A Critical Overview of Models of Reading Comprehension with a Focus on Cognitive Aspects

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Abstract

Reading is a cognitive activity involving skills, strategies, attentional resources, knowledge resources and their integration. The reader's role is to decode the written symbols to allow for the recovery of information from long-term memory to construct a plausible interpretation of the writer's message. Various number of reading models have been proposed by researchers among which some focus on motivational and emotional aspects of reading. Others highlight the cognitive aspects of reading. In this study, the models characterizing reading in terms of cognitive aspects are revieweded, and different viewpoints on the reading process are described. This may help EFL/ESL teachers to improve their understanding of the reading process, update their perspectives on teaching reading tasks which in turn might result in more efficient learning by not putting too much cognitively demanding reading tasks on EFL/ESL learners.

***Keywords*: Reading Models; Attentional Resources; EFL Learners; Cognitive Process.**

1. Introduction

Foreign or second language reading has been the focus of researchers' attention over the past twenty years (Macaro, 2003) and a number of models for this preponderant skill have been proposed. During the 1960s and early 1970s, a number of researchers proposed more or less formal models of reading comprehension. For example, Carroll (1964) suggested a definition of reading along with a simple one-way flow diagram from visual stimulus to an oral language recoding to meaning responses. Since his aim was to be illustrative, rather than definitive, many imprecisely specified stages were left in his model. Also, Levin and Kaplan (1970), Hockberg (1970), and Mackworth (1972) all argued about what a model explaining the processes of skilled reading must account for. This work heralded a change in conceptions of the reading constructs among researchers and practitioners.

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In contrast, Goodman (1965, 1976) described reading as a psycholinguistic guessing game. Three distinctive characteristics distinguished Goodman's model from other models. First, he believed that the reader relies on existing syntactic and semantic knowledge rather than graphic information in the process of reading. Second, he used the term "decoding" differently from others. While others used this term to describe what happens when a reader translates a graphemic input into a phonemic input, Goodman used it to illustrate how either a graphemic input or phonemic input gets translated into a meaning code. He also used the term 'recoding' to describe the process of translating graphemes into phonemes. Goodman's and his colleagues' efforts were mostly focused on indicating the strong procedural preference that readers of all ages had for depending on the meaning cues (rather than graphic and graphophonemic cues) available in the printed message. Third, his model has arguably had the greatest influence on conceptions about reading pedagogy, to the extent that 'the psycholinguistic approach to reading' or 'the whole-language approach to reading' have become commonly used terms in the language teaching field (Samuels & Kamil, 1988).

In summary, Goodman (1996) argued that when an individual reads a text, he or she makes a set of hypotheses about the upcoming text, samples minimally from the text, confirms hypotheses, and then produces new predictions. However, other researchers (e.g., Grabe, 2000, 2009; Koda, 2005; Pressley, 2006) impose some criticisms on this argument. They argue that there is no persuasive evidence in a fluent reading that good readers (a) sample from texts and make hypotheses about what words are coming next (b) control their eye movements (direct the eye where to go during reading to sample from a text). They further argue that good readers do not usually guess upcoming words in a text, and make less use of context for word identification than poor readers. Grabe (2009) argues that Goodman's Psycholinguistic Guessing Game model provides a possible explanation for an early stage of reading development. He further argues that Goodman's Psycholinguistic Guessing Game Model cannot be a valid alternative to any other models of reading, which will be described in the following section (Grabe, 2009).

In the following section, seven models of reading will be discussed in turn: bottom-up, top-down, Rumelhurt's Interactive Model (1977), Stanovich's (1980) Interactive-Compensatory Model, Construction-Integration Model, Verbal Efficiency Theory of Reading, and Compensatory-Encoding Model. Discussion of these models follows by a critical overview with the focus on the cognitive aspects of reading. Other models characterize reading as a more complex process where motivational and emotional aspects play an important role; however, these aspects are beyond the scope of this study.

1.1. Bottom-Up Model

A bottom-up reading model is a model that focuses on a single-direction, part-to-whole processing of a text. More specifically, in bottom-up models, the reader is assumed to be involved in a mechanical process where he or she decodes the ongoing text letter by letter, word by word, and sentence by sentence (Grabe, 2009).In these models, the reader decodes the text which has been previously encoded by the writer. Decoding of the text includes a visual focus on the identification of the letters, noticing the combination of the letters, recognition of the words, establishing sentences via their syntactic structures and finally integrating sentences into coherent discourse until the meaning of the text is eventually determined. The reader's world knowledge, contextual information, and other higher-order processing strategies play a minor role, particularly at beginning stages, in processing information in this model (Alderson, 2000; Beach, 1997; Dechant, 1991; Grabe & Stoller, 2002; Koda, 2005).

The proponents of bottom-up models (e.g., Flesch, 1955; Gough, 1972; LaBerge & Samuels, 1974) argue that these models work on the premise that the written text is hierarchically organized, and the reader's job is to process the smallest linguistic (i.e. grapho-phonic) unit first and then combine the smaller unitsto discover and comprehend the higher (e.g., sentence syntax) units (Alderson, 2000; Dechant, 1991; Field, 2003; Grabe&Stoller, 2002; Koda, 2005; Macaro, 2003; Mitchell, 1982).

Word recognition plays an essential role in reading comprehension. Koda (2005) defines it as "the processes of extracting lexical information from graphic displays of words" (p., 29). Studies on eye movement indicate that nearly every content word obtains direct visual fixation (Balota, Pollasek, &Rayner, 1985; Just & Carpenter, 1980, 1987), and the lack of even a single letter can be disruptive, largely decreasing reading efficiency (e.g., Mc Conkie & Zola, 1981; Rayner & Bertera, 1979). Furthermore, based on developmental studies, researchers argued that poor readers could not extract visual information from print, and deficient word recognition is associated with poor comprehension (e.g., Perfetti, 1985; Stanovich, 1988). If inefficient word recognition continues, it may have adverse effects, directly or indirectly, on the acquisition of reading competence (e.g., Juel, 1988; Juel, Griffith, & Gough, 1986). Thus, word recognition efficiency can result in successful comprehension. Some studies also indicate that automaticity can be rather easily achieved in word recognition (e.g, Adams, 1994; LaBerge & Samuels, 1974; Perfetti & Lesgold, 1979). This may reduce the processing load in working memory, leaving more capacity for the storage component, and eventually facilitating conceptual manipulations of the extracted information (e.g., Daneman & Carpenter, 1980; Waters & Caplan, 1996).

Word recognition involves orthographic, phonological and semantic operations. While a word's meaning is obtained in semantic operation, the word's sound features are achieved in phonological operation. Both of these operations are activated through orthographic operation and achieved via an analysis of graphic symbols (Koda, 2005; Samuels & Kamil, 1988).

Orthographic knowledge plays an important role in word recognition. Research suggested that skilled readers were able to not only analyse and manipulate word-internal elements such as letters and letter clusters (e.g., Ehri, 1998; Shankweiler & Liberman, 1972), but also to pronounce both individual letters and nonsense letter strings (e.g., Siegel & Ryan, 1988; Wanger, Torgesen, & Rashotte, 1994). This is because orthographic knowledge is a powerful mnemonic device that connects the written forms of specific words to their pronunciation in memory (Ehri, 1998).

Phonological decoding may be the most essential competence for reading acquisition in all languages (Koda, 2005). It is defined as the processes involved in accessing, storing, and manipulating phonological information (Torgesen & Burgess, 1998). Researchers argued that deficits in phonological decoding could lead to poor comprehension in both alphabetic (Abu Rabia, 1995) and nonalphabetic languages such as Japanese and Chinese (Kuhara-kojima, Hatano, Saito, & Haebara, 1996; Zhang & Perfetti, 1993).

The empirical evidence supports the idea that all of a word's known meanings are activated by its orthographic input, even when strong constraints are imposed by the context (e.g., Seidenberg, Tanenhaus, Leiman, & Bienkowski, 1982). Then contextual facilitation helps to determine the appropriate meaning of the word in the immediate context at the sentence or discourse level. Researchers also argue that less skilled readers are more likely to be dependent on the context to retrieve word meanings than skilled readers (e.g., Biemiller, 1979; Becker, 1985; Perfetti, 1985; Stanovich, 1988).This supports the idea that poor readers use contextual clues to compensate for their underdeveloped visual information sampling skills in order to decipher a word's meaning (e.g., Pring & Snowling, 1986; Stanovich, 1986).

There is an assumed relationship between contextual effects on word-meaning retrievals and language proficiency. It is suggested that as L2 proficiency improves, reliance on contextual effects to retrieve word meaning diminishes (Becker, 1985; Grabe, 2009; Pring&Snowling, 1986; Stanovich, 1986). A large body of studies also indicates that efficiency in extracting visual information differs among high and low-proficiency readers, suggesting that low-proficiency readers are slower and less accurate in a variety of word recognition tasks (e.g., Favreau & Segalowitz, 1982; Haynes & Carr, 1990; Macnamara, 1970).

Some other studies suggest that low-proficiency readers are more largely involved in word-level than discourse-level processing (e.g., Cziko, 1980; Horiba, 1990). Since low-proficiency readers rely on a word's visual information rather than its semantic information (Chamot & El-Dinary, 1999; Clarke, 1980), they are less likely to engage in conceptual manipulations (such as hypothesizing and predicting) than high-proficiency readers (e.g., Anderson, 1991; Chamot & El-Dinary, 1999).

In bottom-up models, the reader takes a serial order to process the text, and the processing of each component takes place independently of the others (e.g., Alderson, 2000; Grabe, 2009; Koda, 2005; Mitchell, 1982). For example, the perception of phonemes is not influenced by the words in which they appear (Carroll, 2008). Since there is a single and restricted meaning in the text driven and constructed by the writer, the reader needs to extract this meaning and cannot go beyond it (Alderson, 2000; Beach, 1997; Grabe & Stoller, 2002; Koda, 2005). Therefore, it is not possible to make use of higher-order reading skills such as making inferences, and consequently, background knowledge plays virtually no role in deriving and interpreting the meaning of the text in this model.

1.2. Top-Down Model

A top-down reading model is a model that focuses on what the reader brings to the text to arrive at the meaning. In top-down models, it is assumed that the comprehension process is not mechanical, but actively controlled by the reader (Grabe, 2009).The proponents of these models (e.g., Schank, 1978; Smith, 1971) suggested that processing of a text begins in the mind of the reader with meaning-driven processes, or an assumption about the meaning of a text. From this viewpoint, readers identify letters and words only to confirm their assumptions about the meaning of the text (Dechant, 1991). In these models, the primary purpose of reading is deriving meaning from the text rather than mastery of letters, letter-sound correspondence, and words (e.g., Alderson, 2000; Grabe & Stoller, 2002; Macaro, 2003; Smith, 1971). Readers are supposed to use meaning and grammatical cues to identify unfamiliar words, and they are able to comprehend a passage even if they do not recognize each word. In this view, the meaning of a text, which is considered an important goal to achieve, is accessed by the reader's activation of prior knowledge of semantic, pragmatic, syntactic and discourse elements. Then he or shewill be able to predict and infer the meaning underlying propositions and words (e.g., Alderson, 2000; Beach, 1997; Dechant, 1991; Grabe & Stoller, 2002; Koda, 2005). However, this view does not identify what mechanisms the reader draws on to generate inferences or how the mental composition of comprehension works (Grabe, 2009).

1. 3. Rumelhart's (1977) Interactive Model of Reading

Since the information in top-down and bottom-up models is passed along in one direction only and the information contained in higher stages does not influence the information in lower stages, these models could not account for a number of well-known occurrences, such as making inferences, which take place while reading. Thus, to remove this deficiency, Rumelhart (1977) proposed an interactive model of reading. This model, which is a combination of both top-down and bottom-up strategies, is now widely considered a comprehensive explanation of how we derive the meaning of a written text. Rumelhart (1977) developed this model based on the fact that meaning does not reside in the text alone, but is a co-construction of the writer's text and the reader's interpretation. So, reading requires an interaction between the reader's mind and the writer's text. This allows the information contained in higher stages to interact with and influence the information in lower stages.

In this model, the process starts with the information picked up by the eyes in the form of visual features, registered in a visual information store, and then sent to the central component of the model, the pattern synthesizer, at the first stage. Then a wide variety of sources of information about letter shapes and orthography (including what is semantically and syntactically acceptable in the language, the contextual situation, and information in the mental lexicon) is drawn up from long-term memory into working memory. Finally, the pattern synthesizer uses this information to work out the more probable interpretation of the text. During this process, the already-made hypothesis is confirmed, strengthening connections and built-up layers of interpretation by pausing over individual words and syntactic patterns and their relationship with other words and phrases (Macaro, 2003). There fore, the reader is involved in deriving the meaning of the text and making inferences through a constant interaction between the surface structure of the text and his own knowledge of the topic.

Since working memory is the workspace for the temporary storage and processing of ongoing information (e.g., Baddeley & Hitch, 1974, 2000, 2007),it may play a significant role in the processes involved in deriving meaning from text(e.g., Alderson, 2000; Beach, 1997; Cain & Oakhill, 2006; Grabe & Stoller, 2002; Koda, 2005).These processes consist of maintaining the text information, activating the reader's world knowledge and retrieving it from long-term memory, integrating the information received from these two sources into coherent discourse, and finally deriving the meaning of the text. A substantial body of L1 (e.g., Daneman & Carpenter, 1980; Divesta & Dicintio, 1997; Waters & Caplan, 1996) and L2 research (e.g., Harrington & Sawyer, 1990; Lesser, 2007) supports the idea that good readers have higher working memory capacity than poor readers.

1.4. Stanovich's (1980) Interactive-Compensatory Model

Stanovich's (1980) interactive-compensatory model was a refinement of Rumelhart's (1977) interactive model in explaining skilled and unskilled reading. It is based on the principle that a process at any level can compensate for deficiencies at any other level. In his words, "… a deficit in any knowledge results in a heavier reliance on other knowledge sources regardless of their level in the processing hierarchy" (p. 63). So, top-down processing, for a reader weak at word recognition, but good at the knowledge of the text topic, may compensate for this deficit. On the other hand, a reader good at word recognition, but lacking knowledge of the topic may rely on bottom-up processes for this compensation (Samuels & Kamil, 1988). The research also supports the idea that prior knowledge of the topic can be used by the learner as a strategy to reduce the cognitive load when syntactic complexity makes access to meaning difficult (Barry & Lazarte, 1998). From a theoretical perspective, Stanovich (1988) made a unique contribution to reading models by providingan explanation of compensation strategies, which account for why poor readers show greater sensitivity to contextual constraints under some circumstancesthan good readers (e.g., Alderson, 2000; Beach, 1997; Grabe & Stoller, 2002; Samuels & Kamil, 1988).

Unlike the models described above, the following two models (Construction-Integration and Verbal-Efficiency models) are experimental/behaviour models of reading where the researchers draw on a range of experimental evidence to develop and support their assumptions (Grabe, 2009). Moreover, they envision an important role for working memory and automatic bottom-up processing in reading process as it will be described in the following section.

1.5. Construction-Integration Model of Reading

Construction-Integration Model was proposed by Kintsch and his colleague (Kintsch, 1988a, 1998b; Kintsch& van Dijk, 1978; van Dijk & Kintsch, 1983). Based on this model, automatic lower-level reading processes are combined with higher level reading processes to create a coherent discourse representation of a text, and these processes are supported by a limited capacity pool of attentional resources. There are two phases in this model; a construction phase and an integration phase. In the construction phase, a reader develops propositions from the incoming text information in order to generate a mental model of the text. This model is provisional and incoherent since it includes both relevant and irrelevant information which have been activated; when an individual reads a word, all the meanings of the word as well as the semantic associates of that word are automatically activated in his or her long-term memory (Graesser, Millis & Zwaan, 1997). In the integration phase, the reader evaluates the propositions he or she has developed within a global context with the goal of making a stable activation pattern or a coherent mental network. In doing so, the propositions which are compatible within the context are connected to form the network, and those which are incompatible are disregarded. At this phase, the integration of text information with the reader's background knowledge yields a coherent mental model which captures the global and local relations and consequently results in comprehension. All these processes in construction and integration phases are manipulated by working memory. More specifically, working memory is involved in the processes of making propositions, suppressing irrelevant information, and developing a coherent mental network which result in reading comprehension. This suggests that working memory plays a strong role in reading comprehension.

The assumptions of cognitive capacity limitations in comprehension processes followed by the integration processes (summarizing processes due to being overlapping associations among propositions) distinguish the Construction-Integration Model from the models reviewed before.

The automatic lower-level processes and limited pool of attentional resources in working memory are also considered as important assumptions in the Verbal-Efficiency Model, proposed by Perfetti

(1985, 2007). However, the emphasis is on automatic word-recognition skills which result in reserving more attentional resources for higher level processes, and consequently better reading performance.

1.6. Verbal Efficiency Theory of Reading

This model was proposed by Perfetti (1985, 1999, 2007). It is an example of an interactive model which is very constrained by the bottom-up view of reading (Hudson, 2007). Efficient word-recognition skills play a very important role in good reading performance in this model. It is argued that problems with higher-level comprehension skills originate from inefficient word-recognition skills which, in turn, stem from low-quality lexical representations (Perfetti, 2007). Perfetti and his colleague (Perfetti, 2007; Perfetti& Hart, 2001, 2002) argue that there are three constituent information sources for word recognition including phonological, orthographic and semantic information. These constituents work together and share information until a word is recognized.

Based on Verbal Efficiency Theory of reading, skilled readers have automatic lower-level processes (e.g., efficient word recognition skills), and this allows them to draw on their limited attentional resources in working memory for higher level comprehension skills. More specifically, there are two sets of processes in this model, local text processes and text-modelling processes, which have interactions in reading process. The central principle of this model is that the comprehension of a text is partially constrained by the efficient operation of the local processes. The local processes involve the processes that the reader uses to encode contextually appropriate meanings and propositions. When a text is read, first, the possible meanings associated with each word in the text are activated in working memory. Second, the most appropriate semantic meaning for the proposition in the context is selected. Third, initial propositions are created from the propositional encoding of each word and maintained in working memory. Finally, new propositions are integrated with previous propositions held in working memory to give a representation of the text. This representation remains active in working memory to be further processed by text-modelling processes (higher-level processes) (Perfetti, 1985). Text-modelling processes are used to combine the representation of the text with a reader's background knowledge to fill the gaps in the propositional base and make him or her create inferences. It is at this stage that comprehension (text-modelling) takes place and causes the propositions to make sense as a whole. A continual updating process occurs during the reading by reconciling incoming text processing with background knowledge. For this process to be efficient, the processes for word-recognition components (phonological, orthographic, and semantic) must be automatic. As there are limited attentional resources in working memory, automatic processes reduce the amount of attentional resources for processing letter and word identification, and consequently leave further attentional resources for processing higher level comprehension skills. This suggests that efficient working memory processes play an important role in reading comprehension (Hudson, 2007), particularly for low-proficiency readers who have not obtained automaticity in their local processes. If this is the case, working memory is expected to explain individual differences in reading comprehension. However, it is not clear yet whether or not the role of working memory may change as a result of language proficiency development.

Overall, this model is compatible with the Construction-Integration Model where working memory with a limited capacity pool of resources is central to manipulating reading processes. It appears that Verbal-Efficiency Model is more prominent in explaining efficient word-recognition skills which result in automaticity in reading process which leads to leaving more attentional resources in working memory for higher-level processes such as making inferences.

The last model reviewed here is the Compensatory Encoding Model which also conceives of working memory as having a key role in reading process. However, a compensatory process is assumed in this model which distinguishes it from the Verbal Efficiency Model. Moreover, unlike the Verbal Efficiency model, it is a descriptive model where a synthesis of the most important evidence is used to explain how a cognitive process like reading works (Grabe, 2009).

1.7. The Compensatory-Encoding Model

This model of reading was proposed based on verbal efficiency model and adopted its basic assumptions including automatized lower-level processing, well-developed lexical representations, and efficient working memory processes (Walczyk, 1995, 2000; Walczyk, Marsiglia, Bryan, & Naquin, 2001). This model assumes an additional process that is a compensatory process. The compensatory process in this model differs from that of Stanovich's interactive compensatory model in that it is used continually to counter inefficiencies and weaknesses in reading skills. In Stanovich's model, higher-level skills and strategies are used only when needed. Based on the compensatory encoding model, the compensatory processes play an influential and a predictive role in reading performance when there is no time constraint on a reading task. This could work well particularly for readers with lower working memory capacity as they may employ these strategies to compensate for their inefficient working memory processes. These compensatory processes, similar to those in Stanovich's model, include higher-level skills and metacognitive strategies (e.g., goal checking, comprehension monitoring). When the process of reading proceeds under time pressure, the compensatory processes do not play a role and instead lower-level processes become influential and play a predictive role in reading performance (Grabe, 2009).

2. Discussion and Conclusion

Overall,each model can contribute to our understanding of the reading process. With each new model building on previous work, a developing understanding of the reading process has emerged from this rich research history. The increasing specification of the role of cognitive processing in reading is of particular relevance to this study, and makes it possible to more clearly understand the role of cognitive resources in the reading process. Except for bottom-up and top-down models, there are some commonalities among the models reviewed above. They all conceive of the reading process as involving both lower-level (e.g., word-recognition skills, syntactic parsing) and higher-level (e.g., making inferences) processes. The proponents of these models suggest that word-recognition skills play a very important role in reading comprehension. As Perfetti (2007) suggests,one explanation could be that word recognition involves the interaction of orthographic, phonological, semantic and syntactic processes which are cognitively demanding. Thus, those readers who are good at word recognition (due to possessing well-represented lexical information) leave much of their attentional resources for higher-level reading processes which in turn result in better comprehension. Moreover, they argue that basic grammatical information can be extracted to support clause-level meaning and proposition formation. However, these models differ in explaining the nature and role of these processes.

Reading is not a mechanical process, as assumed by bottom-up models, nor is it carried out in a serial order as it is envisioned by the bottom-up and top-down models, but it is an interactive cognitive process involving simultaneous lower-level and higher level processes which are manipulated in working memory. Of the reading models described above, Verbal-Efficiency (Perfetti, 1999, 2007) and Construction-Integration models (Kintsch, 1998) are better in explaining the reading process. They specify the role of cognitive processes in reading comprehension more precisely than other models of reading. They provide a reasonably complete explanation of reading abilities in terms of cognitive processes with empirical evidence, indicating how reading performance may vary under different conditions (Grabe, 2009). They specify how reading performance may vary due to individual differences in reading abilities. These individual differences could stem from either attentional resources or reading skills (e.g., word-recognition skills). For example, in Verbal-Efficiency model, skilled readers are distinguished from poor readers in terms of possessing automatized lower-level processes (e.g, more efficient word-recognition skills). Thus, the central assumption of Verbal Efficiency model could be used to explain the automaticity aspect of the reading process. Based on this assumption, automatized reading processes are not very cognitively demanding of attentional resources, so more attentional resources are left in working memory for higher-level reading processes, which, in turn, enhance the reading performance. This assumption could be used to explain what role working memory plays in reading process and whether this role changes as proficiency increases. For example, lower proficiency learners may struggle with word-recognition processes, and attentional resources are directed towards lower-level processing. However, as familiarity with second language increases, reading becomes more automatized and greater attention can be given to higher-level skills such as making inferences. In Construction-integration model, comprehension processes are carried out within the attentional capacity limitations of working memory. This model may explain how limited-attentional resources in working memory could be drawn on to develop a local representation of a text (a set of main idea and supporting details), and then to integrate this representation with background knowledge to make an interpretation of the text in a global context.

There are still some limitations among all the models of reading described above. None of these models explain how executive control processes in working memorywork in fluent readingand how reading strategies are used when reading more difficult texts or learning from texts. In both phases of Construction-Integration model, the abilities of monitoring comprehension, using strategies, and reassessing and re-establishing goals are used to repair comprehension problems. However, it is not completely clear how the operation of monitoring, as an attentional demanding process and an aspect of executive control processing in working memory, is manipulated cognitively. Moreover, these models do not explain how working memory handles the cognitive processes in comprehending longer and more complex texts.

Finally, the current study can have two implications for EFL/ESL teachers in teaching L2 reading. The first implication is concerned with the type of reading tasks given to EFL/ESL learners. As mentioned before, attentional resources could be one of the sources of individual differences in reading comprehension. This is because these resources are limited and if these learners are given cognitively demanding tasks beyond their proficiency level, this may disturb their reading process. This suggests thatEFL/ESL teachers should be cautious not to place a burden on language learners beyond their capabilities. One way to reduce this burden is giving language learners the reading tasks which match with their proficiency level.

The second implication of the present study is closely associated with enhancing EFL/ESL learners' word-recognition skills. As research shows, word recognition can be very challenging and effortful, particularly for lower proficiency readers, because it involves processing orthographic, phonological and semantic information (e.g., Perfetti, 1985; Segalowitz, Poulsen & Komoda, 1991; Stanovich, 1988). Thus, EFL/ ESL teachers should provide these learners with sufficient practice, for example, on sound discrimination, detecting individual phones, distinctive sound unites (phonemes), and phonological sensitivity to make sure they are competent enough in these abilities and then they are able to identify individual words easily. This may also help these language learners to gain automaticity on word identification which resultsin drawing on less attentional resources. As a result, further resources are leftfor executing other lower and higher level reading processes such assyntactic parsing, semantic proposition formation, inference making, and comprehension monitoring which in turn leads to better reading performance.

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