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THE ROLE OF LEXICAL AND SYNTACTIC KNOWLEDGE IN ENGLISH AS A FOREIGN LANGUAGE READING COMPREHENSION

DISSERTATION

Presented in Partial Fulfillment of the Requirements for the Degree Doctor of Philosophy in the Graduate School of The Ohio State University

By
Raghad A. Dwaik. B.A, M.A.

The Ohio State University
1997

Dissertation Committee:
Professor Keiko Samimy, Advisor
Professor Joseph Zeidan
Professor Mahdi Alish

Approved by
Keiko Samimy
Advisor
College of Education
ABSTRACT

The research in the present study investigates the contribution of learners' knowledge of linguistic factors, namely, vocabulary and syntax to English as a foreign language reading comprehension.

Four research questions are 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?

A total of ninety-four freshman students at the University of Hebron/Palestine participated in the study. The students' lexical and syntactic knowledge were assessed by means of the vocabulary and structure sections of the Test of English as a Foreign Language (TOEFL). Comprehension was assessed through recall protocol of two English authentic texts.

A series of correlations was used to determine the relationships among the variables. Then another series of multiple regression analyses was conducted in order to determine the contributions of the independent variables, namely, lexical and syntactic knowledge, to the dependent variable, namely, reading comprehension of English as a foreign language.

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 lexical knowledge accounted for 21% of the total variance.

With regard to the classroom implications, it is suggested that: a) both lexical and syntactic development be adequately emphasized in the classroom, and b) vocabulary and syntax instruction be informed by research and congruent with our current views concerning the nature of language and learning.
Dedicated to Adnan,
for his love and constant encouragement
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VITA

October 26, 1968                     Born - Hebron, Palestine
1990                                  B. A. English Language and
                                           Literature, University of Jordan.
1994                                  M. A. Foreign Language
                                           Education, The Ohio State University.
1990-1992                             EFL instructor, Hebron district
                                           high schools.
1994-Present                         Graduate Teaching Associate,
                                           Near Eastern, Judaic, and Hellenic
                                           Studies.

FIELDS OF STUDY

Major Field: Education
Foreign/Second Language Education.

Studies in Second and Foreign Language Curriculum Design
and Community Language Learning. Professor Keiko Samimy.

Studies in Educational Psychology, Testing, and Research
Design. Professor Gilbert Jarvis.

Studies in reading, Language Acquisition and Classroom
Language. Professor Elizabeth Bernhardt.

Studies in Quantitative Research Design and
Methodology. Professor John, J., Kennedy.

Minor Fields: Arabic:
Studies in Modern Arabic Literature, Women's Literature,
and Literary Criticism. Professor Joseph Zeidan.
Studies in applied linguistics and teaching Arabic at the college level. Professor Mahdi Alosh.

Teacher Education:
  Studies in Teacher Education and Training. Professors Jose Cruz, Donald Cruickshank and Donald Haefle.
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CHAPTER 1

INTRODUCTION

Research on L1 reading comprehension defines reading as an active constructive process that consists of associating incoming information with information already present in human mind (Anderson & Pearson, 1984; Bloome & Green, 1984; Graesser, 1981). Definitions of L2 comprehension have been based on this definition. In Jarvela and Nelson's words, "[comprehension] is a product of several cognitive subsystems working together in a harmonious way" (1982, p. 73).

From a pedagogical viewpoint, reading comprehension is a very important construct both in second and foreign language contexts. Barnett (1986) argues for the inclusion of reading as a vital component of second and foreign language curricula. This focus on reading can be justified on several bases. First, proficiency in reading is essential for literature courses, an important component in most language programs. Second, reading is a vital skill which students usually maintain after finishing their formal program, thus, being able to use it in their daily lives. In other words, learners may lose their ability to speak or write, yet maintain their ability to understand texts. Third, research on reading is essential for the development and refinement of literacy skills. Omaggio (1993) points out that research on second language reading could shape our understanding of the issue of literacy in general.
Swaffer, Arens and Byrnes (1991) argue for the inclusion of more reading activities in the communicative curriculum to give students the opportunity to utilize their higher-order cognitive skills. This is particularly true when using authentic materials which demand cognitive activities that involve analysis and interaction between the reader and the text.

In a similar attempt to highlight the importance of reading, Lee (1987) points out that reading comprehension plays three roles in foreign language curriculum. First, it provides the context necessary for introducing grammatical structure and vocabulary. Second, it provides the basis for the interactive conversation and oral activity. Third, it is an important skill, which needs to be developed in the same way the skills of speaking, listening, and writing are developed.

From a cultural viewpoint, written texts in foreign and second language contexts serve as a major source of information about the target language culture. Omaggio (1993) explains that reading comprehension is valued in the communicative classroom because authentic materials which are often used in such classes, not only help in developing reading skills, but also foster cultural awareness.

Additionally, one should keep in mind that written texts are highly accessible and may be the cheapest resources among second and foreign language materials. They may be considered the cheapest channel of contact with a foreign language even with the availability of modern technological materials. Thus, "reading is the most cost-effective of the second language skills taught throughout the world," (Bernhardt, 1991, p. 1)
As a process, reading comprehension is a sophisticated multifaceted phenomenon which draws upon several knowledge sources. According to Faerch and Kasper (1986), these knowledge sources involve a wide range of linguistic, communicative and contextual information: "... linguistic and other knowledge, and contextual information deriving from the situational context and the linguistic co-text" (p. 264).

Bernhardt and James (1987) consider comprehension to be a topic-dependent process. It involves making proper decisions from the beginning of the text. It also depends on the selection of critical features for processing and the rapid processing of a given test. Finally, it involves metacognitive awareness of the comprehension process itself. According to this view, background and topic knowledge as well as the learners' linguistic knowledge and cognitive strategies play a critical role in reading comprehension.

The contribution of background or topic knowledge to the comprehension process has been investigated in several studies in foreign language and second language acquisition (Bernhardt, 1983; Carrell, 1984; Hudson, 1982; Johnson, 1982; Lee, 1986). Very few studies, however, have investigated the role of linguistic knowledge in comprehension, therefore, the precise contribution of linguistic knowledge to L2 reading comprehension is yet to be determined (Mecartty, 1994).

When investigating a reader's linguistic knowledge, factors such as lexis, syntax, and grammar are viewed as being essential to language learning; virtually, they provide the basis for text comprehension. In other words, in order for language learners to effectively comprehend discourse, they must show
mastery of these linguistic features (Carrell, 1988; Eskey, 1988; Stanovich, 1980).

The present study will deal with the linguistic factors that are believed to influence second language comprehension, namely, lexis and syntax. The term lexis refers to the meaning carrying elements of the language or the elements of semantic value and content. Syntax refers to the interrelatedness of words to form constituents and to the relationship between these constituents. Berman (1984) states that: "in order to get at the basic propositional content of a sentence, readers must be able to manipulate the following interrelated components of sentence structure: constituent structure - what the parts of a sentence are, and how they interrelate hierarchically; structural items - function words and affixes which serve as markers of grammatical relations and of constituent and rhetorical structure; and dependencies-relations expressed between discontinuous elements such as so and that...above," (p. 142).

It should be noted, however, that the terms syntax and grammar are often used interchangeably in the second language literature. One should keep in mind, though, that grammar is broader in scope. In the traditional sense, the term can be perceived from different angles: "grammar is a concatenation of forms and statements about form - paradigms, lists, word order rules, etc.; grammar represents a set of formal descriptors for the final shape of an utterance; grammar is used to mean analysis of a language system. A grammar according to these definitions is a set of "rules" describing how a language system works" (Garrett, 1986, p. 134-135). On the relationship between grammar and syntax, Fromkin and Rodman (1993) state that "syntax is the part
of the grammar that represents a speaker's knowledge of the structure of phrases and sentences" (p.73). For the purpose of the present study, grammar as a system of rules, which describe the way a language works and syntax as part of this knowledge will be adopted.

Theoretical Background

The Place of Linguistic Knowledge in Models of Reading Comprehension

Reading models attempt to explain how readers derive meaning from text. The conceptual frameworks designed for investigating L2 reading comprehension were derived from L1 reading models. Three types of models were proposed to explain the comprehension process: bottom-up models, top-down models, and interactive models. The bottom-up model conceptualizes reading as a one-way flow of information from the smallest unit of perception and proceeding in a serial fashion to larger units of meaning (Gough, 1972; LaBerge & Samuels, 1974; Smith & Spoehr, 1974). A top-down model, however, views the reading process as one of prediction where meaning is derived through extralinguistic and contextual information (Goodman, 1976; Hochberg, 1970; Kolers, 1972; Smith, 1973). Currently, reading models view the reading process as one of interaction of both top-down and bottom-up processes. Such interactive models of reading assume complex mental processes, an interplay of the knowledge and expectations of the reader in association with the physical features pertaining to the text. For example, Rumelhart's (1977) interactive model describes the reading process in terms of various stages of processing
interacting together so as to facilitate the interpretation of the text. The knowledge sources involved in Rumelhart's model include feature extraction, syntactic knowledge, semantic knowledge, orthographic knowledge, and lexical knowledge. Each of these knowledge sources represents information which provides simultaneous input that affects the reader's interpretation of a text.

Stanovich (1980) integrates the concept of compensatory processing into the interactive model of reading. Within this model, it is assumed that a "deficit in any knowledge results in a heavier reliance on other knowledge sources" (p. 63). That is to say, when readers experience lack of knowledge in one system, they can compensate by relying on a better developed knowledge system. In other words, Stanovich argues that the interactive compensatory model "allows for the readers with poor letter or word recognition skills to draw heavily on higher-level knowledge sources" (p. 48). Grabe (1988) also argues that L2 readers utilize compensatory processing, that is, they rely either on text or context depending on their perceived weaknesses in one area or another.

Two of the most well-known second language interactive models of reading are Coady's Psycholinguistic Model (1979) and Bernhardt's Constructivist Model (1985). Of primary importance in Coady's model are the reader-based features such as the conceptual abilities of the reader, background knowledge, and process strategies which the reader brings to the task. Process strategies, according to Coady, consist of "grapheme-morphophonemic correspondence, syllable-morpheme information, deep and surface syntactic information, lexical and contextual meaning, cognitive strategies and affective mobilizers" (p. 7). The
interaction among these three main components is taken into consideration in analyzing the reading process in a second language.

In her Constructivist Model, Bernhardt acknowledges the interaction of text-based and extra-text based components. Phonemic/graphemic correspondences, word recognition, and syntactic feature recognition represent the text-based components. The extra-text based components, which others sometimes refer to as reader-characteristics (Kaya-Carton & Carton, 1986), include prior knowledge, metacognition, and intratextual perception.

Grabe (1988) argues that the Psycholinguistic Model as well as the Constructivist Model provide a number of important implications for L2. First, reading as an interactive process, is an important part of the overall reading models; that is, the very nature of interactive models suggests that higher-level processing abilities play a significant role. Second, interactive models strongly imply that many lower-level processing skills are basic to good reading. Such a view suggests that methods of instruction for rapid visual recognition, for extensive vocabulary development, and for syntactic pattern recognition should become major pedagogical concerns.

From the previous discussion, one may conclude that although all models of reading recognize language features as essential to the reading process, the specific contribution of each of the linguistic factors has not been determined yet. There is strong justification, therefore, from a research as well as from a pedagogical viewpoint to determine the contribution of knowledge of those features to reading comprehension (Bernhardt, 1991; Mecartty, 1994).
In this section, the role of linguistic knowledge in theoretical reading models has been investigated and explained. In the following section, issues related to grammar and vocabulary instruction will be explored. This should set the stage for the pedagogical significance of the present study and any future classroom implications that might eventually be drawn on the basis of the present research.

**Grammar Instruction and Reading Comprehension**

In the traditional classroom, language instruction focused on promoting the learners' knowledge of the target language grammar, vocabulary, and pronunciation. This traditional grammar-based approach started to be questioned during the early 1970s when a series of empirical studies known as the "morpheme-order" studies were conducted to investigate the learner's language. The findings of these studies (Brown, 1973; Dulay & Burt, 1974) showed that the order of acquisition is a natural one guided by a universal innate process. Under the influence of these studies and the pedagogical recommendations that were later based on them, the role of grammar in language learning and the efficacy of grammatically structured syllabuses were greatly questioned (Nunan, 1991).

Despite this new theoretical orientation, there is still a huge discrepancy between the language acquisition theories and the classroom practices aimed at promoting acquisition (Kramsch, 1987). One of the major fallacies advocated by some educators is that learning linguistic structures eventually transfers to language use in everyday communicative contexts. In Kramsch's words: "the
erroneous belief that conscious learning of the linguistic structures of language will automatically translate into their correct and socially appropriate use in communicative situations has led many teachers to continue to drill grammatical forms ... and correct every linguistic error" (pp. 243-244).

One may, however, hypothesize that such discrepancy also exists between the emphasis placed on syntax in the teaching/learning process and the primacy of comprehension processes in understanding a particular text. Berry (1990) raises the question of whether knowledge of grammatical rules actually correlates with reading comprehension as a functional task.

Traditionally, grammar and syntax teaching and learning have been associated with the productive skills of speaking and writing. According to Menyuk (1984), for instance, a basic requirement of the beginning stages of the reading process is "the ability to bring to conscious awareness the structural categories and relations in language" (p. 111). Such an awareness becomes automatic with time and adequate exposure. The purpose of traditional grammar teaching was, therefore, to equip the learner with an adequate amount of grammatical constructs. These constructs would eventually surface as correct usage in the learner's production (Rutherford, 1987).

Rutherford (1987) argues that there are two inherent fallacies in the traditional approach to language teaching. The first fallacy is the belief that language learning is comprised of a linear accumulation of an inventory of discrete grammatical entities. The second fallacy is the conviction that the rules for the formulation of such entities can be directly taught and learned. This "accumulated entities" approach to language pedagogy can be contrasted with
the grammatical consciousness-raising route. This indirect route to mastery of the language receptive skills is advocated by Elley and Mangubhai (1983) who conducted a study in an ESL context and concluded that "pupils exposed to a rich supply of books were improving their general reading comprehension skill at twice the normal rate" (p. 61). Moreover, the same students sat for a test of English structures, and significantly outperformed their peers in the control group who were given traditional grammar instruction.

From the above discussion, it can be concluded that although high level of grammatical or syntactic competence is assumed to be an important part of successful language acquisition, grammar teaching should never be treated as an end in itself. In other words, one should always bear in mind that knowing grammatical rules does not have much to do with its functional application in a particular linguistic context (Ariew, 1982). Therefore, there is not much justification for the current practice at some programs whereby grammar instruction occupies a major portion of classroom time. Long (1986), for example, found that grammar activities take up to 56 percent of classroom time at beginning levels of college instruction in Spanish. Similarly, Higgs (1979) cites specific examples of classroom practices in which the teacher's goals regarding grammar teaching are stated explicitly. A teacher could, for instance, say something similar to "Today you're going to learn how to use the subjunctive, as if the student knew what the subjunctive was and what it was good for, and needed only to learn how to use it" (p.340). Similarly, Ariew (1982) questioned whether grammar should be studied as an "independent" topic of study at all (p. 24).
Despite students' lack of interest in explicitly taught grammar and our current conviction that it is less than likely that grammar taught in this way will actually be transferred functionally in communicative situations, much emphasis is placed on grammar in today's classroom. Berry (1990) believes that this is largely due to the fact that teachers tend to fall back on their own learning experiences when they teach. One should, however, keep in mind that breaking the habit of grammar or syntax teaching is not easy. Recall that until the late fifties, modern language teaching was based on the objectives of the Latin class, that is, the study of grammar as a gateway to reading and consequently to language learning (Guntermann, 1987; Kramsch, 1987). Some of today's teachers, therefore, were exposed to language in such grammar-oriented settings. Hence, unless a conscious effort is made to break away with tradition, there is great danger that these teachers will themselves fall in the same trap of overemphasizing grammatical constructs (Berry, 1990).

Schultz (1986) summarizes issues of consensus presented by language educators and psycholinguists at a symposium on foreign language skills. One of the points of consensus is that with regard to the content of the foreign language curriculum, vocabulary input within meaningful contexts is more important than analysis of grammar. Another major point of consensus is that content sequencing and grading on grammatical basis is nonessential for language acquisition. Schultz then contrasts these points of consensus with current views and practices. In many classrooms, for instance, language teaching and learning is based on the sequential presentation and practice of grammatical constructs. This may lead teachers to erroneously conclude that
they must stick to the patterns that have already been taught and avoid those that have not been introduced in order to avoid confusing the students (Schultz, 1986). As mentioned earlier, however, according to the current view of linguistic knowledge and its place in the reading models, there is much more to a given text than knowledge of grammatical or syntactic structures. Swaffer (1989) emphasizes the importance of this paradigm shift, and cautions against "trying to construct a new, learner-centered model with the old sentential grammar, when we should be working with a text-based, suprasentential grammar "(p. 308).

This disproportionate focus on grammar can also be seen in currently used textbooks and testing formats (Berry, 1990). Ariew (1982) believes that a major pitfall of some textbooks is the use of grammatical sequencing and grading, thus, "using its internal relationships as the organizing principle for the material," (p. 6). This is a huge fallacy because students are expected to learn what is already assumed in the textbook, i.e, knowledge of the target language grammar.

Instead of using abstract grammatical constructs as the bases of sequencing, we currently believe that textbooks should present structures as they relate to functions which students are already familiar with (Ariew, 1982). This functional-notional orientation has been reflected in syllabus organization in Europe since the 1970s. In the United States, however, "popular texts are not only structured according to extrinsic grammatical concepts but also most of their exercises deal with forms: linguistic calisthenics involving the morphological or syntactic aspects of the language" (Ariew, 1982, p. 24). The assumption underlying these grammatically structured textbooks is that language learning is a process of entity accumulation (Rutherford, 1987). It is important to keep in mind that
textbooks and the philosophy they reflect have a great bearing on the teacher's perception of what it means to learn a language. Ariew (1982) argues that "the text's sequence, methodology, pacing, and vocabulary usage are followed almost to the letter by most teachers" (p. 17).

The nature of current test formats also promotes this focus on grammar in the syllabus. Grammar or structure lend themselves easily to testing, whereas the more integrated language skills are often hard to measure. In other words, assessing the students' communicative competence is more difficult and time-consuming than measuring their knowledge of discrete grammatical features. Therefore, it is not uncommon to see the students' progress in language learning often equated with their grades on achievement tests and quizzes that represent only their linguistic competence.

From the above discussion, one may conclude that although current theory stresses the importance of developing the students' communicative competence as an integrated whole, teachers, textbook writers and even test developers seem to give grammar more than its share of importance.

In the case of reading, clear-cut research is needed to specify the role that knowledge of grammatical structures plays in comprehension. If it turns out that grammar plays only a minor role in reading, then serious attempts should be made to break with the long standing tradition of grammar instruction. If, however, its role proves to be a major one, then the current language classroom needs to witness a clear shift towards a process of grammatical consciousness-raising, whereby grammar is stressed only as a means to an end.
Vocabulary Instruction and Reading Comprehension

Until recently vocabulary instruction has been ignored in discussions related to second language methodology and language learning (Stoller & Grabe, 1993). Maley (1986) states that "It is curious to reflect that so little importance has been given to vocabulary in modern language teaching. Both the behaviorist/structural model and the functional/communicative model have in their different ways, consistently underplayed it," (p. 3).

Vocabulary has been considered a central part of language learning throughout the history of the grammar-translation methods. It continued to be the focus of the language classroom in the early versions of the direct methods as well. Since the early 1940s however, the audiolingual method brought into the foreground oral skills, accurate productions, and limited vocabulary knowledge. Under the influence of this method, vocabulary instruction was therefore pushed to the periphery of the language classroom. This was probably a manifestation of the strong reaction in the field to the weak oral skills produced by grammar-translation (Coady, 1986). Proponents of the audiolingual method assumed that good language habits and later exposure to the language eventually leads to an increased vocabulary wealth (Stern, 1990). Coady (1986) further argues that during the reign of this method, no serious consideration was given to the specific needs of certain students who will eventually have to function in academic contexts with high literacy demands.

When the communicative approach arrived on the scene in the 1970s, it did not attempt to highlight vocabulary instruction in any direct way. Emphasis was
rather placed upon language as discourse and on the notions and functions of the language.

The communicative approach was followed by another major trend, which became to be known as the "natural approaches" (Coady, 1986). Proponents of this approach treated second language acquisition as a phenomenon analogous to first language acquisition. L2 vocabulary acquisition was therefore expected to be as effortless in L2 as it usually is in L1 (Krashen, 1982). Some scholars, however, continued to believe that for students with academic goals, natural learning is not sufficient to provide them with the literacy skills necessary for coping with academic demands (Carrell, Devine, & Eskey, 1988; Dubin, Eskey, & Grabe, 1986). These researchers have argued that although it might be possible to develop oral language skills through natural exposure, instruction and training are required to develop academic literacy skills and subskills such as summarizing a text, finding the main idea, identifying rhetorical structure and so forth. In other words, developing extensive vocabulary knowledge for literacy purposes requires some direct instruction in addition to natural exposure to the language (usually through reading).

Coady (1986) states that vocabulary learning is a mystery and a paradox. He argues that vocabulary instruction has been neglected both in the classroom and in textbooks under the assumption that it could be learned automatically in context presumably through reading. There is no clear-cut research, however, that shows exactly how contextualized learning takes place. Hence, the process continues to be a mystery. From another perspective, vocabulary acquired through reading is a process that involves an inherent paradox. On the one
hand, reading tends to expose students to the less frequent vocabulary, that is, students read to learn the less frequent words only. On the other hand, students do not know enough words to read well in the first place.

Coady (1986) proceeds to give a historical overview of the different attempts to resolve this paradox. A major attempt to solve the paradox has been the vocabulary control movement, which dominated both L1 and L2 instruction for more than 100 years. For instance, textbooks for beginning reading instruction in the United States have attempted to drastically limit the vocabulary used in reading passages. The assumption underlying this practice was that the skill of reading can be more easily acquired once the burden of recognizing too many words has been eliminated. Such vocabulary control attempts bloomed in foreign language contexts as well. In an attempt to produce more comprehensive materials, scores of abridged versions of texts have been produced. One of the methods used to reduce vocabulary involved using frequency lists as a reference, thus, eliminating all words above a certain level of difficulty (Coady, 1986). Another method that has been used with foreign language materials considered to be too difficult for students was to rewrite them using much simpler vocabulary and syntax. The assumption underlying this practice was that using short words and short sentences would create a simpler text (Coady, 1986). Ulijn and Strother (1990) found that syntactic simplification of a technical text did not improve reading comprehension. Coady (1986) argues that for such text revisions to be successful, the adapter should be conscientious about maintaining a text of a native language quality. In recent years, however, much criticism of such simplified texts has surfaced. Bernhardt (1991) argues
that these texts lack the realistic quality, therefore, they do not prepare students for the "real" texts, which they are bound to encounter in the future. Hence, while the 1980s witnessed the hot debate over the issue of whether to use authentic or manipulated texts, the 1990s should witness an end to this debate in favor of authentic texts.

The above discussion shows that there is currently much controversy over issues related to vocabulary instruction in the context of reading comprehension. Vocabulary does not seem to be getting enough attention in the classroom. This neglect is due to the strong influence of the communicative approaches and to the field's reaction to the failure of the grammar-translation method. Another main factor behind this neglect, is the lack of clear cut research that shows the unique contribution of vocabulary knowledge to reading comprehension when the reader is exposed to authentic texts similar to the ones used in this study. Any major pedagogical decisions such as increasing the time devoted to vocabulary or syntax instruction in the classroom should be informed by such research.

Statement of the Problem

The reading process can be viewed as a constant interaction between the reader and the text. Therefore, success in reading is determined partially by factors inherent to the reader as well as by variables pertaining to the text itself. Some of the reader-based variables which have been identified in L1 as well as in L2 models of reading include the cognitive abilities of the reader, the linguistic knowledge and skills of the reader, the familiarity of the reader with the cultural context of the text, and the general world knowledge and experience of the
reader (Kaya-carton & Carton, 1986). Some of the text-related variables or characteristics are structure/syntax, semantic and pragmatic content, vocabulary, sociolinguistic aspect, topical reference, level of formality, literal vs. interpretative presentation and rhetorical organization (Kaya-Carton & Carton, 1986).

It could be argued that although the characteristics of a certain text can either facilitate or complicate the readers' interpretation of it, meaning cannot be constructed without the reader. In other words, what is understood is basically dependent on the reader not on the text. Viewing L2 reading from the readers' perspective should therefore bring to the foreground the readers' cognitive abilities, linguistic knowledge, and general world knowledge. According to Mecartty (1994) "the importance of investigating these variables is clear considering the fact that readers are unique separate entities, who approach the reading process with different linguistic and non-linguistic knowledge, and with different perspectives, motivations, and abilities" (p. 9). Hence, what is understood is mainly influenced by the reader not the text (Bernhardt, 1986; Lee, 1987).

In second language reading, the relationship between reader-based and text-based variables has been, for the most part, investigated from the text perspective, rather than from the readers' perspective. The reader-based variables, however, can be examined and quantified in several ways. First, the readers' cognitive abilities and their relationship to comprehension can be investigated. Second, the readers' background/topic knowledge and its relationship to comprehension can be explored. Finally, the readers' linguistic
knowledge and its relationship to comprehension can be examined and quantified (Mecartty, 1994).

The relationship between readers' background knowledge has often been empirically explored (Bernhardt, 1983; Carrell, 1984; Hudson, 1982; Johnson, 1982; Lee, 1986). With regard to cognitive abilities, it is hard to determine their relationship to comprehension because of the difficulties involved in manipulating them. As for the relationship between readers' linguistic knowledge and comprehension, it needs further investigation (Bernhardt, 1991; Mecartty, 1994).

Readers' linguistic knowledge is central to L1 and L2 models of reading (Bernhardt, 1985; Coady, 1979; Rumelhart, 1977; Stanovich, 1980). Coady's psycholinguistic model (1979), for instance, subsumes process strategies such as word-recognition and syntactic feature recognition that the learners need to master for successful reading. Linguistic knowledge is seen as "part of a larger interacting network of information needed by the second language reader" (Devine, 1988, p. 267). It can be envisioned as either reader-dependent or text-dependent. When it is reader-dependent, it exists as part of the readers' overall language competence and subsumes knowledge of the lexical, syntactic, and grammatical features of language. Text-dependent knowledge, in this case, does not marginalize the reader but interacts with the readers' general knowledge. In other words, reader-based linguistic knowledge assumes that the reader not the text possesses the required knowledge and uses this knowledge to construct meaning a position adopted by Bernhardt (1986) and Lee (1987). Text-based linguistic knowledge is text specific in the sense that certain text
characteristics can be manipulated to determine the learners' mastery of them. Most research conducted in the field of L2 reading falls within this category, that is, text manipulation (Bernhardt, 1991; Mecartty, 1994). A text may be manipulated in terms of syntactic or lexical difficulty or both, then the reader's comprehension of the various versions is assessed (e.g., Berman, 1984; Blau, 1982; Carrell, 1983; Cohern et al., 1979; Freebody & Anderson, 1983a, 1983b; Lee, 1986; Marks, Cotorow & Wittrock, 1974). In this research tradition, the readers' linguistic knowledge is not included as a variable, hence, it is not certain to what extent readers themselves possess knowledge that could be reflected in these different versions (Bernhardt, 1991, Mecartty, 1994).

Actually, very little is known about how the level of linguistic comprehension affects reading comprehension. In other words, while the contribution of background or topic knowledge to the reading comprehension process has been investigated in several studies in foreign and second language acquisition (Bernhardt, 1983, Carrell, 1984; Hudson, 1982; Johnson, 1982; Lee, 1986), the precise contribution of linguistic knowledge to L2 reading comprehension is yet to be determined.

In summary, although linguistic knowledge is one of the important variables that the reader brings to the text (a fact stressed in current reading models), it has not been sufficiently investigated. One may argue that this neglect is due to the strong influence of the communicative approaches that reflected a strong reaction to the failure of the grammar-translation method. Some of the few studies that have been conducted so far examine linguistic knowledge from the text perspective, that is, by manipulating the text to produce several renderings
characterized by various levels of difficulty instead of determining the knowledge that the readers themselves possess regardless of the text. It may, therefore, be concluded that there is currently a gap in L2 research regarding the precise relationship between the reader's knowledge of linguistic factors and reading comprehension. Hence, in order to develop a more cohesive view of comprehension, reader-based knowledge of linguistic factors must be investigated independent of the text (Bernhardt, 1991; Mecartty, 1994).

**Significance of the Problem**

Ongoing research in the field of foreign language reading indicates that it is a complex phenomenon influenced by a number of factors, the most important of which are L1 literacy, background knowledge and interest, individual reading strategies, (e.g., inferencing and predicting), and linguistic knowledge (grammatical, semantic, and lexical).

There is currently a gap in L2 research concerning the precise relationship between the reader's knowledge of linguistic factors and reading comprehension. So far, research has examined the issue primarily from a text-based perspective rather than from a reader-based perspective. In order to develop a more cohesive view of comprehension, however, reader-based knowledge of linguistic factors must be investigated independent of the text (Bernhardt, 1991; Mecartty, 1994).

Upon reviewing the few studies which have examined the relationship of linguistic factors, that is, lexical, grammatical and syntactic knowledge to reading comprehension from the perspective of the reader, one may conclude that a
significant correlation between these linguistic factors and comprehension exists. Mecartty (1994) believes that although these studies managed to illuminate the importance of the linguistic variables, they suffer from a number of drawbacks. In particular, the way knowledge has been assessed was somewhat thorny in previous research. A common practice has been determining the reader’s linguistic knowledge in conjunction with the text rather than independently. The learners’ prior knowledge has, therefore, been underscored in the majority of these studies. Also, different tasks were used to measure comprehension in these few studies which attempted to quantify the contributions of different knowledge sources to comprehension (Barnett, 1986; Sim & Bensoussan, 1979).

In the case of Barnett (1986), for instance, cloze tests were used to measure comprehension. The learners' knowledge source, on the other hand, was not independently measured, thus being merely a fulfillment of the particular demands of the cloze task (Mecartty, 1994). Furthermore, the results may have been confounded by the fact that the subjects' were previously exposed to the content of material previously encountered in the original text. In Barnett’s case, for instance, subjects performed recall of the reading passage first, then they performed the cloze task designed to assess linguistic knowledge of the same content.

It is also worth mentioning that so far, no clear distinction has been made between the relational versus the predictive roles of linguistic knowledge in reading comprehension (Mecartty, 1994). If the relationship between knowledge and comprehension is only relational then the teaching of certain linguistic factors in the classroom needs to be approached from a different perspective. If, on the
other hand, lexical, lexical and/or syntactic knowledge account for variance in the
comprehension construct, then there is evidence to argue in favor of or against
the development of these components as essential components of reading and
therefore of learning in general (Mecartty, 1994).

From a pedagogical viewpoint, Bernhardt (1991) argues that it is surprising
that so little information related to the topic of linguistic knowledge is available
considering the real amount of time and attention given to the instruction and
practice of linguistic items by both teachers and material developers.

Barnett (1986) also points out that although the general thrust of research on
the issues of the relative importance of syntax and vocabulary point to the
relative importance of both components, pedagogical materials seem to put more
emphasis on vocabulary. Most textbooks, for instance, present new vocabulary
immediately before or after the reading selection and rarely is the same attention
given to syntax.

Another major concern pertaining to the previous research is that most of the
earlier studies with the exception of Berry (1990) and Mecartty (1994), have not
reported reliability indices, a fact that casts some doubt on the findings.

The lack of sufficient research that provides clear information on the precise
contribution of linguistic knowledge to reading comprehension combined with the
serious limitation of the few existing studies emphasize the need for a study that
can accomplish the following:
1. Explore the learners' knowledge of lexis and syntax in the same research
design so as to determine their combined contribution as well as the precise
contribution of each of them to reading (Mecartty, 1994)
2. Break with the traditional perspective of measuring learners' knowledge of the linguistic features of the language contained in the text and, therefore, investigate the learners' knowledge independent of text comprehension (Mecartty, 1994).

3. Report reliability indices and utilize a measure of reading comprehension that is more valid than cloze or multiple choice, for example, the recall protocol (Bernhardt, 1991).

From the previous discussion, one may conclude that currently, it is of vital importance to shed more light on the specific role that syntax and vocabulary play in comprehension. The present study will attempt to show whether this relationship is predictive or merely relational. It will also utilize the recall protocol as an instrument for measuring comprehension. Unlike multiple choice, which has been used widely in previous studies, the recall goes beyond the surface structures and forms of the language and taps the learner's knowledge of discourse features (Bernhardt, 1985; Bernhardt & James, 1987; Lee, 1986).

The present study will also attempt to assess the type of tasks used in terms of reliability. The majority of the studies examined here gave little or no indication of the reliability of their research instruments. Before any definitive conclusions can be reached about a particular finding, the research instrument needs to be critically evaluated. Without reliable assessment tasks, research findings cannot be generalized.

Purpose of the Study

The present study aims to provide some insights into the relationship of linguistic factors, namely, vocabulary and syntax to reading comprehension. It
will also attempt to show whether this relationship is predictive or merely relational. The study addresses this issue by measuring individual readers' syntactic and lexical knowledge and assessing the relationship of these factors to overall comprehension. Correlations among these factors are determined with the objective of specifying the degree of association, that is, through correlation coefficients and the strength of the relationship between these factors to the comprehension process. Additionally, regression analysis will be used in order to determine the variance of each of the independent variables: syntax and vocabulary to the dependent variable: reading comprehension.

Research Questions

In the present study the following research questions were investigated:

1. Is there a relationship between the reader's syntactic knowledge and reading comprehension?
2. Does syntactic knowledge predict comprehension?
3. Is there a relationship between lexical knowledge and reading comprehension?
4. Does lexical knowledge predict comprehension?
**Definition of Terms**

**Authentic text:** Unedited texts chosen from newspapers or magazines. They are usually authored by native speakers of English and intended to be read by native speakers of English.

**Content words:** Vocabulary items such as nouns, verbs, adverbs and adjectives. Content words are lexical items which convey the message or idea contained in a text.

**Grammar:** The mental system utilized to construct and understand the words and sentences of a language. It includes such subcomponents as phonetics, phonology, morphology, syntax and semantics.

**Function words:** Vocabulary items such as conjunctions, prepositions, demonstratives, auxiliaries, etc., which are used to signify the phrasal structures of the language such as NP, VP, PP, etc.

**Immediate Recall Protocol:** The subjects' written recollection - in English - of the information from the authentic text, provided as completely and accurately as possible.

**Linguistic factors:** Linguistic features pertaining to vocabulary and syntax.

**Lexis:** The vocabulary or meaning carrying elements of a language.

**Lexical knowledge:** Information that the reader possesses regarding the meaning of words as measured by the vocabulary section of the Test of English as a foreign language (TOEFL).
Passages/texts: Two reading selections of approximately 250 words each selected from a local newspaper (Lantern) and a national magazine (Reader's Digest), and used as part of the research project.

Reader-based variables: Factors directly related to the reader, such as the cognitive abilities, the linguistic knowledge and skills, the familiarity with the cultural context of the text, and the general world knowledge and experience.

Syntax: The rules underlying sentence formation; the component of grammar that represents the learner's knowledge of the structure of phrases and sentences.

Syntactic knowledge: Information that the reader possesses regarding the language system, i.e., rules, for forming and interpreting phrases and sentences as measured by the structure section of the TOEFL test.

Text-related variables: The specific characteristics of a certain text such as syntax, semantics, and pragmatic content, vocabulary, sociolinguistic aspect, topical reference, level of formality, literal vs. interpretative presentation and rhetorical organization.
Assumptions
The following assumptions were made in order to conduct the study:
1. The subjects' performance on the structure and vocabulary sections of the Test of English as a Foreign Language (TOEFL) is a valid representation of their syntactic and lexical knowledge respectively.
2. The students will perform to the best of their abilities on these tests.
3. Subjects' free recall protocols provide an accurate reflection of the text they have read and are, therefore, a valid measure of reading comprehension.

Limitations of the Study
The researcher acknowledges the following limitation to the study:
1. The study will be conducted using only two passages. Due to the possibility of obtaining different passages and text types (Allen, Bernhardt, Berry and Demel, 1988), the conclusions of this study could be generalized only to other similar passage types.
CHAPTER 2

REVIEW OF THE LITERATURE

Introduction

This chapter falls into four sections. The first section gives a historical overview of the research literature which examines the relationship between linguistic knowledge and reading comprehension. The second section examines the L2 reading research that deals with the relationship between lexical knowledge and comprehension. The third section discusses the contributions of grammatical and syntactic knowledge to comprehension. The last part examines the studies that investigate the contribution of both grammatical and lexical knowledge to comprehension.

Early research on L1 reading comprehension and linguistic knowledge has yielded consistent findings. Davis (1968) identified sub-skills related to reading comprehension through conducting a factor analysis of nine comprehension tests. He identified four sub-skills: recalling word meaning, determining meaning from context, finding answers to explicit questions, and drawing inferences. A main factor of .80 was found for recalling word meaning, that is, lexical knowledge. Similarly, Thorndike (1973) collected reading achievement data from 15 countries with students across three age groups (10, 14, and 17 years old). Average correlations were found for lexical knowledge and reading
comprehension. Readability analyses also showed that lexical knowledge contributes to a major proportion of the variance in reading comprehension tests.

Yap (1979) provides partial evidence that lexical knowledge and reading comprehension are related and that lexical knowledge is "likely to be the predominant causal factor" (p.58). It should, however, be noted that in correlation studies mere association between variables does not necessarily imply causation, therefore, the causal relationship between lexical knowledge and reading comprehension should not be assumed.

The positive correlation between lexical knowledge and L1 reading comprehension has been theoretically explained by means of four hypotheses: the aptitude hypothesis, the knowledge hypothesis, the instrumentalist hypothesis, and the access hypothesis. The aptitude hypothesis states that one's intellect or intelligence is the primary force behind vocabulary acquisition and reading skill. In other words, intelligent people tend to know more vocabulary and are consequently better readers. The second explanation is the knowledge hypothesis which states that vocabulary knowledge is a function of general knowledge that indirectly affects one's reading ability. In other words, people who possess more general knowledge are better equipped to learn more words and, consequently, to become better readers. The third explanation is the instrumentalist hypothesis which asserts that the actual number of known words directly correlates with reading comprehension. Advocates of this hypothesis push in the direction of explicit vocabulary instruction and, perhaps, long definitional word lists. Large vocabulary, according to this view, will eventually result in better comprehension. The fourth hypothesis is the access hypothesis,
which stresses the importance of automaticity. This hypothesis claims that knowledge of the various meanings of a certain word makes it more readily usable by the learner. According to this viewpoint, reading is very important as a means to develop vocabulary. In other words, reading and vocabulary are seen as reciprocally developing abilities (Stanovich, 1986).

Kameenui et al. (1987) examined these views in an L1 context and concluded that all these explanation are valid and they all play some role in vocabulary acquisition. Acquisition of lexical items is, therefore, the result of aptitude, background knowledge, instruction, multiple exposures, and opportunity for practice.

Likewise, in the field of L2 reading comprehension, current assumptions state that it is influenced by linguistic factors such as lexical knowledge (Carrell, 1983; Hawas, 1990; Koda, 1989; Laufer, 1992; Lee, 1986; Salyer, 1990), morphosyntactic features (Barnett, 1986; Blau, 1982; Call, 1985; Conrad, 1985, Guarino & perkins, 1986), and grammar (Berry, 1990; Bialystok, 1988). Krashen (1989) claims that proficient readers must have sufficient lexical knowledge and that such knowledge is normally enhanced through reading. Generally speaking, there appears to be an overall acceptance of the fact that lexical knowledge is important to L2 reading comprehension. Furthermore, there appears to be a bidirectional relationship between lexical knowledge and reading comprehension, that is, the more a person reads, the more lexis he/she acquires, and consequently, the more proficient they become in reading (Krashen, 1989; Pitts, White & Krashen, 1989).
As for syntax and grammar, the two terms are currently used interchangeably in second language studies. Grammar refers to the mental system that is used to form the words and sentences of a language. It includes subcomponents such as phonetics, phonology, morphology, syntax and semantics. Syntax refers to the system of rules and categories that underlie sentence formation (Rutherford, 1987).

The role of grammar knowledge in comprehension is still unclear. It is generally viewed as forming part of a larger context of language proficiency (Rutherford, 1987). Therefore, it can be argued that if readers derive meaning from a text, they resort to a system of rules, that is, grammar knowledge for encoding and decoding the language. Knowledge of these grammatical features, however, is never to be seen as a prerequisite for comprehension (Lee, 1987).

As in the case of lexical knowledge, the role of syntax in L2 comprehension has been perceived from a text-based perspective (text simplification). In other words, researchers sought knowledge of how the level of syntactic complexity of a certain text could influence comprehension (e.g., Berman, 1984; Blau, 1982; Cohen et al., 1988). For instance, Bhatia (1984) and Blau (1982) tried to answer the question of whether or not simplifying the syntactic features of a text promotes comprehension. They concluded that simplifying the syntactic complexity facilitated comprehension at all levels of proficiency. Berman (1984) reported the results of a pilot study on 20 ESL college students in an intensive reading course. These results showed that reading the syntactically simplified text aided comprehension. In another study that investigated the effect of compound word usage on comprehension, Olshtain (1982) found that the
complexity of compounding did not hinder comprehension. It should be noted here that the focus of the above mentioned studies is text-based features, or the manipulation of texts in terms of difficulty. That is to say, none of them has investigated syntactic knowledge and its relationship to comprehension from a reader-based viewpoint.

**Lexical Knowledge and Comprehension**

The relationship between comprehension and lexical knowledge in L1 research shows two main trends. The first trend investigates how difficult or low frequency lexical items in a certain text influence comprehension (Freebody & Anderson, 1983a, 1983b; Marks, Coctorow & Wittrock, 1974). The prevalent trend, however, has examined the effects of lexical instruction on subsequent reading comprehension. It has been argued that deliberate instructional intervention could improve lexical knowledge and, therefore, facilitate reading comprehension.

In the case L2 reading research, one should distinguish between studies which treat lexical knowledge as a reader-based variable and those which look at it as a text-based variable. Three studies in the L2 reading literature look at the issue from the reader perspective. Koda (1989) investigated the effects that the transfer of L1 lexical knowledge has on L2 reading comprehension. The researcher had three issues in mind: first, the effects of transferred lexical knowledge on L2 reading; second, the effects of this transferred knowledge on the acquisition of L2 specific lexical knowledge; and third, the effects of transferred lexical knowledge on verbal precessing skills, that is, word recognition and letter
identifications. The subjects of the study were twenty-four college students of various linguistic backgrounds learning Japanese as a foreign language. They were divided into two groups: a Kanji group and a non-Kanji group. The Kanji group consisted of ten subjects whose L1 orthographies are similar to the Chinese language. The fourteen subjects in the non-Kanji group shared an alphabetic orthographic system common to the English, Spanish, and Portuguese languages. The subjects' language proficiency was tested by means of a grammatical knowledge test and a lexical knowledge test. The test of grammatical knowledge tapped word-formation knowledge (inflections and derivations) and particle knowledge (case-marking particles). The lexical knowledge test was comprised of translation, word grouping and sentence completion tasks. In Japanese, both case-marking particles and word order are used for syntactic markings. Hence, the researcher included case marking-particles as a variable in the study "to determine how morphosyntactic features specific to Japanese influence the reading comprehension tactics of L2 learners" (p. 530). Comprehension was assessed by means of a cloze paragraph and a paragraph comprehension task. Sixth-word deletion format was used in the cloze paragraph. The paragraph comprehension test, however, was comprised of four syntactically controlled paragraphs along with five questions for each of the paragraphs. The questions tapped content knowledge of the paragraphs. Upon conducting correlations among the variables (linguistic knowledge, verbal processing skill, and reading comprehension) it was shown that lexical \( r = .74 \) and particle knowledge \( r = .49 \) were significantly correlated with reading comprehension. Significant correlations were also found between the cloze test
and particle knowledge \((r = .77)\) and between lexical knowledge and paragraph comprehension \((r = .74)\). High significant correlations were found between paragraph comprehension and word recognition speed \((r = .68)\), and between lexical knowledge and word-recognition speed \((r = .80)\). Moderate significant correlations were, however, found between letter identification and paragraph comprehension \((r = .44)\). Word formation knowledge neither correlated with paragraph comprehension nor with other language proficiency measures.

Furthermore, the researcher performed a step-wise discriminant analysis procedure and found that lexical knowledge was the single most significant factor among the five variables distinguishing the Kanji from the non-Kanji group \((r = .42)\). Koda found that the Kanji group performed better than the non-Kanji group on all tests which tap the effects of transferred lexical knowledge on the development of L2 reading proficiency: "transfer of vocabulary increases L2 reading comprehension and facilitates the acquisition of L2 linguistic knowledge as well as the mastery of verbal processing skills and thus enhances the overall development of L2 reading proficiency" (p. 537).

Hawas (1990) examined the influence that lexical knowledge had on general reading comprehension as well as reading comprehension tests. The subjects of the study were eighty-eight Arab students of ESL in their first semester at a technical college. The subjects' comprehension of a modified scientific text was assessed by three types of comprehension questions: a) multiple-choice questions in which correct selection of a certain answer depended on subjects' knowledge of the lexical item contained in the passage, b) true/false questions in which the correct response depended on knowledge of a particular lexical item,
and c) word-meaning in which words were chosen from the passage and choice of the correct response was dependent on its contextual meaning in the passage.

Multiple choice and true-false scores were correlated with responses on word-meaning. For subjects who could identify contextual word-meaning and answer the corresponding comprehension questions, a correlation of .68 was obtained between these two measures. Subjects who did not know the meaning of certain words in the passage were not able to answer the corresponding reading comprehension questions. The researcher concluded that students had to be trained in predicting the meaning of words from context so as to improve their reading comprehension.

Laufer (1992) examined first, how L2 reading was influenced by L2 proficiency as a function of the learner's lexical knowledge, and by the students general academic ability; and second, to what extent L2 reading comprehension was influenced by general academic ability at different levels of lexical knowledge. Sixty-four students of Arabic and Hebrew linguistic backgrounds participated in the study. Subjects were categorized according to their lexical knowledge, general academic ability, and L2 comprehension. The subjects' level of lexical knowledge was determined by their score on the Vocabulary Levels Test at the less than 2,000 word level, 2,000, 3,000, 5,000, and 10,000 word level. General academic ability and L2 reading comprehension were based on scores on a standardized entrance examination. Upon conducting correlational analyses between L2 reading level of lexical knowledge and general academic ability, it was found that there is a significant correlation between performance on the reading test and lexical knowledge (r = .51). Furthermore, the correlation
between performance on the reading test and general academic ability was also significant ($r = .39$). English lexical knowledge together with general academic ability accounted for 16% of the variance. Lexical knowledge accounted for 26% of the variance while general academic ability accounted for 16% of it. Post-hoc ANOVA was conducted to determine how general academic ability might contribute differently for different levels of lexical knowledge. Results showed that three lexical knowledge indices proved to be significant in relation to L2 reading comprehension. These knowledge indices are: lower than or equal to 2,000 word level, at the 3,000-4,000 word level, and at the 5,000 word level. The correlation between L2 reading and general academic ability at the lower than or equal to 2000 level, was significant ($r = .56$). At the 3,000-4,000 level no correlations between L2 reading and general academic ability were found. At the 5,000 level, the correlation between L2 reading and general academic ability was also positive ($r = .54$). The author concluded that if the level of lexical knowledge is fewer than 3,000 words, reading comprehension will not be optimum regardless of the learner's general academic ability. This suggests that L2 lexical knowledge is a better predictor of L2 reading comprehension than general academic ability. Mecartty (1994) investigated the contribution of grammatical and lexical knowledge to both reading and listening comprehension. A total of 154 subjects participated in the study. The researcher hypothesized that the contribution of lexical and grammatical knowledge would be different for the different mediums of presentation, that is, reading and listening. She used multiple choice tasks to assess the subjects lexical and grammatical knowledge as well as their reading and listening comprehension. The texts used for reading
and listening were edited for length, vocabulary difficulty and structural complexity in order to facilitate comprehension. Her results showed that while both grammar and vocabulary correlate significantly with reading comprehension, only lexical knowledge could predict the students' performance in reading.

To summarize, the previous studies investigated the relationship between lexical knowledge and overall second language reading comprehension. First, Hawas' study showed that lack of knowledge of the lexical items is an obstacle in reading comprehension. Hawas' assessment of lexical knowledge takes place in a post-reading context, and it is both reader-based and text-based. Lexical knowledge in this study, however, is not determined independently of reading (Mecartty, 1994).

Second, previous studies showed that some indices of lexical knowledge correlate with reading comprehension. Lexical knowledge is measured independently of the text (e.g., Laufer, 1992), and it is correlated with performance on a standardized reading comprehension test. Lexical knowledge is a significant predictor of comprehension. Finally, readers' lexical knowledge in a language is positively transferred and aids lexical knowledge in the second language when the two orthographic systems are similar (Koda, 1989). Lexical knowledge is assessed independent of the text in a multi-task format. Lexical knowledge and comprehension of paragraphs are positively related.

**Grammatical Knowledge and Comprehension**

Only two studies have explored the relationship between L2 grammatical knowledge and reading comprehension. In these studies, the readers'
grammatical knowledge is directly measured and not inferred, that is, it is treated as a variable in and of itself in reading comprehension.

Guarino and Perkins (1986) looked at the relationship between knowledge of form class and L2 reading comprehension. Form class awareness, a subtype of grammatical knowledge, refers to the sensitivity that readers show towards morphemes or structural units of language. Thirty-five ESL students of different linguistic backgrounds participated in the study. The subjects were chosen from intermediate and advanced levels of English language proficiency. Their task was to recognize structural units such as nouns, verbs, adjectives, and adverbs in a series of nonsense sentences. The researcher used nonsense words in order to compel the subjects' to use only their structural knowledge to complete the meaning of the test sentences. The subjects read a series of eight passages and responded to a total of 48 multiple choice items which were intended to test their literal comprehension, main idea comprehension, salients, word-meaning in context, single and multiple string inferences, and evaluation. Average significant correlations between subjects' awareness of form class and reading comprehension (r = .37) were found. The shared variance between the two variables was 17%. Furthermore, group comparisons were conducted with subjects who scored above the mean and those who scored below the mean on the form class awareness test. The results of the t-test showed significant differences between the groups. In other words, the subjects who scored high in the recognition test of form class performed as well on the reading comprehension assessment task. The researchers' conclusion was that
awareness of form class is one important language access to reading comprehension.

Berry (1990) examined the relationship between language experience in French, degree of analyzed knowledge of grammar and reading comprehension. The subject pool consisted of a group of college-bound high school students (number unspecified) enrolled in first through fourth-year French classes. Analyzed knowledge of grammar refers to the specific knowledge of grammar rules. It was assessed through three tasks: grammaticality judgement of a series of sentences, identification of errors in categories of adjectives, pronouns and verbs (form class) contained in the sentences, and selection of the rule governing the error contained in the sentences. The tasks were done in stages in order to determine how subjects' analyzed knowledge of grammar was apparent at each successive stage. For instance, the identification of error contained in the sentence is made possible by the grammatical judgement of a sentence. This would subsequently facilitate selection of the rule governing the error in the sentence, and subsequently make the determination of more formal and detailed knowledge of grammar at each stage possible.

Reading comprehension was assessed by means of a free-recall protocol of an authentic French text. The results of this test showed that subjects at the most advanced level, i.e., fourth year of instruction, achieved the highest mean score while the lowest mean score was reported for subjects at novice level (first year of instruction). The second highest mean score was reported for subjects in the second year while the third year subjects mean score was less than the score of the second year students. Statistical differences were obtained for first and
fourth year subjects while there were no statistical differences between subjects in the second and third year.

In order to identify the best predictor of reading comprehension, simple linear regression and analysis of covariance were conducted on the four variables (i.e., grammaticality judgement, identification of errors contained in the adjectives, pronouns and verbs, identification of the violated rule and year of instruction). The results showed that level of instruction as well as the identification of the violated rule contributed similar amounts of variance to reading comprehension ($r = .48$ and $.46$, respectively). The least amount of variance was accounted for by grammaticality judgements ($r = .13$). The identification of errors contained in the adjectives, pronouns, and verbs explained the second highest variance ($R^2 = 39\%$). The final analysis of covariance with all variables included, both identification of the violated rule and year of instruction accounted for a significant amount of variance in the comprehension scores while the other two remaining variables did not reach significance. For instance, the variable identification of the violated rule combined with year of instruction accounted for the largest variance ($R^2 = 55\%$), while the combination of identification of the rule violated and grammaticality judgment contributed 46% of the variance and identification of the violated rule in combination with identification of errors contained in adjectives, pronouns, and verbs contributed 47% of the variance.

In summary, one cannot ascertain possible relationships of knowledge of grammar to reading comprehension based on the few studies available. First, in some of these studies, grammatical knowledge is measured independently. It is measured by means of a number of tasks such as identification of errors in forms
of adjectives or verbs, and selection of the rule manifested in the error. The selection of the rule manifested in the error explains the greatest variance in reading comprehension. In Berry's (1990) case Reading comprehension is measured by means of a recall-protocol procedure. Second, grammatical knowledge is measured independent of the text. It was found that a type of grammatical knowledge, that is, form class awareness, correlates with reading comprehension. Grammatical knowledge was measured by means of a structural-unit recognition test. Multiple choice was used to assess reading comprehension (Guarino & Perkins, 1986).

**Lexical Knowledge, Syntactic Knowledge and Comprehension**

Only a few studies in L2 research examined the relationship between lexical and grammatical knowledge on the one hand and reading comprehension on the other hand. The studies chosen for review in this section are limited to those which examine lexical and syntactic knowledge in combination and from a reader-based perspective.

It is worth mentioning, however, that researchers adopt different perspectives when it comes to how each of these knowledge sources influences comprehension. For instance, Barnett (1986) operationalizes syntactic knowledge as the knowledge of both verb morphology and pronouns. Sim and Bensoussan (1979), on the other hand, examine the influence that knowledge of content and syntactic function words have on reading comprehension.
Barnett (1986) tested her hypothesis that the students' ability to understand a French text was more dependent on their lexical/semantic knowledge than on syntactic knowledge. The subject pool was comprised of 124 native English readers at the intermediate level of French. Students were asked to read two passages, perform a recall task, and respond to multiple choice rational deletion cloze text of the content of the reading. Deletions corresponded to either a lexical, a lexical/semantic or a syntactic item. Syntactic and lexical/semantic scores on the cloze were obtained in conjunction with recall scores from the protocols. Afterwards, the subjects' scores on the cloze tests were categorized as high, medium or low. A two-way analysis of variance was then performed. The results, showed a significant interaction for syntactic and lexical/semantic knowledge on recall. This suggests that both syntactic as well as semantic/lexical knowledge are necessary for comprehension.

Sim and Benoussan (1979) examined whether students scored higher on questions elicited to test function words than on questions elicited to test function words than on questions elicited to test content words. One hundred and eighty seven students participated in the study. Their reading comprehension was measured by means of a multiple choice task designed to measure comprehension of content and function words. A total of 111 texts along with 103 question were used. The questions corresponded to five categories: questions on function words used in a logical sequence; questions on content words used denotatively for meaning; questions on context words used connotatively for tone and implications; part-text questions on the ability to
recognize a paraphrase of short segments of text; and whole-text questions concerning the author's purpose and manner.

The difficulty index of each question type was determined by an item analysis. The analysis yielded similar difficulty levels on questions designed to test content words as on those testing function words. The researchers concluded that in order to effectively comprehend a text, the student should possess the ability to decode and interpret function words as well as content words.

Mecartty (1994) conducted a study to explore the contribution of linguistic factors to foreign language comprehension. Her study addressed two research questions: a) what is the relationship of lexical and grammatical knowledge to foreign language comprehension? and b) do lexical and grammatical knowledge play the same or different roles for reading vs. listening comprehension? One hundred and fifty-four subjects in their final semester of basic Spanish language study at the University of Illinois participated in the study. In order to investigate the relationship of lexical knowledge on language comprehension subjects performed two assessment tasks: a) a word-meaning association task and b) an antonym task. To investigate the relationship of grammatical knowledge on language comprehension subjects performed two assessment tasks: a) a grammaticality judgement task and b) a sentence completion multiple choice task. Comprehension was assessed through multiple choice questions on main ideas and supporting ideas of two passages. Subjects completed either the listening or reading comprehension task but not both. Seventy-seven subjects completed the listening comprehension and an equal number of students completed the reading comprehension test. Multiple regression analyses were
performed to determine the contributions of the independent variables, lexical and grammatical knowledge, to the dependent variable, comprehension. The results showed significant correlations between lexical and grammatical knowledge with reading comprehension. However, only lexical knowledge could predict comprehension. When entered into the regression model, lexical knowledge accounted for the total percentage (29%) of variance in reading comprehension. Grammatical knowledge was non-significant. In listening comprehension lexical knowledge accounted for 12% of the variance in listening while grammatical knowledge was non-significant.

To summarize, the aforementioned studies have brought into focus both lexical and syntactic knowledge and their correlation with reading comprehension. First, it was shown that the learners' lexical and syntactic knowledge are related to comprehension (Barnett, 1986). Assessment of learners' knowledge was conducted after the reading. The same content was used in the cloze passage and the reading passage. Mecarty (1994) believes that "the use of a rational deletion cloze task to measure subjects' lexical and syntactic knowledge superimposes a level of artificiality on the reading process" (p.40). The cloze passage was the only measure of the learners' lexical and syntactic knowledge. Second, it was shown that readers draw on both their knowledge of function words and content words for reading comprehension (Sim & Bensoussan, 1979). Difficulty indices of question types were used to assess knowledge of content and function words.
Finally, the reliability of these question types was not reported, and the learners' knowledge of function and content words was not assessed prior to conducting the comprehension task. Moreover, the exact contributions of knowledge of content and function words to the variance in reading comprehension was not determined.
CHAPTER 3

PROCEDURES

Population and Sample

The population from which the sample for this study was drawn consisted of freshman level students enrolled in the University of Hebron in the southern part of Palestine. The majority of students attending this university come from the city of Hebron itself and the surrounding rural areas. The sample consisted of 92 students, 54 females and 38 males. In order to secure admission at the Hebron University, all students must pass the Secondary School Certificate Exam in which English is given the same weight as the students' native language (30% of the total score). In this exam, reading comprehension is given 30% of the total score, while grammar and vocabulary are given about 25% each. The students' admission to the Hebron University is also contingent upon passing the Entrance Exam, in which English is given 25% of the total score.

Students in Palestinian public schools start learning English as a foreign language at the beginning of the fifth grade, that is, by the time they start college, these students will have studied English for eight years. They are exposed to English for approximately five hours per week within the classroom atmosphere. All of the English teachers are native speakers of Arabic and there is very limited opportunity for students to interact with native speakers of English. If they
choose to, however, students can listen to or watch some readily available radio or T.V. programs broadcasted in American or British English.

In 1986, the Jordanian ministry of education, which has until recently been in control of the educational system in Palestine, introduced a communicative syllabus that stresses the functional aspects of the language. This syllabus is currently implemented in the compulsory stage (5th-9th grade). During the three subsequent years (secondary stage) students still use a traditional textbook based on audiolinguistics. Therefore, during the last three years of school, correct English usage (through drills and dialogues) is disproportionately stressed at the expense of vocabulary development. According to the general goals underlying this syllabus, students completing the secondary stage should be able to carry out the following tasks successfully:

1. Understand English spoken in different contexts and situations.
2. Speak English with accuracy from a phonological, semantic, syntactic, and morphological viewpoint.
3. Read and comprehend English in different contexts with ease and accuracy.

It is important to keep in mind that Palestinian students are generally highly motivated to learn English for the following reasons:
1. In the general secondary certificate examination, English constitutes
30% of the total score, therefore, the final English language attainment of
school graduates is evaluated by their success or failure in the
secondary certificate examination in English.
2. All local universities ask the applicants to take a level exam in
English. The results of this exam are an important consideration for
admission.
3. In addition to academic goals, English is needed in the different aspects
of life in Palestine. It is needed to secure a good job in the Arab countries
where a high percentage of Palestinian graduates usually seek
employment.
4. English is also essential for the tourist trade in the Holy Land, and it is
highly needed to convey the Palestinian viewpoint regarding the political
situation to the Western world.

Research Design

In the present study, multiple hierarchical regression was used to answer the
following research questions:

1. Is there a relationship between the reader's syntactic knowledge and
   reading comprehension?
2. Does syntactic knowledge predict comprehension?
3. Is there a relationship between lexical knowledge and reading
   comprehension?
4. Does lexical knowledge predict comprehension?
Multiple Regression shows how well scores on the dependent variable (reading comprehension) can be predicted from scores on the two independent variables, namely, lexical and syntactic knowledge. The hierarchical feature of this design helps determine which of all the independent variables best predicts performance on the dependent variable in addition to determining the specific contribution of each of these variables. Using such sophisticated statistical procedures which accommodate several variables is recommended in reading research. Moreover, such techniques accommodate individual rather than collective scores, thus, giving researchers further insight into the individualized nature of discourse processing (Bernhardt, 1991).

Multiple regression as well as linear regression build on correlation. Hence, it is very important that the correlation values be accurate. It is also important to report the reliability index for the tasks used to assess the independent variables. The researcher, therefore, utilized the Kuder-Richardson formula to estimate reliability for the vocabulary and structure sections of the Test of English as a Foreign Language (TOEFL). Although the TOEFL test is an acknowledged standardized test, it was deemed appropriate to conduct a reliability estimate for the particular group of students who participated in the study.

Variables and Treatment Conditions

This study investigates the relationship between lexical and syntactic knowledge and reading comprehension. Multiple regression is used to determine the contribution of these independent variables to the dependent variable.
Multiple regression analyzes the variance in scores accounted for by the independent variables (Kamil, Langer, and Shanahan, 1985).

**Independent variables**

**Lexical knowledge:** The vocabulary section of the TOEFL test was used to assess the students' lexical knowledge. This section is comprised of 30 items.

**Syntactic knowledge:** The structure section of the TOEFL test was used to assess the students' syntactic knowledge. This section consists of 40 items.

**Dependent variable**

**Reading comprehension:** This variable was assessed by means of scores on a free recall protocol of two authentic texts. The scores from each article were combined to give each subject one comprehension score.

**Instrumentation**

**Reading Comprehension Task**

**Recall protocol**

The recall protocol was used to test the subjects' reading comprehension. The advantage of this method is that it requires the reader to integrate the various parts of the reading process to manifest comprehension (Bernhardt, 1983). This type of testing is increasingly being used to measure reading comprehension in L2 (Bernhardt, 1983, 1991; Connor, 1984; Currell, 1983;
The immediate recall is considered to be a valid measure of reading comprehension as it is congruent with current research-driven theories of L2 reading comprehension. As a comprehension assessment method, recall provides data about the "organization of stored information, the retrieval strategies used by readers, and it reveals the method of reconstruction which is employed to encode information in a text" (Bernhardt, 1983, P.31).

The immediate recall protocol was scored by the weighted propositional analysis developed by Johnson (1970). Three native speakers of English were asked to read the two texts and to work independently to divide them into propositional units. The three readers provided almost 98% overlap in their pausal units. The few cases of inconsistency among the readers were resolved by mutual consent of the three of them and the researcher. An Arabic version of the propositions was prepared to score the subjects' Arabic recalls. Two Arabic native speakers who are proficient in English were asked to translate the English propositions into Arabic. In case of any inconsistency in the translation, it was resolved by the two translators and the researcher.

**Johnson's (1970) Scoring System**

Johnson's scoring system is used to grade the recall protocols in this study. This system requires dividing the reading passage into pausal units based on the normally paced oral reading. Each proposition or pausal unit should be put on a scale of four according to its importance to the passage meaning. To develop a scoring template, the pausal units are weighted first. The total score on a recall protocol according to Johnson's system is the sum of the weighted pausal units recalled by the learners.
The Reading Passages

Hughes' (1989) suggestions regarding choosing a reading text for testing and teaching purposes have been taken into consideration in the present study. The following is a summary of these suggestions:

1. The text should be interesting for the students, but not to the extent of "overexciting them".
2. Texts that have a lot of information that could be part of the students' general knowledge should be avoided. Some of the English teachers were consulted to verify this point.
3. Texts that are too "culturally laden" should also be avoided. English teachers were also consulted to verify the cultural references in the texts.
4. Texts that students may have read or that have close approximations to what they have read should be avoided.

Two passages were selected in this study to avoid the effect of the background knowledge and to obtain higher reliability. Hughes (1986) recommends using as many passages as possible to obtain higher reliability. Moreover, the two passages were chosen from authentic sources and were not edited or modified in any way. Bernhardt (1991) asserts that while the 1980s witnessed a concern for the use of authentic materials, the 1990s should witness an end to the debate in favor of authenticity. Research has shown that learners at all levels of proficiency are able to handle such materials when given adequate tasks (Allen, Bernhardt, Berry, & Demel, 1988).

The first text, approximately 220 words was chosen from the Reader's Digest. The text is expository with scientific content. It deals with the health hazards
involved in giving small children large amounts of fruit juice. The second text, approximately 250 words, was chosen from the Ohio State college newspaper, Lantern. The text is a newsstory about an earthquake that took place in Italy. The two texts were judged by three English instructors to be interesting but not too familiar to the students.

The TOEFL Test

The Test of English as a Foreign Language (TOEFL) is owned and administered by the Educational Testing Service (ETS). Test questions are prepared by language specialists who follow careful, standardized procedures to ensure the high quality of the exam (ETS, 1996). After carefully reviewing and revising the test questions, they are usually administered selectively in trial situations to make sure the test forms are free of cultural bias and to provide the necessary information to conduct statistical analyses of individual questions as well as of the complete tests to ensure reliability (ETS, 1997).

The TOEFL test is taken by approximately 600,000 students each year. This test is designed to assess the English skills of foreign students wishing to enter American and Canadian universities.

Since 1975, the TOEFL, which was established in the early sixties, has been divided into three sections: (a) listening comprehension, (b) grammatical structure, and (c) vocabulary and reading comprehension. Scores from the three sections are combined to yield a total score that is reported in addition to the sections scores. Oltman et al. (1990) note that the use of separate scores for each section is meaningful and buttresses the test's construct validity.
Structure section

In this study, the second and the third section of the TOEFL test were used. The structure part of the test consists of forty questions, all with four possible answers. The questions cover basic rules of English structure, such as concordance, tense, function words, parallel structure, and correct usage of prepositions (Traynor, 1985). These questions fall in two sections. In the first section, the students are asked to choose the correct answer from a number of options. In the second section, students are expected to choose the part of the sentence that contains an error, but are not required to correct it.

Vocabulary Section

The vocabulary section of the test is comprised of 30 items. In a given sentence, one word is underlined and four possible synonyms are given. The student must choose the best answer. It should also be noted that in the TOEFL test, there is no penalty for wrong answers. Candidates are, therefore, encouraged not to leave any question unanswered, in other words, they are encouraged to guess.
Pilot Study

All items in the TOEFL test were pilot-tested two weeks prior to the actual study. Thirty subjects participated in the pilot study, which followed the same procedures described in the Data collection section. The pilot study was conducted for the following purposes:

1. To get a clearer idea about the time needed to conduct the actual study.
2. To identify any problems and revising the experience accordingly.
3. To indicate any adjustments that may be needed.

Upon conducting the pilot study, the researcher noticed that the last three or four items on each section were left unanswered by the majority of the students. The decision was then made to expand the original timeline by few minutes to allow more time for these items. The researcher also noticed that some students kept going back to the first section (structure) to change some answers. This resulted in poor performance on the second section. Therefore, prior to the actual study, students were given strict instructions not to go back to a previously finished section until after the whole test has been completed.

The two reading passages were also pilot-tested to get a clearer idea about the time needed for the actual study. During the procedure, the researcher found that some students interpreted recall as a summary of main ideas. This helped the researcher provide clearer information on recall prior to the actual study.
Procedures and Data Collection

Data collection was conducted over a two-day period. The first day was designated for the collection of data to assess subjects' lexical and syntactic knowledge. Subjects were asked to complete the TOEFL test which consists of 70 items: 30 for vocabulary and 40 for structure. The researcher and her assistant read the instructions for the students and explained them in Arabic. The students then were instructed to spend forty minutes on the first section (structure), and thirty minutes on the second section (vocabulary). It was deemed appropriate to expand the original TOEFL time line by few minutes because of the students lack of familiarity with the test, and based on the results of the pilot study. In order to ensure that the students will spend sufficient time on each section, they were instructed not to go back to a previous section once they have finished it.

The second day was designated for the assessment of reading comprehension. Subjects were instructed to read the first text taking as much time as desired. They were advised that they could not go back to the text once they started the recall. They were then asked to hand the passage to the researcher, then write down in Arabic everything that they could remember. They were instructed to follow the same steps for the second text.

Data Analysis

Four sets of analyses were used in the present study: test reliabilities, simple statistics, correlation, and multiple regressions. The researcher conducted analysis of test reliabilities of the items on the TOEFL test of lexical and grammatical knowledge. The Kuder-Richardson estimates of reliability were
used for this purpose. This formula provides information about the degree to which the items in the text measure similar characteristics (Gronlund & Linn, 1990, p.85). The second set of analyses were the descriptive statistics that report the mean, standard deviation, standard error, and the minimum and maximum scores obtained on the knowledge tests and the comprehension tests. The third set of analyses, correlations were undertaken to discover the relationship between the variables. Finally, a series of multiple regression analyses were performed using the SAS statistical package. This method analyzes the collective and separate contribution of two or more independent variables to the variation of the dependent variable. It is a statistical procedure used to account for the variance of the dependent variables by estimating the contributions to this variance from the independent variables (Hatch & Lazaraton, 1991).
CHAPTER 4

RESULTS

The following research questions were investigated in the present study:

1. Is there a relationship between the reader's syntactic knowledge and reading comprehension?
2. Does syntactic knowledge predict comprehension?
3. Is there a relationship between lexical knowledge and reading comprehension?
4. Does lexical knowledge predict comprehension?

In order to find answers for these questions, four sets of statistical analyses were used: test reliabilities, simple statistics, correlation, and multiple regressions. The researcher conducted analysis of test reliabilities of the items on the TOEFL test of lexical and grammatical knowledge. The Kuder-Richardson estimates of reliability were used for this purpose. The second set of analyses was the descriptive statistics that reports the mean, standard deviation, standard error and the minimum and maximum scores obtained on the knowledge tests and the comprehension tests. The third set of analyses, correlations was undertaken to discover the relationship between the variables. Finally, a series of multiple regression analyses were performed using the SAS statistical package. This method analyzes the collective and separate contribution of two or more independent variables to the variation of the dependent variable. In
other words, it is a statistical procedure used to account for the variance of the
dependent variables by estimating the contributions to this variance from the
independent variables (Hatch & Lazaraton, 1991).

Test Reliabilities

Test reliabilities are presented in Table 1. The Kuder-Richardson formula, a
method of estimating test reliability, provides a measure of internal consistency of
test scores. It is based on an estimation of the average of all the possible split-
half coefficients of a certain test. It is also based on the proportion of subjects
correctly responding to each test item and the standard deviation of the total
score (Bachman, 1990).

The reliability coefficients reported in Table 4.1 show the differences in
reliability coefficients of test scores and the number of items on each test.
Internal reliability through a split-half method of the 40-item syntactic knowledge
test using the Kuder-Richardson formula was $r = .80$. Internal reliability through
the same split-half method of the 30-item lexical knowledge test was $r = .73$.

These indices indicate that both test sections yielded high reliability estimates.
One may notice, though, that the reliability of the Syntax section was slightly
higher.
<table>
<thead>
<tr>
<th>Test</th>
<th>Number of items</th>
<th>Reliability coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>Syntax</td>
<td>40</td>
<td>.80</td>
</tr>
<tr>
<td>Vocabulary</td>
<td>30</td>
<td>.73</td>
</tr>
</tbody>
</table>

Table 4.1

Test Reliabilities
Descriptive Statistics

Descriptive statistics for the subjects' performance on the tests of lexical knowledge and syntactic knowledge and performance on the reading comprehension test are presented in Table 4.2. The mean score obtained on the syntax section is higher than the mean score on the vocabulary section. The comprehension mean score is the highest among them all.
<table>
<thead>
<tr>
<th>Variable</th>
<th>N</th>
<th>M</th>
<th>SD</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Synax</td>
<td>92</td>
<td>58.13</td>
<td>14.34</td>
<td>25</td>
<td>94</td>
</tr>
<tr>
<td>Vocabulary</td>
<td>92</td>
<td>45.77</td>
<td>13.98</td>
<td>20</td>
<td>85</td>
</tr>
<tr>
<td>Comprehension</td>
<td>92</td>
<td>68.96</td>
<td>13.60</td>
<td>10</td>
<td>93</td>
</tr>
</tbody>
</table>

Table 4.2

Descriptive Statistics for Lexical, Syntactic Knowledge, and Reading

Comprehension
Correlational Analyses

Correlational analysis was used to examine the relationship of lexical and syntactic knowledge with reading comprehension. The correlational analysis reflects the degree of relationship between the independent variables, namely, lexical and syntactic knowledge and the dependent variable, namely, reading comprehension.

According to Bachman (1990), when two variables are correlated, standing in any of them can be predicted from standing in the other. The correlation coefficients usually show the direction (positive or negative) and strength of the relationship. They range between -1.00 and +1.00. High, moderate, and low positive correlation between two variables can be expressed as follows: .10 low, .30 moderate, .60 high, 1.00 perfect (Levin and Fox, 1991). Table 4.3 presents the correlation matrix for lexical, syntactic knowledge and reading comprehension. The correlations between lexical, syntactic and reading comprehension were all significant (p < .01). As may be noted, the highest correlation .80 is between syntactic knowledge and reading comprehension. Moderate positive correlation of .46 is observed between lexical knowledge and reading comprehension.

Intercorrelations among the two knowledge sources were also determined. As shown in the correlation matrix, a moderate positive correlation .40 is obtained between lexical knowledge and syntactic knowledge.
<table>
<thead>
<tr>
<th>Syntax</th>
<th>Vocabulary</th>
<th>Comprehension</th>
</tr>
</thead>
<tbody>
<tr>
<td>Syntax</td>
<td>---</td>
<td></td>
</tr>
<tr>
<td>Vocabulary</td>
<td>.40</td>
<td>---</td>
</tr>
<tr>
<td>Comprehension</td>
<td>.80</td>
<td>.46</td>
</tr>
</tbody>
</table>

$p < .01$

Table 4.3

Correlational Matrix for Lexical, Syntactic Knowledge with Reading Comprehension
Multiple Regression Analyses

Generally speaking, regression is a method of predicting performance on the dependent variable from one or more independent variables. Simple regression is concerned with predicting scores on one variable on the basis of scores on the second. In multiple regression, we can predict scores on a certain variable on the basis of scores of a combination of other variables. According to Cohen and Cohen (1983): "Multiple regression is the measure of association between a dependent variable and an optimal combination of two or more independent variables" (p.86). Therefore, this statistical procedure is used when we need to assign a certain weight to a number of possible independent variables that relate to performance on the dependent variable. In other words, in the regression analysis, each variable contributes to the extent of its unique correlation with the dependent variable and provides information about the variance with the dependent variable.

Syntactic Knowledge

Regression analysis was performed with syntactic knowledge, the variable most highly correlated to reading comprehension, entered as the first independent variable or regressor, and reading comprehension as the dependent variable. The results, presented in Table 4.4, show the independent variable, syntactic knowledge, to be a significant predictor of reading comprehension. The overall squared multiple coefficient, $R^2$, or amount of variance in the dependent variable accounted for by the independent variable is $R^2 = .643$ and $R^2$ adjusted =
By examining the t-statistic for syntactic knowledge, the highly significant contribution ($t=6.9$, $p < .001$) of this parameter to the dependent variable is apparent. Therefore, syntactic knowledge in and of itself is a significant predictor of reading comprehension.
Model Statement: Reading comprehension = Syntactic Knowledge

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>SS</th>
<th>MS</th>
<th>R^2</th>
<th>R^2adj</th>
<th>F</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model</td>
<td>1</td>
<td>10842.3</td>
<td>10842.3</td>
<td>.6434</td>
<td>.6394</td>
<td>162.349</td>
<td>.0001</td>
</tr>
<tr>
<td>Error</td>
<td>90</td>
<td>6010.56</td>
<td>66.7840</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>91</td>
<td>16852.9</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Parameter Estimates

<table>
<thead>
<tr>
<th>Variable</th>
<th>df</th>
<th>PE</th>
<th>SE</th>
<th>t-stat</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>1</td>
<td>24.7329</td>
<td>3.5746</td>
<td>6.919</td>
<td>.0001</td>
</tr>
<tr>
<td>SK</td>
<td>1</td>
<td>.760952</td>
<td>.05972</td>
<td>12.742</td>
<td>.0001</td>
</tr>
</tbody>
</table>

Table 4.4

Regression Model: Reading Comprehension as a Function of Syntactic Knowledge

SK = Syntactic Knowledge

Note: Presentation of all regression models is based on Carrell, 1991.
Table 4.5 shows the inclusion of the independent variable, lexical knowledge in the regression model as a predictor of reading comprehension. When both regressors are included in the model, the overall squared multiple coefficient correlates accounted for by the two regressors is $R^2 = .649$, $R^2$ adjusted $= .641$. The inclusion of lexical knowledge in the model increases $R^2$ by .006 and $R^2$ adj by .002. In other words, the inclusion of this variable to the model produces a non-significant change in $R^2$ and $R^2$ adjusted. (Table 4.5)
Model statement: Reading Comprehension = Syntactic Knowledge (SK) + Lexical Knowledge (LK).

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>SS</th>
<th>MS</th>
<th>R²</th>
<th>R²adj</th>
<th>F</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model</td>
<td>2</td>
<td>10938.94</td>
<td>469.47</td>
<td>.649</td>
<td>.641</td>
<td>82.31</td>
<td>.0001</td>
</tr>
<tr>
<td>Error</td>
<td>89</td>
<td>5913.953</td>
<td>66.44</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Total</td>
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<td>16852.90</td>
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Parameter Estimates

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<th>Variable</th>
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<th>PE</th>
<th>SE</th>
<th>t-stat</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>1</td>
<td>25.6125</td>
<td>3.6395</td>
<td>7.037</td>
<td>.0001</td>
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<tr>
<td>SK</td>
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<td>.8218</td>
<td>0.7810</td>
<td>10.52</td>
<td>.0001</td>
</tr>
<tr>
<td>LK</td>
<td>1</td>
<td>-.0965</td>
<td>0.0800</td>
<td>-1.206</td>
<td>.2311</td>
</tr>
</tbody>
</table>

Table 4.5

Regression Model: Reading Comprehension as a Function of Syntactic and Lexical Knowledge
Lexical Knowledge

In order to explore the exact contribution of lexical knowledge in and of itself to reading comprehension, another regression analysis was conducted with lexical knowledge (the variable that showed moderate correlation to reading) entered as the first independent variable or regressor. The results presented in Table 4.6 shows vocabulary to be also a moderate significant predictor of reading comprehension. The overall squared multiple coefficient $R^2$, or amount of variance in the dependent variable accounted for by the independent variable is $R^2 = .212$ and $R^2$ adjusted = .203. By examining the parameter estimate, that is, the t-statistic for lexical knowledge, the significant contribution ($t=4.92$) ($p<.001$) of this parameter to reading comprehension is clear.
Model statement: Reading Comprehension = Lexical Knowledge.

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>SS</th>
<th>MS</th>
<th>R²</th>
<th>R²adj</th>
<th>F</th>
<th>P</th>
</tr>
</thead>
<tbody>
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<td>Model</td>
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<td>3581.96</td>
<td>.2125</td>
<td>.2038</td>
<td>24.292</td>
<td>.0001</td>
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Parameter Estimates

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</tr>
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<td>.0001</td>
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<td>0.0910</td>
<td>4.929</td>
<td>.0001</td>
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</table>

Table 4.6

Regression Model: Reading Comprehension as a Function of Lexical Knowledge
Table 4.7 is a summary table that shows the contribution of the two independent variables (lexical and syntactic knowledge) to the dependent variable when these variables are entered in ascending order according to their contribution to reading comprehension.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Simple R</th>
<th>$R^2$</th>
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</thead>
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<td>Vocabulary</td>
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</tr>
<tr>
<td>Syntax</td>
<td>.80</td>
<td>.6434</td>
<td>.43</td>
</tr>
</tbody>
</table>

Table 4.7
A Summary of the Contribution of Lexical and Syntactic Knowledge to Reading Comprehension:
Discussion

In this section, the results of the previously presented statistical analyses will be discussed. These results will be presented in light of the research questions.

In order to investigate the influence of knowledge of certain linguistic factors, namely, vocabulary and syntax on reading comprehension, the following research questions were examined:

Questions 1 and 2
1. Is there a correlation between lexical knowledge and reading comprehension?
2. Does lexical knowledge predict comprehension?

According to the correlation analysis, a moderate positive correlation (r = .46) is observed between lexical knowledge and comprehension. This knowledge source was also shown to be a moderate significant predictor of reading comprehension (R$^2 = .21$). In other words, lexical knowledge in and of itself accounts for over 20% of the variance in reading comprehension. This supports similar findings in the literature, which have suggested that lexical knowledge facilitates comprehension, being an integral aspect of reading comprehension (Hawas, 1990; Koda, 1989; Mecartty, 1994).

Questions 3 and 4
3. Is there a correlation between syntactic knowledge and comprehension?
4. Does syntactic knowledge predict comprehension?

According to the correlation analysis, a high positive correlation (r = .80) is observed between syntactic knowledge and comprehension. This knowledge
source was also shown to be a significant predictor of reading comprehension ($R^2 = .64$). In other words, syntactic knowledge in and of itself accounts for almost two thirds of the variance in reading comprehension. Previous research findings have suggested that recognition of grammatical class and structure is necessary for successful reading (Berry, 1990; Guarino & Perkins, 1986). Findings in the literature also suggest that syntactic knowledge may enhance comprehension in that it sensitizes the reader to discourse structure and the combinatory properties of lexical items (Barnett, 1986; Genoussan, 1979). In the present study, overall syntactic knowledge emerges as a very strong predictor of reading comprehension. The other three studies which included vocabulary and syntax in the same research design, arrived at one of the following findings: a) that both knowledge sources are equally important for comprehension (Barnett, 1986; Sim & Benoussan, 1979), or b) that syntactic knowledge is of no significant importance to reading comprehension (Mecartty, 1994). One may, therefore, conclude that the present study is the first of its kind to provide clear-cut data on the importance of syntactic knowledge to reading comprehension. Moreover, it is the first study to show that syntactic knowledge is actually a stronger predictor of reading comprehension that lexical knowledge.

According to previous research findings, lexical knowledge facilitates comprehension, thus, being an integral part of the reading process (Hawas, 1990; Koda, 1989; Laufer, 1992; Mecartty, 1994). It has also been suggested that syntactic knowledge is necessary for reading especially when it involves the recognition of grammatical class and structure. Such components are believed to be essential for the interpretation of discourse (Berry, 1990; Guarino &
Perkins, 1986). Other findings also suggested that syntactic knowledge may contribute to comprehension when it raises the reader’s awareness of discourse structure and the combinatory properties of lexical items (Barnett, 1986; Sim & Benoussan, 1979).

The results of the present study support previous findings and provide new ones. Two statistical analyses were used to explore the relationship of lexical and syntactic knowledge to English reading comprehension. The first analysis undertaken was a correlational one. The strength of the relationship of the lexical and syntactic knowledge to reading comprehension was explored. It was found that both variables are significantly related to comprehension, albeit the strength of each relationship was different. The correlation in the case of syntax ($r = .80$) was significantly higher than in the case of vocabulary ($r = .46$).

The second analysis undertaken aimed at discovering the predictive roles of lexical and syntactic knowledge to reading comprehension. It can be noticed that the predictive roles of these two variables are different and that they reflect the degree of the relationship. In other words, the stronger the relationship between the variables, the greater the predictive role is. The degree of correlation between syntactic knowledge and comprehension is higher when compared to the correlation between lexical knowledge and comprehension. Similarly, syntactic knowledge plays a more significant predictive role than lexical knowledge. In fact, syntactic knowledge solely contributes over 64% ($R^2 = .643$) of the variance in reading comprehension, (see Table 4.4). As for lexical knowledge, it contributes about 21% ($R^2 = .212$) of the total variance in reading comprehension, as shown in table 4.6. These results are in accordance with the
findings of Laufer's (1992) and Mecartty's (1994), which revealed that lexical knowledge contributed 26% and 29% of the variance in reading comprehension respectively.

It is vital to take the reliability indices into account when interpreting the research findings especially that little of the previous research has reported reliability indices, with the exception of Berry (1990) and Mecartty (1994). Both the lexical and the syntactic assessment tasks yielded high reliability indices in the present study, a fact that adds to the significance of the findings.

Based on the results of the present study and finding of previous research, several reasons may be offered to explain the positive contribution of the linguistic knowledge sources to reading comprehension. First, readers can focus more on the overall meaning of the discourse when they have good decoding skills and are, therefore, capable of manipulating the interrelated components of the text. In this case, comprehension is enhanced because less mental energy is used in the processing of lower-level elements of the discourse (Carrell, 1987; Eskey, 1988; Stanovich, 1980). Grabe (1991) further argues that when readers possess linguistic knowledge, they can better use contextual information to clarify meaning and recognize the more relevant information in the text. Second, when readers possess a high degree of linguistic as well as other knowledge types, comprehension is enhanced because content information as well as language specific information are activated simultaneously, thus, interacting to optimize fluent reading (Bernhardt, 1987; Devine, 1988; Eskey and Grabe, 1988; Faerch & Kasper, 1986).
It is not surprising to see that linguistic knowledge especially knowledge of syntax plays a vital role in the reading comprehension performance of Palestinian students. Recall that these students are exposed to heavy drilling in English structures at least during the high school years (secondary stage). Lexical knowledge, however, is not stressed at all. One may even safely say that it is relegated to the periphery of the English class throughout the high school years. This may explain the relatively low predictive power of vocabulary knowledge when compared to the high predictive power of syntactic knowledge for this particular group of students.
CHAPTER 5

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Summary of Findings

The present study has explored the relationship between the reader's linguistic knowledge particularly lexical and syntactic knowledge and reading comprehension of freshman level college learners of English in the Palestinian West Bank. The results show that lexical knowledge is moderately correlated with reading comprehension and that it accounts for approximately 20% of the variance in the reading comprehension scores.

Syntactic knowledge, on the other hand, is highly correlated with reading comprehension, and it accounts for 64% of the variance in the comprehension scores. In other words, the two variables reached a level of significance (p < .0001) in the regression analysis. When put together, these two variables contribute almost 65% to the variance in comprehension.

Conclusions

The following conclusions can be drawn based on the regressional analyses:

1. Both lexical and syntactic knowledge correlate significantly with reading comprehension.

2. When taken together, lexical and syntactic knowledge explain 65% of the variance in the comprehension scores.
3. Lexical knowledge shows a significant moderate correlation with reading comprehension, and it explains 21% of the variance in the comprehension scores.

4. Syntactic knowledge is highly correlated with comprehension, and it accounts for 64% of the variance in the comprehension scores.

Hence, the general conclusion from this study is that both knowledge sources, namely, lexis and syntax are important in reading comprehension.

**Pedagogical Implications**

The present study has significant pedagogical implications for both vocabulary and syntax instruction. Since both knowledge sources turned out to be significantly related and predictive of reading comprehension, serious efforts should be devoted to developing both components in the language classroom. However, any attempts to incorporate these components in the classroom in a systematic way should be informed by current research on instruction.

**Lexical Knowledge**

Since vocabulary explains a considerable amount of variance in reading, the development of this component is essential to language learning. Those findings have confirmed similar conclusions drawn by other researchers and practitioners (Carrell, 1983; Coady, 1979; Hawas, 1990; Koda, 1989; Laufer, 1992; Lee, 1986b; Salyer, 1990).

The development of this component can be pragmatically justified on several bases. First, as an important component of comprehension, lexical knowledge is
indispensable for communication (Yap, 1979). Second, when the proficiency of learners increases, they become better able at differentiating the range of meaning inherent in lexical items, and therefore, understand the subtle meanings in the discourse. Third, lexical knowledge is one of the primary factors which distinguishes proficient from less proficient readers both in the first and foreign language. Researchers attribute many of the problems encountered by readers both in the first and foreign language to the lack of adequate vocabulary (Hague, 1987; Kelly, 1991; Laufer, 1992; Mezinski, 1983). In summary, since lexical knowledge is an essential component of reading comprehension and, therefore, of learning, lexical growth should be adequately enhanced in the classroom. How to develop this component, however, remains a big practical consideration.

Stoller and Grabe (1993) argue that since research on L2 vocabulary instruction is so meager, the second language classroom can make use of the relevant L1 vocabulary research. Research on first language learning currently suggests that vocabulary has a central role in the understanding process and consequently in language learning. Theories on vocabulary learning presented in Jenkins, Stein, and Wysocki (1984), McKeown and Curtis (1987), Naggy (1988), Nagy, Herman and Anderson (1985), and Sternberg (1987) stress the importance of incremental vocabulary learning and the acquisition of massive recognition vocabulary which is an important requirement for developing literacy skills.

One of the related phenomena that researchers felt they should explain is the fast growth of L1 vocabulary from grades 1 to 12. Most researchers believe that vocabulary size doubles between the third and seventh grades. Theoretical
discussion which aims at explaining this vocabulary growth often revolves around its relationship to reading comprehension (Anderson & Freebody, 1981; Hague, 1987; Mesinski, 1983). One of the explanations offered is the aptitude hypothesis which states that one's intellect or intelligence is the primary force behind vocabulary acquisition and reading skill. In other words, intelligent people tend to know more vocabulary and are consequently better readers. The second explanation is the knowledge hypothesis which states that vocabulary knowledge is a function of general knowledge that indirectly affects one's reading ability. In other words, people who possess more general knowledge are better equipped to learn more words and, therefore to become better readers. The third explanation is the instrumentalist hypothesis which asserts that the actual number of known words directly correlates with reading comprehension. Advocates of this hypothesis push in the direction of explicit vocabulary instruction and, perhaps, long definitional word lists. Large vocabulary, according to this view, will eventually result in better comprehension. The fourth hypothesis is the access hypothesis, which stresses the importance of automaticity. This hypothesis claims that knowledge of the various meanings of a certain word makes it more readily usable by the learner. According to this viewpoint, reading is very important as a means to develop vocabulary. In other words, reading and vocabulary are seen as reciprocally developing abilities (Stanovich, 1986).

Kameenui et al. (1987) examined these views in an L1 context and concluded that all these explanation are valid and they all play some role in vocabulary acquisition. Acquisition of lexical items is, therefore, the result of
aptitude, background knowledge, instruction, multiple exposures, and opportunity for practice.

In addition to the theoretical acquisition hypotheses detailed above, other researchers have adopted a more practical approach to explain vocabulary development. Jenkins and Discon (1983), for instance, argue that in and out of the classroom, vocabulary learning occurs by means of a combination of two or more of the following strategies:

1. through definition or explicit reference,
2. through example,
3. through context,
4. through morphological analysis.

Graves (1987) added to these strategies the use of dictionaries and word lists. Explicit definitions or word associations are now acknowledged as a valid way to gain partial knowledge of a word. Researchers now support this teaching approach as a means to handle inessential words or words that are too specialized in meaning or use (Cohen, 1990; Graves, 1987; Nagy & Herman, 1987). Definitions, associations and even word lists may provide a helpful first exposure for words which may appear later in different reading contexts.

Using example as a means to teach vocabulary has a more extensive literature. Pressly, Levin, and McDaniel (1987) present a review of the different ways to learn vocabulary items through key word approaches and semantic associations. The general consensus among researchers seems to suggest that many examples and uses of specific words provide learners with strong semantic associations with other words.
Learning words in context did not turn out to be the magic solution for all vocabulary learning problems. It can be a useful approach when students are taught how and when to apply the available contextual cues (Sternberg, 1987). It should never, however, be treated as learning tool that can be applied at all times or randomly (Drum & Konopak, 1987).

Morphological analysis has been considered as an important aid for students in vocabulary learning. Graves (1987), for example, believes that teaching the 100 most common and regular affixes of the language may be a productive instructional strategy.

To summarize, the crucial question of how to help students achieve some progress in first language vocabulary learning has been the focus of many theoretical hypotheses and concrete learning approaches. There has been, however, much less research on that topic in L2 research. In order to be able to use L1 research appropriately, we need to consider the constraints specific to vocabulary learning in L2 contexts (Stoller & Grabe, 1993). For instance, L1 children usually come to the vocabulary learning task with most of their syntactic knowledge, phonological system and even a large inventory of vocabulary items already in place. L2 students, on the other hand, are not privileged with the same extensive language background. L2 students, however, especially the older ones are advantaged with a more sophisticated knowledge of the world, a strong sense of purpose and a well-developed set of learning strategies from their L1 school experiences. It might, therefore, be problematic to directly implement L1 findings to L2 instruction without adaptation. Stoller and Grabe
(1993) discuss five issues from L1 vocabulary instruction research that can be adapted to the second or foreign language classroom:

1. A major conclusion that can be drawn from L1 vocabulary research is that vocabulary knowledge is the "cornerstone of literacy". Another important consideration is that instruction influences both vocabulary knowledge and reading comprehension. In the school context in a foreign language situation, for instance, students are usually in great need for a well-developed vocabulary. Vocabulary instruction, therefore, must assume a central role in the curriculum (Stoller & Grabe, 1993).

   Vocabulary knowledge should also be seen as an important factor in reading and reading skills development (Stanovich, 1986). Stoller and Grabe (1993) argue that vocabulary development has mostly been treated as an independent issue in L2 acquisition discussions. From now on, it must be viewed as a cause and a consequence of reading abilities. In other words, discussion of vocabulary in academic contexts must be seen in the context of reading development.

2. L1 research also suggests that vocabulary learning is related to the acquisition of a number of skills. To be successful vocabulary learners, students must be able to recall meaning, infer meaning, comprehend a text, communicate orally, and spell correctly.

   The specific skills that need to be developed in a particular program should be determined taking into account a number of issue such as the students' needs, motivation, instructional objectives, the words to be learned and the importance of these words for the overall curricular objectives (Stoller & Grabe, 1993).
3. Another major implication from L1 research is that incidental learning from written context may account for a large proportion of vocabulary growth (Nagy & Herman, 1985). This perspective is not about teaching words in context as much as it is about words being gradually learned through various exposures in different discourse contexts. Generally speaking, this position tends to undermine the role of explicit vocabulary instruction. This kind of instruction is believed to result in the acquisition of an insufficient number of words. Proponents of this approach argue that instead of explicitly teaching vocabulary, programs should aim at "promoting reading" in the L1 context because it can lead to greater vocabulary growth.

4. A fourth implication is that learning vocabulary in the first language context requires multiple exposures. It has been argued that a minimum of 12 exposures is needed to develop fluent and precise word knowledge. This supports the "access hypothesis", which states that in order to be able to recall words easily, students should be familiar with their various meanings (Stoller & Grabe, 1993). This finding is especially relevant in the foreign language context, where exposure to the target language is very limited when compared to the second language context. It may not be realistic, therefore, to expect students in this context to understand the implications and various meanings of a certain word from one exposure. Hence, it is very important to stress the fact that vocabulary items should be systematically reviewed and recycled in meaningful contexts.

5. Another important finding from L1 research is that elaborated learning can only take place when learners can relate new lexical items to background knowledge (Stoller & Grabe, 1993). This conclusion corroborates findings from schema...
theory research which shows that new learning takes place either when adding to or adjusting already existing knowledge structures. These findings support teaching vocabulary in semantically related groups. The logical conclusion, Stoller and Grabe (1993) argue, is that vocabulary instruction should not be based on lexical difficulty or frequency, as the current practice in many ESL and EFL contexts is, rather, it should be based on the relevance of words to classroom topics and activities.

6. Finally, L1 research has shown that students' motivation is a crucial factor when it comes to vocabulary knowledge. This is especially important in the foreign language context, where students do not feel particularly motivated to accumulate a wealth of vocabulary. After all, these students can easily survive both in the classroom setting and outside with their basic vocabulary knowledge. To increase these students' motivation, the importance of vocabulary and its direct relationship to fluency in reading should be explained. Other instructional techniques such as crossword puzzles, and communicative word games should be a great asset to vocabulary learning.

In summary, when adapted properly, findings from research on L1 vocabulary instruction can greatly enrich the second and foreign language classroom. It is of vital importance, however, to conduct more research on second language vocabulary learning and instruction (Stoller & Grabe, 1993). Such research is still meager despite our current theoretical orientation which stresses the importance of developing the lexical knowledge as an essential component of reading comprehension and language learning in general.
Syntactic Knowledge

The second issue highlighted by the findings of the present study is the role given to grammar in the classroom. For so long, practitioners have assigned a central role to grammar under the assumption that it will eventually be transferred to other language components such as reading and writing. Garret (1986) asserts that while grammatical competence is necessary for communicative competence, learning grammar does not ensure either of these two competencies.

Garret (1990) believes that this paradox can be resolved by redefining the concept of grammar. Grammar has been traditionally conceptualized as "a set of rules that describe how a language system works" or "a concatenation of forms and statements about form ... paradigms, lists, word order rules" (p.135). In all of these definitions, grammar is seen as form. Moreover, such definitions portray grammar as a set of generalizations about an abstract system of language. Such generalizations rarely translate into "directions for actually producing or comprehending language" (p.138). Hence, such a traditional conceptualization of grammar does not reveal the thinking process which governs the encoding of meaning.

Hence, Rutherford (1987) states that grammar should not be taught for its own sake, rather, it should be viewed as a means to help the learners manage their own learning and to bridge the gap between isolated structures and the understanding of these structures when they occur in discourse. Therefore, in order for learners to develop an understanding of the grammatical processing system, they should come into contact with language data. In other words,
contact with language data enables the learner to form hypotheses and
generalizations about the workings of language (Rutherford, 1987). Curriculum
organization may facilitate this through "identification of those grammatical
properties of target-language lexicon considered of crucial importance for learner
"projection" to well-formed grammatical constructions" (p. 151). Consciousness-
raising, in other words, sensitizes students to the different functions grammatical
structures assume in various contexts. Parameters of consciousness raising
techniques fall in the middle of the continuum between the "natural appearance
of a grammatical phenomenon in "authentic" text and its contextless explicit
formulations" (p. 153).

In summary, it is extremely important for teachers to have a clear idea about
the role and importance of grammar in the foreign language classroom. It is
equally important to raise the students' awareness of grammatical structures not
for their own sake but to improve their overall communicative competence. Higgs
and Clifford (1982) warn against falling in the trap of teaching high vocabulary
and low grammar under the impression that this will better help the students
function in the target language. This may result in fossilization as these
grammatical forms become learning-proof.

The third issue that the findings of this study raise concerns the remaining
factors that still unexplained reading comprehension. As mentioned earlier,
reading comprehension is a complex activity that is central to language learning.
Therefore, in order to obtain a more precise picture of this construct, many
factors other than those examined in this study, need to be accounted for and
explained. One implication that emerges from this multidimensional nature of
comprehension is that foreign language reading instruction should not focus solely on one or two factors (Bernhardt, 1991). As shown by the results of this study, two key factors are lexical and syntactic knowledge. Yet, they are insufficient to explain the complexity of reading comprehension and it would be even naive to believe that by developing these two factors solely, learners can become better readers. The implication to be drawn, therefore, is that the teaching of foreign language reading comprehension should be approached from a global perspective taking into account as many variables as possible (Bernhardt, 1991; Mecarty, 1994).

Limitations

All of the students who participated in this study are college students who have an advanced level of proficiency according to Lee's (1986) timeline (more than 900 hours of instruction). Findings of this study can, therefore, be generalized only to similar students in similar settings.

Only one format of testing reading comprehension was used, namely, recall protocol. It is recommended to use other formats in the same research design, such as, summary, multiple choice, and true/false.

The content of the syntax and vocabulary tests may not have been well-suited for correlation with the two reading passages used in the study. One may, however, argue that the grammatical and lexical exposure students get in a particular classroom can never be totally congruent with the demands of any particular authentic passage.
Recommendations for Future Research

The relational as well as the predictive roles of lexical and syntactic knowledge in foreign language reading comprehension were investigated in the present study. Both knowledge sources turned out to be significantly related to reading comprehension. Also, both of them predicted comprehension although to varying degrees. The TOEFL test, which was used in the present study, however, uses solely a multiple choice format. Future research needs to accommodate multiple tasks to assess comprehension as well as knowledge. Also, comprehension was measured only through recall protocol, a method which the students are not very familiar with.

Thus far, studies of second language comprehension have focused on either linguistic or background knowledge. Further research is needed with more focus on other learner-related phenomenon, for example, the role of learner's processing style and first language literacy as additional factors related to the comprehension as a multidimensional process (Mecartty, 1994).
Appendix A

Reading Text 1
PARENTS: WATCH THE JUICE

New evidence shows that for children younger than 24 months, drinking lots of fruit juice can be harmful. The liquid fills their tiny stomachs and ruins their appetite for foods with needed nutrients and calories. According to a study published in Pediatrics, the resulting malnutrition can prevent babies from developing normally.

Dr. Fima Lifshitz and a colleague at Maimonides Medical Center in Brooklyn, N.Y., examined eight children, ages 14 months to 27 months, whose growth had lagged behind their peers. Each was drinking 12 to 30 ounces of juice a day (a standard baby bottle holds eight ounces). After recording what else the children ate, researchers realized that the fruit beverages accounted for 25 to 60 percent of the daily calorie consumption. Soon after parents gave their children less juice and more milk, the infants gained weight.

Health professionals say babies under six months shouldn’t drink juice; some pediatricians suggest waiting until after the first birthday. Whenever they start, young children shouldn’t have more than a few ounces a day. Since apple juice contains two sugars that tots can’t absorb, large amounts can cause diarrhea.

—Christine Gorman in Time
Appendix B
Scoring Template for Text 1
Scoring Template for Text 1
(parenants watch the juice)

<table>
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<td>shows</td>
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<td>that</td>
<td>1</td>
</tr>
<tr>
<td>for children</td>
<td>3</td>
</tr>
<tr>
<td>younger</td>
<td>3</td>
</tr>
<tr>
<td>than</td>
<td>1</td>
</tr>
<tr>
<td>24 months</td>
<td>4</td>
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<td>drinking lots</td>
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</tr>
<tr>
<td>of fruit juice</td>
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<td>can be</td>
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</tr>
<tr>
<td>harmful</td>
<td>4</td>
</tr>
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<td>The liquid</td>
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</tr>
<tr>
<td>fills</td>
<td>3</td>
</tr>
<tr>
<td>their tiny stomachs</td>
<td>3</td>
</tr>
<tr>
<td>and ruins</td>
<td>3</td>
</tr>
<tr>
<td>their appetite</td>
<td>4</td>
</tr>
<tr>
<td>for foods</td>
<td>2</td>
</tr>
<tr>
<td>with needed nutrient</td>
<td>3</td>
</tr>
<tr>
<td>and calories</td>
<td>2</td>
</tr>
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</tr>
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<td>a study published</td>
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<td>in Pediatrics</td>
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<td>the resulting</td>
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<td>malnutrition</td>
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</tr>
<tr>
<td>can prevent babies</td>
<td>3</td>
</tr>
<tr>
<td>from developing</td>
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</tr>
<tr>
<td>normally</td>
<td>4</td>
</tr>
<tr>
<td>Dr. Fima Lifshitz</td>
<td>2</td>
</tr>
<tr>
<td>and a colleague</td>
<td>2</td>
</tr>
<tr>
<td>at Maimonides Medical Center</td>
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</tr>
<tr>
<td>in Brooklyn</td>
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</tr>
<tr>
<td>N.Y.</td>
<td>2</td>
</tr>
<tr>
<td>examined eight children</td>
<td>3</td>
</tr>
<tr>
<td>ages</td>
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</tr>
<tr>
<td>14 months</td>
<td>3</td>
</tr>
<tr>
<td>to 24 months</td>
<td>4</td>
</tr>
<tr>
<td>whose growth</td>
<td>2</td>
</tr>
<tr>
<td>has lagged behind</td>
<td>4</td>
</tr>
<tr>
<td>their peers</td>
<td>2</td>
</tr>
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</table>

95
Each was drinking 12 to 30 ounces a day of juice a standard baby bottle holds eight ounces. After recording what else the children ate, researchers realized that the fruit beverages accounted for 25 to 60 percent of the daily calorie consumption. Soon after parents gave their children less juice and more milk, the infants gained weight. Health Professionals say babies under six months should not drink juice, so some pediatricians suggest waiting until after the first birthday. Whenever they start young children should not have more than a few ounces a day since apple juice contains two sugars that tots don't absorb large amounts can cause diarrhea.
Appendix C

Reading Text 2
Earthquake rocks Italy, two reported killed

MILAN, Italy (AP) — A moderate earthquake shook northern Italy from the Mediterranean to the Alps on Tuesday, damaging buildings, driving people from their homes and causing dozens of minor injuries.

Two elderly people living near the epicenter died of heart attacks during the quake, the ANSA news agency reported.

The magnitude-4.8 quake was centered 90 miles south of Milan, and shook buildings in Milan's downtown business district.

Regional authorities said about 100 people were treated for minor injuries over a wide area. Four were hospitalized with fractures.

Many were injured while fleeing their houses or offices in panic, police said. Several people in the northern town of Carpi were taken to the hospital in shock.

Fifty families were evacuated from their houses in one of the hardest-hit towns, Bagnolo in Piano, a northern town 45 miles west of Milan. Forty patients were transferred from a damaged part of the hospital in northern Correggio.

Elsewhere, the quake caused scattered minor damage, knocking plaster off of buildings, breaking shop windows and briefly knocking out phones and power. There was no damage to the leaning Tower of Pisa, the AGI news agency reported.

Authorities closed the Milan-Bologna railroad line as a precaution. The busy railroad linking northern Italy to Rome was reopened after two hours when technicians verified that tracks and bridges had not been damaged.
Appendix D

Scoring template for Text 2
## Scoring Template For Text 2
*(Earthquake Rocks Italy)*

<table>
<thead>
<tr>
<th>Proposition</th>
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<tbody>
<tr>
<td>A moderate earthquake shook northern Italy from the Mediterranean to the Alps on Tuesday damaging buildings driving people from their homes and causing dozens of minor injuries. Two elderly people living near the epicenter died of heart attacks during the quake. The ANSA news agency reported the magnitude 4.8 quake was centered 90 miles south of Milan and shook buildings in Milan's downtown business district. Regional authorities said about 100 people were treated for minor injuries over a wide area. Four were hospitalized with fractures. Many were injured while fleeing their houses or offices in panic. Police said...</td>
<td>4</td>
</tr>
</tbody>
</table>
several people were taken to the hospital in shock were evacuated from there houses in one of the hardest hit towns Bagnolo in Piano a northern town 45 miles west of Milan Forty patients were transferred from a damaged part of the hospital in northern Corregio Elsewhere the quake caused scattered minor injuries knocking plaster off buildings breaking shop windows and briefly knocking out phones and power There was no damage to the leaning tower of Pisa the AGI news agency reported Authorities closed the Milan Bolgna railroad line as a precaution The busy railroad linking northern Italy to Rome was reopened
after two hours
when technicians verified tracks and bridges had not been damaged
Appendix E
TOEFL Vocabulary Section
SECTION 3
VOCABULARY AND READING COMPREHENSION

Time — 20 Minutes

This section is designed to measure your comprehension of standard written English. There are two types of questions in this section, with special directions for each type.

Directions. In questions 1-10 each sentence has an underlined word or phrase. Below each sentence are four other words or phrases, marked (A), (B), (C), and (D). You are to choose the one word or phrase that best keeps the meaning of the original sentence if it is substituted for the underlined word or phrase. Then, on your answer sheet, find the number of the question and fill in the space that corresponds to the letter you have chosen. Fill in the space so that the letter inside the oval cannot be seen.

Example
Passenger ships and aircraft are often equipped with ship-to-shore or air-to-land radio telephones.
(A) highways
(B) railroads
(C) planes
(D) sailboats

The best answer is (C) because "Passenger ships and planes are often equipped with ship-to-shore or air-to-land radio telephones" is closest in meaning to the original sentence. Therefore, you should choose answer (C).

After you read the directions, begin work on the questions.

1. Handwritten letters vary from person to person.
   (A) differ
   (B) enlarge
   (C) characterize
   (D) shift

2. Ice cream manufacturers make their product in dozens of flavors.
   (A) 12
   (B) 24
   (C) many
   (D) predictable

3. The whiteness of icebergs is caused by tiny, closely spaced gas cavities throughout the ice.
   (A) 
   (B) holes
   (C) eruptions
   (D) lines

4. Francis Scott Key was a well-known Washington lawyer and an amateur verse writer.
   (A) bard
   (B) resident
   (C) legislator
   (D) attorney

5. Before the outbreak of the Civil War, North Carolina tried to
   (A) unify
   (B) prepare
   (C) maintain
   (D) predispose
6. The number of U.S. newspapers peaked in 1909, when the country had about 2,400 dailies. 
   (A) editions appearing every day
   (B) peak day by day
   (C) publications
   (D) editors

7. The years from 1890 to 1930 climaxed the era of heaviest immigration to the United States.
   (A) boom
   (B) peak
   (C) period
   (D) expansion

8. Early American kitchens were designed for the simple, rugged way of life.
   (A) jagged
   (B) basic
   (C) harsh
   (D) unadorned

9. Ralph Nader has argued that the U.S. automobile industry emphasized profits and style over safety.
   (A) on top of
   (B) after
   (C) before
   (D) in addition to

10. In 1942, Enrico Fermi and other scientists at the University of Chicago launched the nuclear age.
    (A) collaborated
    (B) described
    (C) constituted
    (D) inaugurated

11. Ogden Nash was a famous writer of humorous and satirical verse.
    (A) theatrical
    (B) ironic
    (C) comical
    (D) technical

12. The Jefferson nickel has been minted since 1938.
    (A) minted
    (B) extinct
    (C) issued
    (D) used

13. In contrast to realistic novels, romantic novels portray idealized versions of life.
    (A) Analyzing
    (B) Opposed to
    (C) Unlike
    (D) In protest of

14. A nursery school is a school chible for children who are three or four years old.
    (A) primarily
    (B) exclusively
    (C) originally
    (D) designed

15. Tapestry is a woven fabric made from threads of different colors to form a picture or design.
    (A) an interlaced
    (B) a manufactured
    (C) a textile
    (D) a hand-made

16. Most meat-eating animals use their teeth to seize and kill prey.
    (A) attackers
    (B) nourishment
    (C) enemies
    (D) victims

17. When a celestial object is seen through a telescope, it appears upside down.
    (A) an unidentifiable
    (B) an astronomical
    (C) a distant
    (D) an infinitesimal

18. Railroads in the United States are increasingly plagued by train derailments.
    (A) bothered
    (B) alarmed
    (C) taxed
    (D) overcrowded
   (A) opinionated  
   (B) verbose  
   (C) irate  
   (D) direct

20. In form, style, and theme, many of Carl Sandburg's poems resemble the poems in Walt Whitman's collection "Leaves of Grass."
   (A) verse  
   (B) prose  
   (C) subject  
   (D) meter

21. Human skin is almost **impermeable**.
   (A) infectious  
   (B) regenerative  
   (C) impervious  
   (D) callous

22. Georgia has a **diversified** economy.
   (A) a sagging  
   (B) a multifaceted  
   (C) a diminishing  
   (D) an intensified

23. On June 17, 1972, two months before Richard Nixon's renomination, a bungled burglary occurred in the Democratic headquarters.
   (A) a derisory  
   (B) an illegal  
   (C) a derisive  
   (D) a mangled

24. Lou Gehrig established a record for the number of **consecutive** games played by a professional baseball player.
   (A) successive  
   (B) successful  
   (C) superlative  
   (D) demonstrative

25. Susan B. Anthony lived to see four states grant suffrage to women.
   (A) bondage  
   (B) permission  
   (C) tolerance  
   (D) voting rights

26. The George Washington Bridge is a two-level suspension **toll** bridge across the Hudson River.
   (A) lofty  
   (B) fare  
   (C) elevated  
   (D) support

27. George Gershwin's compositions are infused with melodies, rhythms, and harmonies.
   (A) accentuated  
   (B) played  
   (C) instilled  
   (D) intertwined

   (A) foremost  
   (B) mainstream  
   (C) start  
   (D) extreme

29. The Grand Canyon cuts steeply through an arid plateau region.
   (A) a spectacular  
   (B) a barren  
   (C) a moist  
   (D) a majestic

30. Because of its affinity for water and its high viscosity, glycerol is a valuable constituent of stamp-pad inks.
   (A) repulsion for  
   (B) attraction to  
   (C) tincture in  
   (D) solubility in

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Appendix F
TOEFL Syntax Section
SECTION I
STRUCTURE AND WRITTEN EXPRESSION

Time — 18 minutes

This section is designed to measure your ability to recognize language that is appropriate to standard written English. There are two types of questions in this section, with special directions for each type.

Directions: Questions 1-13 are incomplete sentences. Beneath each sentence you will see four words or phrases, marked (A), (B), (C), and (D). Choose the one word or phrase that best completes the sentence. Then, on your answer sheet, find the number of the question and fill in the space that corresponds to the letter of the answer you have chosen. Fill in the space so that the letter inside the oval cannot be seen.

Example I
V egetables are an excellent source — — vitamins.
(A) of
(B) has
(C) where
(D) that

The sentence should read, “Vegetables are an excellent source of vitamins.” Therefore, you should choose answer (A).

Example II
— — in history when remarkable progress was made within a relatively short span of time.
(A) Periods
(B) Throughout periods
(C) There have been periods
(D) Periods have been

The sentence should read, “There have been periods in history when remarkable progress was made within a relatively short span of time.” Therefore, you should choose answer (C).

After you read the directions, begin work on the questions.

1.  Jesse — — a highly flavored spice used in foods.
(A) which
(B) is
(C) as
(D) being

2.  Isaac Bashevis Singer, — — best-known tales are romantic or legendary rather than realistic, won the 1978 Nobel Prize for literature.
(A) a
(B) that
(C) with
(D) whose

3.  Massasoit agreed that his people would not harm the Pilgrims — —.
(A) as long as he lived
(B) though he lived
(C) that he lived
(D) he lived

GO ON TO THE NEXT PAGE
4. Hazelnuts were brought to Hawaii in the 1800s, and today the nuts are an important crop there.
   (A) bringing  
   (B) when brought  
   (C) were brought  
   (D) brought

5. --- may relieve doctors of various routine duties, such as examining patients.
   (A) That nurses with special training  
   (B) Not only nurses with special training  
   (C) That nurses with special training  
   (D) Nurses with special training

6. By 1921, Andrew Mellon had become --- persons in America.
   (A) one of the wealthiest  
   (B) the wealthier  
   (C) which the wealthiest of one  
   (D) one wealthiest

7. --- of measurement has ever equaled the metric system in simplicity.
   (A) Another system  
   (B) No other system  
   (C) No system other  
   (D) Other systems

8. Michigan is --- to Minnesota in iron ore production.
   (A) among second  
   (B) only  
   (C) second only  
   (D) by second

9. Mimicry is the condition in which a living organism imitates --- an animal or a plant.
   (A) both  
   (B) either  
   (C) instead of  
   (D) neither

10. Missionaries --- in establishing contact between whites and Indians in what became the United States.
    (A) the way often led  
    (B) the way was often led  
    (C) often led the way  
    (D) often the way led

11. The Mark Twain Home and Museum in Hannibal, Missouri, is the --- of the writer.
    (A) restored boyhood home  
    (B) home restored of boyhood  
    (C) home where boyhood restored  
    (D) restored home of his boyhood

12. ---, people used beads, cocoa beans, salt, shells, stones, tobacco, and many other objects as money.
    (A) The past  
    (B) Although past  
    (C) That in the past  
    (D) In the past

13. The name "Minnesota" comes from two Sioux Indian words --- "sky-tinted waters."
    (A) to mean  
    (B) by meaning  
    (C) meaning  
    (D) it means

14. ---, it seems much larger than the stars and about the same size as the sun.
    (A) It is the moon so near the earth  
    (B) Despite the moon so near the earth  
    (C) Because the moon is so near the earth  
    (D) The moon that is so near the earth

15. Late in 1939, Orson Welles was invited to Hollywood to make a motion picture ---.
    (A) he chooses  
    (B) his own choosing  
    (C) of his own choosing  
    (D) that would be of his choosing himself
Directions: In questions 16-40, each sentence has four underlined words or phrases. The four underlined parts of the sentence are marked (A), (B), (C), and (D). Identify the one underlined word or phrase that must be changed in order for the sentence to be correct. Then, on your answer sheet, find the number of the question and fill in the space that corresponds to the letter of the answer you have chosen.

Example I

A ray of light passing through the center
(A) B
of a thin lens keep its original direction.
(C)

The sentence should read, "A ray of light passing through the center of a thin lens keeps its original direction." Therefore, you should choose answer (C).

Example II

The mandolin, a musical instrument that has (A) B
strings, was probably copied from the lute, (C)
a much older instrument.
(D)

The sentence should read, "The mandolin, a musical instrument that has strings, was probably copied from the lute, a much older instrument." Therefore, you should choose answer (D).

After you read the directions, begin work on the questions.

16. Doing clothing was an important task in most colonial households.
(A) B

17. On foot, on horseback, and going by boat, William Clark and Meriwether Lewis led an
(A) B
expedition from 1804 to 1806.

18. A clam is an animal whose soft body is covered with a protective shell.
(A) B

19. At the beginning of the Civil War, neither the North nor the South had a prepared
(A) B
strategy.

20. A computer can handle vast amounts of facts and figures and solve complicated
(A) B
problems at incredible high speeds.

GO ON TO THE NEXT PAGE

51+9

111
11. Copper has been one of the most useful metals for more than five thousand years.

12. The cottage industry was an economic system widely used during the Industrial Revolution.

13. Cotton buyers and sellers judge cotton on the basis of samples cut from the bales.

14. Despite the importance of latitude in determining climate, two places at the same latitude may have different climates.

15. Men who care for large herds of cattle are called cowboys or cowhands.

16. When a crossword puzzle is completed, each square will contain a letter that helps to spell a word.

17. The leaves of a cabbage plant grow close together to form a hard, round head.

18. California covers a larger area than any other state except Alaska and Texas.

19. Cancers are identified scientifically according to the type of body tissue in which they originate.

20. U.S. cattle owners have worked to improve breeds and increasing milk and beef production.

21. There are hundreds of kinds of cheeses, and they differ in taste, texture, and appearance.

22. Transformational grammar is a system of precisely describing the rules that determine all the sentences that can possibly be formed in any language.

23. Puritan settlements grew rapidly, as fur trading, fishing, and shipbuilding blossomed into important industries, especially particularly fish and ships.

24. In the three decades after 1950, the population of the North increased at half only the rate of the South and West.
35. The major of bees are solitary insects, as each female provides for her own offspring.

36. In the United States, the first institution for the blind had founded in Boston by
American physician John Dix Fisher.

37. The Berkshire Festival is an annual music festival held in July and August at Tanglewood, a 210-acre estate in the towns of Lenox and Stockbridge, Massachusetts.

38. Bernard Baruch he was often consulted by Presidents Harding, Coolidge, and Hoover on economic matters.

39. Baby’s breath is the common name applied to several World Old plants with blossoms that are delicate in fragrance and appearance.

40. A striking feature of nearly all ballet companies today is their interest in either classical and contemporary works.

**THIS IS THE END OF SECTION 2.**

IF YOU FINISH BEFORE TIME IS CALLED, CHECK YOUR WORK ON SECTION 2 ONLY.

DO NOT READ OR WORK ON ANY OTHER SECTION OF THE TEST. THE SUPERVISOR WILL TELL YOU WHEN TO BEGIN WORK ON SECTION 3.

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Bibliography


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Winston.


