

Processes in Speed Reading*

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تاريخ القبول: 2006/11/12

تاريخ التقديم: 2006/9/15

I. Introduction:

It is worth asking how the act of reading becomes something to value in itself, as for instance, the act of conversation or the act of taking a walk. We all learn to read at school after a model. But for most of us, this is not an optional use of the power of our brain. Moreover, many problems in reading and learning are due to bad habits. Many people are still reading in the way that they were taught at elementary school. The methods currently used in schools do not touch on the problems of speed reading in relation to comprehension and retention. In short, most of our reading problems have not been dealt with during initial education.

II. Aim:

The aim of the present research paper is to put forward a detailed account of the processes that take place in speed reading, the components that are believed to affect and interact with speed reading, and whether or not speed readers differ from normal ones in this respect.

III. The Processes in Speed-Reading

To understand speed-reading, we need to know about the processes that occur during speed-reading and about the information that result. As in the study of other types of reading, eye-movements studies are particularly informative about the processes in speed-reading. Although eye-movements during reading have been described, however these descriptions lack an accompanying test of the speed-reader's comprehension and retention. Therefore, it is our task, in this section, to describe how speed-readers move their eyes,

* A Research Paper Abridged from Ph.D. Thesis Entitled "Efficiency of Speed-reading Techniques in the Comprehension and Retention of Iraqi Learners of English at University Level".

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and whether or not these movements are similar to those in normal reading. Moreover, as we usually do in studying reading, we shall also examine the physically obtainable parameters which are altered during speed-reading; and to what extent these parameters are related to the speed of silent reading performance. As a consequence to such arguments, there is a further need to discuss whether readers do process textual information for adequate comprehension at those high rates suggested by speed-reading proponents.

A. Eye-Movements: Some Basic Facts:

In the past, man thought that the eyes move continuously on a line while reading. This impression is an illusion. The eyes move in synchrony with each other across the page, but their movement is not continuous (Rayner and Pollatsek, 1989: 113). There is more than one type of eye-movements, the first of which is called *fixations*. These are the means by which people fix their vision on some object to obtain more information about it. Two quite different mechanisms are involved in controlling them, viz. the *voluntary* and *involuntary* fixation mechanism. By means of the former, the eyes move at will to seek out something upon which the reader wants to fix his vision. The latter mechanism is used to automatically lock the eyes on the object when it has been found. The movements accompanying the voluntary mechanism have been labeled *saccadic movements* (Downing and Leong, 1982: 142). These are the rapid ballistic movements whose function is to move the eyes from one fixation point to another, i.e. they are the periods between the fixations where the eyes are moving rapidly. The duration of a saccadic eye movement in reading varies from 30 to 120 msec and this is a function of the distance covered (ibid.: 143). While most saccades in reading are forward, some of them move backward and these are termed *regressive saccades*, or *regressions*. These movements cause the eyes to return to re-read words that are already read. Readers make about four to five forward saccades in a second, and one regression about once every two seconds (Rayner and Pollatsek, 1994: 58 and Buzan, 2002: 1).

Another type of eye-movements, mentioned by Buzan (2001: 44), is the return sweep via which the eyes move from the end of one line to the beginning of the next. Although return sweeps are right to left, they are not considered as regressions, because with them the reader moves forward and not backward. One might claim that such an argument is of secondary importance in studying speed-reading. However, it must be emphasized that we, like Rayner and Pollatesk (1989), believe that if we want to get a global measure of reading, such as the overall reading speed, all the above mentioned movements must be taken into account. Following this, putting these movements all together in an ideal reading situation, they would be as follows: readers fixate for about 200-250 msec and saccade forward about eight character spaces. About 10-15% of fixations is regressions (Rayner and Sereno, 1994: 58). These measures are variable both between and within subjects. This variability is closely related to cognitive processing during reading (Rayner, 1978: 632).

Speed-reading proponents claim that many of our eye-movements are not necessary and that large amounts of information can be extracted from a single glance. Lewis (1958: 54) contrasts the reading patterns of the efficient and the inefficient reader that are illustrated as follows:

The eye moves across a printed line and you read. The eye

 is a very special sense organ because it is a direct extension of

 the brain. Consequently, reading is almost a direct mental
 _____ process, _____
 --The Pattern of the Efficient Reader--
 is a very special sense organ because it is a direct extension of

 the brain. Consequently, reading is almost a direct mental

process
--The Pattern of the Inefficient Reader--

Fig. (1) Reading Patterns of Efficient and Inefficient Readers
(Adapted from Lewis, 1958: 54)

It is quite clear from the above patterns that the efficient reader fixates about three to four fixations per line. By employing such patterns, he saves time, works less hard, and has fewer periods of non-reading. On the contrary, the inefficient reader is the word-by-word reader whose pattern is illustrated above. Lewis considers this type of reading as a habit the reader has perfected through constant practice. To break this habit, the reader should also practise to widen his perceptual span, reduce the duration of each fixation, and make few regressions (ibid.: 56).

In the light of the above discussion, two questions need now to be addressed. Firstly, how do speed-readers select which words they will fixate? Secondly, how long readers spend on the words they fixate? Koda (1996) and Hirai (1999) found in their researches on eye-movements that even speed-readers read most of the words on a page, and the absence of even a single letter in a word considerably reduces reading speed. It has also been reported that speed-readers fixate directly on some 80% of content words and 40% of function words. Similarly, difficult words and phrases receive more fixations than simple words (Buswell, 1937 and Chen, 1987 cited in Abu-Rabia, 1997). Moreover, fluent Japanese readers of English fixate longer over a fairly simple English text than native readers do (Bernhardt, 1991a cited in Hirai, 1999: 368). In addition, eye-movements themselves from one fixation point to the next tend to be automatically controlled in normal reading rather than being under the direct control of some attentional strategy. That is, the eye typically moves to the next longer word rather than sampling words selectively (Rayner and Pollatsek, 1989). Following this, Grabe (1991: 387) concludes that (1) readers typically do not guess or sample texts, (2) reading is not an approximative skill, and (3) the reason good readers are able to read so quickly is that they

can identify the vast majority of words automatically. In other words, reading comprehension is dependent upon efficient visual information.

B. Comprehension and Retention:

When we read, two aspects of the situation are important, viz. comprehending what we read, and retaining what we have comprehended after a period. Subjects in reading experiments have been given a variety of instructions among which are memory instructions vs. comprehension instructions. Aaronson (1976: 50) points out that these two aspects are not discrete processes, but rather form two ends of a continuum. At the one end of this continuum, there is the task that requires high retention demands and low comprehension demands, i.e. we have what is called verbatim recall. This kind of recall requires complete retention of both lexical and structural information. On the other end, of this continuum, we have a task with high comprehension but low retention demands, which would be a question-answering task. In such a task, full processing of information contained in the text is required (Chang, 1983: 223f).

The tasks that concern us are those situated at the middle of the comprehension/retention continuum. They include recognition memory or free form paraphrasing the performance on which is greatly aided by comprehension. Moreover, the retention demands for these tasks are so lighter than verbatim recall and in most cases are not mentioned. In this sense, we believe that there would be no retention if there were no comprehension, or to put it differently, comprehension leads to retention. This relation is similar to the equation of giving and taking, i.e. one can not give what s/he does not possess. This amounts to say that the reader would not be able to retain information he has not comprehended originally. That is why, it goes without saying that whatever fact mentioned in relation to comprehension is also applied to retention.

C. Comprehension and Speed-Reading:

Comprehension is frequently mentioned by cognitive and educational psychology. There is often an assumption in the literature that it is the goal of the reading process, or it is what reading is about, i.e. getting information from written texts. In spite of this, however, it remains a somewhat undetermined entity. Rayner and Pollatsek (1989: 264), for example, are neither defining nor describing what comprehension is. From their exposition, we can gather that comprehension for them is “the meaning of the text that is being read”. In fact, comprehension does not have absolute end where readers either comprehend what they are reading or not. Rather, it involves an active, dynamic, and growing process of searching for interrelationships in a text.

What is of basic concern in this section is the relation between reading-speed and comprehension. This relation is usually two-fold, one fold assumes that the accuracy of comprehension increases reading speed, and the other is that accuracy decreases by increasing speed. The emphasis, on reading fast enough to comprehend, comes from a model of reading presented by Kintsch and van Dijk (1978). This model explains how decreases in reading speed result also in a decrease in comprehension. According to their model, Kintsch and van Dijk claim that one part of working memory is a short-term buffer which has a restricted size. The input propositions gained by readers reading a text are always tested against the content of this short-term buffer. The researchers also suggest that “in effect, lowering the speed of scanning and matching operations would have the same effect as decreasing the capacity of the buffer” (1978: 371). Hence, very slow reading rates are thought to lower comprehension by limiting working memory capacity.

These limitations in short-term memory resources also emphasized by Smith (1994: 80) who argues that reading slowly is ineffective, because it means that the reader is paying too much attention to every minute detail. For him, reading slowly means word-by-word reading, i.e. reading isolated words with no context. This type of reading makes the text

meaningless and consequently put an additional burden on memory and thus impairs comprehension.

At the other end of the speed-reading spectrum, there are those models which jeopardize speed-reading in favour of accuracy of comprehension. As mentioned earlier in section 2.3, Carver (1990: 70) listed five types of reading, viz. scanning, skimming, reading, learning, and memorization. He suggests average learning and memorizing speeds as 200 and 138 W.p.m., respectively. The rationale for a decrease in reading speed in these types, compared to the reading speed of 300 W.p.m., comes in the form of an increased number of processes that must take place to store the information read in STM. As an additional support for the above discussion, Just and Carpenter (1987: 427) term the relation between speed and accuracy of comprehension as *trade-off*, since readers can trade away accuracy for more speed and vice versa.

Although the speed-accuracy function is a useful concept, it is also a simplification because we believe that the accuracy of comprehension is not the only dimension. Comprehension consists of obtaining several different kinds of information, with different degrees, which may vary its susceptibility to variations in reading speed and reading types. For example, what is the type of comprehension associated with reading normally and that associated with skimming? How much information are to be comprehended with each type of reading? From certain theories of reading, for instance, Carver (1985: 392), the reader processes each word in a sentence in an effort to assimilate the complete thought contained in the sentences of the text they are reading. This type of comprehension is called *total* or *perfect comprehension*, which is contrasted with that associated with skimming. When skimming, the reader does not attempt to comprehend the complete thoughts expressed in each sentence. Rather, he simply tries to extract as much general information as possible about the text by sampling only isolated words and phrases, i.e. getting the general gist of the text. These facts were studied earlier by Carver in his work of (1984: 212f). He noticed that understanding judgments were

around 80-100% at the low speeds of 62.5 to 250 W.p.m., and about 40% at speeds of 500 W.p.m., and around 15-20% at 1,000 W.p.m.

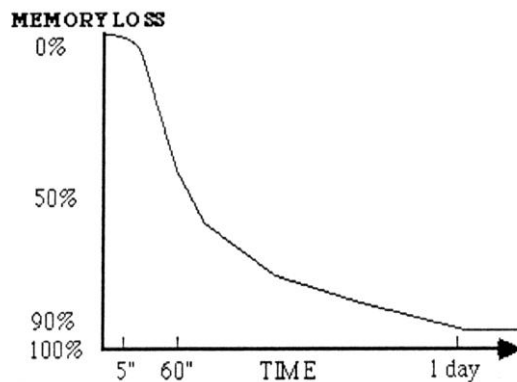
With this in mind, we need to examine in more detail what comprehension of a text might involve. As we noticed in chapter two, most attention has been given to decoding carefully at the word level. Kintsch and van Dijk (1978), in contrast, offer a model, which concentrates on comprehension above word level. They emphasize comprehension to the exclusion of word identification, and mention that most other models including Rumelhart's (1977), for instance, seem to have a bias for explaining word identification. Their model can be used to describe the relationships of a text as a whole that might constitute comprehension whether in careful reading or skimming. It also measures the extent to which information communicated by the writer is understood at both micropropositional and macropositional levels. According to Kintsch and van Dijk, these micropropositions are linked together meaningfully either structurally, in sentences, or by means of cohesion or inference between sentences forming microstructures (see 3.9.2). These microstructures represent the common view that some propositions, i.e. main ideas are more important than others. In this sense, skimming might be seen as an attempt to rapidly form a superordinate macroproposition, which is namely the discourse topic for a text.

D. Remembering vs. Forgetting in Relation to Speed:

The psychology of memory has long distinguished between three stages of analysis, which are often known as the three Rs of memory, viz. registration, retention, and retrieval. These stages are known by a variety of names. Watkins (1978) uses the first stage, i.e. registration to speak of *trace formation*, or information being *learned, acquired, encoded* or *registered*. By the second stage, the products of the first are *retained* or *stored*. The third stage involves *recall* or *recollection*, or the *retrieval, activation, utilization* or *remembering* of what is retained (Cf. Webster, 1965: 155).

Most of these names are interrelated in that they can refer to more than one stage. For example, *storage* may refer to the first and second stages, and *remembering* may refer to any stage or any combination of stages (Watkins, 1978: 49). To avoid any terminological confusion, what is most adequate for our intention is *retention*, which can be tested by the standards of the act of remembering what is retained.

The key concept of retention is LTM which has unlimited capacities. It has been claimed that LTM is the store



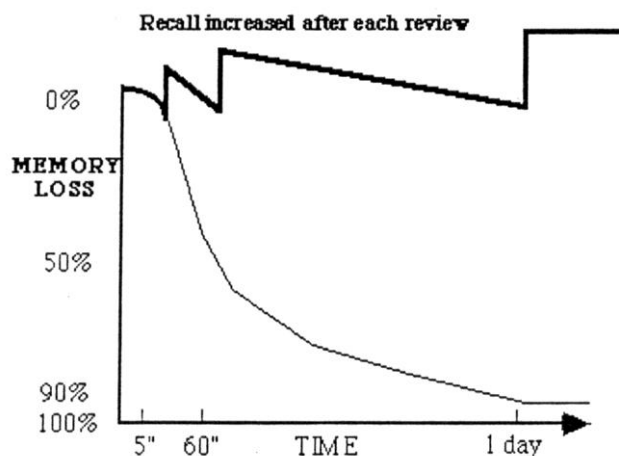
of more than one type of information. It holds semantic information by which we mean information about meaning, and visual information, i.e. picture-like codes, or generated mental images out of a text, in addition to phonetic or acoustic information (Bourne et al., 1979: 30). Speed-reading advocates claim that the powers of visual storage can

Fig. (2) The Forgetting Curve
(Based on Shepherd & Mitchell, 2002: 34)

be increased by increasing the speed at which a certain text can be read, and that LTM is the storage of visual as well as semantic information. Therefore speed-readers would have superior remembering capacities in relation to other normal readers. One support of such claim comes from Shepherd and Mitchell (2002: 34) who point out that “the decay of memory capacity is much that an hour after trying to memorize, approximately fifty percent of the facts may have been

forgotten. A day later nearly everything related to the memory exercise may have evaporated”.

The question to be raised now is ‘is it possible to turn this curve around and increase the amount of remembered facts with the passage of time?’ Studies of speed-reading, like Buzan (2001), Brewton (2002), Shepherd and Mitchell (2002) show that adopting speed-reading techniques enable readers to reverse the above forgetting curve and remember things as time goes by. Their techniques make use of the fact that readers remember information most easily if they are able to construct mental images in the form of pictures of each topic they read for the first time⁽¹⁵⁾. It is also possible to make mental notes of key-points in the text. Repeating these key-points helps the initial neurological consolidation of memories from STM to permanent LTM (Shepherd and Mitchell, 2002: 35). By so doing, Shepherd and Mitchell remark that their subjects, by briefly forming a picture of each major topic when it is initially read and later as they review the topic, enhanced retention and remembering (ibid.). This enhancement is figured out as follows:



**Fig. (3) The Enhancement of Retention
(Based on Shepherd & Mitchell, 2002: 35)**

IV. The Interaction of Other Components of Reading with Speed:

It is better to understand reading as the product of a complex but decomposable information processing system. Such a view of reading would seem to accept that reading can be broken down into underlying components of view of reading. What are of concern to our own objectives are those models of Coady (1979) and Bernhardt (1991b) mentioned in Urquhart and Weir (1998: 49). These models are particularly informative in describing foreign language reading; in addition to their possible interacts with both speed and comprehension.

A. Language

It has already been pointed out that language is the first component of Bernhardt (1991b) reading model. In order to clarify it in more detail, we shall break this topic down into more manageable sub-components. Hence, below, we are going to discuss syntax, the effect of orthographic differences, and vocabulary.

(1) Syntax:

In addition to recognizing the words of a text, the reader needs also to extract the relationships between them. But, how much these relations are important for the speed-reader? The vast amount of work that has been done in the area of syntax suggests that readers perform a structural analysis of text to construct a grammatical representation of sentences as they read. However, none of such analyses seems to have attracted the attention in psychology, as have problems of word-recognition or eye-movements (Rayner and Pollatsek, 1994: 69 and Urquhart and Weir, 1998: 59).

Urquhart and Weir (1998: 59) take the conventional position that syntactic parsing, for example, is necessary in order to impose meaning on the words recognized. Urquhart and Weir (1998) hold this position depending on Rayner and Pollatsek (1989) who, in turn, mention two approaches of processing; *the clausal model* and *the garden path approach*. This latter approach contains two main principles, *minimal attachment* and *late closure* principles. These principles are

general in that they can be applied to a variety of syntactic constructions. More importantly, they also make clear predictions in terms of when reading will be disrupted affecting reading speed (Rayner and Sereno, 1994: 69). Early studies like that of Frazier and Rayner (1982: 198) provide evidence that eye-movements measures are sensitive to syntactic processing.

Still we do not know speed-readers, in general, and readers of EFL do process texts syntactically. Although some kind of processing like the garden path do affect the duration of fixations of readers while reading, there is no clear indication as to how these effects are related to different types of reading. Moreover, no considerations have been paid to the depth of syntactic processing which appears to vary according to the type of reading. In careful reading, for example, the reader's aim is to get to each consecutive sentence to process and state it into memory for later recall. In contrast, types of expeditious reading like scanning and search reading drain the reader's attention away from deep processing of whole sentences and turns it towards the processing of single words or even sometimes to parts of words or numbers. In addition, readers of EFL are quite likely to have more break downs that occur in processing than are obvious on the surface, because they are influenced by their experience with reading in their native language (See Hyönä and Vainio, 2001; and Vos et al., 2001).

(2) The Effect of Orthographic Differences:

It has been claimed that different orthographies may provide different context effects for poor and skilled readers, and that normal readers rely more on the reading context than speed-readers. In this realm, Abu-Rabia (1997: 69) considered carefully the special nature of Arabic orthography in relation to other Latin orthographies like English. He points out that skilled readers rely on their autonomous decoding of words and do not need the context to facilitate word-recognition and augment their reading while poor readers lack these automatic decoding skills.

Additionally, some experiments have examined the pattern of eye-movements of readers reading different orthographies. Osaka (1987) used the moving-window technique⁽¹⁷⁾ to study the eye-movements of Japanese readers. He found that the perceptual span extended about 6 characters to the left of fixation. This means that the perceptual span for Japanese readers is considerably smaller than that for English ones if we equate a Japanese character with a letter. Moreover, Japanese and Chinese readers tend to have longer fixation durations than readers of English. Despite the fact that reading in these languages is slower when measured superficially, i.e. saccade lengths are shorter and fixation durations are longer, reading speeds, when measured in terms of the amount of meaning extracted per unit time, seem to be equivalent (Rayner and Pollatsek, 1989: 121).

(3) *Vocabulary:*

L1 adult, or near adult, readers can be assumed to have lexical entries for the words they encounter while reading, i.e. they know the words. All what they have to do is to make automatic recognition of the orthographic rendering of these words (Urquhart and Weir, 1998: 195). The more familiar a reader is with the words he is reading, the less conscious he is that he is reading words to the extent that he views the page of print as a scene full of images, ideas, and thoughts. So obviously, one of the factors that contribute to speed-reading is a large recognition vocabulary. In contrast, having weak vocabulary reduces both comprehension and reading speed (Lewis, 1985 and Adams, 1982). However, what about the vocabulary of the FL or L2 reader? Is it as large as it should be for skilled and efficient reading?

Urquhart and Weir (1998: 195) claim that the situation with FL or L2 readers is not the same. These readers may quite frequently face words that are both difficult to decode and are unfamiliar for them. This is because these words may not yet have a place in their lexicon. Nuttall (1982: 65) also points out that FL readers suffer from the problem of not having vocabulary well enough to do their readings. She adds, "...the

moderate readers can recognize about 50,000 different words in L1 reading, while graded reader series prepared for the EFL readers seldom go higher than the 3,500 word level". So, what is the student supposed to do with a gap of such a size?

It has often been argued that vocabulary is best acquired through reading. The desire for expanding L2 readers vocabulary stems from the effect of vocabulary knowledge on both comprehension and speed available in L1 literature. Thus, Nuttall (1996), quoted in Urquhart and Weir (1998: 195), states that "an extensive reading program is the single most effective way of improving vocabulary". However, what is important, in our view, is the fact that we do not expect FL readers to know every single word in the texts they read. So, how should they deal with the unknown words? Day and Bamford (2002: 138) have put ten principles for an extensive reading approach of which principle number (7) concentrates on the importance of extensive reading in reading speed. This approach gives the reader a chance to keep reading, and thus to practise such strategies as guessing at or ignoring unknown word without losing the message (See also Laufer-Dvorkin, 1981: 40; Prowse, 2002: 144; and Robb, 2002: 146f).

In addition to the extensive reading approach, Nuttall (1996) offers useful advice on how to ignore unknown words and build up a series of practical techniques for so doing. One such technique is *understanding gapped texts*. This technique shows the readers that they can get the gist of a text without understanding every word.

B. Literacy

Literacy is another component of reading taken from Bernhardt's (1991b) componential model of reading. By *literacy*, Bernhardt means operational knowledge: how to approach a text, knowing why one approaches it and what to do with it. Under literacy component, we include *cohesion and coherence, inference making, text structure and type*.

(1) Cohesion and Coherence:

For de Beaugrande (1980: 19), "cohesion subsumes procedures whereby surface elements appear as progressive

occurrences such that their sequential connectivity is maintained and made recoverable". There is a hint in de Beaugrande's definition that cohesion is a cover term in the sense that writers to achieve coherent discourse representations use different cohesive procedures, such as conjunctions, reference, substitution, and ellipsis. It might seem that the function of cohesive devices is to make the relationships between text units more transparent for the reader and hence easier and faster to read (Nuttall, 1982: 16f).

Meyer (1975) referred to in Urquhart and Weir (1998: 74) and Cohen et al. (1979) have considerable interest in the effect of cohesion on FL reading. Meyer and Urquhart found that, in the case of native speakers, marking the relationships did not seem to have any effect on the recall of a text. On the contrary, Cohen et al. (1979: 558) found that, with extended texts, the understanding of native speakers of English depended in part on conjunctions, whereas the non-native readers failed to understand the relationships marked by the use of conjunctions. The effect of cohesive items is, sometimes, very much on the surface to the extent that Cohen et al. report cases in which subjects did not know the meanings of conjunctions such as *thus*. Moreover, being unfamiliar with the use of such items, FL readers were busy most of the time processing them causing a great drop in their reading rates and comprehension scores.

The other basic issue here is how integrating information and establishing connections in a text can be localized to specific eye fixations. An example of such connections is the distance between the antecedent and the pronoun. This kind of connection is implicitly hinted in Halliday and Hasan (1979) description for whom the form of distance is in terms of the number of sentences and mediated ties. Rayner and Pollatsek (1989: 273), reviewing the evidence, concluded that "pronoun reference...is governed not only by linguistic rules but by a looser set of discourse guidelines...based on the type of verb, parallelism of form, and whether the noun is still the topic of the discourse". Moreover, most of the experiments reviewed in their account

show that at least "...some of the process of assigning the antecedent is done on fixations after the one on which the pronoun is encoded, and slows down processing on these later fixations" (ibid.). Thus, It would seem very likely that cohesive procedures, like those mentioned above, on the part of the reader, have effects on reading performance in that "if we add too much cohesive items, we are likely to annoy the readers, and possibly make the text more difficult to read" (Fries, 1986: 21). This difficulty retards readers' ability to increase reading speed and comprehension.

Before we leave this topic, it is highly significant to raise the question of what should readers do if they cannot detect coherence in the texts they are reading? Nuttall (1982) and Urquhart and Weir (1998) suggest a solution that in such cases the reader need to generate inferences to maintain coherence.

(2) *Inference Making:*

During reading, it is frequently the case that a concept or a proposition from the episodic structure in memory⁽¹⁸⁾ must be reinstated in working memory to ensure the coherence of the mental representation (Caillies et al., 2002: 269). Many experimental results (Kintsch and van Dijk, 1978; Nuttall, 1982; Rayner and Sereno, 1994; Urquhart and Weir, 1998) have shown that in the case of coherence breaks, the readers become involved in an inferential process to search for the lacking information. This process requires more or less time depending on the availability of the lacking information. Reading time being considered an indicator of processing time, Caillies et al. (2002: 270) hypothesize that the visible outcome of such kind of search for lacking information will be to decrease reading speed.

Myers et al. (2003: 1) point out that comprehension of a text requires that the content of each sentence read must be integrated with information contained in earlier parts of the text. To do so, "the reader has to drawn an inference that provides a bridge between the new information and the information read earlier". ***Bridging inferences*** is one main

group of inferences that have been distinguished by Calvo (2001: 366). The other group is called *elaborative inferences*. The former group makes sentences or texts coherent, and is necessary for comprehension, while the latter extends and refines information in the message. Myers et al. (2003: 1) tackle bridging inferences in three successive experiments where participants read pairs of sentences that require a bridging inference between a category in one sentence and a typical or atypical exemplar of that category in the following sentence. The results of experiment (1) show significantly slower reading rates when the exemplar was less typical of the preceding category because both fixations and gaze durations on the target word were longer. Such long fixations and gaze durations, in our view, are the main reason for decreasing reading speed. The results of experiments indicate that participants read the target line faster when the target word was in the nearer position. As for experiment (3), the reading time for the typical items was significantly faster than for atypical items when tested against subject variability, but not when tested against item variability (See Myers et al., 2003: 5ff).

As far as elaborative inferences are concerned, the results from eye-movement experiments confirm the notion that elaborative inferences do occur on-line, i.e. monitoring eye fixations while constructing these inferences (Rayner and Sereno, 1994: 75). Calvo (2001: 366) provides some similar instances of elaborative inferences. He indicates that these inferences are not automatic, but they require more time to be constructed especially when they are at the end of sentences than other parts of the sentence.

It follows, then, that drawing inferences, of whatever type, is to fill gaps produced when facing linguistic and/or conceptual problems in decoding the text. More specifically, the speed-reader's advantage of making inferences is primarily conceptual. Therefore, Just and Carpenter (1987: 448) state that "it probably is best to look at speed-reading as a means of realizing an already existing potential for inference

making, rather than a radical transformation of the reading comprehension process”.

(3) *Text Structure and Type:*

There is a number of intuitions about how speed-reading works and how speed-readers process a text; for example, skimming a text for its gist is usually believed to involve noticing important information in a text, reading it and skipping over unimportant details. Several models have been available, which attempt to tackle such intuitions by taking into account the organization and structure of the text being read. Among such models is Kintsch and van Dijk (1978).

The basic unit of analysis for Kintsch and van Dijk (1978: 367) is the proposition consisting of a predicate and arguments. Predicates “may be realized in the surface structure as verbs, adjectives, adverbs, and sentence connectives”, and the arguments “...are a set of semantic role relationships”. The main organizational components of this model are the *microstructure* and the *macrostructure*. The former is “the local level of the discourse, that is, the structure of the individual propositions and their relations, while the latter is “of a more global nature, characterizing the discourse as a whole” (ibid.: 365). The macrostructure is formed partly by the application of macrorules, for example, deleting irrelevant propositions, which enable the reader to achieve his goal in reading. In other words, the macrostructure is produced in accordance with the reader’s goal. Given this view, Kintsch and van Dijk put forward the following situations. In the first, “a reader’s goals are vague, and the text that he reads lacks a conventional structure” (ibid.: 373). In such a case, the macrostructure would be unpredictable resulting in one of the forms of expeditious reading termed *browsing* (Urquhart and Weir, 1998: 103). In another situation, the reader’s goals are clear, but are set by the reader who has a special purpose in mind that help him a great deal in being a flexible reader varying his reading rate over the text.

Much of the work of Kintsch and van Dijk (1978) focused on demonstrating the reality of propositions. In

particular, it was shown that reading rate was predicted by the number of propositions in a sentence or paragraph (See also Kintsch and Keenan, 1973). In this concern, Rayner and Pollatsek (1989: 296) add, “even if the number of words are the same, the reading time for a passage with more propositions was greater than for a passage with fewer propositions”. This kind of measure is called *readability* formula, which include all the aspects of text that affect reading difficulty.

Another pertinent fact is deciding what are appropriate text types for testing readers’ speed and comprehension. de Beaugrande (1981: 307) asserts that “...reading models will have to find control points in the reading process where text type priorities can be inserted and respected”. The implication is that different text types will affect reading performance. There has been, for example, a general consensus among researchers about using simplified or authentic texts for testing. Linguistically difficult texts are unlikely to be suitable for the developing of reading. If the text is full with new vocabulary and complex structures, the reader will resort to translation which will not only slows down his reading speed, but also “interposes the L1, instead of letting the FL speaks directly for itself” (Nuttall, 1982: 32). This is a view supported by the work of Lewkowicz (1997), reported in Urquhart and Weir (1998: 119), who argues that full authenticity of text may not be necessary, attainable or desirable. Then, how much simplicity is required? We believe that simplifying any text is a process that must be done with so much attention. By removing what we believe to form barriers to speed and comprehension from the original text, we may also be removing the basic qualities of a text. If we make everything explicit in our texts, then how will our students be able to improve their capacities of inferring which is one of the basic techniques used to increase reading speed and comprehension? This is not a kind of warning against using simple texts, but it is valuable to find unsimplified material at the right level. For this reason, we opt, in our empirical study, at using texts taken

from the TOEFL which is originally prepared for FL readers with different difficulty levels.

C. Background Knowledge:

The other component of Bernhardt's (1991b) model of reading is *background knowledge*. There are two significant aspects of background knowledge, viz. *schemata* and *topic familiarity* that envision the important part played by background knowledge in speed-reading. Ajideh (2003: 4) defines schemata as "hypothetical mental structures for representing generic concepts stored in memory", and that they can be seen as "the organized background knowledge, which leads us to expect or predict aspects in our interpretation of discourse". Carrell (1983: 85) distinguishes between *formal* and *content schemata*, i.e. knowledge about (a) the rhetorical structure of texts and (b) the content. Both have been shown by Carrell to have an effect at times on reading performance. Different schema theory based pre-reading activities have been posited.

Ajideh (2003: 8ff) focuses in his work on three of these activities, viz. previewing, questioning, and semantic mapping. At the end of his course, he invited feedback from his students on their impressions and thoughts of the activities covered during the term. In what follows, we are quoting some of their comments.

1. "The method you have introduced us made me conscious my sub-conscious. I tended to read a text word for word until then, being afraid to misunderstand the contents. Now, I am trying to skip as many words as possible even when I am going to read about something not familiar, and I am going to deal with the text I have already had quite a few knowledge".
2. "There are many positive aspects of using predictions..., we can improve our reading speed by predicting the following contents...".

The other aspect of topic familiarity is increasingly seen as one of the critical determinants of performance in reading. It has been operationally defined in Salmani-Nodoushan's

(2003:2) study as “the prior knowledge of the prepositional content of texts”. According to Clapham (1994: 281f), it is only with more specific texts that background knowledge has a significant effect on reading rates and text comprehension. Urquhart and Weir (1998: 65f) support this conclusive evidence. They point out that if we have a text on nuclear physics, for example, taken from a professional journal, it seems unarguable that a professional physicist will read it differently from most other readers. We can state this in relativistic terms, and say, as do Urquhart and Weir, that our reading speed and comprehension will be different; of course the physicist’s reading is likely to be faster and better. Accordingly, it does appear that the “more familiar a text, the more important the contribution of background knowledge to reading performance..., the less familiar a text, the more important the contribution of language proficiency” (ibid.: 144).

V. Conclusions:

1. This research paper yields supporting evidence of the fact that during reading, eye movements are very important in the sense that they serve as the means by which readers are able to acquire new information from the text. The current pages also show that there are differences in the eye-movement characteristics of readers between normal and speed reading. These differences are obviously reflected in the eye-fixation behaviour. The pattern of fixations of speed-readers portrayed by many researchers in this field, reveals that such readers make fewer and shorter fixations than normal readers, and as such they can increase their reading speed. In spite of such differences, both types of readers have been consistently fixating longer on infrequent words and words with thematic importance in the text and fixate for extended periods of time at the ends of sentences. This pattern of fixations appears to reflect the conceptual manner rather than the perceptual demands of the text.
2. Working memory capacity and size plays a crucial role in the speed with which information from the graphic representations can be processed. Much of the variability in

comprehension processes appears to be related to working memory differences between speed and normal readers. For example, readers with small working memories devote resources to the decoding aspects of reading that results in having less capacity for retaining earlier verbatim wording in working memory. This does not imply that speed and normal readers are doing vastly different things. Rather, the speed with which material can be encoded in memory appears to play a part in determining reading speed, and the size of working memory seems to play a role in determining comprehension processes. As such, it tends that almost all readers are doing essentially the same thing; some may do it a bit slower-hence their reading speed will be slower -and some may not have good working memory abilities- hence their comprehension will not be quite as good as others.

3. Automatic word-recognition is more important to speed processing than context clues; the large-scale development of recognition vocabulary may be crucial to reading development. College readers have simply not acquired automatic decoding skills that they spend too much processing time thinking about words and relating them to the surrounding context, rather than automatically recognizing them. It seems likely that it takes longer to access lexical meanings, remember what a word means, in FL than it does in L1. Our readers of EFL neither have large well-practised vocabularies nor years of experience of recognizing words in print. Hence, it takes them longer to decide whether a word is known or unknown, and in the latter case whether to skip it or not.
4. Time to process words, propositions, and especially syntactic units all appear to take longer in the case of our college readers of English. Consequently, they have difficulty-determining relations within and among these syntactic units. This means that these readers fail to keep informed about 'who is doing what to whom' in the text. They process the meaning of text laboriously in a word-by-word fashion which is assumed to require additional

processing time that extremely interferes with their ability to use syntax as the means for interpretation and integration of words, phrases, and clauses. This makes sense of why sometimes FL readers are described as being plodding readers. For such reasons, understanding syntax can help FL readers to comprehend a text more readily and speedily. Moreover, increasing syntactic knowledge may help FL readers to deal with more complex sentences and increasing their automaticity in recognizing syntactic structures should free up processing time.

5. Mastery of textual features, such as the ability to complete anaphoric relations test, is closely related to speed-reading and reading comprehension. It appears that recognition of conjunctions and other inter-sentential linguistic devices is crucial in faster reading and understanding of the foreign language.
6. In reading EFL, even if our students have the necessary background knowledge of a certain topic, this is of no help for them in developing their reading ability. This is put down to the existence of a **threshold level**, i.e. there is a level below which a deficit in one component of the reading process cannot be compensated for by a corresponding strength in another. To put it another way, readers' background knowledge cannot compensate for their low level of proficiency in English. Moreover, this threshold level is not valid for all tasks and all subjects. In fact, it seems obvious that some tasks will require a higher threshold level than others. It is probably also true that some subjects are able to make more of their limited linguistic proficiency than others. Hence, the threshold level must be reset for each subject or group of subjects, and each set of tasks.
7. Speed-reading and its activities are very different from normal reading in terms of what reading components are involved. What components that are involved in scanning, for example, is word-recognition only. There is no need for processing the syntax and semantics of the text containing the search item. Also there is no need for the reader to

bring background knowledge into play; the reader does not even need to access the lexicon since it would be possible to scan a text for a nonsense word. As for skimming, readers' efficiency in such activity depends crucially on their knowledge, either of the topic of the text, or the structure of it, or both. Such knowledge is even more utilized in skimming than with careful reading and it comes either from previous reading in the FL or simply transferring such knowledge from L1 to FL. With careful reading, the state is somewhat different. Students are definitely able to read carefully both locally and globally, whereas this might not be the case for the aforesaid types of reading.

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طرق في القراءة السريعة

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المستخلص

بالرغم من توفر كم هائل من المعلومات حول القراءة، هناك ثغرات كبيرة في معرفتنا وفهمنا لعمليات ومكونات القراءة السريعة. لهذا السبب يركّز البحث الحالي على تقديم نقاشات حول محاور بحثية تتعلق بمواضيع من قبيل العمليات التي تحدث في القراءة السريعة ومكونات القراءة التي من المفروض أن تؤثر وتتفاعل مع القراءة السريعة. وفي إطار الموضوع الأول تمت مناقشة عمليات مختلفة مثل حركات العين والاستيعاب والاستدكار وعلاقتها جميعاً بالقراءة الاعتيادية والقراءة السريعة. أمّا الموضوع الثاني فيغطّي القراءة بوصفها تركيبية تتضمن أكثر من مكون مثلاً المعلومات العامة واللغة و معرفة القراءة والكتابة. وتحت مكون اللغة تمت مناقشة مكونات النحو وتأثير الاختلافات الإملائية والمفردات. أمّا مكون معرفة القراءة والكتابة فيتضمّن مناقشة مسألة تماسك النص وتلاحمه، الاستنتاج وتركيبية النص ونوعه. وأخيراً، تعد مناقشة هذه المكونات ذات فائدة كبيرة من خلال اختيار كيفية تفاعل هذه المكونات مع القراءة السريعة وفيما إذا كان تقويم هذا التفاعل إيجابياً أو سلبياً فيما يتعلق بالقراءة السريعة.

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