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**Literacy Practices: Social and linguistic issues
related to reading in a second orthography**

**by
Sue-san Ghahremani Ghajar**

**A dissertation submitted to the School of Graduate
Studies and Research in partial fulfillment of
the requirements for the degree of
Doctor of Philosophy**

**Faculty of Education
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ABSTRACT

As the English language continues to hold a prominent international position both politically and academically, the need for second/foreign language (L2) learners especially those involved in the scientific and technological disciplines to read from their books in English remains a vital social and educational issue. Even though language learners seem to understand this urgency, they often show resistance towards the L2 literacy package and reading in the language which not only introduces new linguistic knowledge, but more importantly suggests change in a learner's identity. The latter seems to occur more often in situations where the learners' literacy practices do not match those in the second language. This mismatch seems to be more salient between languages in which the construction of orthographic systems are different from the Roman script.

Researchers have suggested that in cultures where literacy is negotiated through scripts differing from English; as in Japanese, Chinese, and Arabic/Farsi, the levels of processing language is different in comparison to languages which use the Roman script in their literacy practices. Furthermore, research has indicated a relationship between first language reading and what takes place in the second/foreign language. For example, investigations of several variables such as background knowledge, text format, and rhetorical structure of the first language, seem to show that they either transfer to or influence second/foreign language reading. However, what has received little attention in

ESL/EFL research is the influence of the first language writing system when it differs from the Roman script.

The present research that was conducted in Iran, is an inquiry into reading processes of sixty-three Iranian undergraduate students. An attempt was made to explore multiple variables related to L2 reading, by applying both quantitative and qualitative methodologies. For the quantitative data, multivariate statistical procedures were conducted to see which variables, namely L1 reading proficiency (first language cloze task), L2 language proficiency (second language cloze task), L1 and L2 visual search strategy (L1 and L2 visual search task), contributed most to comprehension of English text related to both a general topic and a chemistry topic. In the qualitative analysis, introspective techniques were adopted to investigate hidden issues (through think-aloud-protocols) related to social and community literacy practices not tapped in the product-oriented quantitative investigation.

Results of this study reveal the influence of both sociopolitical and linguistic factors in reading English as a second/foreign language.

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CHAPTER I

INTRODUCTION

**" I learned to read and write on the ground of the backyard of my house, in the shade of the mango trees, with words from my world rather than from the wider world of my parents. The earth was my blackboard, sticks my chalk."
(Freire, 1991, p. 141)**

There are literally millions of people in the world who catch a glimpse of some kind of printed material every second. The exposure may vary depending on whether the person involved is for example in a grocery store reading food labels, in a train reading the newspaper, sitting leisurely at home and reading a prayer, attempting to plant a rose in the garden and reading a garden manual, or a student researching in the library. Even though there are obvious scenes of people looking at printed material, it does not necessarily mean they all read in the same way. People in communities may possess various kinds of literacies that are embedded in their social and cultural situation. Any way that they choose to make sense may be regarded as an act of literacy or a literacy event (Heath, 1986). You are math-literate if you understand math related problems, question them, and solve them. You are literature-literate if you have the ability to interpret poetry and prose.

In a broader perspective, the ways individuals choose to make sense of a particular printed material depends on their particular social context, their cognitive abilities, and their knowledge of the world.

" Every social group is ethnocentric-and 'linguacentric'-viewing its own ways of behaving and talking as better than all others and as appropriate for establishing the standards by which all others will be judged." (Heath, 1986, p. 86)

Then reading cannot only be defined as looking at a page and pronouncing the words clearly and automatically, but should be regarded as a literate activity. In this way there may be multiple literacies depending on the social needs and cultural embedding of a group of people (Gee, 1986; Heath, 1986; Street, 1984).

Despite Freire's rather creative description of the act of reading and writing (refer to p.1), there are still many educators and pedagogues who view reading as its dictionary definition (Masny et al., 1993): "to receive or take in the sense of (as letters or symbols) by scanning", or "to study the movements of (as lips) with mental formulation of the communication expressed", or "to utter aloud the printed words", or "to understand the meaning of written or printed matter", or "to learn from what one has seen or found in writing or printing". In the same way, the dictionary defines literacy as " the act of being literate" and literate means "being able to read and write."

If we talk about literacy we must consider multiple literacies and not forget that each type of literacy emerges from a specific social context from which one or more individuals are interpreting text (Watson-Gegeo, 1991). There are various ways of knowing and thinking. Assuming that the cognitive processes of reading involve interpretations, knowing, and most importantly thinking, one must also consider the learners' socio-cultural contributions which shape the latter activities in the process of interacting with text. Vygotsky (1939) is best known for his perspective on human learning which posits a strong relationship between external (social), practical activity mediated by the use of cultural tools, such as speech and writing, and individuals' intellectual activity. This complex and dynamic mediating process between social relations (interpsychological) and intellectual activity (intrapsychological) is facilitated by parent, teacher, and school socialization (cited in Moll, 1989).

First and second language (L1 and L2) research have both underestimated the sociocognitive and sociocultural consequences of language learners. Many, especially in the case of second/foreign language learners have been labelled illiterate or at the most lacking appropriate linguistic skills to cope in a native situation (Hatch, 1974; Masny et al, 1993; Weinstein-shr, 1990). It is unfair and an expression of uncaring pedagogues that learners be labelled as such when it is obvious they come from highly social and literate societies which do not resemble "our" ways of knowing (Ferdman, 1990).

As the English language continues to hold a prominent position both politically and academically among other languages, the need for second/foreign (L2) language learners especially those involved in the scientific and technological disciplines to read from their books in English remains to be a vital social and educational issue (Auerbach, 1993; Wallace, 1990). Even though the learners understand this urgency, they often demonstrate a resistance towards the L2 literacy package which carries with it a powerful political force.

" The linguistic construction of English as a second language, in itself, in the context of a history of empire, reflects a political process, rather than an educative function. Implicitly and explicitly the structural power relationship between the first and the third world." (Mukherjee, 1986, p. 45)

Thus the politics involved in learning a language, in this case English, cannot be denied. For example in the case of learning English as a second language (ESL), the sociopolitical interests of dominating powers have been noted by Mukherjee (1986) as the "real" purpose of ESL instruction in England. In the same way the fixation on the definition of literacy, only knowing how to read and write, by certain dominant social groups has been responsible for the oppression of other social groups who practice different types of literacy. Aside from various contexts literacy may take, it is always presented in the form of print or language as in the case of oral literacy. A prevalent form of neglecting L2 learners' literacy is to overlook orthographic structures in their literacy practices. Researchers have suggested that in cultures where literacy is negotiated through scripts differing from English; as in Japanese, Chinese, and Arabic/Farsi, the levels of

processing language is different in comparison to languages that use the Roman script (Gholamian, 1992; Haynes, 1990; Haynes & Carr, 1990; Koda, 1988; 1989; Randall & Meara, 1988). For example, Randall (1991) looked at the visual scanning patterns produced by Malaysian subjects when exposed to arrays of Roman and Arabic letters. The Malaysian language uses Roman script in its every day language. However, because the majority of Malaysians are Moslems, the Arabic language that uses Arabic script is also highly popular (Randall, 1991). Results of the experiment showed no significant difference between learners' first and second language visual search strategies. That is, Malaysian readers searched Malaysian and Arabic script in the same way and produced a linear pattern.

In a different manner, Koda (1988; 1989) looked at word recognition processes of learners from four different language backgrounds (English, Japanese, Spanish, and Arabic). Results of her study show that the four groups of students are influenced by their L1 orthographic structure and word recognition strategies when they decide to employ a word recognition strategy in English as a second language. Again, Haynes and Carr's (1990) investigation of Chinese native speakers reading in English revealed the importance of writing-system knowledge to visual word processing for L2 readers just as it was important for L1 readers.

Randall and Meara (1983) have also reported on how a group of Arab students demonstrate a totally different use of search strategies from readers whose script uses the Roman alphabet. In this study, the Arabic readers produce U-shaped patterns when searching five letter arrays of Arabic and Roman letters. It is interesting that the latter pattern is similar to the one English native readers use to search arrays of shapes. However, when native English readers search Roman letters, they produce M-shaped patterns (Green et al., 1983; Mason and Katz, 1976). All of the above studies suggest the importance of understanding the nature of L1 transfer of both cognitive and linguistic processes when the second language readers are already literate in a totally different writing system.

Almost all work thus far undertaken in reading in a second language has been enriched by an understanding of reading processes in the first language. However, the research has almost exclusively dealt with Western languages, and in particular English (Rayner and Pollatsek, 1989). The implications of adopting this research perspective of reading in Western languages that only deals with the Roman alphabet, has restricted research practices. Among many drawbacks, one obvious weakness has been the lack of information on a major population of learners of English who come from language backgrounds with totally different writing systems from English.

In this research, it is argued that addressing the latter issue requires, that we review prevailing assumptions about the reading process, unpack conflicting conceptions of reading, and explore what reading constitutes, both in and out of first and second language reading of readers relevant to this study.

CHAPTER II

LITERATURE REVIEW

Reading and the Reading Process

First language research in the psycholinguistic theory of reading has been influential and necessary for the understanding of second language processes (Zvetina, 1987). Cognitive psychologists present their framework for viewing the reading process through three types of models: (1) bottom-up, (2) top-down, or (3) interactive.

Traditional approaches (bottom-up, Gough, 1972) to understanding what individuals do as they attempt to make sense out of print has mainly focused on the technical act of literacy and bottom-up processing. This approach emphasizes the role of cognitive skills and stresses the importance of the learners' proficiency at the basic processing levels of reading: word decoding and eye fixation (cited in Eskey & Grabe, 1988). That is, in bottom-up processing, most information flows so fast that knowledge stored in short-term memory has little impact on how the processing takes place. The latter perspective that dealt with basic processing levels of L1 and L2 reading, influenced those involved with the

teaching of English. As a result, language institutions occupied themselves with teaching grammatical structure and lexical items in exercises that did little more than manipulate linguistic forms.

Goodman (1967; 1988) and Smith (1982) argued against the traditional approach to reading and developed their theories into a psycholinguistic model of reading or top-down processing. In this view, the visual symbols on the page become less important as the reader takes on a central role by constantly making and confirming predictions primarily from background knowledge of the various linguistic levels during the reading process. This model is often referred to as the "hypothesis-testing" model and was very popular before evidence showed that due to the automaticity of visual processing of text and its speed, the readers' engagement in hypothesis testing or guessing behaviours seems to have a minimal role in the process of reading (Rayner and Pollatsek, 1989).

Finally, proponents of the interactive models (Rumelhart, 1977; Just and Carpenter, 1980), argue that during the act of reading, there are all sorts of communications between top-down and bottom-up processes. In these models readers are usually assumed to be drawing upon both top-down and bottom-up information before eventually settling upon an interpretation of the text.

Another way of looking at the reading process has been to view it as component skills (Haynes and Carr, 1990; Rayner and Pollatsek, 1989). Advocates of this method believe in looking at the reading process as component processes in which each component needs special attention. Once all have been completely analyzed, it should be possible to form the big puzzle of the reading process. This method follows a rather interactive model of reading with more emphasis on the bottom-up level processes.

In contrast to the above models of reading, more recent views on reading are held by Bernhardt (1991) who views reading and literacy as: "a complex social and psycholinguistic process that cannot be separated into reading components and language components" (p.32). From this perspective the importance of a "collection of processes" adds significance to the dynamic process of reading. In this respect reading takes place when three variables work simultaneously: linguistic variables, literacy variables, and knowledge variables. The focus of linguistic variables may be seen in L1 orthographic differences where the second language reader is not only learning a second language, but also a second orthography (Seely, 1992). Furthermore, the literacy variables are related to the social context of language learning. Differences may occur depending on how the learners view literacy in their L1 and what constitutes their cultural package and ideology when they enter the new second language situation.

Even though this theory has been adopted for second language learners, it may also be relevant to L1 learners who come with varying L1 literacy packages (Heath, 1986; Masny et al., 1993; Trueba, 1989). That is, what learners bring from their 'world' (Freire, 1991) may be mismatched with school-based forms of literacy, and may seem as if their ways of practicing literacy that stems from a different ideology is actually considered to be illiterate in a new context (Heath, 1986; 1991; Masny et al., 1993).

Because of the complex nature of the act of reading, usually research in reading has over emphasized one or two components of the reading process and placed less importance on the overall picture from the learner perspective. In the same way, as research shows, it is tempting to get preoccupied with one or two components or discrete items of the reading process and forget other simultaneous levels of processing which are crucial for successful reading.

A more inclusive view of reading will be to perhaps reconsider all variables which will possibly influence and contribute to the act of literacy, and then try to decipher the relationship each has in regard to the independent act of reading.

Reading Research L2

A growing body of research in reading, indicates a relationship between research findings in L1 and what takes place in L2 (Alderson, 1984; Eskey, 1988; Ulijn, 1980; Yorio, 1971). A review of reading researchers and pedagogues' theoretical perspectives developed in the past two decades will assist in addressing L2 reading and the presence or absence of L1 transfer.

As was mentioned in the previous section, in recent years there have been three different theoretical perspectives of the reading process: (a) the 'bottom-up' reading process focuses on basic language decoding skills; (b) the 'concept-driven' or top-down (Goodman, 1967) reading process focuses on background knowledge and the readers' predictive power; and (c) the interactive process deals with top-down processing (making predictions about the text based on prior experience) as well as bottom-up (decoding individual linguistic units) reading processing strategies (Carrell, 1988; Eskey, 1988; Rumelhart, 1977).

In addition, all researchers have been able to focus on one central theory known as the schema theory (Zvetina, 1987). The theory proposed indicates that people adjust their memories of a culturally unfamiliar story to fit a "schema" that is more consistent with their

own culturally familiar knowledge of the typical content and structure of stories. Other researchers such as van Dijk and Kintsch (1983) expanded these ideas into a theory of comprehension that emphasizes the fundamental role a reader's background knowledge plays in how well that reader understands a text. Similarly, second language researchers have investigated how texts' content and form influence second language learners' reading comprehension (Carrell, 1983; 1984; 1988; Carrell and Eisterhold, 1983; Eskey, 1988; Johnson, 1982; Meara et al., 1985). The common view of reading for all these researchers is essentially concerned with meaning and especially how it gets transferred through a message by a writer to a reader. (Nuttall, 1983).

Even though the interactive approach to reading has been an asset for developing and understanding more efficient reading strategies, L2 reading pedagogues and researchers still face many ambiguities about reading. For example, Carrell (1988) argues that ESL readers may demonstrate two types of reading behaviour such as overreliance on either the top-down strategies (schema interference, knowledge-based), or the bottom-up strategies (text-based), which may both similarly interfere with fluent comprehension. Contrary to what is usually assumed about unsuccessful readers' reading strategies, her research shows that the latter rely on top-down strategies (guessing-game) because they have weak language proficiency skills (Carrell, 1988). In contrast, successful readers focus upon decoding skills when exposed to contextualized and decontextualized vocabulary recognition tasks. The fluent readers comprehend vocabulary out of context by using

familiar decoding skills (language schemata) such as searching for suffix prefix relationships or looking at the root of the lexical items. However, the less skilled readers, fail to identify lexical items presented with no contextual clues and tend to rely on background knowledge schemata (Grabe, 1988).

Some empirical studies in L2 reading research have focused on readers' background knowledge as an important variable in reading comprehension (Lipson, 1983; Phillips, 1984; Steffenson et al., 1979; Steffenson, 1986). For example, in two studies by Johnson (1981; 1982), it was found that simplification of vocabulary and syntax were less important factors in Iranian ESL readers' comprehension of a text than the cultural experiences prior to reading (as contrasted to formal study of vocabulary items). That is, there was a positive effect on ESL students' reading comprehension of a passage linked to cultural experience. Moreover, a study in Africa (Parry, 1987) demonstrated how previous experience in different physical and social environments (background knowledge), and not lack of linguistic knowledge influenced the reader's interpretation of a text.

Although, the latter studies emphasize the importance of a reader's schemata in influencing the reader's facilitated interaction and comprehension of a particular text, they are mainly concerned with background knowledge or concept-driven processes of reading. Research in both L1 and L2 reading show that there appears to be a certain threshold level before readers are capable of efficiently using their background knowledge (Alderson,

1984; Carrell, 1991). That is, mastery of the orthographic processor and knowledge of language seem to be central to successful reading comprehension in both L1 and L2 (Adams, 1990; Grabe, 1991). In this regard Alderson's question (1984), whether reading in a foreign language is a reading problem or a language problem, addresses important issues in reading a second language. Alderson suggests that highly skilled L1 readers will need to pass the threshold level required in understanding a second language before they can utilize their L1 reading skills. However, the constituents of a threshold level, and whether different language systems may interfere differently with this level remains unclear.

In the past two decades, research on bottom-level processing has been somewhat neglected in both L1 and L2 reading research (Brown and Haynes, 1983; Eskey, 1988; Haynes, 1990; Jew, 1986). The recognition that orthographic schemata (knowledge of language) is an influencing factor in L2 reading, and that its knowledge may be an asset to basic decoding skills, may better prepare second language readers for engagement in the process of L2 reading. In L1 reading, the initial level of reading includes the process of achieving orthographic automaticity (Adams, 1990; Taylor, 1987). In the same way Eskey (1988) asserts in L2 reading, that language knowledge should be given more attention or be regarded as another type of schemata. Considering Carrell's discussion of overreliance on one process over another, it must be noted that the bottom-level or the decoding processes may have a fundamental role in a reader's interaction with text.

A number of researchers criticize the formal way reading has been introduced. Instead they view the reading goal as a more interpretive process (Eisner, 1991; Langer, 1987; Pennycook, 1990; Rodby, 1992; Wallace, 1990). For this group of researchers the act of reading is said to be complete when the readers' voice interacts with the text and comprehension is final only when a series of interpretive strategies have been fully used. This multidimensional and integrative view of reading criticizes the more traditional views because of their overreliance on the perspective that the reading process is a technical act of intelligence or the act of "transmitting messages." (Pennycook, 1990); and one in which meaning is assumed to be "contained within the texts rather than as part of the whole reading experience."(Wallace, 1990)

The multidimensional and integrative view of reading takes a more global look at reading and the position of the reader in the ESL reading experience. In this way, researchers have socially constructed their view of reading by relating it to the learning of cultural knowledge, instead of leaving it as a structural and mechanical skill (Pennycook, 1990). Bernhardt (1991) views second language reading as a "new" and "different" literacy which carries with it the important component of social processes embedded in language learning. It is not so much for the research material or teachers to tell the reader what he or she is doing but instead to provide a critical awareness of what it means to be a reader (Wallace, 1990; Eisner, 1991). That is, the learner will be provided with the opportunity to take full authority in questioning and commenting about, for example, the form of the new

orthographic structure and to simultaneously take up a more equal relationship with the producers of the text. In this way even the most technical process of reading which is the initial level of processing orthography may be brought to light by the reader becoming a critical investigator of the specific orthography.

The perspective portrayed in the present research, focuses on a critical view of the act of reading and a global form of the interactive model, where the reader takes on a social role, and develops an assertive position against the text and the teaching/learning situation.

Reading and Writing Systems: A Political Act?

Understanding the relations among various levels of reading during the act of reading calls for careful recognition of graphic symbols. In the same way sound represents speech, graphic symbols represent reading and writing. If languages had not adopted various forms of geometric shapes which now represent individual phonemes, communication in the written medium would have been impossible. Present day writing systems should not be taken for granted, because history has shown that the transfer of speech to the written medium is not as prevalent as it appears. For example, Ong (1982) reports that among 3000 present day oral languages, only a few have developed a writing system.

Despite the small number of writing systems per language developed internationally, the Roman script seems to have not only become a writing system for most European and American languages, but also a medium for interactional scientific communication and a language of power. For example, scientifically the English language may appear in the form of symbols for elements in chemistry (*Au* is the symbol for gold). Even though the symbol is recognized as the element gold by all nations who have studied chemistry, its name is studied in the specific language of its people and the original Latin name is usually not familiar. In the same way letters such as *T, D, V, E, F, H* in physics, engineering and mathematics represent *temperature, distance, volume, energy, force, and height* respectively in all related books regardless of the text-book's writing system (Farsi, Arabic, German etc.). Learners of these letters learn them for purposes other than their real function in reading, and usually relate them to their specific scientific context.

The more or less subtle use of the Roman alphabet will undoubtedly influence cultures that read the world-word (Freire, 1991) differently. There are many examples in history that show how one nation's writing system has been replaced by another one altogether. In the twentieth century, it seems like the Roman alphabet has taken precedence over other international alphabetical systems in replacing ancient or non-existent (in oral cultures) writing systems (Judd, 1987; Walters, 1989). This is not surprising, if one understands the issue of power and control involved in the act of shaking

a nation's identity through a total replacement of an alphabetic system. Since graphic symbols, as discussed above, represent the building blocks of literacy, their form and shape will inevitably represent the literacy package of another nation with the same writing system.

The practice of changing a writing system from an ancient script related to a people's history and ideology into the Roman script, is not new. Among the countries which have undergone a transformation of their writing systems are Turkey, Malaysia, Tajikistan, and Somalia. Since ancient history, the Turks spoke Turkish, but due to the power of the imposing Persian Empire, they wrote in the Farsi script. At the same time, the Turks practiced the Muslim religion and learned to read in the Arabic script (similar to the Farsi writing system). After World War II, in the name of "cultural revolution", the script of their well known poets and writers was replaced by the Roman script. With the cultural revolution, the elderly became illiterate in the younger generations' literacy practices, and the young lost touch of their ancestors' ways of practicing literacy and reading ancient poetry.

In the same way the Arabic script of the practicing Moslems in Malaysia was replaced by the Roman script when it was colonized, approximately three hundred years ago (Randall, 1991). Recently (Kayhan, 1993), after the fall of the Communist regime in the late Soviet Union, the Tajik people have requested a return to their original script, Farsi,

which had been replaced by first, the Roman and later the Cyrillic writing system when the Communist regime was in power.

Because of the practical insistence of changing alphabets by governing powers, it is questionable why we see very little attention being given to the writing system of EFL/ESL learners in various situations. Whose interests are being served? Why was there constant emphasis on learning to only speak in the L2 (the audiolingual method)? Why has reading only recently been given some importance? Is the literacy tool being reserved for only the elite? Who are the gate-keepers to the supposedly efficient/appropriate written medium?

Auerbach (1993) and Pennycook (1990) have raised the pedagogue's consciousness towards present day supposedly unbiased events. Auerbach (1993) shows how colonialism implemented the one language only curriculum for its own political purposes, and others who followed, never questioned the basic assumptions on which ESL had been initially nurtured. Only recently have some researchers shown interest in new ways of introducing the second language, most specifically English, that is more appropriate to the needs of the learners involved.

One basic research trend has been to give almost equal attention to ways of dealing with the beginning perceptual levels of reading in L1 and L2. Crowder and Wagner (1992) state the importance of viewing the act of reading as a combination of multiple variables at

play: letter by letter processing; orthographic imaging; and word perception. Furthermore, Carr (1985) points out that in order to reach a level of comprehension mastery, the reader needs to first master the process of word recognition. Again the researchers are emphasizing the basic knowledge of the writing system which will then lead to word recognition and higher levels of comprehension and finally interpretation.

The major features of writing systems which influence the process used to translate printed words into mental concepts are (a) graphic features of the characters, and (b) rules for writing sounds and meanings (Just and Carpenter, 1980). One of the most striking differences among writing systems is the graphic symbols that are used to express the characters (Patel and Soper, 1987; Taylor, 1987). The graphic features of alphabets differ in the visual discrimination they require of a reader. For example, English readers must master distinctions among four relatively similar characters: b, d, p, and q. In contrast, some orthographies such as Arabic and Farsi, require fine discrimination. In the latter alphabets, letters differ by placing small marks placed above or below the character to change its phonetic value. In English, it is not enough for the child learning his/her first language or a second language learner to memorize 26 letter-sound associations. In fact, the child must also learn to decode larger units such as digraphs, consonant and vowel clusters (Adams, 1990). Once readers become aware of not only letters, but the composition of letters in English words, they may be able to automatize their skills more efficiently and word imaging may be facilitated. Just and Carpenter (1980) state that word

decoding involves discriminating letters from each other and identifying letters and letter clusters. Once the ability to decode words is established, reading performance starts to improve in several ways, becoming faster, less effortful, and automatic (Adams, 1990). Seely (1992) discovered in his mixed ESL class that students with writing systems (Arabs and Iranians) other than the Roman script did not distinguish between Spanish and English newspapers. In the same way, Americans were not able to distinguish between Farsi and Arabic writing. In both cases students were not able to differentiate between two languages with similar writing systems.

It must be noted that the above descriptions of word imaging and orthographic automaticity are related to reading processes in English only. The main focus of this research is with Farsi speakers and those who read the Farsi/Arabic script. However, a scarcity of research on those languages makes it difficult to distinguish between various levels of reading. However, what is certain is that the graphic form of the Farsi and Arabic languages are different from English. A prominent distinction between the languages is that Farsi and Arabic are known as consonantal languages. Thus, unlike English, writers of Farsi may create an infinite number of words without being restricted by orthographic rules such as in English. Perhaps, Farsi readers become more word-bound because they need to provide appropriate short vowels for each word separately, and therefore pay parallel attention at both the phonetic and syntactic levels. A brief summary of the differences

between Farsi and English writing systems in the next section may provide a better understanding of the orthographic structure of the two languages .

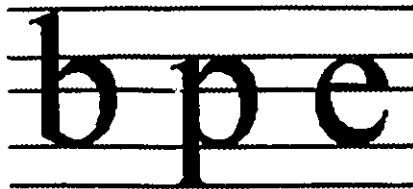
Differences in Reading in Farsi and English

Farsi is a dialect of the Persian language from the family of Indo-European languages and of roughly the same period as English. Farsi words are written from right to left and thus books begin from the right (as opposed to left in English books). The Farsi alphabet is basically Arabic and its shapes are hardly related to the Roman alphabet.

In Farsi there are: (1) no capital letters vs. small letters as in English; (2) no 'printed,' i.e. unconnected, letters vs. 'handwritten' connected letters; and (3) each letter has one, and only one, basic pronunciation (except for **ی** **ا**: either /v-y-/ or /u-i-a/).

Shapes

(a) Base line and 'bands': English letters are written on a base line and extend over three 'bands': most letters extend over either the upper two or lower two bands, some are written in the middle 'band' only.



Similarly, in Farsi the letters are written on a base line, but they extend over four 'bands': two narrow bands framed by two wider bands. Some letters fill just the lower central band, some both central bands, some the upper three bands, some the lower two bands. For example:



(b) Diacritic: Each letter of the Latin alphabet has a different shape, for example b:p / t:d / k:g. In Farsi many distinctions are not made by difference of shape but by diacritic dots. Thus, there are 'pairs' of letters sharing the same basic shape but having a different number of dots. For example:

b	t	z	ž	h	j	s	š
ب	ت	ز	ژ	ح	ج	س	ش

(c) Final arabesques: In final position, most letters (basic shapes) end in an arabesque (mostly either a long stretch to the left, or a semicircle), e.g.:

final j	j	final s	s	final b	b
ج	چ	س	سد	ب	پ

(d) Connecting stroke: Most Farsi letters always have to be connected to the following letters on their left by a 'linking stroke,' in the central band, for example:

پد = پ + د

Only four letter shapes must never connect to the left.

d	r	v	a
د	ر	و	ا

The groups of letters

The traditional way of learning the letters is to learn them in alphabetical order. However, it may be easier to view them as shape-groups defined on the basis of the similarities of their shapes. The criteria for this grouping are: (1) the basic shape shared by those letters which are distinguished only by diacritic dots; (2) the shape of the final arabesque; and (3) whether the letters can be connected to the left, i.e. in the direction of the flow of writing, or not. Most letters have the same shape in initial position and in middle position. Also, most letters have the same shape in final position whether connected or not. Only two letter shapes have special connected forms.

The L1 instruction and reading curriculum in Iran is based on the phonic system and the traditional approach. In first grade, children learn the alphabet according to each letter's level of difficulty. Therefore, the more difficult sounds that appear in four different shapes are kept for the end. Reading strategies usually include decoding of words with great emphasis on pronunciation, 'correct' reading, and vocabulary definitions. Later in elementary and secondary school, the reading texts include a collection of short passages from various contemporary and old Persian authors and poets. During a regular lesson, teachers emphasize 'correct' reading and use one of the students to demonstrate it. Following this rather long and tedious procedure, several comprehension questions at the

end of the text are answered by a few students and finalized by the teacher's 'correct' response. The last four years of L1 instruction in high school are more or less similar to previous elementary school instruction with only a change at the reading level of text.

Students raised in this system, are rarely acquainted with reading strategies that are familiar to the English reader. The Farsi class is a literature or reading course and is one of many (maximum of 15 courses studied in high school) courses offered for gaining factual information to prepare for technical product-oriented final tests. In the same way, community-based literacies are mainly geared towards school-based literacies and oral literacy events.

Literacy Practices in the Iranian Community

Although the Iranian literate history dates back to almost three thousand years, the majority of present day Iranians identify themselves with a more oral culture (Kayhan, 1994). The long history of monarch rule in Iran, and the Kings' total control over literacy as a prestigious act for the elite, may be part of the reason why a preference over an oral literate culture still exists. Islamic literature and literature produced during and after the rise of Islam, which dates back to more than fifteen hundred years, is the most common literate material used in present day Iran.

The majority of the large Iranian population (fifty million) are Moslems and practice Islamic literacy. In this type of literacy, the reader is engaged with Arabic script and the Arabic language. However, the surface similarities of the Farsi and Arabic language scripts which may be compared with the similarity between French and English scripts, allow the Iranian reader to read the Qoran and various prayers in Arabic with some ease. Even though the word 'Qoran' literally means 'something to read', a religious literate activity; in most cases, is confined to reading for recitation purposes, and for a long time before a reader is acquainted with its style, it is usually not accompanied by a type of reading that involves meaning. When the readers are interested in reading and understanding, they refer to a Qoran with both Farsi and Arabic writing.

Previous political issues (Pennycook, 1989) as well as scarcity of paper and printing material, and the unavailability of regular schooling, have contributed to the spread of oral literacy in Iran. The present day Iranians are more listeners than they are readers. Likewise, since great emphasis is placed on group life, literacy practices reflect themselves in groups. Family gatherings are among the most prominent formations of group life where serious conversations about social issues take place. The next important groupings are religious in nature in which the majority of people are listeners, and speakers usually make a point to give a speech without any obvious reference to written text.

Due to preference over the oral culture, up to recent times, oral literate behaviour rather than the written mode carries more prestige in society. For example, writing or keeping notes of simple messages between friends is unusual and may be regarded as an 'illiterate' behaviour. This attitude is suggestive of viewing a literate act as a situation in which facts are memorized perfectly. For this reason, instead of taking note of some message, friends prefer to memorize it, and transmit it via an oral message to another listener.

It may be suggested that traditional ways of making sense in religious literacy practices and the group emphasis in the structure of the Iranian community contribute to the existence of placing importance on memorization skills, as well as on skills that assist in gathering information to transfer to specific groups. It is these community qualities that seem to be in most Iranian citizens' cultural identity packages, but which have at the same time been misrepresented in literacy practices in schools (Heath, 1991). When children enter school and all the way through high school, they appear to be regulated into different kinds of literacy practices that are different from their previous experiences.

It is beyond the scope of this study to detail the reasons underlying the above school-based literacy practices; but what is an important issue relevant to the present research is to acquaint the reader with a general awareness of how the learners in this study read the world/word. The major objective of this research is to explore the multilevels of reading processes through an understanding of the interaction between conceptual, social, and linguistic knowledge of the readers.

In order to achieve the latter objective, the research questions were divided into three categories: (1) reading in the first language/first language literacy: *What is the role of first language literacy in reading in a second/foreign language?*, (2) proficiency in the second/foreign language: *What is the role of second language proficiency in reading in a second/foreign language?*, and (3) perceptual knowledge of first and second language writing systems: *What is the role of perceptual strategies in reading in a second/foreign language?*

CHAPTER III

RESEARCH OBJECTIVES

The overall purpose of this research is to show how EFL readers make sense out of a text that requires knowledge of a different kind of writing system from their own first language. Some researchers (Haynes, 1990; Koda, 1988; Randall and Meara, 1988) have investigated reading strategies and processes by examining distinct components of processes related to reading. Research methodology used by them usually deals with "product analysis" (Cavalcanti, 1987). That is, the end results which may partially represent the readers' understanding of text have been carefully analyzed. Other researchers (Casanave, 1988; Grotjahn, 1987; Harri-Augustine and Thomas, 1984; Hosenfeld, 1979) have found more interest in the actual process of reading. In a process oriented approach, both the participant and the researcher become mutual investigators of reading processes.

The inquiry into reading processes in this study will explore social, cognitive, and linguistic variables related to reading by applying two methodologies. Initially, qualitative interpretations of student performance will be reported by an analysis of think-aloud protocols (Ericsson and Simon, 1984). This will include a description of data collection, analyses and discussion. In chapter IV, the major portion of the collected data will be

analyzed by applying a quantitative methodology. The qualitative analysis is meant to assist in a better understanding of the quantitative study. The following questions guided the analyses and interpretation in the qualitative analysis of data related to this research.

1. How do students approach an English text?
2. What are some common reading strategies the students choose to use?
3. What are some rare reading strategies the students choose to use?
4. What language do the students choose to think-aloud in?
5. Is there a difference in quality between Freshmen and Seniors' ways of reading text in English?
6. What are some topics the students refer to when they read the text?
7. What does the data tell us about how meaning is defined by the students?
8. How is the politics of learning the English language expressed through the data?

QUALITATIVE STUDY

Methodology

In an effort to investigate the act of reading for 32 first year students (Freshmen) and 31 fourth year students (Seniors), a qualitative research methodology was adopted (this study will be a complimentary study to the quantitative study discussed later in chapter IV). Here the 'act' of reading refers to Freire's (1991) interpretation of the importance of understanding the 'act' of reading with the readers themselves. Freire views readers as active subjects of their actions and as agents who are greatly influenced by their social and individual ideologies embedded in them since childhood. It is for this reason that through the process approach, which is rarely undertaken by researchers because it is time consuming and sometimes lacks a specific method design (Rankin, 1988), it is hoped that both the learners and the researcher get a chance to experience an awareness of their own 'voice' (McElroy, 1993) during the act of reading.

The adopted research methodology includes an introspective technique. Through introspection, hidden issues, which may be related to social and community literacy practices and may remain hidden in product oriented analyses, will be brought to light.

Cavalcanti (1987) quotes Radfor and Burton's summary of the introspective technique:

"Introspection gives us information about experience. It yields data otherwise inaccessible. It may, besides, bring to light facts that might otherwise be overlooked, or stimulate us to ask new questions. Like any technique, it has peculiar difficulties, especially when used in odd circumstances. These however, are the hazards of science." (p. 140)

The drawbacks of this technique, which may be related to cognitive capacity, memory and metacognition (Cavalcanti, 1987), are hoped to be lessened by complementing the study with the quantitative study which deals with other aspects of cognitive processes (Rankin, 1988).

Gaining Entry

The university campus was situated on an isolated piece of land outside the small city of Babolsar in Northern Iran. Students attended the chemistry institute and resided in dormitories on campus. Four centers (two for Freshmen and Senior female informants and two for Freshmen and Senior male informants) were set up in dormitories for the experiment equipment. Since this part of the data was collected after the quantitative data collection, and the students had already participated in other sections of the study, the researcher was quite familiar to the learners. She had developed personal ties with most of the students and was in a way residing among them daily to collect the necessary data.

Material

The need for learners from various fields of knowledge to learn English more efficiently in a shorter period of time, inspired pedagogues to devise a new program under the name of ESP or English for specific purposes (Mackay & Mountford, 1978; Strevens, 1980). The aim of this program was to isolate the learner in and around one subject matter and use relevant content material to suit that purpose. One of the main items on the agenda was the instruction of specific vocabulary and rhetorical structure that for example was practiced in the medical, engineering , and/or scientific working areas.

The Senior students in this study had already covered two courses of ESP nature previous to the experiment. Since they were studying chemistry, the topics covered in the ESP courses were only of a chemical nature and they were asked to literally translate texts.

According to student comments, the course was aimed towards professors' personal needs to get their material translated. Freshmen had not received any special English besides the high school material, which was based on traditional and formal language instruction with heavy emphasis on translation.

The text chosen for this task was taken from a General Chemistry book (Ebbing and Wrighton, 1987) and was presented in the form of a two page book with a cover

picture, names of authors and a black binding that kept the two 11' by 14' thick blue paper together.

Eighty one-hour blank tape cassettes were distributed among the participants along with a copy of the text, and three separate pages of questions related to the text. Three tape recorders rotated between participants according to scheduled appointments which were organized in advance.

Data Collection

At first, two representatives, one boy and one girl were asked to assist in the distribution of the experiment material. Students registered for specific scheduled times when they would go to the centers and pick up a tape recorder, one 60 minute cassette (they were told to come back for extra ones if needed), one chemistry text in English, and 15 questions in English printed on three separate pages. The researcher herself practiced with each individual prior to the actual private experimental session. The practice session took place in a room in the computer center. Each session lasted for approximately 15 minutes. During this time, the students practiced the technique of reading a chemistry text somewhat similar to the actual experiment text along with think-aloud protocols. Even though initially the researcher had decided to be present with the reader during the think-aloud task, because all students showed their preference to do the activity privately,

decisions were changed in favour of the students. Some of the student comments were:

"we don't know any English, its embarrassing";

"I forget every thing if someone is sitting next to me";

"I don't want any one to listen to how I read in English".

Because the activity was new and unheard of to all the students, there was some resistance at the beginning. In those cases the practice sessions were made longer and were sometimes held in groups of 3-4 students. When the peers spoke amongst themselves, there was a better sense of understanding and cooperation.

Instructions

The researcher provided instructions in Farsi (the learners' first language) and made the following comments: "What ever you have done up to now (referring to the quantitative study and the tasks they had completed prior to this experiment) shows the product of your reading. If I want to know what you do to reach these conclusions, it will not be possible to understand it by looking at you as you read and answer questions or as you fill in blank spaces of a text. You are the only person who can tell me what you do when you read. How do you decide on the meaning of a word, phrase, or a whole passage? How do you solve a problem when you come to one? I want to look at the

process of your reading which you follow to reach the product. For this you must think-aloud what ever comes to your mind and verbalize it. Please try to be as natural as possible.

Do not explain the text. Only do whatever you normally do when you want to read a new text. Remember to introduce yourself on the cassette before you start. After you finish reading the text, 15 questions will follow. Again you must think-aloud while you answer the questions. Make sure you explain what you do to find the answer. You have one o0 minute tape to use. If you need more let me know. the questions may be answered in whatever language you prefer (Farsi or English)."

Reading Communities: Freshmen and Seniors

"...it (literacy) focuses attention on the importance of acknowledging that meaning is not fixed and that to be literate is to undertake a dialogue with others who speak from different histories, locations, and experiences (Giroux, 1992, p. 63).

The form and shape individuals take in the way they look at the world and read the word depends on their life experiences, their literate background and what they bring with them to a particular situation (Edelskey, 1991; Freire, 1991). As individuals occupy various positions in society they become part of groups or communities and begin to acquire or share their form of looking at the world and their forms of literacy practices.

The participants in this study may be distinguished depending on their sense of belonging to two distinct communities of readers. The Seniors who had been residing at

the university for four academic years picked up university academic literacy practices. This kind of literacy may have influenced both their social and individual behaviour. Most importantly a feeling of their belonging to university grounds, dormitories and facilities was clearly observed. Moreover, there was a sense of friendship and dedication on their part to participate in this experiment, because the researcher had been their English teacher when they were Freshmen.

During the set up procedures for the research study, it was the Seniors who organized centers where all students including Seniors and Freshmen could come and pick up various material related to the experiment. Each room housed three girls and in the usual university housing procedure, every year one Freshman moved in with two Seniors or Sophomores so they could help them settle in at the beginning of the semester.

Signs of exposure to academic English could be seen in the Senior students' book cases. Almost all Seniors had approximately four English text books, one dictionary (usually English-Farsi). In some cases educational models of molecules were stored in boxes and the international periodic table (in English) was placed on the wall. This showed they had experience in ordering books and tools from foreign countries, and had thus filled out application forms, and requested tools or books from various Western companies. This confirms students' familiarity with foreign exchange transactions, writing clear labels of what was under request, and finding correct mailing addresses for publishing companies. In

the case of English text-books, professors had recommended some for course work every semester.

The selective and rather restricted use of English text-books, was according to students' own words: *"We only check a formula the professor teaches in class with our own class notes."* So the English text-book was hardly ever read. It instead acted as resource text for checking specific formulae.

The university library, only 100 feet away from the dormitory, housed a large number of scientific, particularly chemistry books, and up to date journals. During exam periods and when the dormitories were noisy, the library space was used as study rooms. In the opposite direction, another 100 feet away, stood the administration office. There were a variety of notes posted in Farsi on bulletin boards. The notes were mainly related to course announcements and registration schedules. At the time of this research, some of the Senior informants were preparing for the graduate entrance examination and were under a lot of emotional stress. A key factor for getting accepted was English proficiency.

The Freshmen, who were new to the university (registered three weeks prior to this experiment), came from a high school literate community. Since over half of them came from far away cities, their attachment to home was apparent in the long distance telephone

queues, as well as in the city bus stations, where they waited to catch a bus to go back home. This younger group of students spent most of the week thinking about buying tickets to go home, or visualizing what they would do once they were home. This group was also just beginning to settle down after the long hours of studying for the University National Entrance Examinations (UNEE). The literacy practices of the latter students in the past four years had been restricted to intensive L1 studies and preparation for the NEE. As a result, even though they came from a highly literate community in their L1, their L2 literacy practices were limited to formal traditional learning of the English language such as learning how to master the skills of replying to mechanical drills and technical questioning.

This language learning methodology included mimicking vocabulary; translating short simplified texts at the word level; and constructing meaning in isolated ways of referencing to either syntactical rules or lexical meaning . Since all texts were pre-translated by the L2 teachers, the only activity attempted by learners may have been word for word memorization. This method of learning views language learning as a technical task and its application is restricted to the classroom situation only.

The above was a description of where the informants were coming from, and it is this pattern we should keep in mind when we talk about what they do as they read the chemistry text.

Analysis of Data

After all data was collected, it was brought back to Ottawa for analysis. Before analyses could begin, all tapes had to be transcribed. Among the eighty tapes distributed, one was not returned, some participants used more than one tape, and some had a poor sound quality which made them impossible to hear. Even though the text was in English, all the participants did their think-aloud protocols in Farsi. Therefore, the data had to be transcribed in two languages. It was only possible to capture the accurate code switching when the transcription was done manually. The transcribed data filled one 100 page notebook. At this stage the data was color coded according to emerging salient themes (Taylor and Bogdon, 1984). After several reviews of the codes and with reference to related research, the coded data was pulled together to form broader themes. The themes then formed the major portion of the study of reading strategies in English. Themes which formed the study's research questions were related to reading strategies. Moreover, by investigating learners' affective attitude towards the English language, it was hoped to find important political issues related to resistance because of personal identity and social values of learners, especially involved with the learning of English a language of power.

Reading and Making Sense

"When I read English I don't look at the letters. I just look at the form of the word and I read like Farsi. My reading depends on the way I feel. Like today I feel good but yesterday I wasn't in the mood at all. I think the English language doesn't have a special order and you can't relate the words to each other but it's easier (in comparison to Farsi) to understand. I prefer to read the original English text books instead of their translation. They get very complicated and distorted." (Senior female informant)

The above quote is an example of the ways students choose to make sense out of a short article in English about chemistry. The participants reason about English language learning and then get engaged with the text in ways that best fit their personal experiences (Hosenfeld, 1979; 1984).

A qualitative analysis of the data shows how the two literate communities reveal information about the following: how they find themselves as readers of English; and how they make sense as they read a technical article about chemistry. Even though the informants are at two university levels (first year and fourth year) and have been in touch with different literate communities in the past four years, they do share ways of making sense as they read in English. The ways each individual chooses to construct meaning may be divided into two different categories (a) a type of personal involvement with the text (Freire, 1991), and (b) a way of holding back and taking the job as an "on task" activity with very formal 'dry' participation (Edelskey, 1991; Hosenfeld, 1979; 1984).

A close analysis of the reading activity also provides information on various styles of the informants' reading patterns such as when they either rush through or slowly get involved with the text before responding to questions. A description of the various styles of reading may provide a richer understanding of the readers' level of reading comprehension.

Since the reading patterns apply only to a small part of the reading process, the physical act of reading, they will be explained in order to familiarize the reader with an overall picture of the Freshmen and Seniors' reading practices.

Hooked on Words: Pattern 1

The readers in this pattern are hooked on individual words. Reading begins with the utterance of one word at a time and is followed by an attempt to translate every word into Farsi. As the number of unfamiliar words in a sentence increase, frustration on the part of the reader also increases and a feeling of total helplessness is displayed because of comprehension breakdown. Carrell and Eisterhold (1988) refer to this level as "word-bound" and they have observed less successful readers at this lower decoding level of reading. There are rare cases when students want to find a way out of this situation. For example in the following paragraph from the reading text:

Text Paragraph: Upon heating calcium carbonate (limestone) can be decomposed into calcium oxide and carbon dioxide. We may not conclude that calcium oxide and carbon dioxide are elements. Indeed, they are not. Both calcium oxide and carbon dioxide may be further decomposed, indicating that they too are compounds.

Ali, a Freshmen reads in English but thinks aloud in Farsi:

"upon heating means warming upon on top. O.k. calcium carbonate I know that but what's this limitstone? (He skips the other part of the sentence and two sentences after that until he comes to) indeed they are not, indeed they are not, indeed they are not, indeed they are not. This is the first time I have heard this. (continues to read slowly) both calcium oxide and carbon dioxide may be further decomposed, indicating (he pauses) I knew the meaning but I forgot".

In the above reading, Ali gets hooked on selected words. Although he admits he recognizes the chemical elements, he does not choose to use his knowledge meaningfully.

Hooked on Sentences: Pattern 2

Learners begin to read one sentence at a time in English. They start with the first words in the title. The second time the sentence is broken down into its lexical components and each word, if familiar, is translated into Farsi. The third time the sentence is paraphrased in Farsi. For example at the beginning of the text a Senior female learner comments in Farsi:

"O.k. what they want to say is that water can be decomposed."

This pattern of reading continues to the end. Pattern 2 appears to be more advanced than the previous one, but there are still signs of learners interacting with parts and not with the whole. That is, readers focus less on the whole text, instead they try to read each word with

perfect pronunciation. The data suggests that even though this group of students may seem to have a more efficient grasp on language knowledge, just like the previous group, their comprehension ability lags behind.

Hooked on Farsi: Pattern 3

In this pattern the first language dominates the reading activity. Readers translate automatically into Farsi by looking at the text and not verbalizing the words into English. As the text becomes more complicated, students begin to paraphrase at the end of each paragraph. English is used at instances of lexical ambiguity when the reader tries to pronounce them clearly. Maryam a Senior female informant expresses her frustration as she comes across unfamiliar words in the following way:

"it's chemistry and it is a very easy text. We must ... conclude (this word is said in English), that I don't know what it means". "since world war II, what's this when I can't even read it; what's the use?" (She does not understand how to pronounce II and cannot relate it to world war)

For this group of students it appears that word imaging has become more automatic. This pattern is only used by a few Senior learners. Thus it may be suggesting that Seniors have reached a level of automatizing orthographic knowledge (Just and Carpenter, 1980) for a selected number of words.

Hooked on Questions: Pattern 4

The readers who use this pattern are hooked on questions. Before reading the actual text, learners read the questions. After reading four questions and answering only two from his own background knowledge, Ahmad (male Freshman) says:

"It's better to go back to the next paragraph, may be I will understand better."

During the second attempt, he engages himself more extensively with the text and takes careful note of the tables and figures. He follows the style of pattern 1, and even though he hooks into words, he begins to include more paraphrases. The common practice of valuing questions comes from the students' educational background where there is a tendency to be product-oriented and to perform in frequent examinations. It was interesting that all eight senior male students followed this pattern of reading.

Right-Left Drifting: Pattern 5

Although research has placed less emphasis on the importance of reading direction when it is different in the second language, the present research shows that some students read the English text from right to left instead of left to right. That is two Senior female informants began to read from the right side of the page as they would in their first language Farsi. In the first case the reader only comments about the cover by beginning to look on the back of the cover.

"Well there is nothing here (referring to the back cover which was blank) I wonder what's inside."

In the second case, the reader completes reading page 2 before realizing her mistake. At that time, the issue is taken very lightly and she decides to answer nine questions before stopping to think again and says:

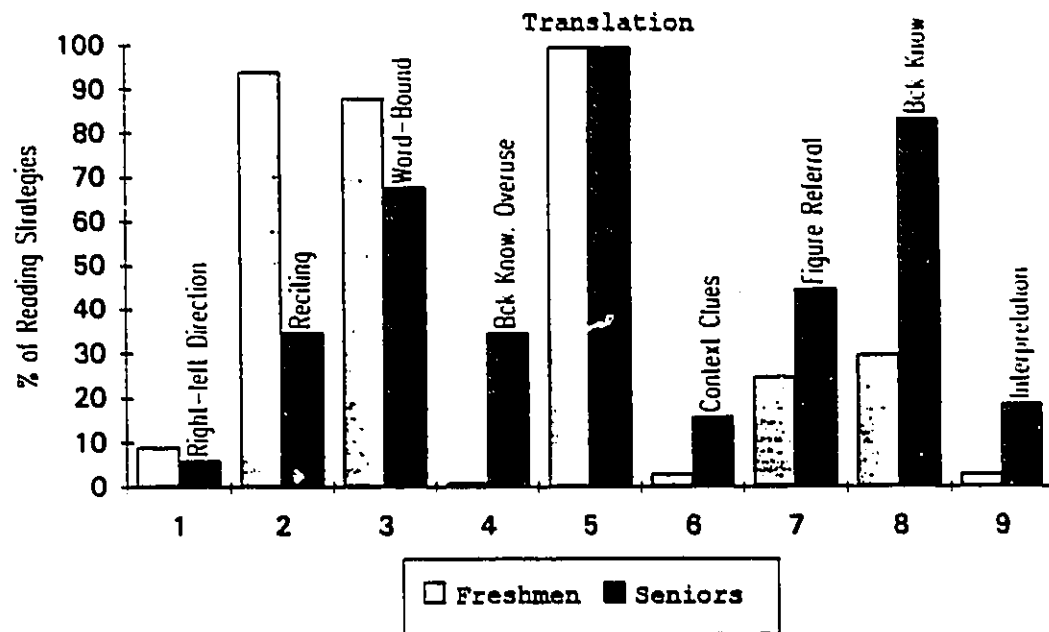
"I just noticed that I read this just as I do in Farsi, first I read the right side then the left side."

After the comment, she continues to answer the questions successfully (It appears that she was able to answer the questions because of her constant referral to previous knowledge in chemistry).

Summary. A count of the number of strategies used by both Freshmen and Seniors, and the percentage of their occurrences, show that the following salient bottom-level strategies were used: (a) a sense of inappropriate reading direction in English (Freshmen, 9%, Seniors, 6%), (b) translation from English to Farsi (Freshmen and Seniors 100%); (c) an overreliance on background knowledge (Freshmen, 35%, Seniors, 1%); and (d) a strong sense of word-boundedness (Freshmen, 88%, Seniors, 68%) (refer to Figure 1). Furthermore, a count of the number of strategies used at higher levels of reading included: (a) the use of contextual clues (Freshmen, 3%, Seniors, 16%); (b) the use of figures and tables (Freshmen, 25%, Seniors, 45%); (c) the use of appropriate background knowledge (Freshmen, 30%, Seniors, 84%); and (d) the use of interpretive skills and reasoning (Freshmen, 3%, and Seniors, 19%) (see Figure 1).

Figure 1

Percentage of reading strategies used by Freshmen and Seniors



Reading in English: A Socializing Process

The findings in the qualitative study, point not only to levels of language difficulty, but more so to how the English language gets barely tied into the learning fabric of the reader.

The subordination of certain social groups, such as the case of minorities in Western or other world countries, where political decision makers invest in language learning equipment and recruit professional teachers to supervise their language programs, is a covert political act of ESL/EFL (Auerbach, 1993; Judd, 1987; Mukherjee, 1986; Pierce, 1989; Walters, 1989). A critical analysis of the situation brings to light the hidden gradual process of subordination ESL/EFL may entail. In fact, in sensitive strategic areas, this can lead to colonization or loss of self-respect and identity in social groups (unhealthy dependence of certain third world countries on the superpowers). Judd (1987) states that ESL teaching is a political act which involves moral issues, and that we as teachers and gatekeepers in addition to teaching are also "directly or indirectly implementing a stated or implied language policy as well as actively promoting a form of language change in our students." (p. 15) For example, ESL teaching has tended to be responsible for change in languages or to a more extreme effect the demise of certain languages (in for example Guam or in regards to some Native American languages in Northern America) (ibid). Apart from the global effect of ESL instruction, learners may also experience a fear of losing their personal identity (Walters, 1989). Change in language and culture can be devastating in circumstances where the change was unexpected, and or unwanted (Trueba, 1989).

The above social factors seem to also be responsible for how the learners in this study react towards reading and learning the English language. Therefore in the following sections an attempt is made to shed light on some socializing practices which seem to be closely related to the processes of either successfully reading a text in English or choosing to remain helpless and superficially 'unconcerned'.

Reading in English: Resisting Imperialism

The participants in this study look at the symbols on the page, sound them out, and create meaning only in close association with their first language, Farsi, which tends to dominate the entire process of reading.

Senior female:

"What I think is that reading English is very difficult. I've used all these words in my translation and the words are familiar but reading them is very difficult. I know the form of the word, e.g. when I want to read hydrogen it's very difficult for me but now that I know it's hydrogen it's easy."

During the act of engaging with the English text, another Senior female participant reveals her personal feelings about English.

"I'm thinking if Mrs.G (the researcher) listens to this she will know how weak my English is. I think most of the students are weak."

It is questionable why these highly L1 literate university students feel helpless towards the English language. Many of the Iranian students feel the same way about English as the servants in a Walt Disney production of *Beauty and The Beast* felt towards the beast.

Walt Disney studios came up with an amazing victory in 1991 when they finished making the animated movie of *Beauty and the Beast*. The hero is a prince transformed into a hideous beast resembling a mighty lion because of his selfishness. His looks are very terrifying: huge strong muscular body with great big fangs, an angry vicious face and a horrible howl. He has a long red cape around his neck that sways around violently when he leaps from one side to the other with the swiftness of a snake. He is shown to have a very unstable temper with everyone including his servants.

The story also has a beautiful book loving heroim called Belle. Her father who gets lost in the forest, seeks shelter in the beast's castle. He is welcomed by the castle's servants who serve him tea and make him comfortable. Initially when the beast finds out about his servants giving shelter to Belle's father, he is outraged and rushes howling to where the old man is sitting. His head of the household explains frightfully that he didn't want the man to be there in the first place, but the beast howls and growls at him angrily, not letting him finish. Now the servant jumps under the carpet shaking. The same thing happens to some of the other servants, and all of them wind up hiding before they get a chance to explain their

situation...After the beast takes the old man as his prisoner he agrees to free him if Belle takes his place. The beast gradually learns to control his temper and when Belle sees the beast isn't what he seems, she falls in love with him.

Exposure to any kind of formal English whether reading, writing, speaking or listening has a beastly image for the participants. The dark cape of fear seems to hang heavily over their minds as it tries to hinder their sense making mechanism in English.

Besides the fear, they despise English and show a very negative attitude towards it. Mukherjee (1986), in England, speaks of how the English language which represents imperialism, cannot be viewed detached from the excess baggage it brings along with it: "ESL and its political orientation has destabilized the motivation of our children to learn the most important language: the language of power."(p. 45) In the same way a male Freshman learner reveals his feelings and strongly assures me that his fellow students unanimously believe that:

" When we think of English, we all hate it....This is difficult, the students who are here are all weak in their English and don't know anything."

A sense of nervousness, and the urge to hide or cover their real reading habits is also apparent. Making sense seems to be at a power and resistance relationship.

"Oh that's good it's finally finished, it was so long." Comments such as:

"Oh! This is so difficult, I don't think it's meant for our level of English", or

"I'm just so nervous and afraid that the cassette may finish before I finish reading and completing the questions."

English acts as a 'beast' overshadowing their sense making mechanism. As the beast traps the beauty in his palace, the readers are trapped by the negative thoughts of English and narrowly escape it at very rare moments. These moments include breakthroughs such as: use of background knowledge in chemistry, syntactic knowledge, and when powerful translation into the first language (Farsi) come to the rescue.

For a few the beastly characteristic of English is transformed similar to how Belle becomes the real force in transforming the Beast into the character which is most appropriate for her. Those special students may have been able to recapture their sense of identity within themselves (McElroy-Johnson, 1993). However as we continue to see the whole group, it is difficult to miss the three main personality types that McElroy also meets in her black school district in California:

"There are people who have a particularly difficult time making contact with their inner voice with any confidence, and thus often take the authority of external voices as their own. Some people are so used to hearing their own voices that they hardly hear anything else, while others have been silenced or unheard for so long that they either never learned to speak or have forgotten how (ibid 1993, p. 97)."

Look at what the Beast did in Beauty and the Beast. The powerful stroll in darkness blows off Belle and her father. The Beast is so loud and overpowering. His presence is everywhere. It's hard to escape him, but when Belle overcomes the fear by holding on to her identity and keeping her voice, the Beast is appropriated just like English may become appropriated to the needs and social values of the learners involved (Rodby, 1992).

"Now I'm understanding, because of the periodic table, we had studied this in high school, so I think I know what element means now. I wish that I could read all English text and comprehend it as easily as this part."

These were some of the negative remarks I was getting at the beginning of the experiment. However, when the students returned the cassettes and recorder, some made comments which seemed to raise issues of pedagogical practices which aim at giving worth to students (Fasheh, 1990; Giroux and McLaren, 1986). In this case the students became the subject instead of the object of study because they decided to take control of their learning (Edelsky, 1991).

"well I don't know what you will do with this but it was a lot of fun and I couldn't stop and wanted to go on and on".

Expressions of learners' appreciation for expressing their 'voice' is also given when they examine the cover of the text; usually the back, perhaps because of Farsi's right to left reading direction. Because students have usually been exposed to standard books, they appreciated the different format of the experiment text.

"I wish we always got such pretty things to read, it's more fun to read."

This attitude change demonstrates how change of pace and new material, new ways of appropriating the beastly image of the second language, may provide positive motivation in the learning environment.

Reading: A Way of "holding back"

In the practice sessions, the participants were told to read and think-out loud. Even though the practice sessions were at least 15-20 minutes long, the readers took the word "read" literally as meaning to recite. This touches on an important issue for this community of readers who have been taught (in first language schooling) to recite and think that good readers are those who recite flawlessly with perfect pronunciation. Unaware of the fact that reading is by definition "the creation of meaning" (Cazden, 1986; Goodman, 1967), the

readers process the text in such a way that meaning is left to the end. Ideal reading for them promotes one and only one 'right' answer. The reading is dry with a technical nature and very formal (Edelskey, 1991; Hosenfeld, 1979). It is only with the introduction of questions at the end of each lesson that extraction of information becomes important (reference to elementary and secondary school books). This puts emphasis on waiting and anticipating the finale more than getting involved with the whole activity. These readers may be referred to as polished, final product readers. They are not used to revealing their way of thinking during the process of reading a text, but instead turn the reading event into a "word search" for filling in slots. The highly competitive nature of the final product-natured reader also brings with it a great deal of disappointment and failure, or in other words it may cause the learners or readers to abandon information they fail to make sense of during the reading of a text.

It is important to keep in mind the final product-natured students, and not underestimate the importance they place on finished products, whether in relation to final grades in school and university courses or in cases of other competitive issues. For example, the male Senior informants, who have been exposed to English text books and advanced English courses, still choose to recite and speed through the text in search of the ultimate final product. In this way they respond to questions and produce end results. Because their knowledge of chemistry is at a higher level for most of the information in the text, they depend on their own knowledge to answer the questions in Farsi. Again a correct

response to the questions can not be proof of total comprehension, especially in cases where the reader starts off by complaining about the text and its level of difficulty:

Mahdi a Senior male recites non stop without looking at the tables or figures. He finally says at the end:

"This is a very difficult text for me, it seems like it may be about chemical elements as I see in this table, but anyway it's very difficult for me."

Hassan is a good example of the majority of students who give up as they attempt to deal with comprehension failure. That is, they prefer to abandon textual information of unfamiliar words such as *compounds*, *decomposed*, *means*, and *constituent* as they appear at the beginning of the text:

"Oh, I don't know: it; oh let it go, oh this is so difficult."

Contextual clues and prediction are restricted to the form of the word. Hassan seeks the answer only through the word itself. If it is not familiar then a sense of carelessness shadows in. In the same way, Amir a Senior reader, comments as he attempts to read the first few lines of the text: *"Man! What's this? It's awful, I can't even read the words."*

He then gives up completely on the text, recites hurriedly with great difficulty to find the questions at the end. The questions are really rescuers of meaning for these types of

readers. Of course it is still not apparent whether text comprehension has taken place even if informants do find the correct answer by matching the text words with the question words.

Reading: A Way of Personalizing Text

When some readers choose to be engaged in what they are reading, they explore various avenues and attempt to create meaning. In this situation, the task becomes informal and the readers' self reflections come through. Moreover, the act of discovery leads the participants to a constant rearrangement of ideas and a constant creation of meaning (Cazden, 1986; Freire, 1991; Grabe, 1991). Hossein a male Freshman, describes his positive feeling after creating meaning through the use of figures and rereading the sentences several times:

"Now I have in a way been familiarized by the word decomposed and it means decomposed (in Farsi). This causes me to feel really successful and want to read the text in a more relaxed manner."

In another section he goes on to say:

"I'm wondering if I have translated this part correctly, because it's going to affect the meaning in the next section."

During the act of engaging with the text, the readers may also personalize the information in the text in a way as to refer to their own experiences or add new information. Hamid a male Freshman makes the following comment after he reads line 32 about the use of the Greek and Latin languages for naming elements:

"This reminds me of ancient history. One of the most popular languages of that time was Greek, just like English is now. Most elements were discovered during that time and that's why they have Greek names. I've learnt about new things here."

Previous research has shown how familiar background knowledge assists comprehension, and even makes the process a more interesting one for the reader (Andersson and Barnitz, 1984; Carrell, 1983). However, language proficiency seems to be an important factor even for some readers who do try to engage with the text. Carrell (1988) views readers as having a tendency to be over dependent on either language or on background knowledge. She argues that both dependencies may cause comprehension failure. The following quote is an example of over dependency on background knowledge which is unable to save the reader from failing comprehension. Ahmad (male Freshman) reads a table from the text carefully word for word and translates into Farsi:

"I have seen this table in my Farsi chemistry book in high school and it means (silence) I still cannot understand it exactly."

In some instances the readers change their stance from feeling "no" to feeling "yes" about themselves and the task. This change of climate comes about as the readers find answers to questions which gives them control of information and stops them from abandoning information. For example a Senior female participant admits towards the end of her reading and after she has responded to 13 questions that:

"Now I like the information in the text a little more because I can understand more. If it wasn't compulsory, I would have left it aside long time ago. At the beginning because I felt my English was very weak, I wouldn't look at it seriously, but later when I saw that I could answer some questions, I began to engage myself with the text and it became interesting."

Reading and Making Sense: A Word Puzzle

As the two reading communities attempt to make sense of the English text, they resemble a group who would like to put a puzzle together but cannot find the top to their box, the actual picture of the puzzle, or in this case the overall picture of the text. In the same way that the puzzle pieces have various forms and shapes, rounded or pointed corners, the participants choose various ways to solve their pictureless puzzle. The readers do not develop a concept about the subject matter. With no picture in hand, clusters of pieces are stored in corners. It is only at the end when questions come in that these clusters take some form and direction in the meaningless process of reciting text. No matter how mechanical, the informants still compose ways of puzzling out words to create meaning. In

some cases reference is given to a place where the word was seen, usually high school or, in the case of seniors, in a university text. Haniyeh a senior informant comments about the familiarity of content:

Text, line 17: Also note that a compound is not a mixture, though both can be broken down ... *"I think we have studied this in analytical chemistry... Proportion, I should remember we had it in analytical chemistry."*

In other cases the word is repeated over and over again to clear the pronunciation, then with a sense of disappointment the informants remark:

"abundance, abbreviate, I've never seen the words before."

Sometimes words that differ only in their vowel sounds cause a comprehension failure.

There have been several instances of this as in the case of "shining dawn" (this was the answer to one of the questions which asked for the original meaning of gold). Ali (a Senior informant) guesses from the immediate word context and says:

"shining dawn, shine means shining and dawn, d...a... I don't know, may be it's some shiny object."

Majid (Senior) abandons the word without any effort:

"shining dawn, I don't know what it means, only shine means brilliant but dawn I don't know. It reminds me of a football team."

Kothar (Senior) replaces the vowel and changes the meaning:

"shining dawn, let me see... sun down... what does it mean? I don't know. May be the way gold shines; it's like the sun."

Vowel switching is another way both reading communities choose to decipher meaning from words: upon heating is read as *open hiding*, symbol as *simple*, simpler as *similar*. In the same way at certain points consonants are added to a word with no explanation: shining/*shining*, limestone/*limitstone*, and recent is read as *percent*, general chemistry/*central chemistry*. In all the above instances of vowel and consonant addition, the readers assume they are perceiving the words as they are written. That is, even though meaning is distorted they continue to translate according to what they have invented.

At times the readers choose to create their familiar environment for a specific lexical entry. In this case a totally incorrect translation is given when the words are translated out of context but are referred to the readers' familiar context of the same word: distinguished

"We have studied this in high school and it has to do with fire" (probably relating to extinguish);

second edition:

"second means seconds and minutes of time..." compounds and elements... "I have seen this some where, I think it's an electric tool."

Another common way of dealing with lexical obstacles is guessing meaning from its stem. For example: elements are given official names... is said to be related to an office it means office names; the periodic table... comes from monthly periods; and ...they have reached an agreement ...is quickly related to its other grammatical forms (agree, agreement, agreeable).

Finally, the reading informants relate the unknown words to their syntactic environment: ...we may conclude...

"conclude means adding, o.k. that was the noun and this is the verb, I think it was introduction."

It is interesting how the short time which is spent trying to overcome a lexical obstacle is not kept in perspective with the meaning preceding or following the text. The readers isolate each cluster of words in a corner in the same way a puzzle is put together without having a complete picture.

Fatima, a Freshmen informant, stops at the word ... neither... and says:

"neither nor, we had this in grammar, I think it was in the 10th grade and it has a negative meaning but it turns the verb into a positive form."

In the next line, she adds:

"we had studied this with the descriptive words, farther is used for travelling and further for measurement."

Again in the next paragraph...do not be misled...

"I don't know what mizled means (misled is pronounced with a /z/ sound) but since do not precedes it, it is a negative statement."

The syntactic referral is very automatic with no apparent use for the actual purpose of creating meaning.

DISCUSSION

In the last decade pedagogues and researchers have developed a more understanding nature of the differences between various literate societies, not only in their spoken language, but also in terms of their written mode of discourse. Through the think-aloud protocols (TAP) in this study, it has been possible to observe to some extent how EFL readers make sense as they read a special text related to familiar knowledge from their field of study.

Even though the two communities of students came from different university levels, results showed only individual differences within the two groups with closely related reading patterns present among them, and with no observable difference in reading practices between groups. This may be related to the general literacy skills all students possess from their L1 practices and the "spoon-feeding" effect of the academic university literacy practices. As long as the learners remain geared towards the true answer and the concept of the only one answer doctrine (Fasheh, 1990; Freire and Macedo, 1987), one cannot expect to observe a different practice coming out of the English classroom.

Another important issue has been raised in Seely's classrooms (1992) where he discovered his foreign students' sense of blindness towards the differences between languages with similar writing systems. He refers to this as the orthographic blindness

syndrome (Arab and Iranian students did not differentiate between English and Spanish newspapers). That is, it has been observed that no matter how advanced EFL students may appear to be in their language skills, their lack of orthographic automaticity will slow down their reading process and signs of the orthographic blindness syndrome will interfere with their reading practices when they come from a different orthographic background (in this case Roman vs Arabic/Persian).

In this study the students did not show any conscious awareness of the latter syndrome, but some symptoms were apparent when they chose to construct or invent new words from already existing ones. For example, words were made up to fit the context, vowels were either deleted or added, and consonants substituted instead of vowels without observing the English orthographic structure. Ryan and Meara (1991) observed similar activities with Arab students who invented new lexical entries without noticing any difference in word structure. They have related this syndrome to first language interference (Arabic is a consonantal language with most vowels missing and readers in both Farsi and Arabic must add appropriate vowels where contextual clues require them).

From a linguistic point of view, learners utilize an interpretive skill in as far as they can translate the given text word for word into the first language. This may be another reason to keep the second language in the 'other' zone. In this way, learners automatically transfer the Roman graphic symbols into familiar meaningful Farsi words, and remain in a

comfortable zone they already 'own'. Since the readers performed almost totally in their L1, we should have seen some kind of L1 literacy practice carry over. It is possible that what they do in Farsi is just what was observed as they read the L2 text. That is, the reading task is turned into an exercise of receiving referential information and relating it to the one and only one response.

The present study reflects a strong tendency of the learners to disown the second language literacy package. No matter how objective the language is presented, its hidden curriculum which suppresses the "other" voice is resented by the readers. The think-aloud protocols show both groups' dislike and interest in learning the language well:

"Oh I hate English and will never learn it." or " I don't know English, it is very difficult, but it's my favourite language."

It would be naive to assume that learners of English do not view their advancement in learning the English language as a parallel advancement in their personal position in the world and in particular as a participant in the Western "power". That is, for the Iranian individual, for example to learn Arabic as a second/foreign language, it is not political power that is achieved, but strength in religious knowledge which may be based on a more personal need. An important question which must be raised concerns the reason why and if learning the Arabic language by an Iranian can become part of "our" literacy, while English

continues to be the "other" after so many years of schooling (Rodby, 1992). Thus, ESL/EFL literacy may take on, not only a cognitive definition, but also a sociocultural one.

No matter how we look at it, the English language is different from other languages in that it is closely woven into the technological advancement fabric of the Western powers.

"Languages compete with one another and win or lose these battles on the basis of outside factors such as political and military power. English is the most studied second or foreign language in the world today not for any intrinsic reasons within the language, but because of the past colonial dominance of Great Britain and the continued military and economic dominance of the United States. When the U.S. begins to lose both economic and military power, then English could lose some of its appeal and other languages will compete for positions of dominance." (Wardhaugh, 1987, p. 28)

In conclusion, results seem to imply that Freshmen and Seniors perform similarly on the chemistry reading task. These similarities are not only shown in students' proficiency in answering questions, but more importantly in the ways they choose to make sense of an English text. Furthermore, salient themes which have emerged from the data point to the importance of understanding the interaction between linguistic, and social issues in learning a second language.

CHAPTER IV

QUANTITATIVE STUDY

Methodology

The quantitative analysis of data was conducted in two phases: (I) analysis of data related to perceptual strategies and decoding strings of letters in Farsi and Roman script: *What is the relationship between first language and second/foreign language letter recognition strategies?* (II) Analysis of data related to the major focus in the study that examined the relationship of cognitive and linguistic variables related to second/foreign language reading: (a) *What is the role of first language literacy in reading in a second/foreign language?* (b) *What is the role of second language proficiency in second/foreign language reading?* (C) *What is the role of perceptual strategies in second/foreign language reading?* The variables were: reading ability in the first language, second language proficiency, first language visual search strategy, second/foreign language visual search strategy, and reading a general text and a chemistry text in the second/foreign language.

Participants. The participants for the experimental study were Farsi speaking students at an Iranian university in Babolsar. All 63 students, 34 (54%) female and 29 (46%) male were studying for a bachelors of science degree at the chemistry institute. The mean age was 21.4 years (standard deviation = 2.4). Thirty two (13 female, 19 male) were registered as Freshmen in the first year of college (group 1), and 31 (22 female, 9 male) were registered as Seniors in their last year (4th year) of college (group 2). Responses to a sociocultural background questionnaire showed that 23 (36.51%) students had attended school in the capital city, Tehran; 7 (11.11%) had attended school in one of five large cities outside the capital (Shiraz, Isfahan, Mashad, Tabriz, Abadan); and 33 (52.38%) had attended school in rural areas. According to the formal schooling system in Iran, instruction of the English language begins at age 11 in grade 7. Thus, mean number of years studying English by the students was 6 years prior to entering the university. Even though the students were attending an Iranian university, the Seniors, in particular, had already experienced academic English at the university level. That is, students mentioned that they were required to write most lab reports in English instead of Farsi. Moreover, professors assigned English text books (up to date texts used in North American universities) as reference and for problem solving purposes.

Materials. Material used in this section included several language and reading related tasks: (a) First language (Farsi) reading ability, L1 Cloze task (C1TO); (b) Second language (English) proficiency, L2 Cloze task(C2TO); (c) First language visual search

strategy, L1 VAT task (VAT1); (d) Second language visual search strategy, L2 VAT task (VAT2); (e) Second language Reading, L2 general text reading task (CGTO), L2 chemistry text reading (CCTO); (f) Sociocultural background questionnaire.

Variable Description

(a) First Language Cloze (CITO). Cloze is used as a measure of reading proficiency in L1 (Heaton, 1988). The cloze task has been used to assess comprehension in many experimental studies and in classrooms (Clarke, 1988; Eskey & Grabe, 1988; MacLean & d'Anglejan, 1986). In a random cloze test, words of a text are systematically deleted (e.g. every 5th, 7th, or ... word). For the purpose of this experiment, every fifth word was deleted and the reader was asked to complete the text by filling in 40 blanks with only one appropriate word.

A 370 word passage on the topic of "Worship of God instead of Idol" was selected from an Iranian book (Sobhani, 1978) and used for the L1 cloze task. The test was administered in Farsi to measure the learners' L1 reading ability. The average time spent on this task was seven minutes. Reliability measures showed an adequate standardized alpha of .75. Previous to the actual research in Iran, this task was pilot tested with a small group of 10 Iranian students from the chemistry department at Carleton University in Ottawa,

Canada. After the responses were scored, two words in the text which seemed to cause ambiguous responses, were edited for the final version.

Since the purpose of the cloze test was to test comprehension of text written in the first language (Farsi), the criteria for scoring the answers was based on Maclean and d'Anglejan's (1986) seven-point scale of the rational cloze test (refer to appendix D). The latter scoring procedure was appropriate for this study because the learner was able to use a variety of appropriate lexical entries in the blanks provided. Thus it was hoped that by providing an option to replace the blanks with a variety of appropriate words, testing bias would be reduced compared to a scoring system which demanded only one exact answer.

(b) Second Language Cloze (C2TO). Cloze was used as a measure of language proficiency in L2. Cohen (1980) has reported that cloze testing is a good indicator of general linguistic ability, including the ability to use language appropriately according to particular linguistic and situational contexts.

The present cloze task was selected from a collection of articles in a university English language text book (1988) on the topic of "Man and Language". The text-book was used at the University of Shiraz (language of instruction is English) for the intermediate English text-book in the ESL/EFL department. The passage contained 256 words and had

a total of forty blanks. Since the task was adopted as a random cloze, every fifth word was deleted.

The same scoring system as above was used for the second language cloze. The scoring procedure was adopted for the L2 cloze because students chose to replace the blanks with appropriate words in either Farsi or English. That is, the learners had the option to use their first language when they were not able to find an appropriate word in English. Average time spent on this task was 45 minutes. Reliability measures showed an adequate standardized alpha of .77.

Before administering this task, a different passage which had a similar topic to the Farsi cloze task was piloted with a group of 10 Iranian students attending Carleton University. However, results of the pilot test were very poor. It appeared that even though students were attending an English speaking university in Canada, the text taken from the Ottawa Citizen newspaper was too difficult to comprehend. Therefore, a different topic which was related to the discovery of different languages was chosen. The new version was piloted with five students in Iran at both the high school and university levels. The set of scores obtained by testing the five students were above 65% and in comparison to the text difficulty level of both high school and university texts, it seemed to show a relatively average level of difficulty.

(c) *Visual Search Strategy (VAT1 & VAT2)*. The purpose for collecting data related to perceptual strategies and letter recognition was to gain a greater understanding of first and second language orthographic patterns produced by the two groups. Recent research in L2 reading (Haynes, 1990; Randall, 1991; Randall & Meara, 1988) has emphasized the importance of recognizing the initial levels of reading which deal with processing graphemic symbols or letters. Some studies (Koda, 1988; Seely, 1992) have shown how various languages may require different orthographic strategies depending on the form of their writing system. Thus, since learners in this study were more familiar with their L1 script (Farsi) which did not resemble Roman script, it was important to understand if the difference in form of script in the first language influenced letter decoding strategies in the second language.

The experiment for the present research attempted to investigate search strategies for two groups of Iranian students by analyzing results of their scanning of Farsi/Arabic letters, and Roman letters. This visual search task was similar to Randall and Meara's (1988) array task for Arab students. Randall and Meara developed Roman and Arabic letter strings in the form of separate (print form) unrelated letters. What the latter researchers did not consider was that unlike the English language in which Roman letters may be presented either in the form of print or cursive writing, the form of presenting Arabic/Farsi letters in the form of separate unattached letters (as in the case of Randall and Meara's study) is never seen or used in real life situations in the Arabic/Farsi languages. Therefore, for the

purposes of this experiment the Arabic/Farsi letters were presented in their normal cursive form. A set of 25 Arabic letters (see figure 2), and a set of 25 upper case Roman letters (see Figure 3) were used for target letter stimuli.

Figure 2

Farsi letter set

ا	ب	ط	ی	ج
خ	س	د	ی	ز
ر	غ	ث	ی	ح
ض	ل	م	ت	ض
ن	پ	و	د	ع

Figure 3

Roman letter set

V	G	Y	W	C
L	K	D	R	S
Q	F	N	O	Z
U	T	M	E	B
P	H	I	A	J

Students completed VAT tasks in both languages during one session. The task procedures were as follows: learners viewed the target letters in Farsi; after the completion of the 25 Farsi letter set, the Roman set of target letters appeared on the screen. During this task, the target letter was present in the string on a randomly selected half of the trials (10 trials in all for each target letter). For example, if the target letter was K, half of the time it appeared in position 1,2,3,4, or 5; and the other half of the time it was absent (position 1: K P T O S; position 2: P K M H Q; position 3: L B K C F; position 4: A Y R K Q; position 5: E W L O K). Finally, response times for correct "yes" responses was

collected, stored and printed at the end of the experiment along with the total number of correct responses and the total number of errors for each learner. The rationale for this choice of task was to measure learners' choice of search patterns in the two languages and to assess the search patterns when the format of the target Farsi/Arabic letters were changed to the cursive mode. The time spent on this task was between 20-35 minutes for each student.

(d) Second Language Reading (CGTO & CCTO). In order to investigate both the reading product and process in second language reading, the learners were given two reading comprehension tasks; (i) text related to a general topic with 15 multiple-choice questions; and (ii) text related to a chemistry topic with 15 open-ended questions.

(i) General reading text (CGTO). The first reading task was text related to a general topic titled "*How to Find Birds*" (Bull et al., 1977). The text was a 512 word passage taken from the introduction of a book on Northern American Birds that addressed the topic of immigration of birds and their living habitat. The learners' previous experience with ESL/EFL instruction had been based on reading comprehension tasks with multiple-choice questions. Therefore, it was assumed that testing all learners on an unfamiliar topic, would assist in the evaluation of the product oriented performance of the learners in their reading in a foreign language.

Fifteen questions were printed on three separate pages. Learners were instructed to find the most appropriate response from a possible of four choices. Each correct response had a total of one point which added up to a maximum score of fifteen for the whole task.

(ii) Chemistry Reading Text (CCTO). The text for the second reading task was taken from The General Chemistry text-book (Ebbing and Wrighton, 1987). It looked at the relationship between compounds and elements in chemistry, and provided information on the history and origin of the table of elements. Towards the end of the passage, the authors suggested predictions for future discoveries in chemistry. The text had 539 words that included 31 sentences, two figures, and two tables. The general format of the text was transformed on two pages of thick blue paper and attached on the left edge with black clipping. Because the plan was to make the reading text look like an authentic book, the top side of the hard blue paper was covered with a copy of the cover of a General Chemistry text-book.

The reason for choosing a chemistry text was in line with special courses offered to EFL learners in Iran and abroad, known world wide as ESP (English for specific purposes). ESP has been developed for a wide range of subjects including medical sciences, engineering, and social studies (Mackey & Mountford, 1978; Strevens, 1980). Its pedagogical implications have been to help students gain fluency in their reading; to teach

them to observe and decipher academic writing, and to begin learning a collection of specific vocabulary related to their field of study. Because the learners in this study were chemistry majors, it was assumed that by offering them a text with familiar background knowledge, reading would become more meaningful and think-aloud protocols (refer to chapter III) may then become more revealing of hidden reading strategies.

Fifteen open-ended questions on the text were printed separately on three sheets of paper with enough space for students to write answers. Learners were given both oral and written instructions. Written instruction was typed in upper case letters in English at the top of the first page of questions. Oral instructions were given in Farsi by the researcher. Learners were instructed to respond to the text questions in either Farsi or English (information deduced from the text was important not grammatical construction of sentences).

The scoring system for this task was based on correct answers. Since each question had one or more subquestions, the maximum score was thirty. The average amount of time spent on this task was 40 minutes. A replica of this text was pilot tested prior to the formal testing sessions with the same ten students at Carleton University who participated on the previous tasks. After a review of the results, and comments made by students, only a few questions had to be reworded.

Questions in both reading tasks measured the following: knowledge in matching words/phrases in the question to words/phrases in the text; understanding relationships between elements in the text both implied and explicit; recognizing text for paraphrases of words/phrases in questions; locating specific pieces of information (names); deducing meaning of unfamiliar lexical items through word formation and contextual clues (Block, 1986).

(e) *Sociocultural Questionnaire*. This was used as a measure to assess level of exposure to print in first and second language reading. Learners in this study were expected to come from diverse 'cultural' and geographic areas (urban and rural). Therefore, a questionnaire translated into Farsi (students objected to filling out the English version) was filled out by each student. The information provided insight into learners' present and previous experience and interests in reading; nature of reading material; amount of exposure to English; and their views on the importance of the English language in their studies. Apart from one page of demographic information, students also provided information on how they perceived their English language proficiency, how they saw themselves as readers, and what strategies they used during a reading activity (50 items covered this topic). Previous research (Devine, 1988; Harri-Augustine, 1980) on developing individual models for reading in class has shown that readers actually perceive their reading behaviour very differently from what they do in reality. It was hoped that data from these questionnaires would enrich the qualitative data analysis.

Procedure. The first language cloze task was the first test administered in the first week of the fall semester. Since English language classes were on Saturdays and Wednesdays, Cloze L1 was administered on the first Saturday. On the following Wednesday Cloze L2 was administered. Finally, the last individually written task, general reading (CGTO), was conducted on the second Saturday. The remaining three tasks (VAT1, VAT2, CCTO) were conducted by appointment. The following is a summary of order of presentation of tasks: C1TO, C2TO, CGTO, VAT1, VAT2, CCTO and think-aloud protocols, and finally the sociocultural questionnaire was completed by students in their English class. Total period of data collection lasted for approximately six weeks.

Data Analysis: Phase I

Objective. The experiment for the present research attempted to investigate search strategies for two groups of Iranian students (thirty two Freshmen, thirty one Seniors) by analyzing results of their scanning of Farsi/Arabic letters, and Roman letters. The purpose of this part of the study was to explore L1 and L2 orthographic strategies in decoding letter strings in the visual array task (VAT), and to answer the following question: *What is the relationship between first language and second/foreign language letter recognition strategies?* Due to the important role orthographic automatization skills have in reading in both L1 and L2 (Adams, 1990; Eskey, 1988), it was important to investigate the relationship between L1 and L2 letter recognition strategies of both groups to see if level of orthographic automaticity and quality of search patterns differed for Freshmen and Seniors, as well as between different writing systems. Results of the latter visual search study were also used in phase II of the research to explore possible relationships with reading ability in both Farsi and English languages.

Materials. For the visual search task which was described previously in 'Description of variables', a computer program was written with the use of the Dbase language (version 2.1 FOXPRO). The target letters, string of letters, response time (RT) results, and scores for correct answers were each stored in individual Dbase files. The program was written in such a way that it was able to produce individual print outs of

finished jobs immediately upon students' task completion. Furthermore, the array of letters were displayed on a color monitor with a red background in white print. The letter arrays were selected in random order and in five blocks of fifty arrays. Each array constituted a total of 250 arrays for each writing system. Figure 4 shows individual Farsi letters and combination of arrays made for each of five letters designated at the top of each column.

Figure 4

Farsi letter strings

ا ب ط ک ج خ س د ک ز ر غ ث ی ح	ش ل م ت ض	ن پ و د ع		
ا ب ط ک ج	فخینش	پمنشو	ز خا ند	فخینش
ط ک و ر	تضاحلد	ط خا ضنج	ط س د ک ز	فخینش
ک س د ی ح	مستیفز	همد شب	س ج ل م و	ک ل ی ح
شد ب ف ط	و ش ل م ت	ب ی د ه ی ح	ح ز ک د س	ح ر ن ف ت
و ش ن گ ر	ف و ت ر ی	ن ی و د ع	د ک م خ م	ش ج ر م و
ج ا ی ط ل	ز ن و ر م	م ی ل و د	ک ر ا ی د	و ز ک ک ج
پ ج ل ا ی	ش ر پ د ل	د ب ش م ت	ی ک خ ب و	ی م ت ر ث
ب ک ا ی ن	و م ش د ی	م و ی ا م	م ن ر م خ	ر ف ش ی ح
ی ط ک ب ا	ل و ف ش ز	و ت ا ح ن	ا د س ز ش	ک ح ی ن پ
ر ز س ج ب	ش ل م ت ی	ا ن ی ط ح	د م ز س گ	ع ل و ف ر

In the same way Figure 5 shows individual Roman upper-case letters and combination of arrays made for each of five letters designated at the top of each column.

Figure 5
Roman letter strings

P H I A J					U T M E B L K D R S Q F N O Z V G Y W C				
JAIHP	UPEHB	ZKOUR	NFYOV	GCEWH					
HBANT	BEMTU	DOLSC	RAQNP	BYVTG					
IZOJF	ZBVAT	KLRIC	ZQMAN	WTGMC					
EPOID	WTVCM	VDMIS	STZRA	VLMYW					
YJSAC	YROES	SRBKL	QNFLO	SVPHO					
CHJWA	FMUBE	NOSLY	FWDQL	ROCVY					
PIVEH	EUTDL	RTADK	SOGFZ	MURPA					
RGQPI	RFQYZ	LEDAM	CVNEQ	YGSCV					
MZPNF	TQBMC	AIKRE	HJOZF	SRWAJ					
ARHSJ	MODUV	USOTD	OZHYV	CWYGR					

Learners were asked to come in groups of two to the computer facility center. Each learner worked with an IBM compatible S computer which was attached to a printer and had a practice trial of approximately 10 minutes before the experiment began. The learners were told that they would practice with two letters and with the option to repeat the

practice trials. The instructions appeared on the screen in Farsi: " this is a practice trial, press the 'enter' key whenever you are ready to start." Learners used their preferred hand and pressed the yes (Y-key) or no (N-key) button with their index finger. They were also encouraged to respond as rapidly as possible keeping in mind that they should make as few errors as possible, if any.

When practice trials were over, learners were asked to type in their first and family names. The researcher and computer engineer assisting with this experiment assigned a separate code number for each participant and recorded it with the person's name on a separate sheet of paper. This record was later used in the stored Dbase files which were listed in numerical order. Furthermore, the mean response time for each subject at each position was computed for correct responses (number of errors were less than 4%). The latter means for each subject became the raw data for the analysis of variance.

In the experimental session, initially the learners viewed the target letter in a Farsi sentence that stated: "*the designated letter is H*". After a short pause (10 seconds), a string of five letters appeared. Immediately after viewing the string of letters, the learners responded 'yes' or 'no' depending on the presence or absence of the target letter. This procedure was repeated ten times for each letter. That is, the target letter was present in the string on a randomly selected half of the trials, (10 trials in all for each target letter). For example, if the target letter was K, it appeared five times in position 1, 2, 3, 4, or 5; and

five times it was absent (position 1: K P T O S; position 2: P K M H Q; position 3: L B K C F; position 4: A Y R K Q; position 5: E W L O K). First position in Farsi is right-left direction observed in reading the language. First position in Roman letters is left-right direction observed in reading English text. After ten trials of one letter was over, the screen was cleared and a new sentence appeared: *"the letter is changing, press enter when you are ready."* The average time spent on this task was 35 minutes for each learner.

When this task was introduced to each learner separately, approximately forty percent of the two groups (especially Freshmen) were uncomfortable with the quick touch of the key board and the form of some letters (u, v, w) on the computer monitor. However, since more practice time was allotted for less experienced learners, it was hoped that we were able to diminish the influence of instrument bias.

Statistical analyses which are presented in the next section are divided into two parts; (a) results from response time data (visual search task), and (b) results from correct responses for each of the five positions. The correct mean response for each position was calculated by dividing the summation of all students' correct responses to 25 letters in each position by the number of students. The latter score was then computed into composite scores and included as independent variables (VAT1 and VAT2) in the second analysis of data (Phase II).

Analysis (a) : Response Time

In this phase of the analysis of data, two groups of students (Freshmen and Seniors) were compared for correct mean response time when responding to strings of letters in their first language script, Farsi, and in their second language script, Roman. Descriptive statistics for correct mean response time (RT) in milliseconds for each letter in five positions (position 1, 2, 3, 4, 5) is presented in Table 1.

Table 1
Descriptive statistics for correct mean response time

Position	1	2	3	4	5
Farsi RT					
Freshmen	839	956	854	968	894
Seniors	809	858	799	904	854
Total	824	907	826	936	874
Roman RT					
Freshmen	912	941	857	955	921
Seniors	856	856	783	893	842
Total	884	898	820	924	881

Because this table is describing time, the smaller values represent faster response time. Therefore, when reading Farsi letters, Freshmen showed a tendency to first see position 1 (which is the right side of the word and confirms right-left direction), then moved to position 3, then 5 (in Farsi the left most letter appears in its final form and signals end of word), then position 2 and finally position 4. Thus the pattern they formed was 1, 3, 5, 2, 4. Similarly, when Freshmen responded to letter strings in Roman script, they followed the same pattern except for the first two positions. That is, they first saw the center of the string, then went to the left (position 1), the right (position 5), and finally positions 2 and 4 were seen. In this case, the prominent pattern is 3, 1, 5, 2, 4.

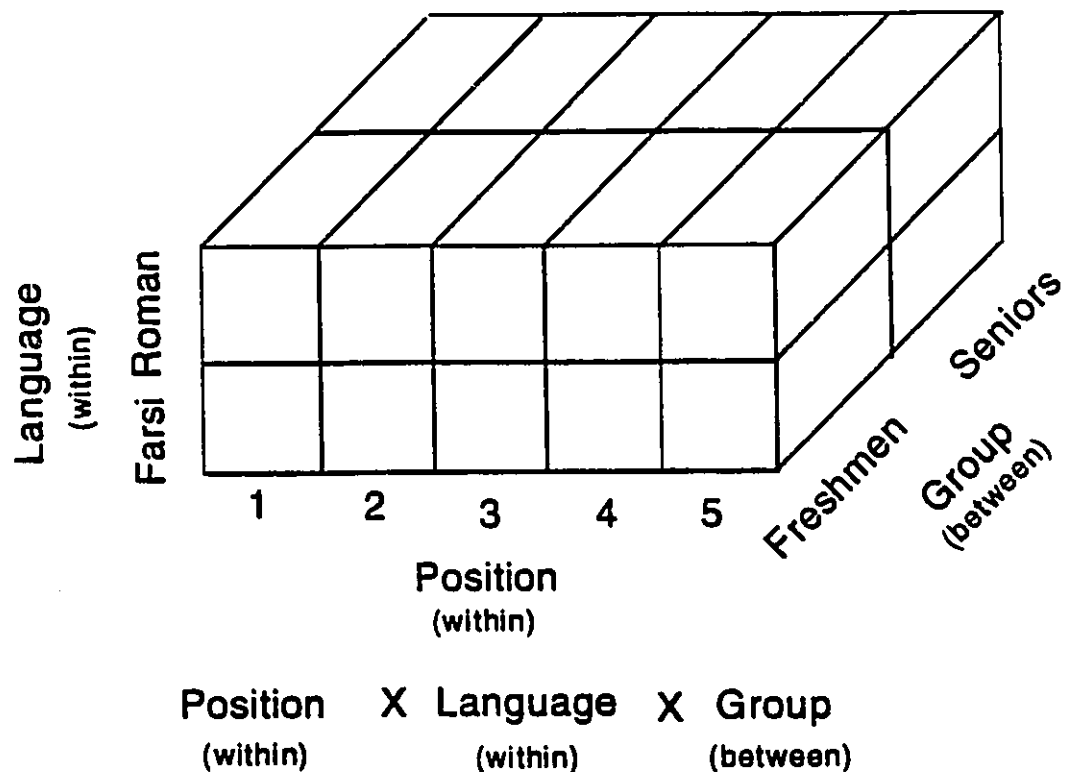
When Seniors responded to Farsi letter strings, they initially focused on the middle of the string, then went to the beginning of the string (position 1) and finally moved to the last letter (position 5) forming a 3, 1, 5, 2, 4 pattern. When Seniors responded to Roman letters they showed a 3, 5 (1, 2) 4 pattern. This shows that they responded most quickly to the center of the string (position 3), then moved to the right (position 5), and then to positions 1 and 2. Finally position 4 represents the position that received the slowest response time.

In order to understand whether learners developed separate perceptual strategies as they attempted to use their search strategies with different writing systems, it was necessary to adopt another statistical technique. Thus, a three-way analysis of variance (ANOVA)

was computed to evaluate learners' visual search strategies. The statistical model was a 2 X 2 X 5 mixed design with repeated measures on two factors. Furthermore, there was one between-subject and two within-subject factors. The between-subject variable had two levels corresponding to the two groups, Freshmen and Seniors. The within-subject factors represented the language variable with two levels, Farsi and Roman script; and the array position variable with five levels, position 1, 2, 3, 4, and 5 (see Figure 6).

Figure 6

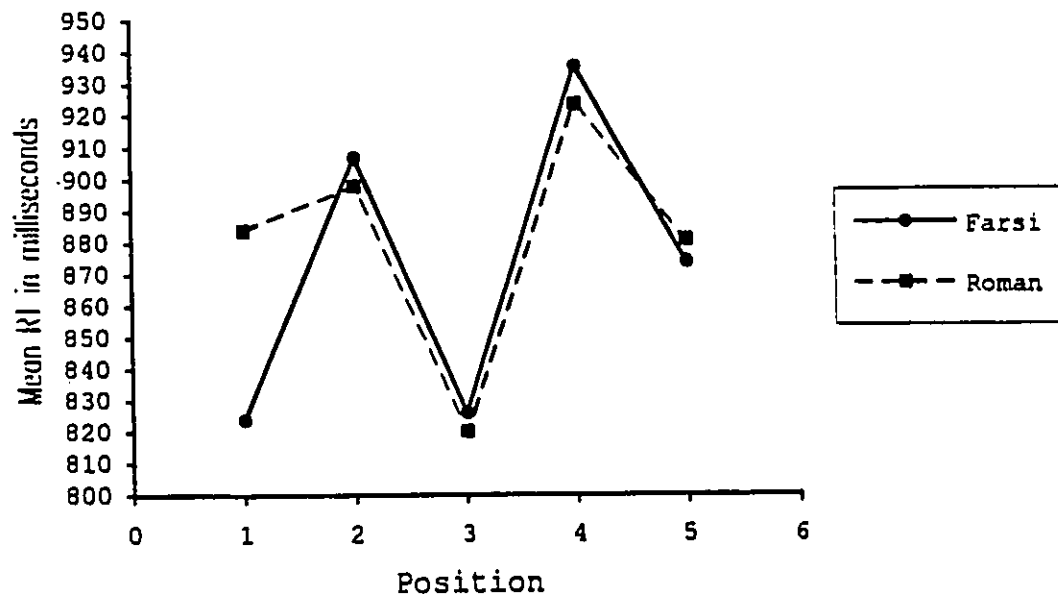
Research design



Results showed that collapsing over language and position, there was no main effect of group. In the same way, averaging over group and position there was no main effect of language. However, averaging over language and group there was a main effect of position: $F(4,244)=23.70$, $p<0.001$. Because this was a within-subject factor, a trend analysis was conducted and the 4th order polynomial (the quartic trend) was statistically significant: $F(1,61)=108.27$, $p<0.001$. However, this main effect was difficult to interpret due to a two-way interaction of language by position (trend): $F(4,244)=3.13$, $p<0.05$. To interpret this interaction refer to Figure 7 wherein it is clear that there is a distinct 'M' (quartic) trend for Farsi and less so for Roman; due to a difference at position 1.

Figure 7

Language x position interaction for mean response time (RT) in msec



All other two-way interactions (language X group, and group X position), as well as the three-way interaction of language X group X position, were not statistically significant.

Analysis (b) : Correct Response

In this phase of the analysis of data, correct number of responses were examined between the two groups. Table 2 lists descriptive statistics for number of correct responses calculated out of a maximum score of 25 for each position 1,2,3,4,5 and for both language scripts.

Table 2
Descriptive Statistics for number of Correct Responses (max. = 25) in five array positions

Position	1	2	3	4	5
Farsi RT					
Freshmen	20.33	22.03	20.60	21.42	20.06
Seniors	20.90	21.93	20.80	21.07	20.33
Total	20.63	21.98	20.70	21.25	20.19
Roman RT					
Freshmen	23.06	21.82	21.67	22.97	22.94
Seniors	23.50	22.53	21.60	23.40	22.93
Total	23.27	22.15	21.63	23.17	22.93

High correct responses are shown in Table 2 by higher scores. Results showed that for both Freshmen and Seniors, number of correct responses for Farsi were higher in position 2 than for position 1,3 and 5. Furthermore, the value for number of correct responses were almost equal in positions 1,3, and 5.

Freshmen and Seniors showed less similar patterns for Roman correct responses. That is, for Freshmen, correct response was highest in position 1 and lowest in positions 2 and 3. Whereas for Seniors correct response was highest in positions 1 and 4 and lowest in position 3.

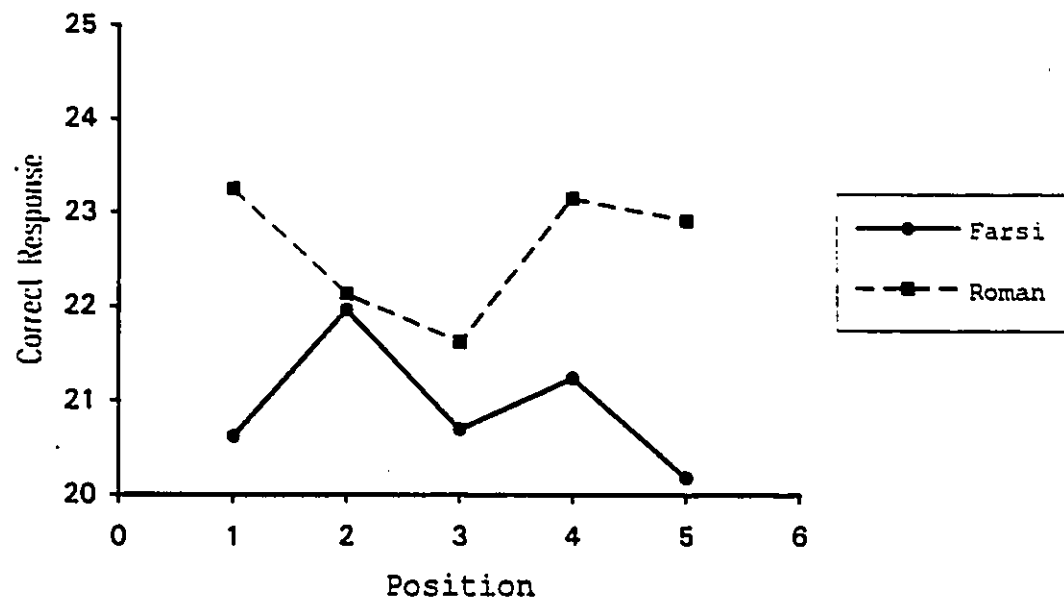
The next step in the method of analysis for number of correct responses was to explore differences between Freshmen and Seniors' performance on Farsi and Roman visual array tasks. Thus, the same statistical procedures as in analysis 'a' were used for number of correct responses. That is, a three-way ANOVA (2 groups of students X 2 levels of language scripts X 5 levels of array position) was performed.

Results showed that collapsing over language and position, there was no main effect of group. However, averaging over group and position there was a main effect of language: $F(1,61)=95.76$, $p<0.001$; and averaging over language and group there was a main effect of position: $F(4,244)=8.37$, $p<0.001$. However, there was a two-way

interaction of language by position (trend): $F(4,244)=15.69$, $p<0.001$ which makes interpretation of the main effects difficult. To interpret this interaction refer to Figure 8 wherein one finds an interaction in positions 1 and 5 (because we are looking at number of correct responses, the pattern is not important).

Figure 8

Language x position interaction for number of correct responses



All other two-way interactions (language X group, and position X group), as well as the three-way interaction of language X group X position were not statistically significant.

Summary: Phase I of the data analysis was related to Freshmen and Seniors' scanning Farsi and Roman letter strings and it was reported in two sections: Response Time (analysis a), and Correct Response (analysis b).

Results from analysis (a), showed that there was no significant difference between Freshmen and Seniors' response time when scanning Farsi and Roman letters. Then when both groups were collapsed , there was no significant difference between Farsi and Roman response time. That is, with the exception of position 1, both groups' response time was similar at all other positions. Results of the ANOVA show that when responding to Farsi and Roman letters, students formed a prominent M-shaped pattern that is similar to what previous research has shown for native English speakers scanning Roman letters.

Results from analysis (b) showed that when Freshmen and Seniors were collapsed, there was a significant difference between correct responses for Farsi and Roman letters. That is, students showed more correct responses for Roman letters than for Farsi.

Data analysis: Phase II

Objective. In the second section of the quantitative study an attempt was made to investigate the relationship among cognitive and linguistic variables and foreign language learners' ability to comprehend text written in the foreign language (English). The independent variables (listed in the previous section) included reading in L1 (first language cloze, C1TO), second language proficiency (second language cloze, C2TO), visual search strategy in L1 (VAT1), and visual search strategy in L2 (VAT2). The dependent variable was reading in L2 which was comprised of a general text (CGTO) and a chemistry text (CCTO). Previous research (Barnitz, 1985; Johnson, 1982, 1981; Steffenson et al., 1979) has tended to overemphasize the importance of conceptual levels of reading and neglect the lower levels of perceptual processes. Even though it seems to be a difficult task to decipher the true nature of the role of each level of reading, it is necessary to continue the search and make discoveries little by little.

Research Questions

I. What is the role of first language literacy in reading in a second/foreign (ESL/EFL) language?

- 1. Is there a difference in first language reading between Freshmen and Seniors?**
- 2. Is there a relationship between Freshmen reading in the first language (C1TO) and reading in the second/foreign language (CCTO)?**
- 3. Is there a relationship between Senior reading in the first language (C1TO) and reading in the second/foreign language (CCTO)?**

II. What is the role of second language proficiency in ESL/EFL reading?

- 1. Is there a difference between Freshmen and Seniors' second language proficiency (C2TO)?**
- 2. Is there a relationship between Freshmen second language proficiency (C2TO) and reading in a second language (CCTO)?**
- 3. Is there a relationship between Senior second language proficiency (C2TO) and reading in a second language (CCTO)?**

III. What is the role of perceptual strategies in ESL/EFL reading?

- 1. Is there a relationship between Freshmen second language proficiency (C2TO) and visual search strategy (VAT2)?**
- 2. Is there a relationship between Senior second language proficiency (C2TO) and visual search strategy (VAT2)?**
- 3. Is there a relationship between Freshmen visual search strategy (VAT2) and reading in a second language (CCTO)?**
- 4. Is there a relationship between Senior visual search strategy (VAT2) and reading in a second language (CCTO)?**

Descriptive Statistics

The same group of students participated in all parts of this study (both qualitative and quantitative sections). However, even though the total number of participants in the previous sections were 63, for reasons which will be explained, they were reduced to 57 in the following sections. Initially 80 students volunteered to participate in all tasks related to the research. They were told that total completion of tasks could take up to parts of three days in their time-table. After reading tasks in Farsi (C1TO) and English (C2TO) were administered, the number of students dropped to 63. Later five more students had to be dropped because their scores were extreme outliers in the statistical results (either very slow or very fast). For example, one student had attended an English speaking elementary school, and another had lived in an English speaking country for approximately three years.

The first step in the analysis of data was to conduct test of normality for each task and for each group (Freshmen and Seniors). This procedure, run through the SAS computer program, produces a test statistic for the null hypothesis that the input data values are a random sample from a normal distribution. Because the sample sizes for each group were less than fifty-one, the Shapiro-Wilk statistic (W) was computed. W must be greater than zero and less than or equal to one, with small values of W leading to rejection of the null hypothesis (Norusis, 1988) (see Table 3).

Table 3

Results representing Test of Normality

Tasks	N	Mean	STD	Max. Score	Pr < W
C1TO					
Freshmen	29	254.0	19.0	280.0	0.007
Seniors	28	254.0	26.0	280.0	0.001
C2TO					
Freshmen	29	79.0	26.0	280.0	0.190
Seniors	28	108.0	37.0	280.0	0.110
CCTO					
Freshmen	29	20.0	8.19	30.0	0.001
Seniors	28	22.7	6.30	30.0	0.010
CGTO					
Freshmen	29	6.0	2.4	15.0	0.280
Seniors	28	6.4	2.6	15.0	0.030
VAT1					
Freshmen	29	112.0	7.1	125.0	0.030
Seniors	28	114.0	8.1	125.0	0.020
VAT2					
Freshmen	29	104.0	7.1	125.0	0.010
Seniors	28	105.0	7.3	125.0	0.060

Results showed that Freshmen met the conditions for the test of normality on tasks in C2TO second language proficiency ($Pr < W = 0.19$), and CGTO general reading in L2 ($Pr < W = 0.28$). In the case of the visual array tasks in Farsi and Roman letters (VAT1 and VAT2), they met the conditions at very low levels: $Pr < W = 0.03$; $Pr < W = 0.01$ respectively. Freshmen did not resemble a normal distribution of values on the chemistry reading in a second language task (CCTO) $Pr < W = 0.001$ or the C1TO reading in Farsi task, perhaps because of one outlier ($Pr < W = 0.007$). In the same way, Seniors met the normality conditions for C2TO ($Pr < W = 0.11$) and barely for CGTO ($Pr < W = 0.03$), VAT1 ($Pr < W = 0.02$), and VAT2 ($Pr < W = 0.06$). Again similar to Freshmen, Seniors did not meet the normality conditions in C1TO ($Pr < W = 0.001$). The first language reading task appeared to be too easy for the students.

In the next step of data analysis, descriptive statistics were computed for all independent and dependent variables (Table 4). Results showed that Freshmen and Seniors both performed equally well on the first language reading task (C1TO, mean=254). For the second language proficiency task (C2TO), even though Seniors (mean=106) appeared to have performed better than Freshmen (mean=80.5), both group means were at a point considerably lower than the maximum score (280). In the general reading text in L2

(CGTO) responses were given to multiple choice questions. The mean score for both groups was 6 and 6.4 and the highest score was 11 out of a maximum of 15.

When reading the chemistry text in L2 (CCTO), Seniors showed higher scores, especially if we account for their minimum score of 15 versus 6 for Freshmen and the mode ranging from between 29, 27, and 19 for Seniors versus 6 for Freshmen.

It must be noted that the VAT variables were related to visual array tasks and represented correct response scores for all positions put together. That is, for ease of computation, a composite score of means for five positions in both languages was computed and divided by five to represent the VAT1 and VAT2 variables for both Freshmen and Seniors.

Descriptive results from these variables showed a similar pattern for Freshmen and Seniors in their responses to Farsi and Roman letter strings (see Table 4).

Table 4

**Means, modes, and standard deviations for Freshmen (29) and Seniors (28) on
C1TO, C2TO, CCTO, CGTO, VAT1, VAT2**

Task	Mean	Mode	STD	Min. Score	Max. Score	Total
C1TO						
Freshmen	254	259	19	190	280	280
Seniors	254	273	26	154	280	280
C2TO						
Freshmen	80.5	65	26	33	130	280
Seniors	106.0	97/82	37	43	182	280
CCTO						
Freshmen	20	6	8.0	6	30	30
Seniors	23	29/27/19	6.3	15	30	30
CGTO						
Freshmen	6.0	4.0	2.4	2	11	15
Seniors	6.4	2.6	2.6	2	11	15
VAT1						
Freshmen	22	22	2.0	18	24	25
Seniors	23	24	2.4	18	25	25
VAT2						
Freshmen	21	22	2	17	22	25
Seniors	21	22	2	18	23	25

Correlations among reading variables

In order to determine the degree of relationship among different variables used in this study, correlation coefficients were calculated for all possible relationships between scores on reading in L1 (C1TO), L2 proficiency (C2TO), reading in L2 (CGTO), reading in L2 (CCTO), search strategy in L1 (VAT1), and search strategy in L2 (VAT2). Table 5 presents the Pearson Correlation Coefficient Matrix for Freshmen and Senior groups. The correlation matrix indicates that for Freshmen there was a significant relationship between the following variables: reading scores in Farsi (C1TO) and scores in second language proficiency (C2TO) $r=0.45$; reading scores in Farsi (C1TO) and number of correct responses on the visual array task in Farsi (VAT1) $r=0.54$; reading scores in Farsi (C1TO) and number of correct responses on the visual array task in L2 (VAT2) $r=0.57$; scores in second language proficiency (C2TO) and number of correct responses on the visual array task in L1 (VAT1) $r=0.45$; and scores in second language proficiency (C2TO) and number of correct responses on the visual array task in L2 (VAT2) $r=0.47$.

For Seniors a significant correlation coefficient was shown between the following scores: scores in reading chemistry text in L2 (CCTO) and scores in L2 proficiency (C2TO) $r=0.67$; scores in reading chemistry text in L2 (CCTO) and scores in reading general text in L2 (CGTO) $r=0.52$; scores in reading general text in L2 (CGTO) and number of correct responses on the visual array task in L1 (VAT1) $r=0.46$; scores in reading a general text in L2 (CGTO) and number of correct responses on the visual array task in L2 (VAT2) $r=0.56$.

Table 5

Pearson Correlation Coefficients for Freshmen and Seniors¹

Variable	1	2	3	4	5	6
Reading in L1 (C1TO)		.45*	.22	-.08	.54*	.57**
Proficiency in L2 (C2TO)	.36		.35	.22	.45*	.47**
Reading in L2 (CCTO)	.37	.67**		.24	-.08	.22
Reading in L2 (CGTO)	.24	.38	.52*		.01	.01
Search Strat L1 (VAT1)	.05	.03	.24	.46*		.66**
Search Strat L2 (VAT2)	.41	.25	.39	.56**	.43	

1 The coefficients above the diagonal are for Freshmen (N=29) and those below the diagonal are for Seniors (N=28)

*** Significantly different from zero at $\alpha = 0.05$**

**** Significantly different from zero at $\alpha = 0.01$**

Multiple Regression

After the preliminary step of conducting correlations to see which reading variables are related, a multiple regression analysis using forward (stepwise) inclusion was computed to estimate whether reading chemistry text in L2 (CCTO) may be associated with other measures of reading C1TO (Cloze L1), C2TO (Cloze L2), CGTO (general comprehension text), VAT1 (number of correct responses on visual array task in L1), and VAT2 (number of correct responses on visual array task in L2).

For purposes of this study, the first multiple regression analysis was conducted for all 57 students (Freshmen and Seniors put together) to see what variables show importance in the equation. The dependent variable was reading chemistry text in L2 (CCTO) and the independent variables entered into the equation were reading in L1 (C1TO), L2 proficiency (C2TO), reading general text in L2 (CGTO), search strategy in L1 (VAT1), and search strategy in L2 (VAT2). Results showed that overall regression effect was significant $F(5,51)=4.45, p<0.001$. Moreover, one variable, second language proficiency (C2TO), was a significant predictor of reading in English (CCTO): $F(1,55)=18.59, p<0.0001$. Next, two separate regression analyses were conducted for each group (Freshmen and Seniors). The forward (stepwise) method was used. With Freshmen's reading scores in L2 (CCTO) as the dependent variable, the overall regression effect was not significant: $F(5,23)=0.96, p<0.45$. However, for Seniors the overall regression effect was significant: $F(5,22)=5.69, p<0.0001$. Two independent variables were significant: L2 proficiency $F(1,26)=21.88, p<0.0001$; and reading general text in L2 $F(2,25)=14.84, p<0.0001$.

Analysis of Variance

One way analyses of variance comparing Freshmen and Senior groups were conducted on groups' reading in L1 (C1TO), L2 proficiency (C2TO), general reading in L2 (CGTO), reading chemistry in L2 (CCTO), visual search strategy in L1 (VAT1), and visual search strategy in L2 (VAT2). Analysis of variance tests the hypothesis that the group means of the dependent variable are equal (Norusis, 1988). Results showed that only L2 proficiency (C2TO) was responsible for a significant mean difference between the two groups $F(1,55)=11.94, p<0.001$ (cf. Table 5).

Summary: Phase II of the data analysis was related to the role of first language literacy, second language proficiency, and first and second language perceptual strategies. Multiple regression results showed that for Seniors second language proficiency had a significant relationship with second language reading of the chemistry text. However, for Freshmen correlation coefficients showed that scores in L1 literacy had a significant relationship with scores in L2 proficiency, and L1 and L2 visual search tasks. Moreover, scores on L2 proficiency had a significant relationship with scores on visual search tasks in L1 and L2. For Seniors, correlation coefficients were significant between scores in reading in English and scores in second language proficiency.

DISCUSSION

Results of this research seem to suggest that one way to understand the very complex act of reading is to adopt a multidimensional perspective (Barnitz, 1985; Bernhardt, 1991). Moreover, a combination of quantitative and qualitative research methodology has shown to be an asset in understanding reading in a second/foreign language (Cavalcanti, 1987; Hosenfeld, 1979; 1984; Rankin, 1988). This section consists of three major areas of discussion related to results in the previous section. The first part, which focuses on first language literacy and reading, focuses on major issues in reading research which view reading as a universal process as opposed to a language specific process.

The second major part of the discussion focuses on learners' ability in the second/foreign language, and in particular it looks at the relationship between first and second language proficiency and how it may relate to reading in a second language.

The third or final part reviews the role of reading and writing systems in the present study. It examines the ability to read and comprehend in a second/foreign language in relation to second language writing systems.

First language Literacy/Reading

In the present study, Freshmen and Seniors performed at a high level of proficiency for reading in Farsi when the end product of the text was of importance. Research on reading has placed great importance on first language literacy in second language reading, and those readers who come into a second language reading situation have been known to benefit from their first language literacy knowledge (Alderson, 1984; Auerbach, 1993; Carrell, 1991; Carrell & Eisterhold, 1983; Coady, 1979). This may be due to some researchers' view, for example Coady (1979), who looks at reading as a universal act. Coady has posited the 'universal hypothesis' that all reading is the same no matter what language you are reading. That is, the process of creating meaning from written material is universal. In this case then it seems to suggest that L2 reading may be predicted from L1 reading, and thus L2 reading would benefit from a transfer of L1 strategies when L2 readers are literate in L1 (Alderson, 1984).

In the present study the analysis of variance shows no significant difference between the groups in their performance in L1 reading; Freshmen and Seniors were both highly literate L1 readers (C1TO, first language Cloze). However, because our source of L1 reading performance is the product-oriented cloze task (C1TO), it is difficult to decipher what strategies readers used to choose a particular word to fill in the blanks. A better

understanding of the educational system and L1 reading instruction is needed to speculate about strategies students use as they attempt to make sense of text.

Results from think-aloud protocols were interesting because students first looked at the Roman print, received the message, and then transformed it into their L1, Farsi. It is only at this stage that they began to make sense and reveal their L1 reading strategies. An analysis of reading strategies described in chapter III suggests use of L2 word-decoding strategies which are portrayed in less successful readers described in first and second language reading research (Elley, 1984; Harri-Augstein and Thomas, 1984). In the Fiji Islands, Elley (1984) found that when children were studying in their L1, they were exposed to only lower levels of reading strategies which involved decoding words and using reading as a mechanical task. Since readers in the present study also came from an educational background where second/foreign language was taught with a major focus on language structure and translation, readers may have become isolated from the cultural context of meaning and use of language. As a result of the latter instructional methods, readers usually seemed to be faced with a break-down in comprehension of English text.

Furthermore, results seem to show that similar to Cazden's observations (1986) where inefficient readers in reading activities attempt to create meaning for words without any meaningful context, readers in this study first attempt to gain an understanding of the "complex whole" by fractionating the tasks into "component parts". According to Cazden

(1986) no matter how well students practice the tedious skill in breaking down the complex task of reading into component parts, they can never recapture the "whole". Results from the qualitative study clearly show how almost all students tediously attempted to fulfill the "reductionist" style of reading as they read the chemistry text. The presence of efficient reading strategies in the L1 cannot be clearly gathered from students' high performance in the cloze task. It is suggested that since all students chose their L1 in the think-aloud protocols, they were, in fact, demonstrating their L1 reading strategies as well. Therefore, it may be concluded that in Farsi, one of the most important reading strategies used by even highly literate readers, is decoding at all levels of reading. Furthermore, the complex nature of the Farsi language at its visual levels of reading where readers need to be prepared to add necessary endings or provide unmarked short vowels may make the readers more cautious than necessary for English language reading which does not necessarily require a sophisticated decoding mechanism.

In order to be able to accept or reject the universal hypothesis, it is necessary to investigate L1 reading strategies in more detail. However, since the latter is beyond the scope of this study, a different attempt is made to first see if L2 proficiency is an important factor in reading in L2, and second to question if visual strategies used for different writing systems vary among languages.

Second Language Reading

Alderson (1984), posed a question which asks if reading is a language problem or a reading problem. In the above section an attempt was made to discuss the importance of first language literacy knowledge, and show how it may or may not transfer to L2 reading. In this section, an argument for the first part of Alderson's question will be presented to examine whether results in this study support the assumption that reading may be a "language problem".

The only variable which showed a significant difference between Freshmen and Seniors was L2 proficiency (C2TO). Since the L1 educational system of our learners was based on drawing from memorized technical information, then it was expected that the reader's conceptual level of reading which required more interpretation would be lost and not transferred because it was obstructed by reader's overreliance on lower level reading processes (Carrell, 1988). For students in this study, the purpose of reading in L1 and L2 seemed to be to store a large amount of information for the purpose of responding to mechanical questions. Therefore, the type of strategies transferred from L1 was expected to be the memorization of technical facts and a strategy in which the unfamiliar would be skipped to the end, so that with the help of questions the readers assigned meaning to text (Bernhardt, 1991).

The readers in this study did not get overly involved with reading (data from qualitative results). That is, the reading patterns discussed earlier in chapter III are indicative of the learners' strong reliance on what first language English research refer to as lower level decoding strategies. For example the second language cloze task (C2TO) which was poorly completed by Freshmen, may have been approached as a mechanical decoding task as well. This may be explained by the correlation coefficient which showed a significant relationship, for Freshmen only, between scores on L2 cloze (C2TO), and scores in visual array tasks in L1 and L2. However, a highly significant correlation coefficient is observed for Seniors between L2 proficiency (C2TO) and scores on reading in L2 (CCTO). This high correlation for Seniors demonstrated their productivity at perhaps higher levels of reading which deals with inferencing and comprehension.

A look at the relationship between reading in L2 using the general text (CGTO) and with the chemistry text (CCTO), shows the existence of a similar discrepancy among Freshmen and Seniors. The scores on these two variables correlated significantly for Seniors but not for Freshmen. As mentioned above, it is expected that Seniors were more efficient than Freshmen in their use of higher level reading strategies (also refer to Figure 1, Chapter III).

A similar argument may be made to explain the fact that for Freshmen there was no correlation among scores on reading in L2 (CGTO) and scores in visual array tasks in L1 and L2 (VAT1 and VAT2) but there was a high correlation between these variables for Seniors. Since the reading task was based on multiple-choice questions, Seniors may have used guessing strategies as they would do in the visual array task. Moreover, the highest significant correlation coefficient for Seniors was at the conceptual levels of reading between linguistic knowledge and comprehension in the second language. Even though results from the quantitative study showed a significant relationship between L2 reading comprehension and L2 reading proficiency, the Senior group still showed a considerably low achievement in the L2 proficiency task (C2TO). Perhaps this is suggestive of the fact that providing background knowledge in chemistry in the reading comprehension task (CCTO) allowed them to use top-down reading strategies. In this way it is assumed that Seniors were able to compensate for lack of language knowledge (Carrell & Eisterhold, 1988). In the case of Freshmen, it seems as though level of second language proficiency was below the threshold level, in a way that background knowledge could not be utilized successfully.

Initially when this study was conducted, it was assumed that Freshmen and Seniors would both benefit from the familiar chemistry topic in the second language reading task (CCTO). Results of this study, in the case of Freshmen, have shown that a certain language proficiency threshold level exists before a reader is able to extract a minimum amount of

meaning from a text (Alderson, 1984). However, it is difficult to define the characteristics of the level of language proficiency required to fit the required threshold level. The Freshmen in this study have shown that six years of schooling with two hours a week of English instruction has not been adequate to prepare for this level of language ability. This is where I want to propose that when terms such as 'language problem' or 'reading problem', are discussed, we are distinguishing the exact two things we should not be separating in the first place. Linguistic knowledge and reading ability are intertwined and cannot be separated. It seems to be an interaction between the two that contributes to a successful act of reading. When our readers are highly literate in their L1, it is expected that they have experience with reading, text, and print. It seems that one may assume that Freshmen failure in the second language task (C2TO) and their struggle to read chemistry text have been influenced by the separation of language and reading in the six years of L2 instruction in secondary schools.

In the following section, another variable related to language proficiency, the basic recognition of letters and search patterns, will be presented to support the importance of keeping linguistic knowledge and reading knowledge in one piece.

Visual Search Strategy

A close examination of results related to visual search strategies for Freshmen and Seniors' mean response time to Farsi and Roman letter strings suggest that there was no difference between the two groups. This may imply that more experience with the language was not an asset in gaining faster or different letter recognition skills. Seniors had been exposed to university text books in English and had also experienced reading and writing English laboratory reports.

Results from mean response time also suggest transfer of L1 visual search strategy to L2 (Randall, 1991; Randall and Meara, 1988). However, unlike previous experiments conducted with Arab students in Britain (*ibid*), Iranian students revealed M-shaped patterns (cf. Figure 7) when responding to arrays in five positions in both Farsi and Roman letters. According to previous research (Green et al., 1983; Mason and Katz, 1976), the 'flying M' shaped pattern was strongly suggested for first language English speakers. The appearance of a similar M-shaped plot in the present research is interesting. In this study, students viewed Farsi letters in connected strings of five letters (in the cursive mode as opposed to print) and not separate characters as in Randall and Meara's (1988) study. It is possible that the new appearance of the letter string, demanded a different search strategy from the previous U-shaped pattern found in other research.

Based on mean response time in this study and those found in Randall and Meara's (1988), it seems questionable why Arab students did not respond to Roman letters in the same M-shaped plot as Iranian students. That is, in previous research (ibid) Arab students produced U-shaped plots when searching Arabic and Roman letters. This may have been due to an interference of testing the Arabic characters first. On the other hand, reading and letter recognition may be different between the languages because even though both Farsi and Arabic have similar characters, they are very different languages.

Another assumption may be that the Arab students tested in Britain were attending a teacher training college, whereas the students in the present study were all science majors and had daily contact with formulae written in the Roman script almost every day. Future research is needed to look at different groups of Iranian students to gain a clearer understanding of visual search patterns in Farsi and Roman letters.

As mentioned above, it seems as though Farsi speakers, with the exception of one position, searched Roman letters in the same way English speakers do (M-shaped). The exception lies in the center position (3) where all students focused more attention when they first searched letters in both languages. This focus may be caused by the usual break found in the middle of most Farsi words. The break in this position diminishes some of the importance on what researchers refer to as 'end effects'. That is, positions 1 and 5 are the end effects which receive the next important attention. In Farsi and Arabic, the last letter of

a word designates end of word position (appears in the form of a capital letter); and the first letter, in the same way, appears as a smaller case letter shape which depends on the form of the second letter. Furthermore, because of the prominent end of word capital letter shape, spacing between words are not as prominent as English.

Since Iranian students showed a similar M-shaped pattern to English speakers, it may be possible to assume that even though the students were at different levels of English proficiency, they recognized Roman letter strings in a very similar pattern to English speakers. Furthermore, we may be able to conclude that in contrast to what was assumed at the beginning of this research, the two groups of students had efficient letter recognition skills. In fact, not only were the two language search patterns similar, but all students gained higher scores when they responded to Roman letters. In turn the better performance with Roman letters may confirm the issue of complexity involved in the Farsi/Arabic languages. That is, it takes a longer time for students to recognize the redundant letters in Farsi which includes at least ten pairs of different letters. In English, the only letters students complained about were u, v, and w.

Another interesting outcome of results was the significant interaction of language and position for mean response time. That is, Figure 7 clearly shows how positions 2, 3, 4, and 5 overlap for both languages, whereas there is a prominent gap in position 1. This may confirm that right-left directionality in searching Farsi letters has been responsible for

reading Roman letters in the same way. The use of a left-right direction for reading Roman letters cannot be confirmed with the results from this study. Future research into the basic structure of the Farsi language is also needed to understand the level of its complexity and to see whether redundancy of letters do interfere with speed in letter recognition.

Perhaps in this study it was not possible to show a significant relationship between learners' visual search strategy in L2 (VAT2), and reading a chemistry text in L2 (CCTO). It is interesting that even though qualitative results showed evidence of learners' decoding strategies, the latter strategies were not related to orthographic decoding except in cases where syntactic decoding was used. However, what is apparent here finds support in Carrell's study (1988) where she reports successful reader strategies and decoding of words at a higher level of reasoning (prefix and suffix deconstruction) is not used by less successful readers. The latter was observed in the qualitative results in rare cases where learners attempted to guess meaning of words such as *agreement* and referred to its root and other syntactic forms: *agree*, *agreement*, *agreeable*. In fact, the few rare cases were reported by Freshmen who may have remembered their formal L2 grammar-translation instruction better than Seniors.

Since the visual array task was only meant to tap letter recognition efficiency, and results seem to show that both groups' performance was at an efficient level, perhaps some other variables were interfering with the act of reading at the visual level that seemed to

impede reading success. Again, qualitative research results showed how learners avoided the English phonological level of reading. That is, the constant translation, at times before pronouncing the English word, and lack of self confidence in reading and pronouncing words may have deprived the students of the rules of the phonological system which simultaneously work with the orthographic structure of English. That is, Iranian students have attempted not only to read English in Farsi, but also to pronounce English words by using their L1 reading rules. Therefore, since reading in Farsi requires that the reader pronounce every letter with a specific pronunciation, the students may have misunderstood the orthographic structure of the English language. This is why words like *construction* were read with each of the letters in *-tion* pronounced clearly .

What needs to be pursued in future research is the recognition of language specific orthographic constructions which may be an influential factor in the process of automatization and reading in L2.

CHAPTER V

CONCLUSION

"Learning to read is certainly a cognitive process; but it is also a very social activity, deeply embedded in interactions with teachers and peers." (Cazden, 1982, p. 414)

The main purpose of this study was to examine certain linguistic, cognitive, and socially related variables that contributed to learners' ability to comprehend English text. Results from the quantitative analysis of the data revealed that second/foreign language proficiency played a significant role in EFL/ESL reading. Moreover, findings showed that Freshmen and Seniors were different in their second language linguistic ability.

Results from the qualitative study also lend support to L2 group differences. That is, in contrast to Seniors, Freshmen appear to depend on word decoding strategies and use less contextual clues. Furthermore, research on orthographic characteristics of the Arabic alphabet which is similar to Farsi, has shown that both Arab and Farsi readers need to compensate for the unmarked forms of vowels (not written) by adopting a sophisticated memory system (Haynes, 1989; Randall & Meara, 1988; Haghighat, 1990). It is for this reason that the Arabic language is often referred to as a consonantal language. Even though a vowel sound does appear between two consonants, if it is a short vowel, it is not

written and the reader only sees a word constructed by a number of consonants. For example the word pepper is *Felfel* in Farsi but is written as *flfl*. On the other hand, Farsi readers must be very skilled in guessing meaning from context because the reader is responsible for placing appropriate grammatical endings for possessive nouns and words which do not carry it automatically. Thus in a language that requires highly skilled inferencing of not only meaning but also grammatical formations, readers may become experts in decoding language. This type of reading in L2 seems to impede the use of higher order processes which deal with conceptual levels of reasoning and interpretation (Barnitz, 1986).

Furthermore, the literacy education of children in Iranian schools is an example of separating language from reading and dealing with each level of reading as a component process (Cazden, 1982). That is, children are expected to master perfect recitation, memorize a large number of words and definitions (separated from context), and read for the purpose of transferring information rather than for creating meaning through reasoning and interpretive strategies. Therefore, it is not surprising that university students continue their schooled ways of reading with a strong overreliance on decoding skills. The effects of traditional teaching practices has also been studied with Fiji children. Elley (1984) reports a close connection between what is learned in the second language and what happens in the learning of the first language. Results of the Elley study show that Fiji children, who were failing more than expected in their reading in a second language course (English), seldom

had the opportunity to use successful reading strategies (Goodman, 1986; Smith, 1973) such as predicting and guessing from context in either language.

The first major finding in the present study was related to the role of first language literacy and reading in the second language. In his review of various frameworks developed for reading, Alderson (1984) insists on the fact that first language literacy is a necessary tool for successful second language reading. Moreover, according to Coady's (1976) universal hypothesis, one would have expected to see a transfer of first language reading strategies to reading in the second language. However, it appears that L1 reading strategies transferred at a very low level, or that reading strategies are language specific and in this case the strategies used in Farsi are different from those used in English. It is quite possible that what was previously explained about L1 early education and the learning of Farsi, which is very product oriented, has a major role in the way learners perceive a second language task. Similar to the study of the Fiji children, Iranian children follow one basic format for learning. Reading is a skill used for the extraction of 'important' information from text. It seems to be clear that more process-oriented research into the reading of Farsi is necessary for the possibility of making more valid conclusions about foreign language reading behaviour.

Another important issue, which is the case of most non-English speaking countries especially those with different writing systems, is the learners' rare contact with written

English material. The learners in these situations are limited to English exposure through one classroom text-book (usually 60 pages in Iran) and three hours of English language instruction which includes dictation, grammar, and reading comprehension exercises. Thus, the instructional methodology constitutes a mechanically skill oriented one in which the doctrine of one 'right' answer only is practiced and language learning means memorizing a set of mathematical formulae. This type of language learning practice may be an influencing factor in reading in a second language. As Grabe (1991) posits: "...the social context of students' uses of reading in their first language, and their access to texts, may have a profound effect on their abilities to develop academic reading skills in English." (p. 380)

The second finding in the study showed a significant relationship between Seniors' proficiency in the second language and reading a chemistry text in the second language. Results seem to support research which emphasize the importance of linguistic proficiency in L2 at the beginning levels of reading. For example, Devine (1987) points to the language threshold necessary for L2 reading ability that if not met may block the transfer of L1 comprehension processes to L2. Other results from the qualitative study reveal a more extensive use of chemistry background knowledge by the Seniors than the Freshmen. It appears that in situations where Freshmen fell below the language proficiency threshold level, background knowledge acquired in the first language hardly accounted for any success in the comprehension processes in L2. However, for some Seniors, academic

experience in university and background knowledge studied in English text books was an asset in comprehending second language text. This supports Bernhardt's results (1991) from a study in which she found that Spanish students' with varying degrees of background knowledge performed equally well on similar tasks. Thus, even though the presence of background knowledge in some contexts may influence the process of reading comprehension, its impact and influence may not always be predictable as easily as previous research have led us to believe (Barnitz, 1985; Steffenson et al., 1979). In other words since in some research good readers have been shown to appropriately adjust their reliance on background knowledge and the text without an over use of either one, an over emphasis on prior knowledge should not be stressed (Graves and Piche, 1989).

A third major finding in this study revealed the relative importance of orthographic knowledge in L2 reading. The visual search task and the think-aloud protocols in the reading comprehension text about chemistry help us speculate about the relevance of perceptual strategies. What is clear from the visual array tasks in L1 and L2 script is that both Freshmen and Senior groups use similar strategies in decoding letter strings in Farsi and Roman script. The results further reveal a prominent M-shaped pattern of mean response time in the five positions tested. This contradicts previous research (Randall & Meara, 1989; Randall, 1990) which reported U-shaped patterns produced by Arab students when they searched both Arabic and Roman script. Thus in this research it has been

possible to suggest the presence of a rather similar pattern (upward M-shape) to those established in research conducted with native speakers of English and the Roman script (Mason, 1980; Green, 1982). The latter studies all point to the importance of "end-effects" that relates to the sense of directionality (left to right in the English language). It is interesting that learners in this study produce "end-effects" for Farsi script only. In fact results on response time in Farsi script shows the same upward M-shaped pattern that has been observed with English native speakers responding to Roman script. It must be noted that one of the main differences between reading in Farsi and reading in English is related to reading direction. Results of the visual array task seem to suggest that while Iranian learners pay less attention to left-right direction when searching Roman letters, they show a prominent right-left direction when searching Farsi letters. The argument that needs some explanation here is related to Randall and Meara's (1989) study which used Arabic characters in the form of letter strings. Due to the orthographic structure of the Arabic and Farsi language, separate letters as in the case of print format (vs cursive) in English do not exist. Arabic and Farsi letter presentation, except for lessons on the alphabet of the language, are always in the form of cursive writing. In cases where abbreviations of words are used, the letters are connected to form a pseudoword. Thus, semantic ambiguity of a word is indicative of its abbreviated form.

What became clear from this study is that where Roman letter strings are an obvious representation of non-words, Farsi letter strings which had to appear in the cursive

form, represented possible combinations of real words. That is, there are an infinite number of possibilities for creating word like shapes in Farsi because of the orthographic structure that deletes short vowels. In contrast, in English word formation is more confined to the possibilities of vowel and consonant combinations. Therefore, it may be postulated that learners in this study were not so much processing letter strings in Farsi, but were instead closely tuned into a form of a word.

Moreover, results from the qualitative analysis in this study show that both Freshmen and Seniors were limited in the automatic skills they needed for processing at the very basic levels of reading in English. This behaviour was portrayed in the ways participants chose to pronounce words in the chemistry text. The spelling invention strategies which included the addition or deletion of vowels and consonants may also be indicative of the use of first language reading strategies described above. All of the above findings seem to indicate the use of highly skilled word decoding strategies which help Farsi readers identify accurate word formation in their L1. Thus, it is possible to assume that due to the special formation of Farsi words both phonetically and in grammatical context, readers develop a strong reliance on separate words even when they read in the second language. Such assumptions lend support to a statement by Grabe (1991) about learners reading in L2 and focusing on words:

"Readers are 'stuck' on words. The problem is that students do not simply recognize the words rapidly and accurately but are consciously attending to the graphic form (and in many second language texts there are often far too many new forms for students to attend to efficiently). No amount of guessing will lead to automatic-word recognition."(p. 386)

From the think-aloud protocols it appears learners in this study did not view their own act of reading critically. Thus, as they attempted to read the chemistry text they did not become investigators of the forms of print they were processing. In this way the learners failed to investigate the differences between writing systems in the L1 and L2 (Wallace, 1990). It is in light of the insignificant importance given to this level of reading that many learners and pedagogues still view mastering of the orthographic structure of a language as a trivial act (Haynes, 1990; Eskey, 1988).

What is questionable is the extent and quality of L1 perceptual strategy transfer to the readers' management of predicting correct or incorrect orthographic structure when responding to and identifying Roman letters. Future research is necessary to provide insight into the understanding of orthographic processing strategies in the Arabic/Farsi writing system.

A fourth interesting outcome of the study concerns the rarely noticed issue in most second language and especially foreign language research, the social act of reading in a foreign language. The importance of this variable was revealed by the qualitative analysis of think-aloud protocols. It must be noted that in countries other than those where English is the dominant language, since there are rare instances of oral communication with a native English speaker, the English language is taught and learned mostly through the written medium. Thus reading becomes the most important foreign language learning tool for technical and scientific material.

As was mentioned before, students in this study came from an educational background in which they probably did not receive the type of instruction that would lead to creative meaningful learning from text. Instead, their previous learning was mainly based on repeated reading of information with embedded mechanical questions. Here it must be pointed out that the learning methodology, like the one described in Iran, is an example of a partial form of problem-solving instead of a problem-posing educational system (Freire, 1983). In the latter system, Freire proposes an active role for the learner in which questioning and interpretation on the part of learners is vital. Freire then compares this problem-posing system with a problem-solving one in which questions have been preset and prepared in advance by text-book writers and teachers. Here, learners do not create through an understanding of their world, but instead take a partial role not in creating but in "solving what has already been solved" (Edelskey, 1992, p.25).

Similarly, Fasheh (1991) exemplifies a situation in Palestine where oppressive educational practices, resemble the act of sewing a suit and expecting it to fit all learners. Accordingly, learners not only receive limited and restrictive knowledge, but also fail to flourish in ways other than those set by the dominant group in power. In the same way, it seems evident that the reason why we still see a traditional system of education dominating the educational institutions in Iran, is due to the left-overs of the days of colonization. That is, in the more than one hundred years of colonization by the Western and Eastern Powers, the Iranian educational system was governed by powers which demanded partial assimilation to the West with promises of 'great' opportunities. Thus, in order to reach the promised 'doors of opportunity', a majority of learners became obsessed with knowledge and technological advancements of the West.

Unfortunately, the past has left its mark on the present, and we see those responsible for transforming the educational policies today, take the same previous policies for granted and even perceive them as neutral practices. In fact, those in power have found importance in transforming content of school material, instead of attempting to change the context or socializing practices of educational institutions. In a study of Athabaskans in Alaska, Scollen and Scollen(cited in Gee, 1986) mention how the concept of text-based literacy conflicts with the Athabaskan values, social practices, and ways of knowing. More importantly their study points out how misunderstandings due to ethnic, cultural, and social

characteristics arise and then result in inventing labels for Athabaskan as unsure, aimless, incompetent, and withdrawn people. This same danger threatens the Iranian students especially when they are in contexts of second language learning. Even worse, we find the Freshmen and Seniors in the qualitative study labelling themselves with labels that 'outsiders' attribute to Athabaskan.

The relationship between ESL and power is cited in Walters (1989) who points to the "intricate relationship that exist between global power and language" (p. 5). He reasons that because of Britain's past colonial dominance and the United States' continued military and economic dominance, the English language has been able to dominate all other languages. Thus, the actual link between language, culture, and politics suggest that teaching English as a second/foreign language is a 'political act' (Judd, 1987).

With this in mind, as educators and pedagogues, we must closely evaluate and consider our teaching circumstances and make careful decisions concerning the learners involved in this socializing process. A dynamic model of a community of people, who decided to empower themselves, is in South Africa (Pierce, 1989). The People's English Commission developed People's English as a component of "People's Education for Peoples' Power", and as a sign of protest against Apartheid. Their view of the English language is:

"...language, and English in particular, is not a neutral practice. It plays a constitutive role in determining how people think, speak, and act. ...it takes a pedagogy of possibility rather than a communicative approach to enable these students of English to free themselves from oppression." (Pierce, 1989, p.417)

People's English in Africa is a fine example of what can be achieved when people become aware of their social existence and resist an imposed position in society. Presently, circumstances seem to be most appropriate for the Iranian learner and all others who resemble them to transform their learning by adopting a pedagogy of possibility which Simon (1987) defines as:

" The project of possibility requires an education rooted in a view of human freedom as the understanding of necessity and the transformation of necessity." (p. 373)

Because human freedom is a source of power for the learner, students are encouraged to be active participants in the act of learning, to struggle, question and critically contrast and compare the situations they encounter (Walsh, 1987). Furthermore, Giroux (1983) stresses the importance of developing student voice. Once students begin to hear their own voice, they will learn to discuss social and political issues of their own interest (cited in Walsh, 1987). A pedagogy of possibility allows time and space for all voices to comment, criticize and socialize in groups to reach relative negotiated meaning

and understanding. It is both the teachers' and students' responsibility to create an atmosphere where everyone can grow, speak up, and let their ideas be known to others.

" Public education must fulfil the task of educating citizens to take risks, to struggle for institutional and social change, and to fight against oppression both inside and outside of schools. Pedagogical empowerment necessarily goes hand-in-hand with social and political transformation." (Giroux and McLaren, 1986, p. 237)

In summary, the enlightenment of teachers will reflect further light onto learners who are all regardless of age, sex, race, religion, or other sociocultural characteristic, equal in possessing a need to be regarded as valuable individuals in search of freedom of identity for themselves and their community. Likewise, a close contact with learners' world as well as a constant return to it, can make the process of reading the world-word more natural. Paulo Freire (1993) informs us of how he was able to overcome 'the fear' of learning:

"As I became familiar with my world, however, as I perceived and understood it better by *READING* it, my terrors diminished.... Deciphering the word flowed naturally from *READING* my particular world; it was not something superimposed on it." (p. 141)

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APPENDIX A (Cloze L1)

پرستش مخلوق به حای عبادت خالستی

جهل و بی‌خبری را میتوان مهمترین عامل مخلوق پرستی بشر به حساب آورد، زیرا از یک طرف بحکم فطرت پاک مجبور بوده نقطه ای امن پناه ببرد، یعنی یک مقام قاهر و توانا را در وجود آمدن این نظام بدیع موثر بداند، و نقشهای زیبای هستی را اثر یک نقاش هنرمند تصور کند. از طرف دیگر چون (۱) _____ این راه را بدون (۲) _____ و تعلیمات پیامبران که (۳) _____ الهی هستند بپیماید، پیش (۴) _____ آنکه به اصل مقصود (۵) _____، یعنی از مشاهده آیات (۶) _____ و خلقت به خدا (۷) _____ بوده و به او (۸) _____ شود به جماد و (۹) _____ و انسان پناهنده می‌شد. (۱۰) _____ دیگر تصور میکرد که (۱۱) _____ همان گمشده او هستند. (۱۲) _____ این نظر دانشمندان پس (۱۳) _____ مطالعه در کتابهای آسمانی (۱۴) _____ طرز دعوت پیامبران و (۱۵) _____ آنان با مردم اذعان (۱۶) _____ که هدف پیامبران، تنها (۱۷) _____ نمودن مردم به وجود (۱۸) _____ جهان نمی‌باشد بلکه نقش (۱۹) _____ آنان در اجتماع، آزاد (۲۰) _____ مردم از چنگال شرک (۲۱) _____ بت پرستی است.

پیامبران آمده (۲۲) _____ به مردم بگویند، ای (۲۳) _____ آن خدائیکه همه به (۲۴) _____ آن معتقدیم دارا این (۲۵) _____ است. مخلوق را بجای (۲۶) _____ نگذارید، خدا را به (۲۷) _____ بپذیرید، شریک و همتا (۲۸) _____ او قرار ندهید.

کلمه لاله الاله (۲۹) _____ گواه این گذار است . (۳۰) _____
 نقطه ای که رسول اکرم (ص) رشته ء (۳۱) _____ خود را از آنجا (۳۲) _____
 کرد، تعلیم همین جمله (۳۳) _____ که مفاد آن این (۳۴) _____
 که معبودی جز خدای (۳۵) _____ نیست .
 بدیهی است باید (۳۶) _____ از این بادل (۳۷) _____ استدلال،
 اصل وجود خدا (۳۸) _____ شده باشد، تا دعوت (۳۹) _____ توحید
 ویگانه بودن (۴۰) _____ صورت گیرد . این جمله می رساند که قسمت اول یعنی قبول خدا
 از نظر بشر آن روز مورد گفتگو و اعتراض نبوده است . مطالعه قصص قرآن و گفتگوهای پیامبران با مردم
 نیز در تائید همین مطلب می باشد، که اساس کلیه ادیان توحیدی بر نفی ظلم و شرک و بت پرستی مرفنظر
 از نوع و شکل آن استوار می باشد .

APPENDIX B (Cloze L2)

Man and Language

We know that when man settled in different parts of the earth, his physical features changed. Now men in different parts of the world look different from each other. Also, man's work varies according to the geography of the place where he lives, and even the language he speaks differs from place to place. In fact, so many differences in language have developed that today there are over twenty-seven hundred languages, not counting regional dialects. You can imagine, then, how difficult it is for men all over the world to understand each other.

Can you believe that (1) _____ these languages could have (2) _____ from one language? The (3) _____ of language, the linguists, (4) _____ that this might be (5) _____, because when speakers of (6) _____ same language are separated, (7) _____ changes take place in (8) _____ language. Therefore all the (9) _____ languages of today could (10) _____ been originally one language.

Of the thousands of (11) _____ dialects that man now (12) _____, only one hundred are (13) _____ languages. Even fewer, thirteen, (14) _____ of cultural and international (15) _____, spoken by more than 50 million (16) _____. Languages are like people: (17) _____ are born, they flourish, (18) _____ they die. Among the (19) _____ in use today, the oldest

(20) _____ the family of Indo-European (21) _____ spoken by most of
(22) _____ people in the western (23) _____. Besides the great Indo-
European (24) _____ of languages, there (25) _____ ten other families.

Although (26) _____ ancient Greeks talked about (27) _____ origin,
history, and structure (28) _____ their own language, it (29) _____ not until
the 19th (30) _____ that students began a (31) _____ and scientific study of
(32) _____ languages.

English, a member (33) _____ the Indo-European family of (34) _____
has become the most (35) _____ spoken language on earth. (36) _____ in
1066 A.D. English (37) _____ only a million and (38) _____ half speakers,
today it (39) _____ 250 million speakers; and 600 million (40) _____ people
can use this language to communicate.

Men of the modern world, conscious of their basic unity as human beings,
linked by commerce, political alliance, and easy travel, want and need a universal
language. The artificial languages like Esperanto and Volapuk have been designed to
meet this demand.

APPENDIX C Cloze Instructions

Read the following passage and fill in the blanks with only one word which seems the most appropriate within the context of the passage. Misspellings will not count as long as the word is recognizable. In the English text if you cannot find the appropriate word, you may fill the blank with a Farsi word.

There is no limit on your reading time. However, your individual time will be recorded.

EXAMPLE:

Once upon a time a farmer had three sons. The farmer was rich and had many fields, but his sons were lazy. When the farmer was dying, he called his three sons to him. "I have left you (1) _____ which will make you (2) _____, " he told them. " But (3) _____ must dig in all (4) _____ fields to find the (5) _____ where the treasure is (6) _____."

Answer: (1) something, (2) happy, (3) you, (4) the, (5), (6)

APPENDIX D Scoring Cloze L1 & Cloze L2

The criteria for scoring the cloze tasks were based on MacLean and d'Anglejan's (1986) seven-point scale of the rational cloze test.

7: exact replacement

The response exactly matches the text word which was deleted.

6: semantically and syntactically acceptable in terms of total text.

Responses which do not change or radically alter the text meaning are included in this category.

5: semantically acceptable within total text but response requires some minor syntactic adjustment.

Responses in this category are acceptable in terms of whole text meaning, but are not wholly acceptable in terms of syntax.

4: semantically and syntactically acceptable at the sentence level but unacceptable in terms of text level meaning.

Responses in this category are acceptable at the sentence level; however, they are not acceptable at the text level as they change whole text meaning.

3: semantically acceptable at sentence level but response requires some minor syntactic changes.

Responses in this category are semantically acceptable at the sentence level, but require minor syntactic adjustments.

2: semantically and syntactically acceptable with a fragment of the sentence either before or after the blank.

A response fits semantically and syntactically with text prior to the blank but not after the blank, whereas another word fits with text after the blank. However, neither response is acceptable in terms of sentence or text meaning.

1: semantically or syntactically unacceptable with a fragment of the sentence either before or after the blank.

Responses are not acceptable syntactically or semantically with even a fragment of the sentence before or after the blank.

0: no response; or response unclear.

HOW TO FIND BIRDS

Although it is almost impossible to go outdoors without seeing at least a few birds, some advance planning will enable you to increase the number of species you see on a field trip. Many birds tend to confine their activity to one particular habitat, so you should plan to visit as many different habitats as possible during a day of birding.

A good system is to begin your field trip at dawn, going first to a freshwater marsh. Rails, bitterns, and other marsh birds are most active and vocal at that hour, and a few minutes in a marsh at sunrise can be more productive than several hours later in the day. From the marsh you can go on to woodlands, fields, or thickets.

Until the middle of the morning most songbirds are busily searching for food and singing and are relatively easy to see. From midmorning until late in the afternoon land birds are quiet, while the birds of the beaches, lakes, and other aquatic or marine habitats are active all day. This then, is the time to search for herons, cormorants, ducks, and sandpipers. Late in the day land birds start singing and foraging again, so you can return to woods and other inland habitats to spot the species you may have missed in the morning. To round out a full day of birding, make an after-dark visit to a forest or wooded swamp to listen for owls.

The greatest variety of birds can be seen during the migration seasons. It is, therefore, a good idea to plan several field trips during the spring and fall. In spring the best time to search is during the latter half of April and the first half of May, when most of the songbirds migrate north through eastern Asia. Most migrating birds fly at night, breasting their journey during the day, when they rest and feed. They tend to gather in quiet places where food is easy to find. In a light woodland along a stream, where there are newly opened leaves and an abundance of small insects, it is possible to see as many as two dozen species of warblers in a single spring morning.

Migrating songbirds also concentrate in isolated groves of trees along the coast or in the prairie, and in well-planted city parks. When the land bird migration tapers off in late May, sandpipers and plovers are still flying through. Now is the time to visit beaches, lakes, and marshes. The fall migration is under way by August, when the first of the sandpipers and plovers reappear. In September and October most of the song birds pass through. The migration of ducks, geese, and other water birds continues into November; visits to lakes and bays will pay dividends then.

While many species are rather tame, others are shy or secretive. Learn to move slowly and quietly and to avoid wearing brightly coloured clothing. Some of these elusive birds can be lured into view by an imitation of the sound of a bird in distress, or by a whistled imitation of a Screech Owl. Rails and certain other secretive species can be attracted by playing tape recordings of their calls.

For each of the following statements choose the word or phrase that best completes the statement according to the information contained in the passage. Write the number of the question and the answer you have chosen on your answer sheet.

1. What should you do to find as many different species of birds as possible on a field trip?
 - a. Pick a particular habitat and search it all over.
 - b. Go to the zoo.
 - c. Visit as many different habitats as possible.
 - d. Visit mostly jungles and marine areas.

2. Why is it best to search the beaches, lakes and other aquatic or marine habitats from mid morning to late in the afternoon?
 - a. Because the most beautiful birds are at these habitats.
 - b. Because birds of other habitats are singing at this time.
 - c. Because birds of these habitats only sing at this time.
 - d. Because herons, cormorants, ducks, and sandpipers are the only birds singing at this time.

3. When is the best time to find the greatest variety of birds?
- a. In the spring and fall.
 - b. At night.
 - c. When birds rest and feed in the day.
 - d. During the latter half of April.
4. Why is it a good idea to look for migrating birds at night?
- a. Because plenty of insects are around at night.
 - b. Because all birds fly at night.
 - c. Because all migrating birds gather up at night.
 - d. Because most birds don't fly during the day.
5. Why is it possible to see up to two dozen species of warblers in a spring morning?
- a. Because warblers stay at these habitats when migrating.
 - b. Because there are lots of small insects in spring.
 - c. Because warblers breed, lay eggs and live here.
 - d. Because there is an abundance of leaves.
6. What does an isolated grove of trees refer to?
- a. A bunch of trees of special species in a forest.
 - b. A place where the song birds and other animals live.
 - c. A bunch of trees standing alone.
 - d. Trees growing in prairie and well planted city parks.
7. What might be an easier verb than tapers off in the fifth paragraph?
- a. Slows down
 - b. Gets faster
 - c. Wears down
 - d. Begins

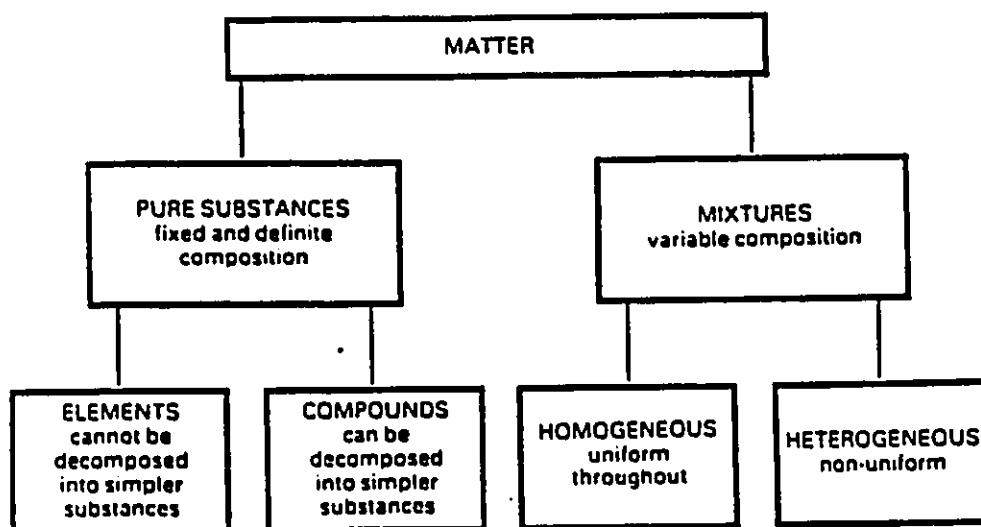
8. What does secretive mean in this text?
- a. Animals that only come out and sing during the day.
 - b. Animals that don't show themselves.
 - c. Animals that have secrets and mysteries.
 - d. Animals that only come out at night.
9. How can some secretive and shy birds be brought into sight?
- a. By making bird sounds.
 - b. By dressing up like the birds.
 - c. By putting food for it in sight.
 - d. By scaring them to come out.
10. Which birds still fly when the migration is almost over?
- a. Bitterns and sandpipers
 - b. Geese and rails
 - c. Warblers and ducks
 - d- Sandpipers and plovers
11. The birds of which habitat should be visited at dawn?
- a. Fresh water marshes
 - b. Woodlands
 - c. Thickets
 - d. Beaches

12. What could be a good system for looking for as many different species as possible?
List in order where you should go to:
- a. Fresh water marsh, beaches, lakes, woodlands, fields, thickets, woods, forest or wooded swamp.
 - b. Woodlands, fresh water marsh, fields, thickets, beaches, lakes, woods, forest or wooded swamp.
 - c. Fresh water marsh, woodlands, fields, thickets, beaches, lakes, woods, forest or wooded swamp.
 - d. Forest or wooded swamp, fields, beaches, lakes, fresh water marsh, woodlands, thickets, woods.
13. Until mid morning most songbirds are easy to see. Why?
- a. Because they sleep at this time and can be found easily.
 - b. Because they are singing and looking for food.
 - c. Because this is the only time of day the birds are active.
 - d. Because they fly around and sing all the time at this time.
14. Where do most song birds migrate in spring?
- a. North through western Asia.
 - b. East through western Asia.
 - c. South to western Asia.
 - d. North through eastern Asia.
15. What should you learn to do when looking for shy and secretive birds?
- a. Move slowly and quietly and wear clothes that fit the colour of the trees and flowers.
 - b. Move slowly and quietly and do not wear brightly coloured clothing.
 - c. Move fast and quietly and wear brightly coloured clothing.
 - d. Move quietly and imitate the bird sounds and calls.

COMPOUNDS AND ELEMENTS

Pure substances are divided into two categories: compounds and elements (see fig 2-1). Compounds are pure substances that can be decomposed into simpler substances. For example, water can be broken down into hydrogen and oxygen. Thus water must be a compound. A pure substance that cannot be broken down into simpler substances by ordinary chemical means is called an element. Neither hydrogen nor oxygen (the constituent elements of water) can be further decomposed, so each is classified as an element.

FIGURE 2-1



Do not be misled by these examples, however. Upon heating, calcium carbonate (limestone) can be decomposed into calcium oxide and carbon dioxide. But all this tells us is that calcium carbonate must be a compound, because it is decomposed into simpler compounds. We may not conclude that calcium oxide and carbon dioxide are elements. Indeed, they are not. Both calcium oxide and carbon dioxide may be further decomposed, indicating that they too are compounds.

Also note that a compound is not a mixture, though both can be broken down into simpler substances. Remember that a pure substance, is distinguished from a mixture by its fixed composition. A compound is made up of two or more kinds of elements, but they are always combined in the same fixed proportions. (The distinctions we have made so far between mixtures and pure substances were summarized earlier in fig 2-1.)

By 1974 the first 106 elements had been discovered. These elements are displayed in a chart called the periodic table. Some of the most common elements are listed in Table 2-1, along with the symbols used to abbreviate them. In each case the first letter is always capitalized (upper case), whereas the second letter (if there is one) is lower case.

TABLE 2-1

Names and Symbols of Some Important Elements			
Al	Aluminum	He	Helium
Ag	Silver	Hg	Mercury
Au	Gold	K	Potassium
C	Carbon	Mg	Magnesium
Ca	Calcium	N	Nitrogen
Cl	Chlorine	Na	Sodium
Cu	Copper	O	Oxygen
Fe	Iron	P	Phosphorus
H	Hydrogen	S	Sulfur

You may also note that some of the symbols do not seem to correspond to the names of their elements. The reason for this is that many of the elements derive their names from either Latin or Greek. A few of these symbols and their original meanings are included in Table 2-2. Fig. 2-2 shows the relative abundances of the elements as they occur in our earthly surroundings and in our bodies.

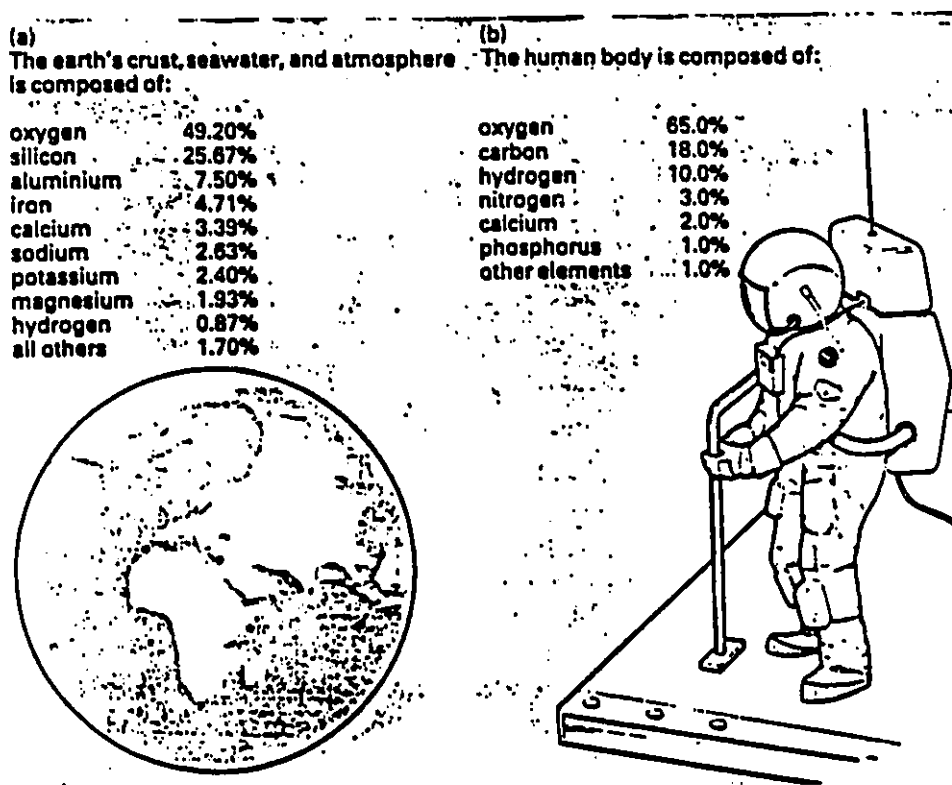
Since World War II, most newly discovered elements have been named after prominent scientists or places of scientific importance. Unfortunately, after the discovery of elements 104 and 105, some disagreement arose over the official names of these elements. A recent recommendation is to assign systematic names to new elements until an official name is agreed upon. According to this system, element 104 would be unnilquadium (Unq), element 105 would be unnilpentium (Unp), and element 106 would be unnilhexium (Unh). (Each name stands for the element's three-digit number. Thus, for element 104 : un = 1, nil = 0, and quad = 4).

TABLE 2-2

Selected Symbols and Their Origins				
Symbol	English Name	Language	Original Name	Meaning
H	Hydrogen	Greek	Hydros and genes	Water-forming
Au	Gold	Latin	Aurum	Shining dawn
Ag	Silver	Latin	Argentum	Silver
Cu	Copper	Latin	Cuprum	From island of Cyprus
Ca	Calcium	Latin	Calx	Lime
Sn	Tin	Latin	Stannum	Tin
Fe	Iron	Latin	Ferrum	Iron
O	Oxygen	Greek	Oxys and genes	Acid-forming
S	Sulfur	Latin	Sulfur	Sulfur
Cl	Chlorine	Greek	Chloros	Greenish-yellow

The need to arrive at an agreement on the naming of elements is made more urgent by recent advance in technique, which have already led to the reporting of elements 107 and 109. These new techniques make it likely that a whole series of new "superheavy" elements will be reported in the near future.

FIGURE 2-2



**READ THE PASSAGE CAREFULLY.
ANSWER THE FOLLOWING QUESTIONS IN COMPLETE SENTENCE
FORM.**

**REMEMBER THAT SOME QUESTIONS MAY HAVE SEVERAL SECTIONS.
ANSWER ALL SUBSECTIONS CAREFULLY.**

1- What is the difference between elements and compounds?

2- Is calcium carbonate a compound or an element?

If it can be decomposed, are the simpler substances compounds or elements?

Can it be broken down even further? Explain.

3- Are compounds and mixtures the same? Why or why not?

4- What does the periodic table display?

How many elements had been discovered by the year 1974?

5- How are the symbols of the common elements shown?

6- Do the symbols of the elements always correspond to their names? Why or why not?

7- What are elements 104, 105, and 106 called and how are they named?

8- What has caused an urgent need to arrive at an agreement on the naming of elements?

9- What type of elements will be reported in the future?

10- Which kinds of matter have not been explained in the text?

11- What percent of the earth's crust, seawater, and atmosphere is composed of hydrogen?

12- What is the symbol for Gold?

What language did it come from?

What is its original name and meaning?

13- What percent of the human body is composed of hydrogen?

14- What is the symbol for copper?

What language did it come from?

What is its original name and meaning?

15- What is another name for calcium carbonate?

APPENDIX G Sociocultural Questionnaire in English

NAME.....ID NUMBER.....

NATIVE LANGUAGE.....SEX.....

FRESHMEN/SENIOR.....AGE.....

Can you read any language(s) other than farsi and/or English?

Circle: yes no

If yes, which language(s)?.....

Other than your assigned readings, do you regularly read English materials outside the classroom?

Circle: yes no

If so, please check whichever apply: newspapers
..... popular magazines
..... novels, literature
..... other (specify)

During your leisure time do you:

.....listen to English news on T.V.; How often:.....
.....listen to English tapes; How often:.....
.....watch English speaking movies; How often:.....
.....listen to English radio news; How often:.....
.....speak with a friend; How often:.....
.....write English letters; How often:.....
.....other, specify

Number of years of studying English

a. In Iran (specify city).....

b. In other country

Specify country

In the following statements please indicate the level of your agreement or disagreement with each statement by placing an X in the appropriate blank space.

1. If I were to rate my interest in foreign languages, I would say that it is

WEAK ____:____:____:____:____:____:____ STRONG

2. If I were to rate my desire to learn English, I would say that it is

WEAK ____:____:____:____:____:____:____ STRONG

3. If I were to rate my feelings about learning English for practical purposes such as to improve my academic needs, I would say that they are

WEAK ____:____:____:____: 1 :____:____ STRONG

4. If I were to rate my attitude toward the English learning situation (type of courses and teachers), I would say that it is

UNFAVOURABLE ____:____:____:____:____:____:____ FAVOURABLE

For each of the following statements, you are asked to evaluate how well you feel you can do what is described according to the following scale:

- A. I can do this all the time (always)
- B. I can often do this (often)
- C. I can do this about half the time(half)
- D. I can seldom do this (seldom)
- E. I cannot do this at all (never)

5. In a short text in English, I can recognize proper names and numbers.

a b c d e

6. When I see a notice in English on a classroom door, I understand what course has been cancelled and when it will be rescheduled

a b c d e

7. I can understand a one page text in my field of specialization when there are useful titles and subtitles to guide me.

a b c d e

8. If I have to fill out a detailed application form in English, I understand most of the information requested

a b c d e

9. In a 2-3 page text, I can find the details that I need to answer specific questions

a b c d e

10. From an interview written in English in the English newspaper, I can understand the thrust of the answers and draw some personal conclusions

from the content

a b c d e

11. When I look at a well detailed table of content of book written in English, I can tell whether the book will be useful to me or not

a b c d e

SCORE CODE: a-always; b-often; c-half; d-seldom; e-never

12. I understand written English well enough so that if exam questions for a course were written in that language only, I would have no problem

a b c d e

13. I can read an adventure story in English (about 5 pages long) and rarely have to use the dictionary

a b c d e

14. I know written English well enough to be able to spot mistakes and misprints in a text

a b c d e

15. When reading silently in English, I am able to anticipate what will come next in the text

a b c d e

16. When reading silently in English, I am able to recognize the difference between main points and supporting details

a b c d e

17. When reading silently in English, I am able to relate information which comes next in the text to previous information in the text

a b c d e

18. When reading silently in English, I am able to question the significance or truthfulness of what the author says

a b c d e

19. When reading silently in English, I am able to use my prior

knowledge and experience to
understand the content of the
text I am reading

a b c d e

20. When reading silently in English,
I have a good sense of when I
understand something and when
I do not

a b c d e

SCORE CODE: a-always; b-often; c-half; d-seldom; e-never

When reading silently in English, If I don't understand something,

21. I keep on reading and hope
for clarification further on

a b c d e

22. I reread the problematic part

a b c d e

23. I go back to a point before
the problematic part and reread
from there

a b c d e .

24. I look up unknown words in
a dictionary

a b c d e

25. I give up and stop reading

When reading silently in English, the things I do to read
effectively are to focus on

26. mentally sounding out parts of
the words

a b c d e

27. understanding the meaning of
each word

a b c d e

28. getting the overall meaning of
the text

a b c d e

29. being able to pronounce each
whole word

- | | | | | | |
|---|---|---|---|---|---|
| 30. the grammatical structures | a | b | c | d | e |
| | a | b | c | d | e |
| 31. relating the text to what I
already know about the topic | | | | | |
| | a | b | c | d | e |
| 32. looking up words in the dictionary | | | | | |
| | a | b | c | d | e |

SCORE CODE: a-always; b-often; c-half; d-seldom; e-never

- | | | | | | |
|----------------------------------|---|---|---|---|---|
| 33. the details of the content | | | | | |
| | a | b | c | d | e |
| 34. the organization of the text | | | | | |
| | a | b | c | d | e |

When reading silently in English, things that make the reading difficult are

- | | | | | | |
|---|---|---|---|---|---|
| 35. the sounds of the individual words | a | b | c | d | e |
| 36. pronunciation of the words | a | b | c | d | e |
| 37. recognizing the words | a | b | c | d | e |
| 38. the grammatical structures | a | b | c | d | e |
| 39. the alphabet | a | b | c | d | e |
| 40. relating the text to what I
already know about the topic | | | | | |
| | a | b | c | d | e |
| 41. getting the overall meaning of
the text | | | | | |
| | a | b | c | d | e |
| 42. the organization of the text | a | b | c | d | e |
| | a | b | c | d | e |
- The best reader I know in English is a good reader because of his/her ability to
43. recognize words

- | | | | | | |
|--|-----------|----------|---------|-----------|---------|
| | a | b | c | d | e |
| 44. sound out words | | | | | |
| | a | b | c | d | e |
| 45. understand the overall meaning
of a text | | | | | |
| | a | b | c | d | e |
| 46. use a dictionary | | | | | |
| | a | b | c | d | e |
| SCORE CODE: | a-always; | b-often; | c-half; | d-seldom; | e-never |
| 47. guess at word meanings | | | | | |
| | a | b | c | d | e |
| 48. integrate the information in the
text with what he/she already
knows | | | | | |
| | a | b | c | d | e |
| 49. focus on the details of the content | | | | | |
| | a | b | c | d | e |
| 50. grasp the organization of the text | | | | | |
| | a | b | c | d | e |

APPENDIX H Sociocultural Questionnaire in Farsi

به عالی

نام و نام خانوادگی
 سال ورود به دانشگاه
 زبان محلی (بومی)
 سال چهارم / سال اول
 جنس
 سن

آیا می توانید به زبان دیگری به جز زبان فارسی و انگلیسی مطلبی بخوانید؟

یکی را علامت بزنید. ☐ بله ☐ خیر

اگر جوابتان "مثبت" است چه زبانهایی را می توانید بخوانید؟

صرف نظر از تکالیف خواندنی خودتان، آیا بطور مرتب مطالب انگلیسی خارج از کلاس را می خوانید؟

علامت بزنید: ☐ بله ☐ خیر

در صورت "مثبت بودن" کدام یک از مطالب ذکر شده را می خوانید، لطفاً علامت بزنید. :

روزنامه

مجله های مشهور

رمانها، ادبیات

مطالب دیگر (متخصص کنید)

در مواقع فراغت آیا شما :

به اخبار انگلیسی تلویزیون گوش می دهید؟ هر چند وقت؟

به نوارهای انگلیسی گوش می دهید؟ هر چند وقت؟

فیلم های انگلیسی را نگاه می کنید (انگلیسی زبان)؟ هر چند وقت؟

اخبار انگلیسی را گوش می دهید؟ هر چند وقت؟

با دوستان به انگلیسی صحبت می کنید؟ هر چند وقت؟

نامه های انگلیسی می نویسید؟ هر چند وقت؟

موارد دیگر را بنویسید؟

چند سال انگلیسی خوانده اید (درس)؟

الف - ایران (کدام شهر)

ب - در کشور دیگر (کدام کشور)

مهران موافقت با عدم موافقت خود را با هر يك از عبارات زیر با گذاشتن علامت X در جاهای خالی مناسب مشخص کنید.

۱- مهران علاقه من به زبانهای خارجی

ضعیف : _____ : _____ : _____ : قوی

۲- تمایلم به فراگیری انگلیسی :

ضعیف : _____ : _____ : _____ : قوی

۳- احساساتم در مورد یادگیری انگلیسی برای اهداف خاصی به منظور بهبود بخشیدن نیازهای دانشگاهی :

ضعیف : _____ : _____ : _____ : قوی

۴- نگرش نسبت به موقعیت یادگیری انگلیسی (انواع کلاسها و معلمان) :

علاقتمندم : _____ : _____ : _____ : علاقمند نیستم.

برای هر يك از عبارات زیر بنویسید بر اساس مقیاس زیر چه اندازه می توانید کارهای گفته شده را انجام دهید :

الف. همیشه اینکار را می توانم انجام دهم. : ۱۰۰٪

ب. اکثر اوقات اینکار را می توانم انجام دهم.

ج. پنجاه درصد می توانم اینکار را انجام دهم.

د. بندرت میتوانم اینکار را انجام دهم.

هـ. اصلاً نمی توانم اینکار را انجام دهم.

۵- در يك نوشته کوتاه انگلیسی می توانم اسمهای عام و اعداد را تشخیص دهم.

الف ب ج د هـ

۶- وقتی که اطلاعاتی ای انگلیسی بر در کلاس بهیمن می توانم کلاسهای حذف شده و زمان بعدی که آن

را خوانند گذاشت تشخیص دهم

الف ب ج د هـ

۷- می توانم نوشته های يك صفحه در مورد رشته تخصصی ام را هنگامی که تهرها و زیر تهرهای خوبی

جهت راهنمایی ام قرار داده شود بفهمم.

الف ب ج د هـ

۸- اگر قرار باشد تقاضا نامه ای انگلیسی را برکنم اکثر موارد خواسته شده را می فهمم.

الف ب ج د هـ

۹- در يك متن ۲ الی ۳ صفحه ای می توانم جزئیات لازم برای جواب دادن به سوالات خاص را پیدا کنم.

الف ب ج د هـ

کدعلامت گذاری . الف - همیشه ب - اغلب ج - پنجاه درصد د - بندرت ه - هرگز

۱۰- در يك مصاحبه نوشته شده به انگلیسی در روزنامه انگلیسی می توانم منظور جوابها را فهمیده و نتیجه های شخصی را بدست بیاورم.

الف ب ج د ه

۱۱- اگر به فهرست مطالب و جزئیات کتاب انگلیسی نگاه کنم می توانم بفهمم که آیا این کتاب برایم مفیدی باشد یا خیر.

الف ب ج د ه

۱۲- نوشته های انگلیسی را به اندازه ای می فهمم که اگر سوالات امتحانی فقط به آن زبان نوشته شده باشند، مشکلی نخواهم داشت.

الف ب ج د ه

۱۳- می توانم يك داستان همچنان انگیز انگلیسی (حدود ۵ صفحه ای) را بخوانم و کمترین لغت نامه مراجعه کنم.

الف ب ج د ه

۱۴- نوشته های انگلیسی را به اندازه ای می فهمم که بتوانم اشکالات يك نوشته را پیدا کنم.

الف ب ج د ه

۱۵- وقتی که درسکوت انگلیسی میخوانم قادر به پیش بینی مسائل بعدی در نوشته هستم.

الف ب ج د ه

۱۶- وقتی که درسکوت انگلیسی میخوانم قادرم تفاوت بین نکات اصلی و فرعی را تشخیص دهم.

الف ب ج د ه

۱۷- وقتی که درسکوت انگلیسی می خوانم قادر به ربط دادن مسائل بعدی به نوشته های قبلی هستم

الف ب ج د ه

۱۸- وقتی که درسکوت انگلیسی می خوانم قادرم در مورد صداقت گفتار نویسنده سوال کنم.

الف ب ج د ه

۱۹- وقتی که درسکوت انگلیسی می خوانم قادر به استفاده از دانسته ها و تجربیات قبلی ام برای فهمیدن بهتر نوشته استفاده کنم.

الف ب ج د ه

۲۰- وقتی که درسکوت انگلیسی می خوانم می فهمم که کدام مسائل را درك می کنم و چه مسائلی را درك نمی کنم.

الف ب ج د ه

کدهلاٲ گءاری . الف - هٲٲه . ب - اءلف . ج - ٲنءاه درصء . د - سءءرء . هـ - هرگز

هنگامی که درسکوء انگلیسی می خوانم ،اگرمطلبی را درك نکنم .

۲۱- به خوانءن اءامه می ءهم وامءءوارم که درصءءات بعءی اٲن مساله ءوضیح ءاءه شود .

الف ب ج د هـ

۲۲- قسمء مشكل را ءءوباره می خوانم .

الف ب ج د هـ

۲۳- به قسمء قبل از مسءله مشكل برمی گردم وءوباره می خوانم

الف ب ج د هـ

۲۴- کلمه هایی را که نمی ءانم به ءیکشءری مراجعه می کنم .

الف ب ج د هـ

۲۵- مایوس شده وءیکر به خوانءن اءامه نمی ءهم .

الف ب ج د هـ

هنگامی که درسکوء انگلیسی می خوانم ،کارهایی که جهت بهءر خوانءن میکنم اٲن اسء که
بر اٲن مسائل ءوجه بهءشءری ءاشءه باشم :

۲۶- صءای قسمءهای مشءلف کلمه را ءءرفهم مرور می کنم .

الف ب ج د هـ

۲۷- فهمءن معنی هر کلمه

الف ب ج د هـ

۲۸- گرفتن معنی کلی مءن

الف ب ج د هـ

۲۹- قاءر بوءن به ءلفظ هر کلمه (کل کلمه)

الف ب ج د هـ

۳۰- ساخءمانهای گرامری

الف ب ج د هـ

۳۱- ربط ءاءن مءن به ءانستهءها و ءءربءهءات قبلی خود در مورد آن عنوان .

الف ب ج د هـ

۳۲- ٲءءا کردن معنی کلمات در لءفء نامه .

الف ب ج د هـ

۳۳- مسائل مهم نوشءه (مءن) .

الف ب ج د هـ

کدعلامت گذاری الف هیت - ا - اغلب - ح - سجاه در صد - د - بندرت - ه - هرگز

۳۴ - ساختمان و طرز مرتب شدن قسمت‌های مختلف نوشته

الف ب ج د ه

هنگامی که درسکوت انگلیسی می‌خوانم، مسائلی که خواندن را برایم مشکل می‌سازند، عبارتند:

۳۵ - صدای تک تک کلمات

الف ب ج د ه

۳۶ - تلفظ کلمات

الف ب ج د ه

۳۷ - شناخت کلمات

الف ب ج د ه

۳۸ - ساختمان گرامری متن

الف ب ج د ه

۳۹ - الفبای انگلیسی

الف ب ج د ه

۴۰ - ربط دادن نوشته به مطالبی که خودم در مورد آن می‌دانم

الف ب ج د ه

۴۱ - گرفتن معنی کلی نوشته

الف ب ج د ه

۴۲ - ساختمان و طرز مرتب کردن نوشته

الف ب ج د ه

بهترین خواننده‌ای که من در انگلیسی می‌شناسم و به نظر من خواننده خوبی است، بخاطر تسلط او در:

۴۳ تشخیص کلمات الف ب ج د ه

۴۴ بیرون کشیدن صدای کلمات الف ب ج د ه

۴۵ فهمیدن معنی کلی نوشته الف ب ج د ه

۴۶ استفاده از لغت نامه الف ب ج د ه

۴۷ حدس زدن معنی کلمات الف ب ج د ه

۴۸ ربط دادن نوشته با دانستیهای قبلی خود الف ب ج د ه

۴۹ تکیه کردن بر مسائل و جزئیات نوشته الف ب ج د ه

۵۰ گرفتن ساختمان اصلی نوشته الف ب ج د ه