
    e. Outlet(s) (n.)
    f. To express (v.)

Group A	**Group B**
Answer: To hold, to repress, pent-up (adj.)	**Answer:** Outlet (n.), to vent, to express

Extract 61 taken from the Lexical Cohesion Analysis for Text 6 also indicates the lexical links related to words mentioned in this question:

Extract 61: From the Lexical Cohesion Analysis for the Text Titled "Aggression"

17. to **vent agressive impulses**
    a. to gratify their demands (collocational pair)
    b. their parent's **punishment** (antonym)
        i. **loss of parental love** (hyponym)
    c. **to repress impulses**
        i. to vent agressive impulses (antonym)
18. yet (conjunction)
19. **steam engines**
    a. holding in steam (collocation)
        i. **venting steam** (antonym)
        ii. agressive impulses (synonym)
            1. venting off agressive impulses (repetition)
            2. venting off agressive impulses = catharsis (labeling)
            3. a safety valve (labeling)
        iii. explosion (complex synonymy)
            1. outlet = (synonym)
                a. destroying furniture (hyponym)
                b. **purging** of strong emotions (last sentence) (synonym)
    b. steam engine **analogy** (labeling)

Although recognizing the lexical links in this question was crucial for the overall comprehension of the text, 32 percent of the readers were unable to categorize the words into two groups, each of which has three synonyms within.

4.11 Discussion of the Results with Regard to the Research Questions

Here the possible answers and explanations for the research questions of the study are interpreted in the light of the findings.

a. The First Research Question

The first research question asked whether there is a correlation between the number of lexical cohesive links correctly recognized and the reading comprehension scores in the TOEFL IBT reading comprehension test. Before making any claims as to the relation between lexical cohesive links and reading test performance, it is better to look at the relationship between reading comprehension and vocabulary knowledge, which forms the basis for the ability to identify lexical cohesive links in a text.

In order to determine the extent to which vocabulary knowledge is likely to contribute to reading comprehension of L2 readers, the correlation between vocabulary knowledge and comprehension test scores is needed. In the current study, to test the hypothesis whether there is a correlation between readers'

vocabulary knowledge and their performance in reading comprehension section of the TOEFL IBT test, the Pearson correlation was run and the results indicated a moderate correlation between the two: r = .662, p = .000. This correlation could have been even higher if the vocabulary task had not provided options.

Similarly, to unravel the relationship between the ability to recognize lexical cohesive links and reading test performance, the issue raised by the first research question, a Pearson correlation analysis was run. The results indicated that there is a strong correlation between the two: r = .902, p = .000. This high level of correlation might seem to be unexpected at first glance (as compared to the correlation between vocabulary knowledge and reading test performance, which is r = .662, p = .000.), but previous studies also found very strong correlations between vocabulary knowledge coupled with syntactic knowledge, termed as "**lexico-grammatical ability**" (Purpura, 1999) and performance in reading comprehension tests. For example, Enright et al. (2002) reported a very strong relationship between the structure and reading subsections of the computer-based (CBT) TOEFL (r=.91) and a strong relationship between the structure section and the reading section of the TOEFL IBT (r=.83).

Liu and Jiang (2009) also claim that grammar and lexis are inextricably interwoven and should be dealt with as a single entity in grammar instruction. They point out that the integration of corpus use, lexicogrammar, and contextualization in grammar teaching is not a random proposition, but one motivated by the inherent connection and interdependency found among these three practices. They make the following statement on the indivisibility of lexical skills and grammatical awareness:

> Lexicogrammar views lexicon and grammar as two inherently connected parts of a single entity, challenging the traditional "wisdom of postulating separate domains of lexis and syntax" (Sinclair, 1991, p. 104). In this view, "a grammatical structure may be lexically restricted" (Francis, 1993, p. 142) and, conversely, lexical items are often grammatical in nature, for the use of a lexical item often has grammatical implications (Biber, Conrad, & Reppen, 1998; Conrad, 2000; Hunston & Francis, 2000). Many corpus studies have exhibited this close lexical and grammatical connection (Biber et al., 1998; Biber, Johansson, Leech, Conrad, & Finegan, 1999; Francis, Hunston, & Manning, 1996, 1998; Hunston & Francis). There also has been increasing evidence in applied linguistics showing the importance of contextual patterns in language use and learning (Hunston & Francis, 1998). In light of these findings, many scholars have argued for the use of a lexicogrammatical approach in language instruction (Aston, 2001; Clear, 2000; Schmitt, 2004, 2005; Sinclair, 1991), (Liu and Jiang, 2009, p. 62).

Aston (2001) also makes the following argument:

> insofar as different words appear to have distinctive collocational, colligational, semantic, pragmatic and generic associations, . . . every word may have its own grammar in these respects, a grammar which can only be acquired through experience of its typical contextual patternings. (Aston, 2001, p. 15)

Alimorad, Ghalebi and Soozandehfar (2010) carried out a study on the role of grammatical knowledge in L2 lexical inferencing and pointed out to the significant role of grammar knowledge in inferencing word meaning. They support the fact that good knowledge of grammar can enhance reading comprehension, particularly lexical guessing, and can help learners improve other types of knowledge. Inadequate knowledge of vocabulary can, to some extent, be improved by adequate knowledge of grammar. According to Paribakht (2004), most researchers agree that lexical and syntactic knowledge bases are fundamentally interrelated in a kind of lexicogrammar. As it is mentioned by Schmitt (2000, p. 14), "much of what was previously considered grammar is actually constrained by lexical choices". He further argues that vocabulary and grammar can be conceptualized "as partners in synergy, with no discrete boundary" (p. 14).

It should also be acknowledged here that the recognition of the lexical cohesive links, as used in this study, are heavily dependent on the ability of the readers to make lexical inferences in the face of unknown words. As also implied by the above mentioned studies, lexical inferencing is also dependent on certain linguistic/grammatical capabilities. This is well supported by Paribakht (2004). He claims that of all the sources used in inferencing, knowledge of sentence level grammar was the source most frequently used by the participants (i.e. 42%). The knowledge sources contributing to lexical infrencing ability are listed as follows:

- Sentence-level grammatical knowledge 42%
- Word morphology 17%
- Word association 9%
- Minor linguistic sources 24%
- Discourse/text
- Homonymy
- Cognates
- Extra linguistic sources 8%

Concurring with the view that grammar knowledge influences lexical inferencing, Haastrup (1991) notes ‘‘lexical inferencing involves making informed guesses as to the meaning of a word in light of *all available linguistic cues* in combination with the learner’s general knowledge of the world, her awareness of the context, and her relevant linguistic knowledge” (p. 40).

It thus follows that vocabulary learning and grammar learning often take place simultaneously and that the teaching of the two should be conducted jointly. Considering the above mentioned claims, it is reasonable for awareness of lexical cohesive links, which is one step further than mere word knowledge, to correlate with reading test performance even more strongly.

b. The second research question

This research question inquired whether awareness of lexical cohesive links contributes to L2 reading comprehension during a reading test and if so, to what extent? In other words, it asked “What percentage of the variance in reading comprehension test scores can be explained by the variation in the lexical links tasks? For this purpose, a regression analysis was run on the results of the reading comprehension tests and the results of the lexical cohesive links tasks. The analysis indicated a strong predictive value of the awareness of lexical cohesive links: R^2 = .813, adjusted R^2 = .809, F (1, 48) = 208,422, p < .000. What this means is that 81.3 percent of the variance in reading comprehension test scores can be explained by the readers’ ability to identify lexical cohesive links.

What can be inferred from all these findings is that a skilled reader, who is -with some training in lexical cohesion- adept at finding the lexical links and inferring the meaning of unknown words in a text, is very much likely to correctly answer a great portion of the reading comprehension questions in a TOEFL reading test. To put it differently, those readers with a higher awareness of lexical cohesive links will certainly do better in tests of reading comprehension as compared to those with little or no awareness. Therefore, it seems that teaching a learner how to identify lexical links almost means the same as teaching him/her the text-attack skills vital for dealing with reading texts. Then, this ability[recognition of lexical cohesive links] can be assumed to be sharing very similar cognitive, linguistic and strategic requirements to the ones necessitated by reading comprehension.

c. The third research question

The third research question asked whether vocabulary knowledge [at recognition level] guarantees that L2 readers will recognize the "lexical cohesive links" in L2 texts during a reading comprehension test. In other words, an answer to the question "Does L2 readers' knowledge of vocabulary items in a text facilitate their recognition of lexical cohesive links?" was sought during the study. According to the results of the regression analysis carried out to determine the predictive value of the vocabulary for reading comprehension, the vocabulary factor alone can predict up to 43 percent of the variance in TOEFL reading comprehension scores: R^2 = .438, adjusted R^2 = .427, F (1, 48) = 37,482, p < .000. The rest of the variance (57 percent) in reading test scores must be attributed to other variables. This shows that a learner's lexicon alone would not suffice to get the highest scores in a reading test: there must be some other linguistic and non-linguistic factors contributing to reading test performance.

d. The fourth research question

Another research question inquired whether there was a statistically significant difference between the upper-intermediate and advanced level groups in terms of achievements levels in vocabulary knowledge, the lexical links tasks and the reading comprehension tests. According to the results, there is a statistically significant difference in the performance of the two groups in all of the three areas tested in this study.

In the vocabulary familiarity tasks administered prior to the comprehension tests, there was not any statistically significant difference in only tasks 1 (p= .065) and 3 (p= .362). Put simply, the groups were similar in their level of vocabulary knowledge based these two texts. However, for the same texts, there was a statistically significant difference in the reading comprehension tests and the lexical links tasks. This shows that although the intermediate and advanced groups had almost the same amount of vocabulary knowledge, advanced level learners still did better in terms of comprehension and the recognition of lexical cohesive links. Thus, it can be inferred that vocabulary knowledge may sometimes not be a factor strong enough to discriminate between two different proficiency levels. This in fact results from the fact, in some texts, in spite of knowing the majority of lexical items occurring in the text, still the readers may not perform the given tasks if they lack the other required knowledge types, skills and strategies.

e. The fifth research question

The fifth research question inquired about the questions that proved to be the most challenging for the readers; that is, the questions with the lowest mean scores in the reading tests. According to the results of the reading comprehension tests, the question type that received the lowest score was Fill-in-table and Prose Summary questions, which fall into the "reading to learn" category. As explained earlier in the third chapter, these question types require the readers to synthesize information from the text and digest it in a meaningful way. The readers are asked to either create a summary of the text using the sentences given in a multiple choice format, or fill in a table with sentences or phrases to make a coherent outline or summary of the whole text.

The other question types that proved challenging were negative factual information questions and inference questions, both of which require the readers to make some kind of an inference, through making connections among different linguistic and lexical elements. Table 4.35 indicates the mean scores for these question types.

Table 4.35 Top-Three Challenging Comprehension Question Types

QUESTION TYPES	Distribution of questions	Average scores	Percentages (%) of correct answers
Fill in table/ Prose Summary	**10 Questions**	**0.574**	**57,4**
Negative Factual Information	**3 Questions**	**0,582**	**58,2**
Inference	**3 Questions**	**0,656**	**65,6**

f. The Sixth research question

The sixth research question asked: What are the factors that result in failure in the comprehension questions that are more challenging for L2 readers?

The challenging comprehension questions were analyzed qualitatively and the findings were categorized into a set of skills and strategies that the failing students (poor readers) lack, as shown below:

1. The ability to follow lexical cohesive links in an authentic text

a) Recognizing the semantic relationship between topically-related words in different sentences

b) Recognizing words with similar meaning

c) Recognizing words with opposite meaning

d) Recognizing sentences that support the same line of reasoning (synonym)

e) Recognizing sentences that support the opposite line of reasoning (antonym)

f) Recognizing the super-ordinate and hyponym words

2. Following the line of reasoning of the writer

(a) Recognizing words carrying negative meaning

(b) Recognizing words carrying positive meaning

3. Recognizing the overall message of the text and thus making top-down inferences (deduction)

4.Differentiating the main ideas from the supportive details (essential versus non-essential information)

5. Comparing and synthesizing ideas mentioned in different parts of the text

a) To interpret the meaning of the text as a whole (macro level)

b) To decide on the truth value of a statement (micro level)

6. Understanding and defining the concepts which are not clearly/explicitly defined through the analysis of the available clues or examples given in the context

7. Identifying the right meaning of a word in a text using lexical knowledge and contextual clues

8. Making informed guesses about the meaning of unknown words in text (lexical inferencing)

Thus, it can be claimed that, if the students are given opportunities to foster the previous set of skills and strategies, they will perform significantly better in the reading comprehension tests.

Chapter 5

CONCLUSION

5.0 Presentation

In this chapter, a brief summary of the study is presented. The chapter also includes the conclusions drawn from the data analyzed. There are also pedagogical implications for ELT practitioners, particularly for the instructors offering reading, writing and vocabulary courses. The final section of the chapter is reserved for a discussion of the limitations of the study and a few suggestions for further research.

5.1 Summary of the Study

The present research was undertaken to evaluate the relationship among three different variables: vocabulary knowledge, reading comprehension test performance and an awareness of lexical cohesive links in an authentic text. The study included three different instruments applied consecutively in a single session: Vocabulary Familiarity Tasks, reading comprehension tests and the Lexical Cohesive Links Tasks. The readers were first given a "Vocabulary Familiarity Task", which was followed by a set of reading comprehension questions based on three different texts. Finally, they were given the "Lexical Links Tasks", in which the students were asked to find semantically related words constituting lexical cohesive links. After two weeks, the procedure with the same format was repeated for the second time but with a set of different texts and tasks. The aim of the research was to see how awareness of lexical cohesive links, vocabulary knowledge (at recognition level) and the reading comprehension test performance interact. To put it differently, this study aimed at discovering the role of lexical cohesive links in L2 reading comprehension.

The study was completed in two sessions and the tests and tasks in each session were based on three different texts, with a total of six texts applied in two sessions. The following format was followed for each text used in the study. The first instrument was the vocabulary familiarity task, which allowed the researcher to see to what degree the readers were familiar with certain words in the texts. The vocabulary familiarity tasks were based on the lexical cohesion analysis of the texts. The researcher with a colleague in the same department carried out lexical cohesion analysis of six texts (one-page long reading passages) used in the TOEFL

IBT reading tests. Second, the students were administered the reading comprehension tests. Upon completion of the reading test, the lexical cohesive links task was given to the students. For each text, suggested timing per task was as follows:

Vocabulary Familiarity Task: 10 minutes

Reading Comprehension Test: 20 minutes

Lexical Cohesive Links Task: 15 minutes

Total time per text: 45 minutes

The tests and tasks were applied to 17 upper-intermediate and 33 advanced level EFL students at Middle East Technical University, Ankara, Turkey. Prior to the reading tests, the students were administered "a vocabulary familiarity task" and after each test, a post-reading "cohesive links recognition task" was given.

Finally, the results of the tests and tasks were entered into the SPSS 13 statistical software program. The data were analyzed to compare reader performance on each instrument, both within and across the groups. The researcher analyzed the reading test results, the accompanying lexical cohesive links tasks besides the results of the vocabulary familiarity tasks to see if there is a "significant relationship" between the three factors: vocabulary knowledge, reading comprehension level and recognition of lexical cohesive links. For this purpose, reliability analysis, Pearson correlation analysis and Regression analysis were carried out to find answers to the research questions raised in the earlier chapters.

The main assumption in the current study was that, in multiple choice reading comprehension tests, there are always lexical links that connect the texts with correct options and the question stems (Batista, 2006). Moreover, considering that sentences central to the topic of a text are likely to contain a larger number of lexical links (Hoey, 1991), awareness of lexical connections that contribute to the cohesiveness of the text should help students recognize the links between the concepts and identify important information in the text. From these findings, it was hypothesized by the researcher that awareness of these lexical cohesive links should significantly increase a reader's reading comprehension test performance. A more cohesive representation of a text is expected to make discourse comprehension easier for readers, enabling them to redirect their attention resources to unfamiliar words in the text, which again should promote effective reading ability and vocabulary development. In other words, identifying the lexical cohesive links in

the text may facilitate not only accurate comprehension of text, but also learning of items reiterated by the author besides implicit learning of some novel words in the text.

The results of the study were evaluated under two main parts. In the quantitative section, the researcher looked at the relationship among three linguistic factors, namely reading ability, vocabulary knowledge and the ability to recognize and follow lexical cohesive links. Statistical analysis of the test results have indicated that there is a strong correlation between the ability to identify and follow lexical cohesive links and reading comprehension test performance. Awareness of lexical cohesive links is in fact a better predictor of reading performance and mere vocabulary knowledge itself.

In the qualitative section, the researcher looked at the challenging questions that some of the readers failed to answer correctly and tried to figure out why they had failed. A great number of the problems lie in the fact that some of the readers were not aware of lexical associations among the words and thus were not able to link the correct option to the information given in the source texts. They had problems in recognizing synonymous words, particularly contextual synonyms, and also hyponyms.

Overall, the results have indicated that awareness of lexical cohesive links noticeably contributes to reading test scores in L2 and that recognition-level vocabulary knowledge may not guarantee better reading comprehension scores.

What the results of the study point at is that training students to recognize markers of cohesion and to focus on the relations among lexically associated words and relevant sentences helps them cope with authentic texts intended for even native readership and at the same time become better readers in their native language. The concepts of coherence and cohesion are not merely descriptive theoretical constructs but integral factors in the reading process. An awareness of how they operate in texts will help EFL students to become more proficient readers.

5.2 Conclusions Drawn from the Results of the Study

A qualitative analysis of the tests results and written student responses in the lexical cohesive links tasks provided the researcher with the opportunity to draw some conclusions regarding L2 reading comprehension test performance and the recognition of lexical cohesive links as well as vocabulary knowledge. The following conclusions can be drawn from the results found in the present study:

▪ Knowing a great majority of the words in an authentic text (at recognition level) may not, in itself, guarantee high scores in the TOEFL reading tests and also may not directly contribute to the recognition of lexical cohesive links. Vocabulary size alone does not necessarily result in better comprehension of the text. The depth and breadth of vocabulary also play a crucial role. However, there is ample evidence that an extensive knowledge of vocabulary does facilitate the overall reading process.

▪ Vocabulary knowledge and an awareness of lexical cohesion, which involves the use of syntactic/grammatical knowledge, can explain up to 83 percent of the variance in reading comprehension scores in the TOEFL IBT test. In fact, vocabulary knowledge is the basis for developing an awareness of lexical cohesive links.

▪ All of the "lexical cohesive links" tasks employed in the data collection stage are "good predictors" of reading performance in TOEFL Reading Comprehension Tests.

▪ The degree to which a reader is able to recognize and respond to the lexical associations/relationships between words influences the readers' reading comprehension test performance. Overall, we can say that there is a positive correlation between the ability to recognize lexical cohesive links and the reading comprehension scores.

▪ "Fill in a table", "Insert text", "rhetorical purpose", "negative factual information" and "sentence simplification" [finding sentences with a parallel meaning], have proven to be relatively more challenging than other question types for the L2 readers.

▪ In general, students have difficulty in finding the links between synonymous/antonymous words through contextual clues. They also have difficulty in assigning the right meaning to a word in a specific context (E.g. relevant=applicable): *recognizing contextual synonyms or antonyms* is problematic for both groups of readers. The readers, especially the upper-intermediate group, have difficulty extending the semantic/lexical links to consecutive sentences in the same paragraph.

▪ Lexical links between non-adjacent sentences (across paragraphs) in texts are more difficult to identify: as the distance between the lexical links increases, it becomes very difficult to recognize the semantic relationships.

▪ It was also observed that a few advanced level students received scores lower than some of their upper-intermediate counterparts, which was unexpected of them since they had already passed the English proficiency exam of the university. One possible explanation that can be put forth to account for such unexpected instances may be the fact that some of the advanced students come from vocational teacher training schools where they are immersed in heavy structural and drill-based language learning activities. In such an environment, they usually cannot develop critical reading skills and paraphrasing skills, let alone the identification of lexical links and contextual clues in authentic texts. They usually focus on discrete test items and words in isolation, which prevents them from seeing sentences as integral parts of discourse. For all these reasons, some of the readers might have experienced problems dealing with the tasks used in this study, particularly the identification of lexical cohesive links and "reading to learn" items presented in the TOEFL IBT reading section.

What Hoey (1991) says, and what is intended to point at here is that it is possible to get good sense out of a text by reading mutually relevant sentences, as long as these sentences are linked with lexical items. However, students need to be introduced to these lexical cohesive links. Put simply, all they need to be told is to look for sentences with the same or closely related words in them. The ability to recognize lexical repetitions influences the way in which a text is interpreted. If the reader does not recognize some of the links, for example in the form of synonymy, hyponymy or co-reference, he might fail to make important semantic relations between sentences. Therefore, lexical cohesion and word associations should be emphasized so that students recognize lexical semantic relations between sentences.

In the second chapter, where the theoretical bases of the study were laid out, different frameworks and approaches to reading ability were introduced. However, for the purposes of this study, it is assumed that L2 readers in academic settings most often need to develop "reading for understanding" and "reading to learn" skills, which is the view adopted by the makers of the TOEFL exam. Under both reading purposes, it is possible to say that reading is "the process of receiving and interpreting information encoded in language form via the medium of print" (Urquhart and Weir 199, p.22). At the same time, this definition does not indicate the many components of the required cognitive processing or the knowledge bases being integrated during the reading process. Thus, a definition of reading requires

some elaborated recognition that a reader engages in phonological processing, morphological processing, syntactic and lexical processing, semantic processing, discourse processing, goal setting, text-summary building, interpretive synthesis from knowledge resources, monitoring and assessment of goal achievement, various adjustments to enhance comprehension, and repairs to comprehension processing as needed. Moreover, these processes are integrated in working memory under intense processing-time constraints. With this more elaborated definition of reading, it becomes more apparent that the tasks of understanding the nature and development of L2 reading skills is complex. It is also apparent that developing fluent L2 readers is a challenging task requiring much time, resources, and effort.

The findings of this study seem to be more in line with the propositions made by the bottom-up approach to reading mentioned in the review of literature chapter. Nevertheless, it is more realistic to say that in any reading situation, issues highlighted by the various approaches are all at work and function in a complementary fashion. The discussion in this study has aimed specifically at getting to the bottom of the reading process; that is, reinforcing and strengthening our understanding and appreciation for the details of lexical knowledge and word-processing strategies our students need to read texts in English. This focus, however, doesn't mean that higher-level knowledge of the world and top-down processing strategies are less important. In fact, the bottom of the reading processor serves the top because the more efficiently and "quietly" the bottom functions, the more attention there will be for higher-level processing of meaning, implications, outside references, and so on. Language processing skills are one subcomponent of more general cognitive processing; linguistic knowledge is just one area of the complete knowledge about the world, culture, or personal memories of the reader. This seems to be a more balanced and integrated view of reading.

5.3 Pedagogical Implications of the Study

Having considered the results of the study, since lexical cohesive devices have a direct effect on reading comprehension and reading comprehension level is closely related to the recognition of these devices, it is reasonable to put more emphasis on lexical cohesive devices in our language teaching programs. The above findings can be useful guidelines for L2 practitioners in helping their students become more efficient L2 readers by encouraging them to pay closer attention to lexical cohesive links and lexical network features in a text, raising their awareness

about the significance of in-depth vocabulary knowledge for reading test performance, thus helping them also to develop productive lexical processing strategies and encouraging them to process newly encountered words more elaborately within the context they appear.

The concept of using lexical reiteration to achieve cohesion should be integrated into L2 reading instruction in English classes through engaging students in a variety of activities which help the L2 learners have a clear idea of the use of repetition, synonyms, hyponyms and antonyms, as well as their effects on lexical cohesion. The application of lexical cohesion activities and instruction, especially at the intermediate level and further, is believed to make a difference in students' vocabulary learning, reading and writing. They will come to realize that vocabulary learning is not the rote-learning of a long list of words, but a dynamic process in which words are used functionally. They will also experience the joy in discovering how vocabulary brings cohesion to a passage.

If grammatical knowledge is the skeleton of language, then vocabulary is the blood and flesh that fill in this skeleton and give it a physical life. As a result, the EFL/L2 readers' increased awareness of how lexical reiteration is used in authentic texts and how lexical items form lexical networks, especially through word association activities and identification of lexical/semantic links in a text, vocabulary learning can also be enhanced. Another effect of the increased awareness of lexical cohesive links could be observed in the learning and retention of new vocabulary items. According to a study by Vasiljevic (2008) comparing three vocabulary teaching methods, word association technique yielded the most effective results.

It seems quite far-fetched to expect L2 readers to know every single word or vocabulary item which appears in an authentic text. Providing learners with the meanings of all the new words or encouraging extensive reading and self-study dictionary work may not sound appropriate or adequate enough to stimulate sustainable vocabulary development. The reason is that only "vocabulary lists" or "word-translation pairs" approaches deprive students of searching for and applying suitable strategies such as making inferences and meaning-guessing of words in their natural context or doing lexical analysis at text level, such as creating lexical networks, in unfolding the meaning of unknown words. Therefore, most EFL vocabulary learning guides and instructional methodologies advocate a "teach

vocabulary in context" approach, suggesting that EFL vocabulary should never be taught in isolation as in word lists with their native-tongue equivalents. Most scholars assume that vocabulary lists accompanied by translated meanings or native equivalents create less opportunity for EFL learners to achieve autonomy in second language learning or could lead to confusion in getting the right contextual meaning, especially with synonyms, antonyms, and hyponyms or meronyms, which has proven to be quite useful in the reading comprehension process (McCarthy, 1990; Prince, 1996).

Texts have lexical cohesion, which can be described as a writing mechanism that connects ideas across phrases and sentences by using words like pronouns (he, she, it, etc.) synonyms (words with similar meanings), antonyms (words with opposite meanings), linkers (and, but, because, etc.) or through simple repetition (Harmer, 2007, p.276). Because the meanings of words are embedded in their relationship to other words, training students to identify elements of lexical cohesion in texts is another approach to helping them become effective guessers.

L2 reading instructors also can use these lexical devices in their lesson plans and teach them to students and reveal lexical cohesive links in different activities. This helps students understand the text better because awareness of cohesive devices can have a positive effect on reading comprehension (Mokhtary, 1998). Teachers can develop some exercises to teach devices and in this way improve students' knowledge of lexical cohesive sub-types.

To start, teachers should provide the students with a text that has a lot of lexical relationships of synonymy and antonymy (Grellet, 1983, p.28-29). Giving line or paragraph numbers to aid students while scanning, the teacher may ask them to find specific words that have a similar or opposite meaning to a word that students are more likely to know already. Similarly, the relationships that linkers create between words like contrast or cause and effect can be identified by students as well. Another exercise adapted from Mikulecky and Jeffries (1996, p.53) helps students understand the relationships that words have in describing the parts of a whole (meronymy). Teachers should also provide the students with a set of sentences that contain the same unknown word, but used in different ways.

On the other hand, material developers should be encouraged to develop appropriate teaching materials containing lexical cohesive devices for different proficiency levels and different linguistic backgrounds because production of

suitable teaching materials is an important part of every teaching program. Material developers should provide learners with some exercises which pave the way for them to practice lexical inference, identifying lexically related words and phrases, giving more space to contextualized vocabulary presentation, local and global comprehension tasks, and more drills with synonymy, antonyms, word puzzles, and other word games.

After listing a set of implications related to developing L2 readers' awareness of lexical cohesive links, some of the important insights and suggestions derived from the present study with regard to L2 reading courses could be listed as follows:

- The explicit teaching of how to determine lexically linked words should help EFL readers better comprehend a text and get higher scores in tests of reading comprehension.
- The application of lexical cohesion activities and instruction beginning at intermediate level is believed to make a difference in students' vocabulary learning, reading and also writing in the long run.
- A by-product of the increased awareness of how lexical cohesive devices function in a text should significantly contribute to the readers' paraphrasing skills in their writing practices. Over time, as they get more practice in identifying lexically associated words, they may sharpen the skill to detect the reiterative mechanisms more effectively, both repetition-based paraphrases and inference-based ones.
- Training students to develop a higher awareness of lexical cohesive links may increase their capacity to deal with syntactic and lexical-wise more challenging texts.
- The explicit teaching of how to determine lexically linked words should help EFL readers better comprehend a text and get higher scores in tests of reading comprehension.
- A by-product of the increased awareness of how lexical cohesive devices function in a text should significantly contribute to the readers' paraphrasing skills in their writing practices since paraphrasing is frequently used in the word repetition process.
- As for its implication for vocabulary learning, it provides ESL/EFL readers with opportunities of multiple vocabulary exposures (Hwang and Nation 1989) and

learning of vocabulary within the context they appear (Hoey, 1991; Nation and Coady, 1988).

- Training students to effectively combine the top-down (schema theory) and bottom-up (concrete linguistic evidence in text) skills, which include identification of lexical cohesive links in texts, may help them achieve higher scores in reading tests.
- Since deficiencies in linguistic competence may result, for instance, in a failure to identify the cohesive links, linguistic (grammatical) competence is intrinsically related to discourse competence, which includes the ability to recognize and process lexical cohesion;. Hence, syntactic-level deficiencies cause problems in the interpretation of a written text (as also supported Celce-Murcia and Olshtain, 2000).
- Material developers should provide learners with some exercises which pave the way for them to practice lexical inference, identifying lexically related words and phrases, giving more space to contextualized vocabulary presentation, local and global comprehension tasks, and more drills with synonymy, antonyms, word puzzles, and other word games.
- The concept of using reiteration to achieve cohesion should be integrated into English classes through engaging students in a variety of activities which help them have a clear idea of the use of repetition, synonym, hyponym and antonym as well as their effect on lexical cohesion. Lexical cohesive links tasks provide learners with varied and multiple encounters with given words that highlight different lexical features, promoting elaboration and strengthening of different aspects of word knowledge.
- L2 readers will come to realize that vocabulary learning is not the rote-learning of a long list of words, but a dynamic process in which words are used functionally. They will also experience the joy in discovering how vocabulary brings cohesion to a passage.

All in all, explicit teaching of lexical cohesive links is predicted to be useful for better reading comprehension. This was suggested by the correlation and regression analysis of the link between reading comprehension scores and the achievement levels in lexical links tasks. The encouraging findings of this study suggest that the reading comprehension of foreign language students could be improved if they are explicitly taught lexical cohesive links and how these links are used in making the semantic relations in expository texts explicit.

It is necessary to make another crucial point here. The teaching of lexical cohesion and the use of lexical repetition requires that L2 teachers have a proper grounding in discourse analysis and linguistics as well as a sound foundation in language teaching pedagogy and SLA theory. However, many teacher training programs lack such special training, which is deemed crucial for effective teachers. Olshtain and Celce-Murcia (2003), a good resource to refer to, particularly for teachers of reading and discourse analysis, point at this fact and complain about the inadequacy of training in "pedagogical discourse analysis":

> The biggest obstacle with regard to moving beyond ad hoc approaches to communicative language teaching, and arriving at a communicative approach that is fully informed by discourse analysis at both the theoretical and practical levels, is to provide language teachers and other teaching professionals (curriculum developers, textbook writers, language testers) with proper grounding in discourse analysis. Many language teaching professionals receive training in grammar, phonetics, and the teaching of the language skills such as reading, writing, and speaking. A few programs also include a theoretical course in discourse analysis, but such a course generally does not make practical connections with the language classroom. Courses in "pedagogical discourse analysis" are still the exception in teacher training programs, despite the fact that a body of appropriate pedagogical material exists. The need for professional training in pedagogical discourse analysis is clear not only for second and foreign language teachers but also for first language educators and literacy specialists. Until training catches up with need, appropriate reading materials, in-service training, and professional conferences are some of the ways to fill the gap (p.727).

A useful resource for the teaching of lexical links is Liu (2000), where the various types and use of content lexical ties (lexical cohesive links) are reviewed, and examples of ESL student writing are used to illustrate that the lack of content lexical ties is often compounded by misuse of connectives. Exercises are then introduced to help students use content lexical ties to improve both cohesion and overall quality in their writing. Exercises for understanding and using content lexical ties are presented under three main headings:

1) finding synonyms, antonyms, superordinates, and hyponyms, or classifying words into these categories;

2) identifying content lexical ties or the lack of them in writing; and

3) creating lexical cohesive ties. Although these exercises can be conducted individually, pair or group work is preferable.

Having noted the above issues, there follow a number of brief suggestions for L2 teachers to consider when thinking about the teaching of lexical cohesion to their students in their reading and also writing classes:

1. Teachers should increase their students' awareness of the role of lexical cohesive devices in creating textual cohesion. Authentic texts can be analyzed for different lexical links and comparisons made between published texts and students' own writing. Salkie's (1995) workbook contains some exercises specifically aimed at encouraging students to identify cohesion through lexical repetition in texts. Though a fruitful learning resource, it should also be noted that it is not a book targeted at EFL learners, and the texts used contain some rather difficult vocabulary items.

2. Teachers should also warn their students against adopting a simplistic attitude towards the use of synonyms and antonyms. Texts tailored for specific purposes can be given to students asking them to identify inappropriate uses of near synonyms, and students can also be challenged to choose from a variety of options which word (maybe from a list of 'synonyms') is missing from a piece of discourse. Such exercises will underline the point that synonymy is a slippery concept that can pose challenges for learners.

3. Teachers may give their students practice in using hyponyms and hypernyms of key vocabulary items in their reading and writing classes. Students are sometimes asked by teachers to use certain specific words in their writing, and it is not too difficult to develop this kind of exercise to work on this specific skill. Wordnet 3.0, an online lexical database considered to be the most important resource available to researchers in computational linguistics, text analysis, and many related areas, is a useful resource for teachers to refer to.

4. Teachers must be aware of the problem of collocation. Collocation errors are pervasive in student attempts to vary their lexis. As much as possible collocation knowledge must be developed alongside lexical cohesion skill development. Collocation dictionaries or corpus data can be used by teachers to help give students the most typical or strongest collocates of important words.

5. Finally, teachers should raise student awareness of redundant repetition in their writing. Highlighting overuse may well provide the required stimulus for students to begin thinking about lexical cohesive links in their writing.

The next section discusses the limitations of the study and makes some suggestions for future studies.

5.4 Limitations of the Study and Recommendations for Further Research

Obviously, no research effort is exhaustive in and of itself, and further research is needed to confirm, validate, and expand upon its results. This section briefly touches upon some of the major limitations of the study.

The first issue to acknowledge here is that although the title of the study seems to represent reading comprehension "at large", the results are in fact quite specific to the context it was carried out and also to the texts and tasks used, which were taken from the official guide book for TOEFL IBT, which is aimed at only the testing and assessment of the reading process in an academic setting. Hence, it does not reflect the reading skill in general; but is a reflection of the theoretical framework adopted by ETS for the testing of academic reading skills. It may be possible to expand the results of the current study to reading ability in general only through the replication of the study in different reading contexts with different purposes. The same results may not be obtained in contexts other than the one described in this study. For example, reading for literary and artistic purposes may not be a proper context to carry out such a "bottom-up" lexical processing technique.

This study has several other limitations. In the study, only the TOEFL IBT reading questions were used to measure the participants' reading test performance. In the future studies, reading tests from a variety of other exam types such as IELTS, CPE, FCE, etc. can be used to measure reading comprehension.

The participants of the current study were adult, upper-intermediate and advanced learners studying English at university; replications should be made using participants of diverse age groups who are classified according to their different majors. The same basic design could also be carried out using different tests English proficiency tests and even on learners of other languages.

Furthermore, the readers were not questioned on their perceptions of or attitudes toward L2 reading test-taking strategies and the use of lexical processing strategies. In terms of methodology, the study included only paper-pencil tests and tasks, and the researcher attempted to draw conclusions based on student tests scores and written responses. Studies in the future should also allow for some form of a "think aloud protocol", or a post-test questionnaire, where the readers may

have a chance to express what had been going on in their heads while answering the questions and doing the tasks. Another alternative might be to make "a post-reading interview" with the readers and get their thoughts and reactions in a detailed manner, which was not possible in the current study.

Another limitation of the study was that the lexical cohesive links in the reading texts were labeled and categorized into different groups, but these were not quantified for each question in the lexical links tasks. In other words, the number of lexical cohesive links per question was not identified. In the future studies with a more quantitative orientation, the exact number and nature of lexical links per each question in the lexical links tasks can be identified and thus a comparison of student performance according to lexical link type can be made possible.

This study involved a small sample: only fifty participants from two different proficiency levels took part in the experiments. Future studies may employ a larger group of readers from all proficiency levels. Moreover, the number of tests and tasks can be increased for even higher reliability purposes.

Another possible avenue of inquiry should focus on the readers' lexical processing strategies in L1, particularly the ability to recognize lexical cohesive links while reading Turkish texts in a high-stake reading comprehension test, as used in the university entrance examinations. A comparative study might yield some kind of a relationship between readers' abilities in L1 and L2.

Finally, due to limitations of time and resources, the present study did not follow an experimental research design with treatment and control groups. For many true experimental designs, pretest-posttest designs are the preferred method to compare participant groups and measure the degree of change occurring as a result of treatments or interventions. Studies in the future may follow a longitudinal experimental design where the treatment and control groups are compared on their achievement levels both before and after the intervention. Also, the participants' comprehension of the reading material was tested at the recognition level with multiple-choice responses. A combination of multiple-choice and other more open-ended questions may have yielded different results at varying levels of comprehension.

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APPENDICES

APPENDIX A: Work Plan and Schedule for the Study

Here are the guidelines and the work plan followed during the course of the study for the smooth and planned implementation of the research**:**

1.Determine the target groups of students to administer the reading comprehension test (50 EFL students, 17 upper-intermediate students at English preparatory school and 33 advanced level freshmen students at the department of Foreign Language Education at METU)

2.Make sure that, within groups, they are at the same proficiency level as reflected by the standardized proficiency test of the university (METU-EPE)

3.Choose reading comprehension questions from a standardized and reliable reading test (TOEFL reading comprehension questions parallel to the real test, available in the sample CDs and books)

4.Determine all the lexical cohesive links available in the sample reading tests by carrying a cohesion analysis.

5.Carry out a discourse analysis of these questions along with the accompanying texts and:

a. identify the types of cohesive devices (in both the text and the question stem) that are essential to determine the correct option.

b. find a co-rater and ask her/him do the same and then identify inter-coder reliability indices for all the questions on the tests.

c. if the inter-coder reliability index is lower than 0.75, then eliminate questions that cause conflict (at least 75 % agreement is desirable).

d. identify the average number of unknown lexical items per text and determine cases where there is still poor comprehension in spite of only few unknown words.

6.Apply the test to the target group of students and run reliability analysis and descriptive statistics for the test results

a. Before the test, students were given a “vocabulary familiarity test” to find out which words had already been already in the readers’ lexicon. (So that

the researcher can make sure whether it is only a problem of vocabulary that causes poor comprehension or lack of awareness of lexical cohesive links).

b.After the reading test, the students were asked to do a post-reading lexical task: they were asked to provide lexical items that are related with the given lexical items. (This will indicate whether they were able to perceive the links among cohesive devices)

c. The reading test includes 10 different types of reading comprehension questions drawn from the reading section of the official guide book for the TOELF-IBT exam prepared by the Educational Testing Service (ETS).

d. Students take 2 (paper-and-pencil) reading tests in 2 consecutive weeks; the two exams each contain 3 passages with 39 reading comprehension questions (a total of 78 questions: 39 X 2= 78 questions). Each set of reading tests accompanied with the vocabulary familiarity tasks and the cohesive links tasks took approximately three hours and a half to complete, requiring almost 200 minutes.

7.Determine the item-difficulty index for each question and determine the questions that posed difficulty for the readers.

8.Analyzing the results statistically, determining:

a. Which category of lexical cohesive links has been the most difficult to recognize for students.

b. Which category of lexical cohesive links has been the easiest to recognize for students.

9.Analyzing the results and drawing conclusions as to how the implications of the study might be reflected in a reading course, providing comments on why some students might have failed to choose the correct option: explaining what they might have misinterpreted and the other possible reasons for failing to find the correct option. The last step is drawing some conclusions and commenting on the practical implications of the study.

SCHEDULE FOR THE STUDY

1. Doing new readings and enrichment of the Lit. Review section (an ongoing process)	
2. Selecting the reading passages from the ETS Official Guide to TOEFL	**(Feb 25, 2009)**
3. Doing library research on types of lexical reiteration, lexical semantic links (hyponym, meronyms, hypernyms, synonyms, antonmys, same semantic field, etc.) and classroom applications of such knowledge (M. MacCarthy, S. Thornbury, Michael Hoey)	**(by March 15 2009)**
4. Lexical cohesion **analysis** of the 6 reading passages, along with questions/answer choices, from the TOEFL exam	**(by April 10, 2009)**
5. Based on the lexical-cohesion analysis, preparing lexical/grammatical cohesive links **recognition tasks**	**(by April 15, 2009)**
6. Preparing pre-reading **"vocabulary familiarity" tasks**	**(by April 20, 2009)**
7. Arranging the sample group for the piloting of the tests and the tasks	**(by April 30, 2009)**
8. Piloting all the research tools:	**by May 10, 2009**
9. **Application** of the tests on the subjects	**(btw Sept 30- Oct 30, 2009)**
10. Data analysis	**(December 2009- March 2010)**
11. Writing the results and the conclusion sections	**(by September 2010)**
12. Revision and final corrections	**(by March 2011)**
13. Thesis Defense	**Last week of March 2011**

APPENDIX B:

INFORMED CONSENT FORM FOR THE PARTICIPANTS

Study Title : The Role of Lexical Cohesion in L2 Reading Comprehension

Persons in Charge: Prof. Dr. Hüsnü Enginarlar(Thesis supervisor)
telephone: +90 (312) 2102160, Hasan Bayraktar (Researcher, PhD candidate)
telephone: +90 506 217 78 55

I. Explanation of Study: The study in which you will be participating will attempt to examine text comprehension and the recognition of lexical links. By conducting this study, we hope to shed new light on reading comprehension and vocabulary learning.

Your role in the study: If you agree to take part in this research, you will be asked read through a few texts in English. (The entire class will be involved in this project as a regular class activity). Then you will answer some comprehension questions. Your participation in this research will take you about 135 minutes for each of the two sessions.

Benefits to you: Your participation in this study will be educationally beneficial for you. The activity will provide you with additional opportunities to practice and enhance your reading comprehension skills. You will be provided refreshments during the sessions. The findings and implications of the study will be shared with you.

II. Your rights as a research participant: The purpose of the research and your role in it will be explained. You may ask any questions about the research procedures, and these questions will be answered.

Your participation in this research is confidential. Only the researcher in charge will have access to your identity and to information that can be associated with your identity. In the event of publication of this research, no personally identifying information will be disclosed. To make sure your participation is confidential, the researcher will identify you on the written transcript of your conversation using a coded number. Your participation is voluntary. You are free to stop participating in the research at any time, or to decline to answer any specific questions without penalty. This study involves minimal risk; that is, no risks to your physical or mental health beyond those encountered in the normal course of everyday life.

III. This section indicates that you are giving your informed consent to participate in this research:

PARTICIPANT:

I agree to participate in a scientific investigation of The Role of Lexical Cohesion in L2 Reading Comprehension as an authorized part of the education program of Middle East Technical University.

I understand the information given to me, and I have received answers to any questions I may have had about the research procedure. I understand and agree to the conditions of this study as described.

To the best of my knowledge and belief, I have no physical or mental illness or difficulties that would increase the risk to me of participation in this study.

I understand that I will receive no compensation for participation.

I understand that my participation in this research is voluntary, and that I may withdraw from this study at any time by notifying the person in charge.

I am 18 years of age or older.

I understand that I will receive a signed copy of this consent form.

_____ _____

Signature Date

RESEARCHER:

I certify that the informed consent procedure has been followed, and that I have answered any questions from the participant above as fully as possible.

_____ _____

Signature Date

APPENDIX C: TEST ADMINISTRATION PROCEDURE

The following instructions were given to the students, both written and oral, prior to each of the two test sessions. This was intended to clarify the procedures and ensure fair and reliable results.

1- LISTEN TO THE INSTRUCTOR'S EXPLANATIONS CAREFULLY AND ASK YOUR QUESTIONS, IF ANY, AT THE BEGINNING OF THE TEST. PLEASE, DO NOT TALK LOUDLY ONCE THE TEST STARTS.

2- THERE ARE THREE DIFFERENT PASSAGES IN THE TEST. THE TEST WILL TAKE APPROXIMATELY 2 HRS 15 MINUTES. **FOR EACH PASSAGE, FOLLOW THE PROCEDURE BELOW**:

a. DO THE "PRE-READING VOCABULARY TASKS" BEFORE YOU READ EACH PASSAGE. Duration: (10 mins)

b. THEN, READ THE PASSAGE AND ANSWER THE COMPREHENSION QUESTIONS [Duration: (20 mins.)] AND MARK YOUR ANSWERS CAREFULLY IN THE ANSWER SHEET (1=A, 2=B, 3=C, 4=D)

c. DO THE "LEXICAL LINKS TASK" FOR THE SAME PASSAGE. Duration: (15 mins.)

d. FINALLY, MOVE TO THE NEXT PASSAGE.

e. REPEAT THE SAME PROCEDURE FOR ALL OF THE THREE PASSAGES.

3- AFTER YOU HAVE COMPLETED THESE STEPS FOR EACH OF THE PASSAGES, SUBMIT YOUR ANSWER SHEET TO THE INSTRUCTOR.

4- PLEASE TRY TO ANSWER ALL THE QUESTIONS ON YOUR OWN, WITHOUT GETTING ANY HELP FROM OTHERS. THIS IS VERY IMPORTANT FOR THE PURPOSES OF THIS STUDY.

5- THANK YOU VERY MUCH IN ADVANCE FOR YOUR VALUABLE CONTRIBUTION.

APPENDIX D

TEST MATERIALS AND TASKS USED IN THE STUDY

The test administration was completed in two different sessions and in each session, the readers were given one set of reading comprehension questions based on three different texts. The second session followed the same format but with different texts and questions. In the following pages, besides the 6 original texts from TOEFL IBT test book, you will find the "Lexical Cohesion Analysis" documents, "the Vocabulary Familiarity Tasks, and the "Lexical Cohesive Links Tasks" for each of the passages. For copyright reasons, the reading comprehension questions cannot be disseminated in a publication since ETS, the owner of the comprehension questions, deserves the right to prohibit any duplication of their published copyrighted materials.

APPENDIX D-1: MATERIALS AND TASKS BASED ON TEXT 1

A- PASSAGE 1: “THE EXPRESSION OF EMOTIONS”

Joy and sadness are experienced by people in all cultures around the world, but how can we tell when other people are happy or despondent? It turns out that the expression of many emotions may be universal. Smiling is apparently a universal sign of friendliness and approval. Baring the teeth in a hostile way, as noted by Charles Darwin in the nineteenth century, may be a universal sign of anger. As the originator of the theory of evolution, Darwin believed that the universal recognition of facial expressions would have survival value. For example, facial expressions could signal the approach of enemies (or friends) in the absence of language.

Most investigators concur that certain facial expressions suggest the same emotions in all people. Moreover, people in diverse cultures recognize the emotions manifested by the facial expressions. In classic research Paul Ekman took photographs of people exhibiting the emotions of anger, disgust, fear, happiness, and sadness. He then asked people around the world to indicate what emotions were being depicted in them. Those queried ranged from European college students to members of the Fore, a tribe that dwells in the New Guinea highlands. All groups, including the Fore, who had almost no contact with Western culture, agreed on the portrayed emotions. The Fore also displayed familiar facial expressions when asked how they would respond if they were the characters in stories that called for basic emotional responses. Ekman and his colleagues more recently obtained similar results in a study of ten cultures in which participants were permitted to report that multiple emotions were shown by facial expressions. The participants generally agreed on which two emotions were being shown and which emotion was more intense.

Psychological researchers generally recognize that facial expressions reflect emotional states. In fact, various emotional states give rise to certain patterns of electrical activity in the facial muscles and in the brain. The facial-feedback hypothesis argues, however, that the causal relationship between emotions and facial expressions can also work in the opposite direction. According to this hypothesis, signals from the facial muscles ("feedback") are sent back to emotion centers of the brain, and so a person's facial expression can influence that person's emotional state. Consider Darwin's words: "The free expression by outward signs of an emotion intensifies it. On the other hand, the repression, as far as possible, of all outward signs softens our emotions." Can smiling give rise to feelings of good will, for example, and frowning to anger?

Psychological research has given rise to some interesting findings concerning the facial-feedback hypothesis. Causing participants in experiments to smile, for example, leads them to report more positive feelings and to rate cartoons (humorous drawings of people or situations) as being more humorous. When they are caused to frown, they rate cartoons as being more aggressive.

What are the possible links between facial expressions and emotion? One link is arousal, which is the level of activity or preparedness for activity in an organism. Intense contraction of facial muscles, such as those used in signifying fear, heightens arousal. Self-perception of heightened arousal then leads to heightened emotional activity. Other links may involve changes in brain temperature and the release of neurotransmitters (substances that transmit nerve impulses.) The contraction of facial muscles both influences the internal emotional state and reflects it. Ekman has found that the so-called Duchenne smile, which is characterized by "crow's feet" wrinkles around the eyes and a subtle drop in the eye cover fold so that the skin above the eye moves down slightly toward the eyeball, can lead to pleasant feelings.

B- Lexical Cohesion Analysis of the text titled "The Expression of Emotions"

THE EXPRESSION OF EMOTIONS

1.expression of emotions
- a. the expression of many emotions (repetition)

2.Joy
- a. Happy (complex synonymy)

3.sadness
- a. despondent (complex synonymy)

4.universal
- a. in all cultures around the world (paraphrase)

5.smiling
- a. (sign of) friendliness (complex synonymy)

6.baring the teeth in hostile way
- a. (sign of) **anger** (complex synonymy)

7.Charles Darwin
- a. Darwin (simple repetition)
- b. The originator of theory of evolution (labeling)

8.facial expressions
- a. **facial expressions** (simple repetition)
- b. certain **facial expressions** (simple repetition)

9.**recognition** of (facial expressions)
- a. **recognize** (p.2) (complex repetition)

10. **signal** (p.1)
- a. suggest (p.2) (synonym)
- b. signifying (fear) (p.5) (synonym)

11. concur
- a. recognize that ..(p.3) (synonym)

12. investigators
- a. **research** (same lexical set)
  - i. **study** (synonym)
- b. (those) **queried** (same lexical set)
- c. (psychological) **researchers** (synonym)
- d. Psychological **research** (same lexical set)

13. Paul Ekman
- a. He (pronoun reference)
- b. Ekman(p.5) (simple repetition)
- c. Ekman's observation(p. 6) (simple repetition)

14. to indicate
- a. to report (synonym)

15. **manifest**ed
- a. exhibiting (synonym)
  - i. depicted (synonym)
  - ii. portrayed (synonym)
- b. shown (synonym)

16. emotional states
- a. various emotional states (simple repetition)
- b. emotional state (simple repetition)
- c. internal emotional states (simple repetition)

17. give rise to
    a. can give rise to ((simple repetition))
    b. a causal relationship (same lexical set)
18. facial muscles
    a. **facial muscles** (simple repetition)
    b. contraction of **facial muscles** (simple repetition)
    c. **facial feedback** hypothesis (p.3) (same lexical set)
        i. this hypothesis (demonstrative reference)
        ii. facial feedback hypothesis (p.4) ((simple repetition))
        iii. facial feedback (p.6) (same lexical set)
19. the free **expression** of an emotion
    a. the **repression** of all outward signs (antonym
        i. **suppresses** emotional response (p.6)(synonym)
            1. **heighten** emotional response (antonym)
20. **on the other hand** (conjunction signalling contrast)
21. intensify
    a. **sotfen** (antonym)
    b. **intense contraction** of facial muscles (same lexical set)
        i. contraction of facial muscles (simple repetition)
    c. **heightens** arousal (synonym)
        i. heightened arousal (complex repetition)
        ii. heightened emotional activity (paraphrase)
        iii. heightened emotional response (paraphrase)
22. feelings of **good will**
    a. anger (antonym)
23. possible links
    a. **one** link (reference)
    b. **other** links (reference)
24. arousal
    a. heightened **arousal** (simple repetition)
25. leads to
    a. lead to (simple repetition)

C- VOCABULARY FAMILIARITY TASK

Below are some of the frequently occurring words in the text, which are also critical to the comprehension of the text and answering the test questions. Match the words on the left with their definitions/explanations on the right. Write in the empty boxes "only the letters" of the definitions and explanations.

	Answer	WORDS		DEFINITIONS/EXPLANATIONS
1		Joy (n.)	A	angry and deliberately unfriendly towards someone
2		Despondent (adj.)	B	directly connected with the subject you are discussing or considering
3		to bare the teeth (v.)	C	to bring your eyebrows together so that lines appear on your face above your eyes, in an expression of anger, disapproval, or worry
4		Hostile (adj.)	D	The shortening and thickening of functioning muscle or muscle fiber
5		To concur (v.)	E	tightness or stiffness in a wire, rope, muscle etc.
6		To suggest (v.)	F	To show anger by opening the mouth, to snarl, to growl (esp. dogs)
7		To depict (v.)	G	to judge the value or worth of something
8		To rate (v.)	H	to prevent (something) from being expressed or known, To inhibit the expression of (an impulse, for example)
9		Relevant (adj.)	I	to agree with someone or have the same opinion as them
10		To portray (v.)	J	to represent, mean, or be a sign of something
11		To frown (v.)	K	to represent or show (something) in a picture, story, movie, etc.
12		Contraction (n.)	L	extremely unhappy and discouraged, or depressed
13		To signify (v.)	M	to describe or show someone or something in a particular way, especially in writing or in a movie, often as having particular qualities
14		To suppress (v.)	N	great happiness and pleasure, felicity
15		Tension (n.)	O	to communicate or show (an idea or feeling) without stating it directly [= indicate]

D- LEXICAL COHESIVE LINKS TASK (Based on the text titled "The Expression of Emotions")

1. In the first paragraph, find a synonym for each of the following words:

Joyful: …… sad: ……

2. In the first paragraph, the expression "baring the teeth in a hostile way" means the opposite of

a) approval b) smiling c) sadness d) anger

3. Scan the first and second paragraphs and find a verb which has a similar meaning to the verb " to mean "

……

4. In the second paragraph, find a synonym for the word "(to be) depicted".

……

5. Find two verbs [in the second paragraph] which have the same meaning as the verb "to show" as it occurs in the following sentence: (… multiple emotions were shown by facial expressions.)

……

6. If smiling gives rise to good will, what do you think the meaning of "frowning" is? (Refer to paragraph 3)

……

7. According to the 4th paragraph, if "smiling" is related to "…….." , then "being aggressive" is related to "……..." .

APPENDIX D-2: MATERIALS AND TASKS BASED ON TEXT 2

A- PASSAGE 2: "GEOLOGY AND LANDSCAPE"

Most people consider the landscape to be unchanging, but Earth is a dynamic body, and its surface is continually altering—slowly on the human time scale, but relatively rapidly when compared to the great age of Earth (about 4,500 billion years). There are two principal influences that shape the terrain: constructive processes such as uplift, which create new landscape features, and destructive forces such as erosion, which gradually wear away exposed landforms.

Hills and mountains are often regarded as the epitome of permanence, successfully resisting the destructive forces of nature, but in fact they tend to be relatively short-lived in geological terms. As a general rule, the higher a mountain is, the more recently it was formed; for example, the high mountains of the Himalayas are only about 50 million years old. Lower mountains tend to be older, and are often the eroded relics of much higher mountain chains. About 400 million years ago, when the present-day continents of North America and Europe were joined, the Caledonian mountain chain was the same size as the modern Himalayas. Today, however, the relics of the Caledonian orogeny (mountain-building period) exist as the comparatively low mountains of Greenland, the northern Appalachians in the United States, the Scottish Highlands, and the Norwegian coastal plateau.

The Earth's crust is thought to be divided into huge, movable segments, called plates, which float on a soft plastic layer of rock. Some mountains were formed as a result of these plates crashing into each other and forcing up the rock at the plate margins. In this process, sedimentary rocks that originally formed on the seabed may be folded upwards to altitudes of more than 26,000 feet. Other mountains may be raised by earthquakes, which fracture the Earth's crust and can displace enough rock to produce block mountains. A third type of mountain may be formed as a result of volcanic activity which occurs in regions of active fold mountain belts, such as in the Cascade Range of western North America. The Cascades are made up of lavas and volcanic materials. Many of the peaks are extinct volcanoes.

Whatever the reason for mountain formation, as soon as land rises above sea level it is subjected to destructive forces. The exposed rocks are attacked by the various weather processes and gradually broken down into fragments, which are then carried away and later deposited as sediments. Thus, any landscape represents only a temporary stage in the continuous battle between the forces of uplift and those of erosion.

The weather, in its many forms, is the main agent of erosion. Rain washes away loose soil and penetrates cracks in the rocks. Carbon dioxide in the air reacts with the rainwater, forming a weak acid (carbonic acid) that may chemically attack the rocks. The rain seeps underground and the water may reappear later as springs. These springs are the sources of streams and rivers, which cut through the rocks and carry away debris from the mountains to the lowlands.

Under very cold conditions, rocks can be shattered by ice and frost. Glaciers may form in permanently cold areas, and these slowly moving masses of ice cut out valleys, carrying with them huge quantities of eroded rock debris. In dry areas the wind is the principal agent of erosion. It carries fine particles of sand, which bombard exposed rock surfaces, thereby wearing them into yet more sand. Even living things contribute to the formation of landscapes. Tree roots force their way into cracks in rocks and. in so doing, speed their splitting. In contrast, the roots of grasses and other small plants may help to hold loose soil fragments together, thereby helping to prevent erosion by the wind.

B- Lexical Cohesion Analysis of the text titled "Geology and Landscape"

1. **consider**
    a. regard (synonym)
2. **landscape**
    a. surface (synonym)
    b. terrain (synonym)
    c. landforms (synonym)
    d. the earth's crust (synonym)
    e. any landscape (p.49) (simple repetition)
3. **unchanging**
    a. dynamic (antonym)
    b. altering (antonym)
4. **but (conjunction of contrast)**
5. **slowly** on the human time scale
    a. relativel **rapidly** compared to the age of earth (antonym)
6. **two principal influences**
    a. constructive processes (hyponym)
        i. uplift (hyponym)
            1. forces of uplift (p.4) (simple repetition)
        ii. create new landscape features (hyponym)
    b. destructive processes (hyponym)
        i. erosion (hyponym)
            1. forces of uplift (antonym)
            2. forces of erosion (p.4) (simple repetition)
            3. carried away (complex synonnmy)
                a. (fragments which are) deposited as sediments
                b. wear away exposed landforms
                c. create new landscape features (antonym)
            4. broken down into segments (p.4)(synonym)
                a. shattered (p.6) (synonym)
            5. principal agent of erosion (p.6) (simple repetition)
            6. erosion by the wind (simple repetition)
7. **hills and mountains**
    a. epitome of permanence (labeling)
        i. resisting the destructive forces of nature (synonym)
        ii. relatively short-lived (BUT-conjunction) (antonym)
    b. they (pronoun reference)
    c. a mountain (repetition)
        i. it (pronoun reference)
        ii. high mountains of Himalayas (repetition)
        iii. some mountains (p.3)
8. **short-lived**
    a. older
9. **higher**
    a. lower (antonym)
    b. lower (mountains) (simple repetition)
    c. eroded relics (labeling)
10. **continents**
    a. America (hyponym)
    b. Europe (hyponym)

11. divided into

a. Segments (collocation)
    i. Plates (labeling)
        1. these plates (demonstrative reference)
        2. each other (pronoun reference)

12. soft plactic layer of rock

a. the rock (simple repetition)
b. sedimentary rocks (simple repetition)

13. some mountains

a. Other mountains (reference)
b. A third type (of mountain) (reference)

14. mountain formation

a. plates crashing into each other (same lexical set)
b. Folded upwards (same lexical set)
    i. Raised by earthquakes (synonym)
c. Fracture earth's crust (same lexical set)
d. Volcanic activity (same lexical set)
    i. Lavas (hyponym)
    ii. Volcanic materials (hyponym)
    iii. Extinct volcanoes (hyponym)
e. Formation of landscpaes (co-hyponym)

15. altitudes of

a. 28.000 feet (collocation)

16. weather processes

a. the weather (p.5) (simple repetition)
b. cold conditions (hyponym)
    i. ice (same lexical set)
    ii. frost (same lexical set)
    iii. glaciers(same lexical set)
        1. these masses of ice (labeling)
    iv. permanently cold areas (paraphrase)
c. dry conditions (hyponym)
    i. dry areas (parahphrase)

17. subjected to

a. **attacked** (synonym)
b. exposed rocks (synonym)
    i. exposed rock surfaces (p.6)(simple repetition)

18. continuous battle between

a. bombards (same lexical set)

19. rain

a. rainwater (hyponym)
b. the rain (synonym)
c. spring (same lexical set)
    i. these springs (demonstrative reference)
d. streams (same lexical set)
e. rivers

20. penetrates

a. seeps underground (synonym)
b. cut through (synonym)
c. force their way into cracks (p.6) (synonym)

    d. their splitting (synonym)
        i. **hold** loose soil fragments **together** (antonym)

21. cracks in the rocks

a. attack the rocks (simple repetition)
b. cut through the rocks
c. rocks can be shattered
d. eroded rock debris

22. mountains

a. lowlands (antonmy)

23. living things

a. tree roots (hyponym)
b. roots of grasses (hyponym)
c. (roots of) other small plants (hyponym)

C- VOCABULARY FAMILIARITY TASK

Match the words on the left with their definitions/explanations on the right. Write in the empty boxes **only** the letters to the left of the definitions/explanations.

	Answer	WORDS		DEFINITIONS/EXPLANATIONS
1		Relatively (adv.)		an increase in something, upward movement
2		Relics (n.)		the state of being judged in comparison with other things and not by itself, or when something is "true to a particular degree when it is being compared with other things"
3		To seep into (v.)		useful and helpful, or likely to produce good results
4		Constructive (adj.)		an area of countryside or land of a particular type, used especially when talking about its appearance
5		Landscape (n.)		to break or cause a break in, especially a bone, or other stiff materials.
6		Altitude (n.)		to enter something and pass or spread through it, especially when this is difficult
7		Epitome (n.)		The state of breaking up or separating by force or as though by force; tearing apart
8		Terrain (n.)		a small, flowing body of water, such as a brook, creek, or rivulet; a natural flow of water that moves across the land
9		To fracture (v.)		the hard outer layer of the Earth
10		Uplift (n.)		the height of an object or place above the sea
11		To penetrate (v.)		to move or spread slowly out of a hole or through something
12		Splitting (n.)		the pieces of something that are left after it has been destroyed in an accident, explosion etc
13		Stream (n.)		the best possible example of something
14		Debris (n.)		the natural surface features of a tract of land, esp. considered in relation to some use or activity
15		Crust (n.)		something that has survived from an earlier time, such as a custom or artifact of an earlier culture, the remains of ancient times

D- LEXICAL COHESIVE LINKS TASK (Based on the text titled "Geology and Landscape")

1. Read the first and second paragraphs of the text and then provide a synonym/antonym for the following words: all words should come from the text.

    a. Antonym of "dynamic":…….
    b. Antonym of "constructive": ……..
    c. Synonym of "landscape": …….
    d. Antonym of "erosion": …….
    e. Antonym of "Rapidly" : ……
2. How do you undersand the meaning of "altitude" and what are the related words given in the text?

……
……

3. As used in the 5th paragraph, the counterpart or opposite of the word "mountain" is .....
4. Consider the meaning of the phrases (paragraph 2) given below.
    a. "resisting the destructive forces of nature" b. "relatively short-lived"

Then what do you think the phrase "epitome of permanence" mean? Explain briefly in a sentence.

……

5. Which process do all the following phrases below describe in the text? (Refer to the 3rd paragraph.)
    a. …plates crashing into each other
    b. …Folded upwards
    c. …Fracture earth's crust
    d. …Volcanic activity
    e. …Raised by earthquakes?

……

6. Read the last two paragraphs of the text, and then find the verb which has a similar meaning to the following verbs taken from the text:
    d. …seeps underground (synonym)
    e. …cut through (synonym)
    f. …force their way into cracks

……

7. What is the common function/role of the following items, as it is mentioned in the last paragraph?
    a. tree roots
    b. roots of grasses
    c. (roots of) other small plants

……

APPENDIX D-3: MATERIALS AND TASKS BASED ON TEXT 3

A-PASSAGE 3: “SWIMMING MACHINES”

Tunas, mackerels, and billfishes (marlins, sailfishes, and swordfish) swim continuously. Feeding, courtship, reproduction, and even "rest" are carried out while in constant motion. As a result, practically every aspect of the body form and function of these swimming "machines" is adapted to enhance their ability to swim.

Many of the adaptations of these fishes serve to reduce water resistance (drag). Interestingly enough, several of these hydrodynamic adaptations resemble features designed to improve the aerodynamics of high-speed aircraft. Though human engineers are new to the game, tunas and their relatives evolved their "high-tech" designs long ago.

Tunas, mackerels, and billfishes have made streamlining into an art form. Their bodies are sleek and compact. The body shapes of tunas, in fact, are nearly ideal from an engineering point of view. Most species lack scales over most of the body, making it smooth and slippery. The eyes lie flush with the body and do not protrude at all. They are also covered with a slick, transparent lid that reduces drag. The fins are stiff, smooth, and narrow, qualities that also help cut drag. When not in use, the fins are tucked into special grooves or depressions so that they lie flush with the body and do not break up its smooth contours. Airplanes retract their landing gear while in flight for the same reason.

Tunas, mackerels, and billfishes have even more sophisticated adaptations than these to improve their hydrodynamics. The long bill of marlins, sailfishes, and swordfish probably helps them slip through the water. Many supersonic aircraft have a similar needle at the nose.

Most tunas and billfishes have a series of keels and finlets near the tail. Although most of their scales have been lost, tunas and mackerels retain a patch of coarse scales near the head called the corselet. The keels, finlets, and corselet help direct the flow of water over the body surface in such as way as to reduce resistance (see the figure). Again, supersonic jets have similar features.

Because they are always swimming, tunas simply have to open their mouths and water is forced in and over their gills. Accordingly, they have lost most of the muscles that other fishes use to suck in water and push it past the gills. In fact, tunas must swim to breathe. They must also keep swimming to keep from sinking, since most have largely or completely lost the swim bladder, the gas-filled sac that helps most other fish remain buoyant.

One potential problem is that opening the mouth to breathe detracts from the streamlining of these fishes and tends to slow them down. Some species of tuna have specialized grooves in their tongue. It is thought that these grooves help to channel water through the mouth and out the gill slits, thereby reducing water resistance.

There are adaptations that increase the amount of forward thrust as well as those that reduce drag. Again, these fishes are the envy of engineers. Their high, narrow tails with swept-back tips are almost perfectly adapted to provide propulsion with the least possible effort. Perhaps most important of all to these and other fast swimmers is their ability to sense and make use of swirls and eddies (circular currents) in the water. They can glide past eddies that would slow them down and then gain extra thrust by "pushing off" the eddies. Scientists and engineers are beginning to study this ability of fishes in the hope of designing more efficient propulsion systems for ships.

The muscles of these fishes and the mechanism that maintains a warm body temperature are also highly efficient. A bluefin tuna in water of 7 C (45°F) can maintain a core temperature of over 25"C (77°F). This warm body temperature may help not only the muscles to work better, but also the brain and the eyes. The billfishes have gone one step further. They have evolved special "heaters" of modified muscle tissue that warm the eyes and brain, maintaining peak performance of these critical organs.

B- Lexical Cohesion Analysis of the text titled "Swimming Machines"

1. Swimming machines
    a. Swim(repetition)
    b. These swimming "machines"
2. fish
    a. tunas (hyponym)
        i. tunas and their relatives (p.2)
    b. mackerels (hyponym)
    c. billfishes(hyponym)
        i. marlins (hyponym)
        ii. sailfishes(hyponym)
        iii. swordfish(hyponym)
3. continuously
    a. constant motion (synonym)

4. as a result (conjunction- effect)
5. every aspect of body form and function
    a. feeding, courtship, reproduction, rest (co-hyponym)
6. adapt
    a. adaptations (complex repetition)
    b. hydrodynamic adaptations (complex repetition)
    c. designed (synonym)
        i. human engineers (same lexical set)
            1. (envy) of engineers (repetition)
            2. scientist and engineers (repetition) (p.8)
        ii. high-tech design (complex repetition)
    d. evolve (tunas and their relatives) (p.2)
        i. evolve (p.8) simple repetition
    e. more sophisticated adaptations (p.5)
    f. adaptations (p.8)
7. to enhance (their ability to swim)
    a. serve to reduce water resistance
    b. improve aerodynamic of aircraft
    c.
8. reduce
    a. reduce (p.3)
9. water resistance
    a. hydrodynamic (adaptations) (same lexical set)
    b. drag
    c. drag (p.3)
    d. resistance (p.3) (ellipsis)
    e. (reducing) water resistance (p.7) (repetition)
10. tunas, mackerels, billfishes
    a. their bodies
11. streamlining
    a. slip through (p.5) (synonym)
    b. slip through the water (repetition)

12. their bodies
    a. sleek and compact

13. scales
    a. smooth and slippery
14. eyes
    a. flush (synonym)
    b. protrude (opposite)
    c. they (pronoun reference)
    d. slick and transparent (lids)
15. the fins
    a. stiff, smooth and narrow
        i. lie flush (collocation)
    b. help cut drag
        i. not break up smooth contours (collocation)
16. airplanes
    a. retract (same lexical set)
    b. landing gear (same lexical set)
17. the long bill (of marlins sailfishes and swordfish)
    a. needle (of supersonic aircraft at the nose) (synonym)
18. keels and finlets
    a. supersonic jets (similar features) (metaphor)
19. tail
20. scales
    a. coarse scales
    b. corselet
21. the flow of water
    a. reduce (water) resistance
22. most tunas and billfishes (p.5)
    a. tunas (repetition)
    b. (streamlining of) these fishes (p.7)
        i. they (cataphora)
23. swim
    a. swim (to be able to breathe) (repetition)
    b. swimming (complex repetition)
24. keep swimming
    a. keep from sinking (polysemy)
25. open their mouth
    a. opening the mouth
26. gills
27. accordingly
28. muscles
29. water
    a. forced in (collocation)
    b. to suck in(collocation)
    c. push it past the gills (antonym)
30. since (conjunction)
31. swim bladder
    a. gas filled sac (labeling/defining)
32. sinking
    a. remain buoyant (opposite)
33. detracts from
    a. slow down (synonym)
        i. to channel water (opposite)

        ii. reducing water resistance (opposite)
34. specialized grooves in their tongues
    a. these grooves
35. forward thrust
    a. reduce **drag** (same lexical set)
    b. **propulsion** (synonym)
        i. eddies (same lexical set)
        ii. swirls (same lexical set)
        iii. circular currents (same lexical set)
        iv. **propulsion systems** for ships (simple repetition)
    c. glide past eddies
    d. gain extra thrust (repetition)
36. envy of engineers
37. tails
    a. high (collocation)
    b. narrow (collocation)
    c. with swept-back tips (collocation)
38. muscles of these fishes (p.9)
    a. the muscles
    b. brain and eyes (co-hyponym)
    c. these critical organs (labeling)
39. highly efficient
    a. work better (complex synonym)
    b. peak performance (complex synonym)
40. warm
    a. warm (simple repetition)
    b. that **warms** the eyes (complex repetition)
41. body temperature
    a. a core temperature of 25 °**C** (repetition)

C-VOCABULARY FAMILIARITY TASK

Match the words on the left with their definitions/explanations on the right. Write in the empty boxes "only the letters" on the left of the definitions/explanations.

	Answer	WORDS		DEFINITIONS/EXPLANATIONS
1		Motion (n.)	A	to push or extend outward; to project; to stick out
2		To enhance (v.)	B	to develop and change gradually over a long period of time
3		Sophisticated (adj.)	C	having a slick surface that is difficult to move upon without sliding
4		To channel (v.)	D	smooth or shiny
5		To evolve (v.)	E	to improve the quality, amount, or strength of (something)
6		Slippery (adj.)	F	very complicated or complex; very well designed and very advanced, and often works in a complicated way
7		Drag (n.)	G	to send water through a passage; to direct (something) into a particular place or situation
8		Scale(s) (n.)	H	To be able to float
9		Thrust (n.)	I	the many small, hard, thin plates that cover fish, reptiles, and certain mammals.
10		Propulsion (n.)	J	the force of air that pushes against an aircraft or a vehicle that is moving forward; anything that adds friction or retards movement
11		To retract (v.)	K	the wheels or pontoons of an aircraft designed to enable it to move on land or water when not airborne
12		Landing gear (n.)	L	the act or an instance of putting, pushing, or lunging forward forcibly;
13		To remain buoyant (v.)	M	the force that drives a vehicle forward
14		Sleek (adj.)	N	the process of moving or the way that someone or something moves; a particular action or movement
15		To protrude (v.)	O	to pull back in, to withdraw

D- LEXICAL COHESIVE LINKS TASK (Based on the text titled "Swimming Machines")

1. Think about why tunas, mackerels and billfishes are called "swimming machines". Then, provide TWO clue phrases/words from the first paragraph of the text about the swimming ability of these fish.

A……B……

2. What does "the game" refer to, in Paragraph 2?

……

3. Find FOUR qualities (adjectives) in the whole text about the bodies of tunas, mackerels and billfishes, all of which help reduce "water resistance"?

A……B……C……D……

4. The needle of an aircraft has the same function as the ……. of marlins, sword fish and sailfishes.

5. The opposite of the concept "drag [water resistance]" is "……" (as given in the text)

6. What does the phrase "remain buoyant" mean, in paragraph 6, about tunas? Write a clue phrase from the text.

……

APPENDIX D-4: MATERIALS AND TASKS BASED ON TEXT 4

A-PASSAGE 4: "DESERT FORMATION"

The deserts, which already occupy approximately a fourth of the Earth's land surface, have in recent decades been increasing at an alarming pace. The expansion of desertlike conditions into areas where they did not previously exist is called desertification. It has been estimated that an additional one-fourth of the Earth's land surface is threatened by this process.

Desertification is accomplished primarily through the loss of stabilizing natural vegetation and the subsequent accelerated erosion of the soil by wind and water. In some cases the loose soil is blown completely away, leaving a stony surface. In other cases, the finer particles may be removed, while the sand-sized particles are accumulated to form mobile hills or ridges of sand.

Even in the areas that retain a soil cover, the reduction of vegetation typically results in the loss of the soil's ability to absorb substantial quantities of water. The impact of raindrops on the loose soil tends to transfer fine clay particles into the tiniest soil spaces, sealing them and producing a surface that allows very little water penetration. Water absorption is greatly reduced, consequently runoff is increased, resulting in accelerated erosion rates. The gradual drying of the soil caused by its diminished ability to absorb water results in the further loss of vegetation, so that a cycle of progressive surface deterioration is established.

In some regions, the increase in desert areas is occurring largely as the result of a trend toward drier climatic conditions. Continued gradual global warming has produced an increase in aridity for some areas over the past few thousand years. The process may be accelerated in subsequent decades if global warming resulting from air pollution seriously increases.

There is little doubt, however, that desertification in most areas results primarily from human activities rather than natural processes. The semiarid lands bordering the deserts exist in a delicate ecological balance and are limited in their potential to adjust to increased environmental pressures. Expanding populations are subjecting the land to increasing pressures to provide them with food and fuel. In wet periods, the land may be able to respond to these stresses. During the dry periods that are common phenomena along the desert margins, though, the pressure on the land is often far in excess of its diminished capacity, and desertification results.

Four specific activities have been identified as major contributors to the desertification processes: overcultivation, overgrazing, firewood gathering, and overirrigation. The cultivation of crops has expanded into progressively drier regions as population densities have grown. These regions are especially likely to have periods of severe dryness, so that crop failures are common. Since the raising of most crops necessitates the prior removal of the natural vegetation, crop failures leave extensive tracts of land devoid of a plant cover and susceptible to wind and water erosion.

The raising of livestock is a major economic activity in semiarid lands, where grasses are generally the dominant type of natural vegetation. The consequences of an excessive number of livestock grazing in an area are the reduction of the vegetation cover and the trampling and pulverization of the soil. This is usually followed by the drying of the soil and accelerated erosion.

Firewood is the chief fuel used for cooking and heating in many countries. The increased pressures of expanding populations have led to the removal of woody plants so that many cities and towns are surrounded by large areas completely lacking in trees and shrubs. The increasing use of dried animal waste as a substitute fuel has also hurt the soil because this valuable soil conditioner and source of plant nutrients is no longer being returned to the land.

The final major human cause of desertification is soil salinization resulting from overirrigation. Excess water from irrigation sinks down into the water table. If no drainage system exists, the water table rises, bringing dissolved salts to the surface. The water evaporates and the salts are left behind, creating a white crustal layer that prevents air and water from reaching the underlying soil.

The extreme seriousness of desertification results from the vast areas of land and the tremendous numbers of people affected, as well as from the great difficulty of reversing or even slowing the process. Once the soil has been removed by erosion, only the passage of centuries or millennia will enable new soil to form. In areas where considerable soil still remains, though, a rigorously enforced program of land protection and cover-crop planting may make it possible to reverse the present deterioration of the surface.

B- Lexical Cohesion Analysis of the text titled "Desert Formation"

1. **Desertification**
    a. this process (labeling)
    b. **desertification** (simple repetition)
    c. **desertification** in most areas (simple repetition)
    d. **desertification** ((simple repetition))
    e. the extreme seriousness of **desertification** ((simple repetition))
    f. slowing the process (labeling)
    g. the present deterioration of the surface (paraphrase)
    h. the final major human cause of **desertification**
    i. the extreme seriousness of **desertification**

2. Earth's **land** surface-
    a. Areas (simple synonymy)
    b. Earth's **land** surface (simple repetition)
    c. a stony surface (simple repetition)
    d. a surface that allows very little watrer penetration (complex repetition)
    e. semi-arid **land**s (simple repetition)
    f. the **land** ((simple repetition))
    g. extensive tracts of **land** devoid of a plant ((simple repetition))
    h. semi-arid **land**s (simple repetition)
    i. large areas completely lacking in trees and shrub (simple synonymy)
    j. vast areas of land ((simple repetition))
    k. **land** protection ((simple repetition))
    l. deterioration of the surface (simple synonymy)

3. **Increasing** at an alarming (= threaten) pace
    a. expansion (complex synonymy)
    b. the **increase** in desert areas (complex repetition)
    c. cultivation of crops **expand** into drier regions (complex synonymy)

4. **Loss of vegetation**
    a. reduction of vegetation (simple synonymy)
    b. loss of soil's ability (paraphrase)
    c. further loss of vegetation (simple repetition)
    d. the prior removal of natural vegetation (complex synonymy)
    e. the reduction of vegetation cover (paraphrase)
5. Erosion of **soil**
    a. the soil (simple repetition)
    b. finer **particles** (metonymy)
    c. (Accumulation of) sand-sized **particles (metonymy)**
    d. hills or ridges of **sand** (collocation)
    e. retain of soil cover (repetition)
    f. loose soil (simple repetition)
    g. clay particles (metonymy)
    h. trampling and pulverization of soil (=erosion of soil- collocations)

6. **Wind** and **water**
    a. blown away (collocation with wind)

b. blown away **X** retain (antonym-opposites)
c. substantial quantities of water (repetition)
d. raindrops (hyponym)
e. water penetration (simple repetition)
f. water penetration= water absorption (the ability to absorb water) synonymy)
g. run-off=blown away (simple synonymy)
h. accelerated erosion rates (collocations with runoff and blown away)
i. wind and water erosion (repetition)

7. drier **climatic conditions**
    a. continued gradual global warming (hyponymy)
    b. the process (of global warming) (hyponymy)
    c. an increase in aridity(semi-arid lands) (hyponymy)
    d. accelerated global warming (hyponymy)
    e. global warming resulting from air pollution (hyponymy)

8. **the result of** (drier climatic conditions)
    a. has **produced** an increase (paraphrase)
    b. the **consequences** of overgrazing (synonymy)
9. **human activities**
    a. increased environmental pressures (hyponym)
    b. stresses (for fuel and food) (hyponym)
    c. expanding populations (=increased pressures of expanding populations) (hyponym)
    d. the pressure on the land (hyponym)
    e. four specific activities (hyponym)
    f. population densities have grown (hyponym)
10. **natural processes**
    a. delicate ecological balance (hyponym)
    b. wet/dry periods (hyponym)

11. the potential (to adjust to increased environmental pressures)
    a. diminished capacity (synonymy)

12. wet periods
    a. dry periods (opposite)
    b. severe dryness (opposite)

13. **contributors to desertification** (four specific activities)-
    a. overcultivating(the cultivation of crops) (hyponym)
    b. overgrazing[= excessive number of livestock grazing (paraphrase)] (hyponym)
        i. the raising of livestock (collocation)
        ii. a major economic activity (labeling)
    c. firewood = (fuel used for cooking and heating) (hyponym)
    d. irrigation (=the final major human cause of desertification) (hyponym)
14. overcultivating
    a. the cultivation of crops (simple repetition)
    b. crop failures (hyponym)
    c. crop failures (hyponym)

15. drier **regions**
    a. these **regions (demonstrative reference)**
    b. severe dryness (collocation)
    c. extensive tracts of **land** devoid of a plant (simple synonymy)
16. the raising of **livestock**
    a. a major economic activity (labeling)
    b. excessive number of **livestock** grazing (simple repetition)
17. natural **vegetation**
    a. grasses (hyponym)
    b. the reduction of vegetation cover (simple repetition)
    c. trampling and pulverization of soil
    d. drying of the soil and accelerated erosion
    e. large areas lacking in trees and shrubs
18. firewood
    a. chief **fuel** for cooking and heating (labeling)
    b. dried animal waste as a **substitute fuel** (hyponymy)
        i. soil conditioner (labeling)
19. led to
    a. hurt (synonym)

20. the final major human cause of **desertification**
    a. soil **salinization** resulting from overirrigation (hyponymy)
        i. excess water from irrigation (paraphrase)
        ii. dissolved **salts** (complex repetition)
        iii. a white crustal layer (collocation)
        iv. (excessive water sinks down into) the water table (collocation)
        v. drainage system (collocation)
21. the extreme seriousness of **desertification**
    a. **soil erosion** (hyponymy)
        i. **new soil to form** takes millennia (opposite)
22. **rigorously enforced** land protection program-
    a. make it possible (collocation)

C- VOCABULARY FAMILIARITY TASK

Match the words on the left with their definitions/explanations on the right. Write in the empty boxes "only the letters" on the left of the definitions/explanations.

	Answer	WORDS		DEFINITIONS/EXPLANATIONS
1		Expansion (n.)	A	to become greater; to gradually increase in numbers or amount until there is a large quantity in one place
2		To accumulate (v.)	B	An increase, growth or enlargement in size or quantity
3		Delicate (adj.)	C	easily influenced or impressed; likely to suffer from a particular negative factor or be affected by a particular problem
4		susceptible (adj.)	D	to maintain something or continue to have something
5		Devoid of (adj.)	E	needing to be dealt with carefully or sensitively in order to avoid problems or failure; sensitive
6		Clay (n.)	F	the action of entering, or passing through something
7		Penetration (n.)	G	domestic animals, such as cows, horses, or sheep, raised or kept on a farm or ranch
8		Overgrazing (n.)	H	becoming or making something worse in quality, value, or strength
9		Irrigation (n.)	I	Contamination of something with salt; a build up of salts in soil, eventually to toxic levels for plants
10		Aridity (n.)	J	a type of heavy sticky earth that can be used for making pots, bricks etc
11		Livestock (n.)	K	not having something; totally lacking
12		salinization (n.)	L	The state of being extremely dry or parched, esp. as land which has received little or no rainfall
13		To retain (v.)	M	to cause (a particular activity or process) to happen faster; to quicken
14		To accelerate (v.)	N	the supplying of water to land by man-made means to aid in growing crops
15		Deterioration (n.)	O	(for cows and sheep) excessively eating grass and green plants that are growing

D- LEXICAL COHESIVE LINKS TASK (Based on the text titled "Desert Formation")

1. In the whole text, what are the two different words or phrases which have the same meaning as "the earth's top layer" or "the ground we walk on"?

……

2. Find a word or phrase in the first paragraph which gives a clue about the meaning of "to threaten".

……

3. The phrase "loss of vegetation" is paraphrased a few times throughout the text. Find three phrases which mean the same thing.

……

4. What is the relationship between the word "soil" and "clay particles"?

……

5. Considering the meaning of "water penetration" and "water absorption" as mentioned in the 3rd paragraph, what does "runoff" mean? Explain very briefly.

……

6. Give two examples of "climatic conditions" mentioned in the text.

……

7. Find a phrase in the text that explains the meaning of "overgrazing".
……

8. What is the relationship between a "drainage system" and "irrigation".
……

9. Find a prefix in the text that means "too much, more than adequate".
……

10. In the last paragraph, find two emphatic or exaggeration adjectives that indicate the importance and severity of the desertification problem.

……

APPENDIX D-5: MATERIALS AND TASKS BASED ON TEXT 5

A- PASSAGE 5: "ARTISANS AND INDUSTRIALIZATION"

Before 1815 manufacturing in the United States had been done in homes or shops by skilled artisans. As master craftworkers, they imparted the knowledge of their trades to apprentices and journeymen. In addition, women often worked in their homes part-time, making finished articles from raw material supplied by merchant capitalists. After 1815 this older form of manufacturing began to give way to factories with machinery tended by unskilled or semiskilled laborers. Cheap transportation networks, the rise of cities, and the availability of capital and credit all stimulated the shift to factory production.

The creation of a labor force that was accustomed to working in factories did not occur easily. Before the rise of the factory, artisans had worked within the home. Apprentices were considered part of the family, and masters were responsible not only for teaching their apprentices a trade but also for providing them some education and for supervising their moral behavior. Journeymen knew that if they perfected their skill, they could become respected master artisans with their own shops. Also, skilled artisans did not work by the clock, at a steady pace, but rather in bursts of intense labor alternating with more leisurely time.

The factory changed that. Goods produced by factories were not as finished or elegant as those done by hand, and pride in craftsmanship gave way to the pressure to increase rates of productivity. The new methods of doing business involved a new and stricter sense of time. Factory life necessitated a more regimented schedule, where work began at the sound of a bell and workers kept machines going at a constant pace. At the same time, workers were required to discard old habits, for industrialism demanded a worker who was alert, dependable, and self-disciplined. Absenteeism and lateness hurt productivity and, since work was specialized, disrupted the regular factory routine. Industrialization not only produced a fundamental change in the way work was organized; it transformed the very nature of work.

The first generation to experience these changes did not adopt the new attitudes easily. The factory clock became the symbol of the new work rules. One mill worker who finally quit complained revealingly about "obedience to the ding-dong of the bell—just as though we are so many living machines." With the loss of personal freedom also came the loss of standing in the community. Unlike artisan workshops in which apprentices worked closely with the masters supervising them, factories sharply separated workers from management. Few workers rose through the ranks to supervisory positions, and even fewer could achieve the artisan's dream of setting up one's own business. Even well-paid workers sensed their decline in status.

In this newly emerging economic order, workers sometimes organized to protect their rights and traditional ways of life. Craftworkers such as carpenters, printers, and tailors formed unions, and in 1834 individual unions came together in the National Trades' Union. The labor movement gathered some momentum in the decade before the Panic of 1837, but in the depression that followed, labor's strength collapsed. During hard times, few workers were willing to strike* or engage in collective action. And skilled craftworkers, who spearheaded the union movement, did not feel a particularly strong bond with semiskilled factory workers and unskilled laborers. More than a decade of agitation did finally bring a workday shortened to 10 hours to most industries by the 1850's, and the courts also recognized workers' right to strike, but these gains had little immediate impact.

Workers were united *in* resenting the industrial system and their loss of status, but they were divided by ethnic and racial antagonisms, gender, conflicting religious perspectives, occupational differences, political party loyalties, and disagreements over tactics. For them, the factory and industrialism were not agents of opportunity but reminders of their loss of independence and a measure of control over their lives. As United States society became more specialized and differentiated, greater extremes of wealth began to appear. And as the new markets created fortunes for the few, the factory system lowered the wages of workers by dividing labor into smaller, less skilled tasks.

B- Lexical Cohesion Analysis of the text titled "Artisans and Industrialization"

1. **artisans**
    a. master craftworkers
        i. craftworkers (p.5)
            1. carpenters
            2. printers
            3. tailors
        ii. skilled craftworkers (p.5)
    b. artisans (p.2)
    c. masters (p.2)
        i. masters (p.4)
        ii. management
    d. respected master artisans (p.2)
    e. skilled artisans (p.2)
    f. artisans workshops (p.4)
    g. the artisan's dream of.. (p.4)
2. **manufacturing**
    a. this older form of manufacturing
3. **impart their trades**
    a. a trade (Synonym)(p.1)
    b. some education (collocation)
        i. supervising (collocation)
    c. their skill (p.2)
        i. skilled artisans
    d. (pride in) craftsmanship
        i. Produced (by hand)(p.2)
        ii. Productivity (p.3)
        iii. Productivity (p.3)
4. **apprentices (and journeymen)**
    a. laborers
    b. unskilled or semi-skilled laborers
        i. semi-skilled factory workers (p.5)
        ii. unskilled laborers
    c. labor force
    d. apprentices (p.2)
    e. journeymen (p.2)
    f. a worker (p.3)
    g. the very nature of work (p.3)
    h. one mill worker (p.4)
        i. workers
    i. apprentices (p.4)
        i. (masters supervising) them
    j. Workers (p.5)
    k. Few workers (p.5)
    l. Workers (p.6)
5. **raw materials**
    a. finished articles
        i. goods (p.3)
6. **began to give way**

a. the shift to …
b. changed (p.3)
c. gave way to (p.3)
d. new methods (of doing business) (p.3)
e. discard old habits
f. a fundamental change
    i. these changes (p.4)
g. transformed
h. the new attitudes (p.4)
i. in this newly emerging economic order (p.5)
    i. traditional ways of life
j. the new markets
k. the factory system

7. factories with machinery
a. in factories
b. the rise of the factory
c. the factory (p.3)
d. factory life
e. industrialism (p.3)
    i. industrialization
    ii. to most industries(p.5)
f. the factory and industrialism (p.6)
g. the factory system (6.)

8. perfected (their skill)

9. (work by) **the clock (p.1)**
a. At a steady pace (collocations)
    i. At a constant pace (p.3)
b. More leisurely time (same lexical set)
c. A new and stricter sense of time (p.3) (simple repetition)
d. (A more regimented) schedule (same lexical set)
e. Sound of a bell (general semantic association)
f. The factory clock

10. produced by factory
a. Done by hand (opposite)

11. absenteeism and lateness

12. **hurt** (productivity)
a. disrupt regular factory routine

13. adopt
a. quit
b. obeidence to the ding-dong
    i. loss of personal freedom

14. rise through
a. Supervisory positions
b. (Fewer could) achieve
c. Decline in status
d. Agents of opportunity

15. supervising
a. supervisory

16. organized
a. formed unions
    i. individual unions

ii. National trades' Union
b. came together
c. engage in collective action
d. (workers were) **united** (p.6)
i. (<u>but</u> they were) **divided** by ethnic and racial(antonym)

17. to protect their rights
a. the labor movement
b. the union movement

18. gathered some momentum
a. (labor's strength) collapsed

19. Panic of 1837
a. Depression
b. Hard times
c. agitation

20. strike
a. engage in collective action
b. workers' right to strike (p.5)
i. these gains
ii. loss of status (opposite)

21. spearheaded the union movement

22. divided by
a. ethnic and racial antagonisms
b. gender
c. conflicting religious perspectives
d. occupational differences
e. political party loyalties
f. disagreements over tactics

23. agents of opportunity
a. reminders of their loss of independence
b. a measure of control over their lives

C- VOCABULARY FAMILIARITY TASK

Match the words on the left with their definitions/explanations on the right. Write in the empty boxes "only the letters" on the left of the definitions/explanations.

	Answer	WORDS		DEFINITIONS/EXPLANATIONS
1		To disrupt (v.)	A	a particular job, especially one needing special skill with your hands
2		To gather momentum (v.)	B	hatred between people or groups of people; a state of being opposed; hostility
3		To spearhead (v.)	C	the special skill that someone uses to make something beautiful with their hands
4		Artisan(s) (n.)	D	to completely change the appearance, form, or character of something or someone, especially in a way that improves it; to change completely for the better
5		Trade (n.)	E	someone whose work needs physical strength, for example building work; a person engaged in unskilled manual labor
6		Craftsmanship (n.)	F	to move faster, become stronger, get more support etc
7		Apprentice (n.)	G	to lead an attack or organized action
8		To discard (v.)	H	things that are produced in order to be sold; merchandise; wares
9		To transform (v.)	I	a period of time when a group of workers deliberately stop working because of a disagreement about pay, working conditions etc
10		Union (n.)	J	shared or made by every member of a group or society
11		Laborer (n.)	K	an organization formed by workers to protect their rights
12		Goods (n.)	L	someone who works for an employer for a fixed period of time in order to learn a particular skill or job
13		Strike (n.)	M	to get rid of something, to give up
14		Collective (adj.)	N	to prevent something from continuing in its usual way by causing problems; to destroy the order or orderly progression of something
15		Antagonism (n.)	O	someone who does skilled work, making things with their hands

D- LEXICAL COHESIVE LINKS TASK (Based on the text titled "Artisans and Industrialization")

1. In the first paragraph, find 4 different nouns that roughly mean "workers" [these workers might have varying degrees of skill] :

    a. ……
    b. ……
    c. ……
    d. ……

2. Read again the first and second paragraphs, and explain the meaning of the noun "trade" . Does it mean "the activity of buying, selling, or exchanging goods"?

……
……

3. Find a word in the third paragraph which means the same as "articles" [as it occurs in the first paragraph, third line]."

……...

4. Reading the whole text, what do you think is the relationship between these three groups of people: "master craftworkers, aprentices and journeymen" ? What differentiates these workers?

……...
……...

5. What is the opposite meaning of "produced by factory"? [third paragraph]

……...

6. In the third paragraph, find TWO verbs which have the same meaning as "to require".

a……b……

7. In the fifth paragraph, find TWO verbs which mean "to come together".

……...

8. According to the last paragraph, what are the two issues the workers agreed on?

……...

APPENDIX D-6: MATERIALS AND TASKS BASED ON TEXT 6
A- PASSAGE 6: “AGRESSION”

When one animal attacks another, it engages in the most obvious example of aggressive behavior. Psychologists have adopted several approaches to understanding aggressive behavior in people.

The Biological Approach. Numerous biological structures and chemicals appear to be involved in aggression. One is the hypothalamus, a region of the brain. In response to certain stimuli, many animals show instinctive aggressive reactions. The hypothalamus appears to be involved in this inborn reaction pattern: electrical stimulation of part of the hypothalamus triggers stereotypical aggressive behaviors in many animals. In people, however, whose brains are more complex, other brain structures apparently moderate possible instincts.

An offshoot of the biological approach called *sociobiology* suggests that aggression is natural and even desirable for people. Sociobiology views much social behavior, including aggressive behavior, as genetically determined. Consider Darwin's theory of evolution. Darwin held that many more individuals are produced than can find food and survive into adulthood. A struggle for survival follows. Those individuals who possess characteristics that provide them with an advantage in the struggle for existence are more likely to survive and contribute their genes to the next generation. In many species, such characteristics include aggressiveness. Because aggressive individuals are more likely to survive and reproduce, whatever genes are linked to aggressive behavior are more likely to be transmitted to subsequent generations.

The sociobiological view has been attacked on numerous grounds. One is that people's capacity to outwit other species, not their aggressiveness, appears to be the dominant factor in human survival. Another is that there is too much variation among people to believe that they are dominated by, or at the mercy of, aggressive impulses.

The Psychodynamic Approach. Theorists adopting the psychodynamic approach hold that inner conflicts are crucial for understanding human behavior, including aggression. Sigmund Freud, for example, believed that aggressive impulses are inevitable reactions to the frustrations of daily life. Children normally desire to vent aggressive impulses on other people, including their parents, because even the most attentive parents cannot gratify all of their demands immediately. Yet children, also fearing their parents' punishment and the loss of parental love, come to repress most aggressive impulses. The Freudian perspective, in a sense, sees us as "steam engines." By holding in rather than venting "steam," we set the stage for future explosions. Pent-up aggressive impulses demand outlets. They may be expressed toward parents in indirect ways such as destroying furniture, or they may be expressed toward strangers later in life.

According to psychodynamic theory, the best ways to prevent harmful aggression may be to encourage less harmful aggression. In the steam-engine analogy, verbal aggression may vent some of the aggressive steam. So might cheering on one's favorite sports team. Psychoanalysts, therapists adopting a psychodynamic approach, refer to the venting of aggressive impulses as "catharsis." Catharsis is theorized to be a safety valve. But research findings on the usefulness of catharsis are mixed. Some studies suggest that catharsis leads to reductions in tension and a lowered likelihood of future aggression. Other studies, however, suggest that letting some steam escape actually encourages more aggression later on.

The Cognitive Approach. Cognitive psychologists assert that our behavior is influenced by our values, by the ways in which we interpret our situations, and by choice. For example, people who believe that aggression is necessary and justified—as during wartime—are likely to act aggressively, whereas people who believe that a particular war or act of aggression is unjust, or who think that aggression is never justified, are less likely to behave aggressively.

One cognitive theory suggests that aggravating and painful events trigger unpleasant feelings. These feelings, in turn, can lead to aggressive action, but *not* automatically. Cognitive factors intervene. People *decide* whether they will act aggressively or not on the basis of factors such as their experiences with aggression and their interpretation of other people's motives. Supporting evidence comes from research showing that aggressive people often distort other people's motives. For example, they assume that other people mean them harm when they do not.

B- Lexical Cohesion Analysis of the text titled "Aggression"

1. animal
    a. people (co-hyponym)
    b. many animals (par.2) (simple repetition)
    c. in many animals (par.2) (simple repetition)
    d. in people (par.2) (co-hyponym)
    e. individuals (par.3) (synonym)
    f. in many *species* = next *generation* (par.3) (synonymy)
    g. next *generation= subsequent generation* (par.3) (synonymy
2. Attack
    a. Agressive behaviour (hyponym)
        i. Agressive behaviour in people (hyponym)
        ii. Agressiveness (par.3) (hypernym)
        iii. Agressive impulses (par.4) (synonym)
        iv. Agressive impulses ((par.5) (synonym))
        v. Aggravating (par.8) (synonym)
            1. painful events (co-hyponym)
        vi. agressive reaction (par.8) (synonym)
    b. Agression (par.2) (complex repetition)
    c. instinctive aggressive reaction (synonymy) reaction=behavior
    d. inborn reaction pattern (parahphrase) inborn = instinctive (synonymy)
    e. inevitable reactions (par.5) (synonym)
    f. stereotypical agressive behaviors (hyponym)
    g. agression (par.3) = agressive behavior (complex repetition)
    h. much social behavior – agression (hypernym)
    i. genetically determined behavior = instinctive agressive reaction (paraphrase)
    j. human behavior (hypernym-superordinate)
        i. our behavior (par.7)
3. psychologists
    a. theorist (par.5) (synonym)
        i. Sigmund Freud (hyponym)
4. approaches
    a. biological approach (hyponym)
        i. sociobiology
        ii. Darwin's theory of evolution (hyponym)
        iii. Sociobiological view = darwin's theory of evolution (labeling)
    b. psychodinamic approach (hyponym)
        i. psychodinamic theory
        ii. psychoanalysts
    c. cognitive approach(hyponym)
        i. cognitive psychologists
5. Darwin **held** that
    a. theorists **hold** that (par.5)(synonym)
    b. cognitive psychologist **assert** that (synonym)
6. biological **structures** and chemicals
    a. hypotalamus
    b. the hypothalamus
        i. a region of brain (labeling)
        ii. whose brains are

iii. other brain structures

7. involved in
    a. moderate possible instincts (synonym)
8. **stimuli**
    a. electrical stimulation (complex repetition)
    b. triggers (complex synonymy)
    c. trigger (par.8) (synonymy)
    d. lead to (par.8) (synonym)
9. **find food**
    a. survive (synonym) = struggle for survival (complex repetition)
        i. struggle for survival/ existence (synonym)
    b. survive and reproduce (complex synonym)
        i. people's capacity to outwit other species (paraphrase)
    c. human survival (complex synonymy)

10. **contribute** their genes
    a. transmit
11. AND contribute their genes to the next generation (conjunction)
    a. Because (survive and reproduce)
    b. Result (agressive genes transmitted to subsequet generations)
12. on numerous **grounds**
    a. one is (ellipsis)
    b. another is
13. **Sigmund Freud**
    a. The Freudian Perspective (hyponym)
    b. Psychoanalysts
        i. Therapists adopting.. (labeling)
14. **inner conflicts**
    a. frustrations of daily life (co-hyponym)
15. children
    a. other people (co-hyponym)
        i. their parents (hyponym)
16. because (conjuction)
17. to **vent agressive impulses**
    a. to gratify their demands (collocational pair)
    b. their parent's **punishment** (antonym)
        i. **loss of parental love** (hyponym)
    c. to repress impulses X to vent agressive impulses (antonym)
18. yet (conjunction)
19. **steam engines**
    a. holding in steam (collocation)
        i. **venting steam** (antonym)
        ii. agressive impulses (synonym)
            1. venting off agressive impulses (repetition)
            2. venting off agressive impulses = catharsis (labeling)
            3. a safety valve (labeling)
        iii. explosion (complex synonymy)
            1. outlet = (synonym)
                a. destroying furniture (hyponym)
                b. **purging** of strong emotions (last sentence)(synonym)

    b. steam engine **analogy** (labeling)
20. prevent harmful agression
    a. less harmful agression (repetition)
    b. verbal agression (hyponym)
        i. cheering on one's favorite sports team (co-hyponym)
21. research **findings** on the usefulness of catharsis
    a. some studies suggest
    b. other studies suggest that
22. **mixed** (shows disagreement)
    a. however (conjunction)
    b. some (determiner)
    c. other (determiner)
23. reduction in **tension**
    a. lowered likelihood of future aggression (co-hyponym)
    b. more agression later (antonym)
24. choice
    a. agression is **necessary**
    b. and **justified** (collocation)
    c. **unjust** (antonym)
        i. **never justified** (synonym)
    d. people **decide (collocation)**
25. **war** time
    a. a particular war (hyponym)
    b. an **act of agression** (co-hyponym)
26. people who (repetition)
    a. whereas (conjunction)
27. unpleasant feelings
    a. **these**(determiner) feelings (repetition)
28. cognitive factors
    a. experiences with aggression (hyponym)
    b. **interpretation** of other people's motives (hyponym)
        i. **distort** other people's motives (hyponym)
        ii. assume (same semantic set)
29. **or (conjunction)**
    a. **purging of** strong emotions (last sentence)(synonym)
    b. **relieving of** tension (synonym)

C- VOCABULARY FAMILIARITY TASK

Match the words on the left with their definitions/explanations on the right. Write in the empty boxes "only the letters" on the left of the definitions/explanations.

	Answer	WORDS		DEFINITIONS/EXPLANATIONS
1		Instinctive (adj.)	A	something that provokes a response, esp. in an organ, nerve, or gland; something that makes someone or something move or react
2		Stimuli (n.)	B	held in; not released or expressed; confined; not allowed to be expressed or released
3		To reproduce (v.)	C	to express feelings of anger, hatred etc, especially by doing something violent or harmful
4		Impulse (n.)	D	a way of expressing or getting rid of strong feelings
5		To vent (v.)	E	to report something in a way that is not completely true or correct; to falsify or misrepresent
6		Outlet (n.)	F	to restrain or prevent the expression of (feelings, utterances, or the like)
7		To distort (v.)	G	to create (offspring) by means of a sexual or an asexual process
8		Aggravating (adj.)	H	impulsive, intuitive, spontaneous, unlearned
9		To assert (v.)	I	to satisfy a desire, need etc.; to make someone feel pleased and satisfied
10		To trigger (v.)	J	to remove something that is thought to be harmful or unacceptable
11		To purge (of) (v.)	K	a sudden strong desire to do something without thinking about whether it is a sensible thing to do
12		To relieve (v.)	L	making a bad situation, an illness, or an injury worse
13		To gratify (v.)	M	to state firmly that something is true;
14		pent-up (adj.)	N	to reduce someone's pain or unpleasant feelings
15		To repress (v.)	O	to make something happen very quickly, especially a series of events; to cause, begin, or set off (an action or series of actions)

D- LEXICAL COHESIVE LINKS TASK (Based on the text titled "Aggression")

1. In the second paragraph of the text, identify two adjectives which both mean the same as "unlearned", or "geneticaly determined". These adjectives are generally used to describe human behavior.
   a. …….. b. ……..

2. The word "reaction" (par.2) means feedback or response.Then, what does "stimuli" (par.2) mean?

   a. Attack
   b. Aggression
   c. Pattern
   d. Activation, triggering
   e. Results, consequences

3. Are there any clues in the third paragraph as to the meaning of "reproduce". Write a word or phrase that most helps you guess the meaning.

…….

4. In paragraph 5, the word "impulses" probably means

   a. spontaneous behavior or desires
   b. inner conflicts
   c. instincts
   d. explosions

5. Consider the steam engine analogy mentioned in the text and categorize the following words into two groups based on their meaning. (Write only the letters, not the whole words!)

   a. To vent (v.)
   b. Pent-up (adj.)
   c. To hold in (v.)
   d. To repress (v.)
   e. Outlet(s) (n.)
   f. To express (v.)

APPENDIX E: DESCRIPTIVE STATISTICS

Descriptive Statistics for Vocabulary Familiarity Task 1

	N	Mean	Std. Deviation
V1Q6	50	.3400	.47852
V1Q5	50	.4600	.50346
V1Q12	50	.5400	.50346
V1Q15	50	.6000	.49487
V1Q13	50	.6200	.49031
V1Q7	50	.6400	.48487
V1Q14	50	.7200	.45356
V1Q11	50	.7400	.44309
V1Q10	50	.8000	.40406
V1Q8	50	.8200	.38809
V1Q2	50	.8400	.37033
V1Q3	50	.8800	.32826
V1Q4	50	.9200	.27405
V1Q9	50	.9400	.23990
V1Q1	50	.9800	.14142
Valid N (listwise)	50		

Descriptive Statistics for Vocabulary Familiarity Task 2

	N	Mean	Std. Deviation
V2Q7	50	.5200	.50467
V2Q8	50	.5400	.50346
V2Q15	50	.5600	.50143
V2Q12	50	.6200	.49031
V2Q3	50	.6600	.47852
V2Q11	50	.7000	.46291
V2Q14	50	.7000	.46291
V2Q6	50	.7200	.45356
V2Q2	50	.7600	.43142
V2Q9	50	.7600	.43142
V2Q5	50	.8000	.40406
V2Q1	50	.8200	.38809
V2Q13	50	.8400	.37033
V2Q4	50	.8600	.35051
V2Q10	50	.8800	.32826
Valid N (listwise)	50		

Descriptive Statistics for Vocabulary Familiarity Task 3

	N	Mean	Std. Deviation
V3Q7	50	.2200	.41845
V3Q9	50	.2800	.45356
V3Q10	50	.3200	.47121
V3Q15	50	.4200	.49857
V3Q8	50	.5400	.50346
V3Q13	50	.6000	.49487
V3Q1	50	.6800	.47121
V3Q4	50	.6800	.47121
V3Q6	50	.7000	.46291
V3Q11	50	.7000	.46291
V3Q14	50	.7000	.46291
V3Q12	50	.7200	.45356
V3Q5	50	.8200	.38809
V3Q2	50	.8600	.35051
V3Q3	50	.9800	.14142
Valid N (listwise)	50		

Descriptive Statistics for Vocabulary Familiarity Task 4

	N	Mean	Std. Deviation
V4Q9	50	.5800	.49857
V4Q3	50	.6000	.49487
V4Q5	50	.6600	.47852
V4Q4	50	.6800	.47121
V4Q12	50	.7200	.45356
V4Q6	50	.7200	.45356
V4Q11	50	.7200	.45356
V4Q15	50	.7200	.45356
V4Q10	50	.7600	.43142
V4Q8	50	.7600	.43142
V4Q2	50	.8400	.37033
V4Q7	50	.8600	.35051
V4Q13	50	.9000	.30305
V4Q14	50	.9000	.30305
V4Q1	50	.9000	.30305
Valid N (listwise)	50		

Descriptive Statistics for Vocabulary Familiarity Task 5

	N	Mean	Std. Deviation
V5Q6	50	.3800	.49031
V5Q5	50	.4200	.49857
V5Q7	50	.7000	.46291
V5Q1	50	.7400	.44309
V5Q4	50	.7800	.41845
V5Q14	50	.7800	.41845
V5Q3	50	.8000	.40406
V5Q8	50	.8000	.40406
V5Q15	49	.8367	.37344
V5Q2	50	.8600	.35051
V5Q11	50	.8800	.32826
V5Q12	50	.8800	.32826
V5Q10	50	.9000	.30305
V5Q13	50	.9600	.19795
V5Q9	50	1.0000	.00000
Valid N (listwise)	49		

Descriptive Statistics for Vocabulary Familiarity Task 6

	N	Mean	Std. Deviation
V6Q5	50	.3200	.47121
V6Q11	50	.3200	.47121
V6Q7	50	.3600	.48487
V6Q4	50	.4600	.50346
V6Q13	50	.5000	.50508
V6Q6	50	.5400	.50346
V6Q3	50	.5600	.50143
V6Q9	50	.5600	.50143
V6Q2	50	.5800	.49857
V6Q12	50	.6000	.49487
V6Q15	50	.6400	.48487
V6Q8	50	.6600	.47852
V6Q14	50	.7000	.46291
V6Q10	50	.7400	.44309
V6Q1	50	.8400	.37033
Valid N (listwise)	50		

Descriptive Statistics for TOEFL Reading Comprehension Test 1

	N	Sum	**Mean**	Std. Deviation
T1Q10	50	23.00	**.4600**	.50346
T1Q11	50	32.00	**.6400**	.48487
T1Q6	50	33.00	**.6600**	.47852
T1Q13	50	35.00	**.7000**	.46291
T1Q4	50	36.00	**.7200**	.45356
T1Q8	50	37.00	**.7400**	.44309
T1Q12	50	40.00	**.8000**	.40406
T1Q7	50	43.00	**.8600**	.35051
T1Q9	50	43.00	**.8600**	.35051
T1Q3	50	45.00	**.9000**	.30305
T1Q2	50	45.00	**.9000**	.30305
T1Q5	50	47.00	**.9400**	.23990
T1Q1	50	50.00	**1.0000**	.00000
Valid N (listwise)	50			

Descriptive Statistics for TOEFL Reading Comprehension Test 2

	N	Sum	**Mean**	Std. Deviation
T2Q10	50	25.00	**.5000**	.50508
T2Q12A	50	27.00	**.5400**	.50346
T2Q12B	50	27.00	**.5400**	.50346
T2Q3	50	37.00	**.7400**	.44309
T2Q11	50	37.00	**.7400**	.44309
T2Q9	50	39.00	**.7800**	.41845
T2Q4	50	40.00	**.8000**	.40406
T2Q1	50	42.00	**.8400**	.37033
T2Q6	50	43.00	**.8600**	.35051
T2Q2	50	43.00	**.8600**	.35051
T2Q8	50	44.00	**.8800**	.32826
T2Q7	50	45.00	**.9000**	.30305
T2Q5	50	49.00	**.9800**	.14142
Valid N (listwise)	50			

Descriptive Statistics for TOEFL Reading Comprehension Test 3

	N	Sum	**Mean**	Std. Deviation
T3Q11	50	16.00	**.3200**	.47121
T3Q12B	50	17.00	**.3400**	.47852
T3Q12A	50	19.00	**.3800**	.49031
T3Q10	50	20.00	**.4000**	.49487
T3Q9	50	28.00	**.5600**	.50143
T3Q6	50	29.00	**.5800**	.49857
T3Q8	50	37.00	**.7400**	.44309
T3Q5	50	40.00	**.8000**	.40406
T3Q4	50	45.00	**.9000**	.30305
T3Q7	50	47.00	**.9400**	.23990
T3Q3	50	47.00	**.9400**	.23990
T3Q1	50	49.00	**.9800**	.14142
T3Q2	50	49.00	**.9800**	.14142
Valid N (listwise)	50			

Descriptive Statistics for TOEFL Reading Comprehension Test 4

	N	Sum		Std. Deviation
T4Q11	50	16.00	**.3200**	.47121
T4Q9	50	25.00	**.5000**	.50508
T4Q13	50	32.00	**.6400**	.48487
T4Q4	50	33.00	**.6600**	.47852
T4Q6	50	33.00	**.6600**	.47852
T4Q3	50	38.00	**.7600**	.43142
T4Q7	50	38.00	**.7600**	.43142
T4Q8	50	45.00	**.9000**	.30305
T4Q10	50	45.00	**.9000**	.30305
T4Q12	50	46.00	**.9200**	.27405
T4Q2	50	47.00	**.9400**	.23990
T4Q1	50	48.00	**.9600**	.19795
T4Q5	50	49.00	**.9800**	.14142
Valid N (listwise)	50			

Descriptive Statistics for TOEFL Reading Comprehension Test 5

	N	Sum	**Mean**	Std. Deviation
T5Q12B	50	18.00	**.3600**	.48487
T5Q6	50	23.00	**.4600**	.50346
T5Q12A	50	28.00	**.5600**	.50143
T5Q5	50	32.00	**.6400**	.48487
T5Q7	50	32.00	**.6400**	.48487
T5Q3	50	34.00	**.6800**	.47121
T5Q9	50	37.00	**.7400**	.44309
T5Q8	50	40.00	**.8000**	.40406
T5Q2	50	41.00	**.8200**	.38809
T5Q4	50	43.00	**.8600**	.35051
T5Q1	50	46.00	**.9200**	.27405
T5Q11	50	46.00	**.9200**	.27405
T5Q10	50	47.00	**.9400**	.23990
Valid N (listwise)	50			

Descriptive Statistics for TOEFL Reading Comprehension Test 6

	N	Sum	**Mean**	Std. Deviation
T6Q7	50	15.00	**.3000**	.46291
T6Q1	50	16.00	**.3200**	.47121
T6Q2	50	22.00	**.4400**	.50143
T6Q9	50	31.00	**.6200**	.49031
T6Q11	50	34.00	**.6800**	.47121
T6Q10	50	34.00	**.6800**	.47121
T6Q8	50	38.00	**.7600**	.43142
T6Q5	50	38.00	**.7600**	.43142
T6Q12A	50	43.00	**.8600**	.35051
T6Q12B	50	43.00	**.8600**	.35051
T6Q6	50	44.00	**.8800**	.32826
T6Q3	50	44.00	**.8800**	.32826
T6Q4	50	47.00	**.9400**	.23990
Valid N (listwise)	50			

Descriptive Statistics for LEXICAL LINKS TASK 1

	N	Sum	Mean	Std. Deviation
L1Q3	50	23.00	.4600	.50346
L1Q4	50	31.00	.6200	.49031
L1Q2	50	38.00	.7600	.43142
L1Q5B	50	39.00	.7800	.41845
L1Q5A	50	40.00	.8000	.40406
L1Q7B	50	41.00	.8200	.38809
L1Q6	50	42.00	.8400	.37033
L1Q7A	50	45.00	.9000	.30305
L1Q1A	50	49.00	.9800	.14142
L1Q1B	50	49.00	.9800	.14142
Valid N (listwise)	50			

Descriptive Statistics for LEXICAL LINKS TASK 2

	N	Sum	Mean	Std. Deviation
L2Q7	50	21.00	.4200	.49857
L2Q2	50	29.00	.5800	.49857
L2Q4	50	31.00	.6200	.49031
L2Q1D	50	33.00	.6600	.47852
L2Q6	50	33.00	.6600	.47852
L2Q5	50	37.00	.7400	.44309
L2Q3	50	40.00	.8000	.40406
L2Q1A	50	42.00	.8400	.37033
L2Q1E	50	43.00	.8600	.35051
L2Q1C	50	47.00	.9400	.23990
L2Q1B	50	49.00	.9800	.14142
Valid N (listwise)	50			

Descriptive Statistics for LEXICAL LINKS TASK 3

	N	Sum	Mean	Std. Deviation
L3Q5	50	24.00	.4800	.50467
L3Q6	50	30.00	.6000	.49487
L3Q3A	50	36.00	.7200	.45356
L3Q3D	50	39.00	.7800	.41845
L3Q4	50	39.00	.7800	.41845
L3Q3B	50	39.00	.7800	.41845
L3Q2	50	40.00	.8000	.40406
L3Q3C	50	43.00	.8600	.35051
L3Q1A	50	44.00	.8800	.32826
L3Q1B	50	44.00	.8800	.32826
Valid N (listwise)	50			

Descriptive Statistics for LEXICAL LINKS TASK 4

	N	Sum	Mean	Std. Deviation
L4Q8	50	22.00	.4400	.50143
L4Q4	50	26.00	.5200	.50467
L4Q5	50	28.00	.5600	.50143
L4Q7	50	31.00	.6200	.49031
L4Q3B	50	38.00	.7600	.43142
L4Q9	50	39.00	.7800	.41845
L4Q2	50	43.00	.8600	.35051
L4Q6	50	44.00	.8800	.32826
L4Q3A	50	45.00	.9000	.30305
L4Q10	50	46.50	.9300	.24764
L4Q1	50	47.50	.9500	.20825
Valid N (listwise)	50			

Descriptive Statistics for LEXICAL LINKS TASK 5

	N	Sum	Mean	Std. Deviation
L5Q2	50	30.00	.6000	.49487
L5Q8	50	32.00	.6400	.48487
L5Q4	50	34.00	.6800	.47121
L5Q7	50	45.00	.9000	.26726
L5Q5	50	46.00	.9200	.27405
L5Q1D	50	47.00	.9400	.23990
L5Q6	50	48.00	.9600	.17023
L5Q3	50	48.00	.9600	.19795
L5Q1B	50	49.00	.9800	.14142
L5Q1C	50	49.00	.9800	.14142
L5Q1A	50	50.00	1.0000	.00000
Valid N (listwise)	50			

Descriptive Statistics for LEXICAL LINKS TASK 6

	N	Sum	Mean	Std. Deviation
L6Q6A	50	31.00	.6200	.49031
L6Q6B	50	31.00	.6200	.49031
L6Q4	50	32.00	.6400	.48487
L6Q7	50	32.00	.6400	.48487
L6Q3	50	34.00	.6800	.47121
L6Q5A	50	34.00	.6800	.47121
L6Q8	50	35.00	.7000	.46291
L6Q5B	50	35.00	.7000	.46291
L6Q1B	50	37.00	.7400	.44309
L6Q2	50	45.00	.9000	.30305
L6Q1A	50	48.00	.9600	.19795
Valid N (listwise)	50			

APPENDIX F

A Sample Analysis of Lexical Cohesive Links in a Paragraph

Line	
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16	If **people(1)** are satisfied where they are, they have no **reason(2)** to **migrate(3)**. Throughout the history, people have left their **native-lands(4)** for a variety of reasons: **religious(5)** or **racial(6) persecution(7)**, lack of political freedom, economic **deprivation(8)**. The forces that **attracted(9)** them to new homelands were the opposites of these: religious and political freedom, ethnic tolerance, economic opportunity. The leading motive behind migration has always been economic. **Overpopulation(10)** creates **shortages(11)** of jobs and food. The natural resources of a region can become exhausted, impelling a whole group of people to migrate. People who are oppressed by others for any reason will in all likelihood be economically deprived as well. The **movement from farm to city (12)** is a **prime (13)** example of migration for economic reasons. During the Industrial Revolution of the 18th and 19th centuries, millions of people left poverty-stricken rural areas for the cities. **Even(14)** the **low-paying, seven-day-a-week jobs(15)** in early factories were better than the endless toil and misery of trying to earn a living on the farm. This search for jobs in urban areas has continued to be a leading cause of migration up to the present. That is why we now have millions of people living in the cities.

1- people-they (pronoun reference)
people-them (pronoun reference),
overpopulation (synonymy)
a whole group of people (hyponym)
people who are oppressed (hyponym)
millions of people (simple repetition)
millions of people (simple repetition)

2- reason
Forces (synonym)
Motive (synonym)
Any reason (simple repetition)
Economic reason ((simple repetition))
Leading cause (synonym)
That is why (paraphrasing)

3- migrate
Left (synonym)
Migration (complex repetition)
Migrate (repetition)
Movement (synonym)
Migrate (repetition)
Left (synonym)
Migration (complex repetition)

4- native-land
Home land (synonym)

Region (hyponym)
Rural areas (hyponym)

5- religious persecution
Religious freedom (opposite)

6- racial persecution
Political freedom (opposite)
Ethnic tolerance (opposite)
7- persecution
Freedom (opposite)
Tolerance (opposite)
Oppressed (synonym)
8- economic deprivation
Economic opportunity (opposite)
Deprived (repetition)
Poverty-stricken (complex synonymy)
9- attract
Impel (complex synonymy)
Better than (paraphrase)
10- overpopulation
Millions of people (complex synonym)
11-shortages
Resources (opposite)
Become exhausted (paraphrase)
12- (movement from) farm to city
Farm – rural (hyponym)
City – urban (hyponym)
Farm (repetition)
Cities (repetition)
13-prime
Leading (synonym)

14- even (emphatic adverb)
Comparison: urban vs. rural jobs (better than)

15- the low-paying, seven-day-a-week jobs
the endless toil and misery of life on the farms (lexical substitution-parallelism)

APPENDIX G

CURRICULUM VITAE

PERSONAL INFORMATION

Surname, Name: Bayraktar, Hasan
Nationality: Turkish (TC)
Date and Place of Birth: 25.02.1980, ILGAZ
Marital Status: Married
Phone: +90 312 210 4071
Email: bayraktarhasan@yahoo.com

EDUCATION

2005-2011	PhD in English Language Teaching (ELT), Department of Foreign Language Education, Middle East Technical University (METU), Ankara, Turkey
2001-2005	MA in (ELT), Department of Foreign Language Education, Middle East Technical University (METU), Ankara,Turkey
1997-2001	BA, Department of Foreign Language Education, Boğaziçi University, Bebek/İstanbul/Turkey
1993- 1997	Anatolian Teacher Training High School (English-Medium), Kastamonu, Turkey

WORK EXPERIENCE

Sept 2001-Present	Research & Teaching Assistant in the Department of Foreign Language Education, Middle East Technical University, Turkey
Feb 2007 - present	Academic Advisor & Materials Developer at SmartSoft Ltd. Cyberpark, Teknokent, Bilkent Uni., Ankara, Turkey
Sept 2007-June 2009	Part-time Lecturer, Turkish National Police, Foreign Languages Unit, Anıttepe Campus, Ankara
Jan 2004- May 2004	ESL/EFL Academic Writing Specialist, University of Richmond Academic Writing Center, Virginia, USA
Aug 2003-May 2004	Fulbright Foreign Language Teaching Assistant and Turkish Instructor, University of Richmond, Virginia, USA

ACADEMIC AWARDS

Granted full scholarship and assistantship by American Fulbright Association to join in the Foreign Language Teaching Asistantship program (May, 2003)

Awarded scholarship by the Senate of the School of Education of Boğaziçi University for great social and academic success financed by Prof. Dr. Hikmet SEBÜKTEKİN, (November 24, 2000, on teacher's day).

LANGUAGES

- Highly proficient in English, excellent written and spoken communication skills (TOEFL SCORE [CBT]: 283/300, KPDS 96/100)
- Beginner French
- Native Turkish Speaker

COMPUTING

Excellent command of Microsoft Office and SPSS Software

PUBLICATIONS

Bayraktar, H. (2005). A Communicative Competence Perspective on Difficulties in L2 Reading. Unpublished MA Thesis, Middle East Technical University, Ankara.

Bayraktar, H. (2008). A Communicative Competence Perspective on Difficulties in L2 Reading. Paper presented at the 5th International ELT Research Conference. 23-25 May, Çanakkale

Bayraktar, H. (2011). The Role of Lexical Cohesion in L2 Reading. Unpublished PhD Thesis, Middle East Technical University, Ankara

Bayraktar, H. (2011). The Use of Lexical Networks in EFL Vocabulary Teaching. International Conference on New Trends in Education and Their Implications-ICONTE 2011, 27-29 Nisan 2011, Antalya.

MEMBERSHIPS

Member of British Council, İNGED, and TESOL

REFERENCES

Assoc. Prof. Dr. Joshua Bear, Middle East Technical University, Ankara,
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APPENDIX H

TÜRKÇE ÖZET

KELİMELER ARASI SEMANTİK BAĞLANTILARIN(SÖZCÜKSEL BAĞDAŞIKLIK) YABANCI DİLDE OKUMA ÜZERİNDEKİ ETKİSİ

1. Giriş

Gelişmiş İngilizce okuma becerilerine sahip olmak, ingilizce eğitim veren öğretim kurumlarında eğitim gören öğrenciler için çok önemli bir hazinedir ve işte bu nedenledir ki bir çok lise ve ingilizce hazırlık okulu müfredatlarında okuma becerilerine büyük bir zaman ayırmıştır. Buna paralel olarak, dünya çapında akademisyenlerce okuma becerilerinin geliştirilmesi ve öğrencilerin okuma sorunlarının tespiti üzerine binlerce makale kaleme alınmıştır. Bu makalelerin çoğunda amaç, okumayı etkileyen unsurları daha iyi kavramak ve teoriler geliştirmek olmuştur. Okuma sürecini en iyi temsil eden model/teori geliştirme çabaları hala sürmesine rağmen, geçmişten günümüze varlığını korumuş üç temel yaklaşım mevcutur: tüme-varan yaklaşım (bottom-up approach), tümden-gelim yaklaşım (top-down approach) ve etkileşimci yaklaşım (interactive approach).

Bu tez çalışması, daha çok tüme-varım(bottom-up) yaklaşımının önerileri doğrultusunda araştırma soruları yöneltmiş ve bu yaklaşımın aslında diğer yaklaşımlara temel teşkil ettiğini bir kez daha vurgulamayı hedeflemiştir. Tüme-varım yaklaşımı, öğrencilerin dilbilgisel birikim ve becerilerini okuduğunu anlama süreci esnasında etkin olarak kullanmalarını hedeflemektedir. Bu yaklaşımı iletişimsel yeterlilik (communicative competence) modelinin söylem analizi (discourse competence) unsuru ile ilişkilendirmek mümkündür. Son yıllarda bazı araştırmacılar söylem analizi yeteneğinin bütün dil bederilerinin gelişiminin merkezinde olduğunu bile iddia etmektedirler.

Söylem analizi yeteneği, gramer yapıları ve kelimelerin belli bir bağlamda nasıl ve ne amaçla kullanıldığını incelemektedir. Buna ilişkin olarak Purpura (1999) kelime-gramer becerisi (lexico-grammatical ability) adı altında yeni bir kavram ortaya koyarak aslında kelime bilgisi ile gramer bilgisinin birlikte ele alınması gerektiğini vurgulamıştır. Bu çalışma ise, kelimeler arasındaki anlamsal bağlantıların (lexical cohesive links) farkında olabilen öğrencilerin okuma testlerinde daha yüksek puanlar alacağı hipotezi üzerine kurulmuştur.

2. Önceki Çalışmalar

Sözcüksel bağdaşıklık (Lexical cohesion) üzerine araştırmalar yapan Hoey (2001) her metinde semantik ilişkilere dayanan "kelime ağları"nın bulunduğunu ileri sürmüş ve bu ağların farkında olan öğrencilerin okuduğunu anlama açısından bir adım önde olacaklarını iddia etmiştir. İşte bu noktada, kelime bilgisi ve kelimeler arası semantik bağlantıların farkında olabilmenin test metnini anlama ve seçenekler ile metin arasında köprüler kurma süreci esnasında öğrencilere faydalı olabileceği fikri ortaya araştırmacı tarafından ortaya atılmıştır. Buna ilham kaynağı olan çalışmayı gerçekleştiren Macmillan (2007), geçmiş yıllarda uygulanmış TOEFL testlerinin okuma bölümündeki 600'den fazla sorudan oluşan yazılı derlemi analiz etmiş ve her soruda metin ile bağlantı kuran "kelimeler arası semantik ilişkilerin" bulunduğunu ispat etmiştir. Eğer kelimeler arası semantik ilişkiler mevcut ise ve bunları görmek mümkün kılınırsa, öğrencinin "soru-metin-doğru seçenek" üçlüsü arasındaki köprüleri yakalaması sağlanabilir ve bunun sonucunda -özellikle de farklı kelimeler kullanarak aynı ifadenin yeniden yazıldığı (paraphrasing) yerlerde- okuyucunun metni daha iyi kavraması mümkün olabilir görüşü araştırmacı tarafından öne sürülmüştür.

Bu çalışmanın öne sürdüğü tez şudur:

Eğer bir öğrenci, gramer bilgisi ve kelimeler arası anlamsal ilişkileri görme becerisini birleştirirse, test esnasında doğru seçeneğe daha kolay ulaşabilir ve ayrıca bu farkındalık sayesinde bilmediği kelimeleri bağlamsal ip uçlarından da faydalanarak tahmin edebilir. Bu çalışmanın sonuçları TOEFL, KPDS, YDS ve ÜDS gibi çoktan seçmeli okuma sorularının bulunduğu sınavlara hazırlanan adaylar için önemli öneri ve ip uçları sunmaktadır.

3. Yöntem

Bu çalışma, üç farklı dilbilimsel etken (kelime bilgisi, okuma testlerindeki başarı ve metinlerdeki anlamsal/semantik bağlantıların farkında olma) arasındaki ilişkiyi irdelemek üzere gerçekleştirilmiştir.

A- Araştırma Soruları

1. TOEFL okuma puanı ile metinlerdeki anlamsal/semantik bağlantıların farkında olma arasında anlamlı bir ilişki var mıdır?

2. Metinlerdeki anlamsal/semantik bağlantıların farkında olmak ne ölçüde okuma skorunu etkilemektedir?

3. Öğrencilerin kelime bilgisi düzeyi ile metinlerdeki anlamsal/semantik bağlantıların farkında olma arasında nasıl bir ilişki mevcuttur?

4. İleri düzey öğrenciler ile orta-ileri düzey öğrenciler arasında bu farkındalık açısından anlamlı fark var mıdır?

5. Öğrenciler TOEFL sınavında en çok hangi soru tiplerinde zorluk çekmektedirler?

6. Öğrencileri zorlayan bu sorularda başarısızlığa neden olan ana faktörler nelerdir?

B- Katılımcılar:

Çalışmada kullanılan testler, orta-ileri (33) ve ileri düzeyde(17) İngilizce bilgisine sahip 50 öğrenci üzerinde uygulanmıştır. Orta ileri düzey öğrenciler ODTÜ Yabancı Diller Yüksek Okulu temel İngilizce Bölümü (hazırlık okulu) öğrencileridir. İleri düzey öğrenciler ise ODTÜ Y.Diller Eğitimi Bölümü (İngilizce öğretmenliği) birinci sınıf öğrencileridir.

C- Veri toplama araçları, prosedürler ve veri analizi

Çalışmada kullanılacak veriler 3 araç kullanılarak iki farklı oturumda toplanmıştır. Kullanılan veri toplama araçları şunlardır:

- Okuma Öncesi Kelime Tanıma Testi
- Okuduğunu anlama testleri (her biri 3 farklı metinden oluşmaktadır)
- Kelimeler arası semantik bağlantılar farkındalık testi

İlk olarak, araştırmacı TOEFL sınavını tanıtmak amacıyla Educational Testin Service (2006) tarafından hazırlanmış kitaptan alınan ve herbiri 3 farklı metin üzerinde hazırlanmış 2 adet okuma testi seçmiştir. Daha sonra okuma parçalarının ve soruların metin analizini yapmış ve kelimeler arası semantik bağlantıları çözümleyip bunlara dayanarak "Kelimeler arası semantik bağlantılar farkındalık testi"ni geliştirmiştir. Test uygulama sürecinin ilk aşaması olarak, metindeki kelimelerin bilinirliğini tespit etmek üzere "Okuma Öncesi Kelime Tanıma Testi" orta-ileri ve ileri düzeyde İngilizce bilgisine sahip 50 öğrenci üzerinde uygulanmıştır. İkinci basamak olarak ise okuduğunu analama testi aynı grup öğrencilere uygulanmıştır. Bu okuma sınavı sonrası ise, metin analizi sırasında ilişkili olduğu tespit edilen kelimeler arasındaki bağlantıları farkedip etmediklerini bulmaya yarayan bir "kelimeler arası semantik bağlantılar farkındalık testi" uygulanmıştır. Aynı formata sahip ancak farklı metinler içeren ikinci okuma testi ise 2 hafta sonra uygulanmıştır. Böylelikle araştırmacı bir öğrencinin okuma

yetenegi, kelime bilgisi ve kelimeler arası bağlantıların farkedilmesi etkenleri arasında kayda değer bir etkileşim olup olmadığını inceleme fırsatı bulmuştur.

Veri toplama süreci iki oturumda tamamlanmış ve katılımcılara toplamda 6 farklı metine dayalı 212 soru yöneltilmiştir. Test materyali sırasıyla aşağıdaki araçlardan oluşmuştur:

- Okuma Öncesi Kelime Tanıma Testi: 10 dk.
- Okuduğunu anlama testi (3 farklı metinden oluşmaktadır): 20 dk.
- Kelimeler arası semantik bağlantılar farkındalık testi:15 dk.

Bu test ve sorulardan elde edilen sayısal veriler SPSS 13 isimli istatistiksel veri analizi programında analiz edilmiş, regresyon ve korelasyon işlemleri gerçekleştirilerek, değişkenler arası ilişkilerin tespit edilmesi hedeflenmiştir. Ayrıca testlerde kullanılan materyallerin güvenilirliğini tespit etmek üzere, "Cronbach's Alpha güvenilirlik testi" yapılmış ve testlerin bir bütün olarak güvenilirlik derecesinin .95 civarında olduğu saptanmıştır.

4. Bulgular

Araştırmanın sonuçlarına göre adayların araçlardan aldığı ortalama skorlar aşağıda Tablo 1'de verilmiştir. Adaylar en düşük puanı Kelime Tanıma testlerinde almasına rağmen en yüksek puanı Kelimeler Arası ilşkileri Tanıma Testlerinde beklenenden yüksek puanlar almışlardır.

Tablo 1

	Grup Adı	**Öğ.sayısı**	**ortalama**	**Std. sapma**
Okuma testleri	ileri	33	79.7948	6.32961
	Orta-ileri	17	60.8572	8.67268
Kelime arası ilişkileri tanıma testleri	ileri	33	83.9757	7.45270
	Orta-ileri	17	63.0716	10.22976
Kelime Tanıma Testleri	ileri	33	74.2354	9.26516
	Orta-ileri	17	58.9605	15.95025

Öğrencilerin okuduğunu anlama becerisi ile kelimeler arası ilişkileri tanıma becerisi arasında .902 oranında yüksek bir korelasyon bulunmuştur ki bu rakam iki becerinin çok yakından ilişkili olduğunu göstermektedir. Kelime Tanıma testi ile okuma becerisi arasındaki korelasyon çok daha düşüktür: . 662. Bu da gösteriyor ki ingilizce kelimeleri sadece tanıma/hatırlama düzeyinde bilmek, okuduğunu anlama sürecinde çok da kuvvetli başarı belirleyici bir unsur değildir. Ayrıca, kelimeler

arası semantik bağlantıları görebilme yeteneği ile hatırlama/tanıma düzeyinde kelime bilgisi arasındaki ilişki de sanıldığı kadar kuvvetli değildir. Bu iki değişken arsındaki korelasyon .597'dir. Diğer bir ifadeyle, herhangi bir eğitsel uygulamaya maruz kalmaksızın öğrencilerin kelime bilgileri sayesinde kelimeler arası semantik bağlantıları görmeleri tamamen mümkün değildir, ancak ortalama olarak bu ilişkilerin % 35.6 sını görebilmektedirler. Oysa kelimeler arası semantik bağlantılar konusunda iyi yetiştirilmiş bir öğrencinin çoktan seçmeli testteki okuma skorundaki değişimin (variance) yaklaşık % 81 bu sayede açıklanabilmektedir.

Purpura (1999) ve Liu ve Jiang (2009) bu durumu "kelime-gramer becerisi" yaklaşımı (Lexicogrammar Approach) ile izah etmektedirler. Bu yaklaşıma göre her iki unsur birbirinden ayırt edilemez bir bütündür ve okuma esnasında bu iki unsur birlikte etkili olmaktadır. Dolayısıyla, bu çalışmada verilen "% 81" oranı, aslında sadece kelimeler arası ilişkilerin farkında olabilmeyi değil okuyucunun arka planda aktif olarak görev yapan gizli gramer bilgisini de içerdiğini de göz ardı etmemek gerekir.

Çalışmadaki bir diğer bulgu ise "Tablo oluşturma/Özet çıkarma" tipindeki soruların en zorlyaıcı sorular olduğudur. Bu sorularda adayların doğru cevap sayısı sadece % 57'dir. İkinci olarak ise "Gerçeğe dayalı olumsuz bilgi soruları"dır(Negative factual information) ve öğrencilerin doğru cevap sayısı 58.2'dir. Üçüncü olarak ise çıkarım (inference) soruları öğrencilerce zor bulunmuştur ve doğru cevap oranı %65.6'dır.

5. Sonuçlar

Bu tez çalışmasının sonuçları iki ana başlık altında incelenmiştir: Nicel ve nitel sonuçlar. Nicel sonuçlar Tablo 1'de ve bir önceki kısımda korelasyon ve regresyon sonuçları olarak değinilmiştir. Nitel sonuçlar ise şu şekilde özetlenebilir:

- Öğrencilerin kelime bilgisi bakımından çok geniş bir dağarcığa sahip olmaları her zaman onların okuma testlerinden yüksek puan almalarını garanti edemez. Her ne kadar kelime bilgisi okuma becerisi ile doğrudan ilişkili olsada kelime bilgisinin derinliği ve kalitesiyle kelimelerin birbirleriyle olan semantik bağlantıları çok büyük önem arz etmektedir.

- Kelime bilgisi ve kelimelerin birbirleriyle olan semantik bağlantılarının farkında olma, öğrencilerin okuma becerisi skorlarındaki değişimin (variance) yaklaşık % 83'ünü açıklayabilmektedir.

- Bu çalışmada kullanılan "kelimelerin birbirleriyle olan semantik bağlantıları"na dayalı testlerin hepsi de okuma becerisini çok iyi tahmin eden unsurlardır. Dolaysıyla her iki değişken arasında çok güçlü bir korelasyon olduğunu söylemek mümkündür.
- İleri düzey gruptaki öğrencilerin orta-ileri gruba göre sınırlı kelime bilgisini kullanarak "kelimelerin birbirleriyle olan semantik bağlantıları"nı daha yüksek başarıyla buldukları saptanmıştır.
- Öğrencilerin genelde önceden görmedikleri ve bilmedikleri eş anlamlı ve zıt anlamlı kelimeler arasındaki ilişkileri bağlamsal ip uçlarından yararlanarak tespit etmekte zorlandıkları görülmüş ve ana kelime ile tekrar edilen ilişkili kelimeler arasındaki mesafenin artmasıyla zorluk derecesinin giderek arttığı tespit edilmiştir.

Özetle, bu çalışma kelimelerin birbirleriyle olan semantik bağlantıları tespit yeteneği, okuma yeteneğine büyük bir katkı sağlamaktadır; ancak tanıma/hatırlama düzeyindeki kelime bilgisi okuma becerileri testlerinde yüksek skorları garanti edememektedir.

Bu çalışmanın pedagojik sonuçları ise şöyle özetlenebilir:

- Öğrencilere sözcüksel bağdaşıklık(lexical cohesion) kavramının metin üzerinde uygulamalı olarak öğretilmesi onların orijinal ingilizce metinler ve okuma testi metinleri ile daha kolay baş etmelerini sağlayacaktır.
- Öğrenciler, kelimelerin birbirleriyle olan semantik bağlantılarının farkında olmaları ile birlikte coktan seçmeli okuma sorularında metin-soru kökü-doğru seçenek üçlüsü arasındaki sözcüksel ilişkileri daha kolayca görebilecek ve kısa zamanda doğru cevaba erişecektir.
- Öğrencilerin okumakta oldukları ingilizce metinlerdeki tüm kelimeleri bilmelerini beklemek gerçeğe aykırı bir tutumdur ve de her zaman mümkün değildir. Öyleyse, öğrencilere bilinmeyen kelimelerin anlamlarını bağlamsal ip uçlarından ve etraftaki diğer kelimelerin anlamlarından yararlanarak tahmin etmeyi öğretmek çok mantıklı bir yöntemdir ve de tek çıkar yol gibi görünmektedir.
- İşte bu bağlamda öğrencilere sözcüksel bağdaşıklık kavramına dayanan "kelimelerin birbirleriyle olan semantik bağlantıları görme yeteneği"nin kazandırılması çok büyük bir önem arz etmektedir.