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A STATE-OF-THE-ART REVIEW OF BACKGROUND KNOWLEDGE AS ONE OF THE MAJOR FACTORS THAT INFLUENCE READING COMPREHENSION PERFORMANCE

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The aim of this paper is to review the research carried out to date on the use and effect of background knowledge on reading comprehension. We want to reflect on the use of background knowledge in first (L1) and second (L2) language reading comprehension and on the interrelation between language proficiency and background knowledge in reading comprehension performance. This study aims to provide more insight into the relationship between prior knowledge and reading comprehension, which will add to the knowledge of reading research and will help better understand the role of these factors and how they affect one another.

Key words: review, research, background knowledge, reading comprehension, language proficiency

El objetivo de este artículo es revisar la investigación que se ha llevado a cabo hasta la fecha acerca del uso y efecto del conocimiento previo en la comprensión escrita. Queremos reflexionar sobre el uso del conocimiento previo en la comprensión lectora en una lengua nativa y en una segunda lengua, así como sobre la interrelación entre la competencia lingüística y el conocimiento previo en la comprensión lectora. Este estudio pretende profundizar en la relación entre el conocimiento previo y la comprensión lectora, lo que incrementará el conocimiento de la investigación llevada a

cabo en el campo de la lectura y ayudará a entender mejor el papel de estos factores y qué efecto tienen entre sí.

Palabras clave: revisión, investigación, conocimiento previo, comprensión lectora, competencia lingüística

1. Introduction

Research on reading has attempted to look for components that affect reading performance. Gender, background knowledge, interest, and language ability have been seen as amongst the major factors that influence reading comprehension performance (Brantmeier, 2001, 2003; Bügel and Buunk, 1996; Carrell, 1987; Grabe and Stoller, 2002; Hyde and Linn, 1988; Koda, 2005; Rosén, 2001; Pae, 2004; Urquhart and Weir, 1998; Yongqi, 2002).

The aim of this paper is to review the research carried out to date on the use and effect of one of these factors -background knowledge- on reading comprehension. We want to approach the role of prior knowledge in reading comprehension and analyse how these two factors affect each other. We will also study the interrelation between language proficiency and background knowledge in reading comprehension.

2. The Use of Background Knowledge in L1 and L2 Reading Comprehension

Background knowledge relative to the content domain of the reading passage that the reader brings to a text plays a supportive role in comprehending a written message. The role of background knowledge in language comprehension has been formalized as schema theory. A schema theory is a theory about how knowledge is represented and about how that representation facilitates the use of the knowledge in particular ways. According to schema theories, all knowledge is packaged into units. These units are the schemas or schemata. Embedded in these packets of knowledge is, in addition to the knowledge itself, information about how this knowledge is to be used. Each schema contains many components, parts, or "slots", which are hierarchically linked, representing the relationships among the

components relative to the schema in question (Anderson and Pearson 1984; Carrell 1991). If new information is incomplete, the reader makes inferences on the basis of the selected schema in order to fill in the missing parts. The earliest study on the impact of schemata on reading comprehension dates back to the classical research of Bartlett (1932). In his study, English participants were asked to read and recall a story from an unfamiliar culture, and the major finding was that the recall was inaccurate. They tended to alter the text in the direction of their own cultural background knowledge.

2.1. Research Carried Out on the Effect of Background Knowledge on L1 and L2 Reading Comprehension

Research into the schema-comprehension relationship has been conducted initially and primarily in the realm of English as a first language. Much of the research into content schemata use has centred on the relevance of the reader's cultural background knowledge of the content schematic area of the text in reading comprehension, i.e. looking into schema use from a cross-cultural perspective. Research has shown that texts whose content schematic area corresponds to the readers' cultural background area are more easily processed. Schreck (1981) examined the relationship between content schemata and reading comprehension for fifth- and sixth-grade readers from three different American cultural groups (Hispanic, Black and White). Pickens (1982) worked with sixth graders from three American culturally diverse groups (Hispanic, American Indian and Anglo-American). They found that familiarity with the cultural content schematic area of the text facilitates reading comprehension.

The use of content schemata~~,~~ which do not involve cultural specific knowledge~~-~~, has also been examined. Bransford and Johnson (1972) have shown that subjects find it difficult and sometimes impossible to understand a text when they cannot access its content schematic area if there are not enough clues in the text. They have shown that sometimes a title to the passage or a drawing makes the content schema accessible and, consequently, the passage is understood.

Other studies into L1 reading comprehension also show that world knowledge has strong effects on readers' construction of meaning from a text. Thus, Beaugrande (1980) presents evidence through miscues in oral reading that subjects activate content schemata. Thus, miscues are signals of the subjects' predictions on the basis of the content schemata instantiated. For example, as Beaugrande (1980:227) explains, a subject reading a text about a rocket which was fired in the presence of generals read "war" for "roar". He also shows that subjects tend to add information to a text they read when asked to recall it on the basis of the content schema activated. When recalling a text about the launching of a rocket from a desert, they added information about the brightness of the sun in the desert, which seems to be evidence of schema use in reading comprehension.

Carrell (1983) investigated the role of three components of background knowledge as identified in the literature in L1 reading comprehension: (1) presence or absence of context (indicated by clues like a title and a picture preceding the text) facilitating top-down processing; (2) transparency or opaqueness of lexical items in the text (which provide clues to the content schematic area of the text) facilitating bottom-up processing; (3) reader's familiarity or unfamiliarity with the content schematic area of the text. Her results indicate that the three components affect the way native speakers read, understand and recall passages.

To show the difficulty of eliminating test bias and to develop a methodology for distinguishing between the effects of prior knowledge and of skill development on reading comprehension, Johnston (1984) administered an 18-question reading comprehension test to 207 eighth-grade students. Quantitative and qualitative effects of prior knowledge on reading comprehension were demonstrated through an examination of student performance on the test's different types of questions: (1) textually explicit--drawing on information directly stated in a single sentence of text, (2) textually implicit--requiring a synthesis of information, and (3) scriptally implicit--demanding background knowledge. The study suggests that test scores are biased by prior knowledge and reflect the students' I.Q. more than specific reading comprehension skills.

Studies like Roller's (1985) help to specify the effects of world knowledge (including knowledge of the relation between concepts) on comprehension. She investigated the effects of prior knowledge by presenting subjects with new knowledge (using a fictitious insect schema) and then observing the effects of the newly acquired information on comprehension of prose passages related to the schema. Knowledge effects were found on an importance rating task, but not on a summary task.

Some researchers study the effects of readers' world knowledge when it conflicts with information presented in the text. Alvermann, Smith, and Readence (1985) suggest that, when prior knowledge is activated that contradicts information in the text, readers may allow prior knowledge to override the text. On the other hand, Peeck, Van Den Bosch and Kreupling (1982) suggest that a text that specifically refutes impossible misconceptions may result in better comprehension. In either event, world knowledge has strong effects on readers' construction of meaning from a text.

The powerful effect of prior knowledge is also shown in Recht and Leslie's (1988) work. They investigated how prior knowledge influences the amount of short-term nonverbal and verbal memory and long-term retention in students of high and low ability in reading comprehension. Sixty-four junior high students were divided into four equal-sized groups on the basis of preassessed reading ability (high and low) and preassessed amount of existing prior knowledge about baseball (high and low). Each subject silently read an account of a half inning of a baseball game. After reading, each subject recalled the account nonverbally by moving figures and verbally by retelling the story. After an interpolated task, they summarized the game and sorted passage sentences for idea importance. There was a significant main effect for prior knowledge on all measures. No interactions between prior knowledge and ability were found.

Some studies show that the frequency with which certain strategies are used differs according to whether subjects are reading a culturally familiar or a culturally unfamiliar passage. Pritchard's (1990) study was designed to identify the strategies proficient readers employ in developing their understanding of several passages. He worked with the variable of the consideration of the previous knowledge the reader has of the meaning of the

text. He tried to identify the strategies readers employ in understanding culturally familiar and culturally unfamiliar passages, and to examine those strategies in relation to the cultural backgrounds of the readers and the cultural perspectives of the reading materials. The subjects' in-process reports of strategies were considered as evidence of the covert mental processes that occur during reading.

The participants were 30 American and 30 Palauan eleventh-grade students who were randomly selected from 174 proficient readers. The results of this investigation provide evidence of how cultural schemata affect the processing and comprehension of text by proficient readers. The frequency with which certain strategies were used differed according to whether subjects were reading the culturally familiar or the culturally unfamiliar passage. When reading culturally unfamiliar materials, readers rely on strategies for establishing intrasentential ties. When reading culturally familiar materials, readers are more likely to attempt to establish intersentential ties and use their background knowledge.

The recall results suggest that these differences in strategy usage may have been related to differences in comprehension of the text. As predicted by schema theory, readers who possessed accurate schemata related to the material they were reading comprehended that material more effectively than readers who lacked such schemata. Significantly more idea units were recalled from the culturally familiar than from the culturally unfamiliar passage. The schemata embodying readers' background knowledge about the content of culturally familiar materials facilitate the integration of local understandings and enable readers to develop a unified meaning of the text. When reading culturally unfamiliar materials, readers lack the relevant schemata, resulting in fewer connections and greater ambiguity.

Other authors have also presented evidence for the use of content schemata in L1 reading comprehension: Afflerbach (1990), Anderson and Pichert (1978), Anderson et al. (1977, 1978), Kintsch and Greene (1978), Koda (2005), Pichert and Anderson (1977), or Schallert (1976). Their results show that the interpretations that readers give reflect the use of content schemata corresponding to their backgrounds.

Motivated by the first language studies, second language reading researchers have also attempted to examine the effect of knowledge structures on L2 readers' comprehension. With two passages about an Indian wedding and an American wedding, Steffensen, Joag-dev, and Anderson (1979) reported that participants read the native culture content-oriented passage faster and recalled a larger amount of information from the native passage. They concluded that differences in existing knowledge about the content of text materials may be an important source of individual differences in reading comprehension.

This effect of the cultural origin of a text on the subject's understanding and recall of information is also shown in Johnson (1982), who investigated the effect of the cultural origin of prose on the reading comprehension of Iranian intermediate and advanced students of English as a second language at university level. She showed that her subjects could better recall a passage about a subject (Halloween) which they had culturally experienced. She also demonstrated that cohesive links are correctly understood when the reader makes use of appropriate schemata in comprehending a passage. Further, she pointed out that the activation of appropriate content schemata helps L2 readers to cope with unfamiliar lexis.

Another example of the preponderant role that cultural content schematic knowledge plays as a factor in reading comprehension is the study by Carrell (1981). She examined the comprehension of advanced ESL Japanese and Chinese subjects using folktales from different cultural orientations. Her findings showed that the cultural origin of the text affected the subject's recall of information from the texts, as well as the subjects' judgments of the level of difficulty of the texts.

The cultural origin of a text affects the strategies subjects use. Malik (1990) analyzed the oral reading behavior of 15 EFL proficient Iranian readers. Results show that cultural schemata affected the reading comprehension and strategies of EFL-proficient readers reading expository texts.

Results also show that helping readers build background knowledge through pre-reading activities helps improve their reading comprehension.

Floyd and Carrell (1987) examined intermediate-level ESL students for levels of reading comprehension. Half of each group (experimental and control) received more complete versions of test passages than the other half, and the experimental group was taught appropriate cultural background information between tests. Background knowledge did improve reading comprehension. Likewise, Hudson (1988) demonstrates that helping readers build background knowledge through pre-reading activities helped improve their reading scores measured by objective questions.

Droop and Verhoeven (1998) examined the role of cultural background knowledge on the reading comprehension of third graders acquiring literacy in Dutch as a first and second language while the children read noncontrived texts from the reading curricula. Children were given three types of texts: texts referring to Dutch culture, texts referring to the cultures of immigrants from Near Eastern countries (i.e., Turkey and Morocco), and neutral texts. Within each type of text, a distinction was made between two levels of linguistic complexity. By means of reading-aloud protocols, retelling and questioning the children's reading performance on the distinguished types of texts was analyzed. A facilitating effect of cultural familiarity was found for both reading comprehension and reading efficiency. For the minority children, this effect was restricted to linguistically simple texts, because of their limited knowledge of the target language, Dutch.

From the previous studies it is clear that background knowledge has an effect on both L1 and L2 reading comprehension. The studies into L1 reading comprehension analysed show that world knowledge has strong effects on readers' construction of meaning from a text, that the interpretations that readers give reflect the use of their background knowledge, and the familiarity with the cultural content schematic area of the text facilitates reading comprehension. We have also seen that the frequency with which certain strategies are used differs according to whether subjects are reading a culturally familiar or a culturally unfamiliar passage.

The main results in L2 reading comprehension point out that the cultural origin of a text affects the subject's understanding and recall of information from the text, as well as the strategies subjects use; that

differences in existing knowledge about the content of text materials may be an important source of individual differences in reading comprehension; that exposure to the target culture helps readers in free recall and sentence recognition tasks; and that helping readers build background knowledge through pre-reading activities helps improve their reading scores measured by objective questions.

2.2. Research Carried Out on the Role of Interest and Analogies in L1 and L2 Reading Comprehension

The more recent studies tackle new issues like the role of interest in L2 reading. Brantmeier (2006) explores the role of interest in L2 reading comprehension. Her study attempts to begin to conceptualize interest as a variable involved in the L2 reading process. From a consideration of L2 reading as a multivariate process involving a variety of text and reader characteristics, the role of interest in this phenomenon is analysed. This study attempts to examine the relationships among sources of interest, perceived interest, and three different comprehension assessment tasks (i.e., written recall, sentence completion items, and multiple choice items). Sources of interest refer to variables that induce feelings of interest in a text. Perceived interest refers to the feeling of interest itself. The study with advanced readers reveals five sources of interest in L2 reading: cohesion, prior knowledge, engagement, ease of recollection, and emotiveness, with three factors (cohesion, engagement, and ease of recollection) connected to reader's perceived interest. Perceived interest was related to sentence completion items and multiple choice items, but not recall. Ease of recollection appears to be the only factor that is related to the three different comprehension assessment tasks. Findings of the study identify sources of interest similar to L1 studies; however, results contradict the relationships between interest and comprehension. Findings serve as an attempt to develop an instrument to assess different sources of interest in L2 reading.

Another topic that has received considerable attention in reading research is the role of analogies. Many researchers in L1 reading claim that analogies may aid readers in the same way as models do, and may themselves be small-scale models of the process of acquiring new

knowledge (e.g., Vosniadou & Brewer, 1987; Vosniadou & Ortony, 1983). Other researchers contend that analogies inhibit comprehension (Giora, 1993; Nash, 1989).

Little research has been done on the role of analogy in L2 reading comprehension and the results show that, in general, analogies do not have a positive effect on L2 comprehension. In Hammadou's (1990) study of high school nonnative readers of French, both novice and advanced readers recalled more of the non-analogy than analogy passages. The written recalls of the non-analogy passages were more accurate than those of the analogy passages, which, though of equal length, contained more misinformation. For both passage topics, analogy had a debilitating effect on comprehension. Therefore, the evidence was that analogy would not aid L2 reading comprehension.

Hammadou (2000) explored the impact of analogies and prior content knowledge on reading comprehension of expository texts by both L1 and L2 readers. Written recall protocols from approximately 163 participants were analyzed for 2 texts. Readers were university students of either French or English as a foreign language and were categorized according to level of proficiency and amount of prior content knowledge. Participants read either an analogy or nonanalogy version of 2 separate passages in either their L1 or L2. Analogy had a debilitating effect on comprehension regardless of learner group on the first text and no significant effect on the second text. Level of proficiency and prior content knowledge were significantly related to reading comprehension.

Brantmeier (2005) examined how a reader's subject knowledge, the analogy versus non-analogy difference in text type, and type of test affect L1 and L2 reading comprehension. In order to try to reveal additional insights into the use of analogies to aid comprehension and study if Hammadou's result could be due to a test-method effect, her study included learners from two different language backgrounds (Spanish and English) and incorporated three measures of comprehension (written recall, sentence completion, and multiple choice). Analysis of covariance revealed that subject knowledge related significantly to reading comprehension as measured by the three assessment tasks. However, the addition of analogies did not compensate for

the lack of subject knowledge. There was no overall positive effect of the analogy text type on L1 and L2 comprehension as measured by recall, sentence completion, and multiple choice tests. The positive effect for the non-analogy version held for the recall task. The participants scored higher on the non-analogy version of both texts than on the analogy version when assessed by the recall test; no such differences emerged for either passage on the sentence completion and multiple choice tests.

In conclusion, Brantmeier's (2005) study, along with Hamadou's (1990, 2000) investigations, have shown that analogic changes to scientific passages do not have the expected positive effect on L2 comprehension. More research needs to be conducted to determine when and why analogies might be helpful.

2.3. Research Carried Out on the Effect of Discipline-Related Knowledge on Reading Comprehension

Research on the effect of discipline-related knowledge on English reading offers disparate results. Some studies show that students perform better when reading a text in their own subject area (e.g. Alderson & Urquhart,1983; Chen & Donin, 1997; and Tan, 1990). Others, however, show that students do not always do best in their own subject area (e.g., Alderson & Urquhart, 1985; Koh, 1985) or that although discipline-related knowledge affects reading, its effect is not not being detectable in some groups (Clapham, 1996; Ridgway, 1997).

Recent studies try to investigate this issue more thoroughly, striving to overcome previous studies' methodological shortcomings. Thus, Usó-Juan (2006) carried out a study to estimate, by means of regression techniques, the contribution of discipline-related knowledge and English-language proficiency to reading comprehension in EAP. She also analysed the compensatory effect of discipline-related knowledge and English-language proficiency on EAP reading, that is, whether strength in one of these two areas, discipline-related knowledge or English-language proficiency, can compensate for weakness in the other area. She tried to specify the levels at which the compensatory effect between the two variables takes place for

successful EAP reading, an issue previously addressed by other authors: Koh (1985), who could not specify the levels of discipline-related knowledge and English language proficiency at which the compensatory effect took place for EAP reading; and Chen and Donin (1997) in whose study the two variables were categorized into just two values (high background knowledge and low background knowledge vs. more proficiency and less proficiency), which resulted in a loss of information. Moreover, the sample size was very small in some defined groups, making the statistical estimation imprecise and thus the generalization of the findings difficult.

The participants' existing discipline-related knowledge was measured by Usó-Juan (2006) by giving them knowledge tests on the topics and areas of her research (psychology, marketing and industrial engineering). As for the participants' English proficiency, she used a standardized language proficiency test. The participants in the study were 380 native Spanish-speaking undergraduates who exhibited a wide range of proficiency in English as a foreign language and knowledge of the topics being tested. Scores for the 3-criterion variables (discipline-related knowledge, English proficiency level, and academic reading) were subjected to 6 multiple regression analyses.

She concluded that: (a) discipline-related knowledge and English-language proficiency always contribute to EAP reading performance. The higher the participants' discipline-related knowledge or English-language proficiency, the better the participants' EAP reading performance will be; (b) English-language proficiency level predicts an EAP reading level from two to three times better than does discipline-related knowledge. The results indicated that English proficiency accounted for a range varying between 58% and 68% of EAP reading, whereas discipline-related knowledge accounted for a range varying between 21% and 31%; (c) Finally, successful EAP reading is possible without discipline-related knowledge if the participants' English proficiency level is advanced or intermediate. However, if the participants have a low level of proficiency in English, successful EAP reading is possible if the participants reach a linguistic threshold and have discipline-related knowledge. The linguistic threshold is not fixed, given that it changes gradually depending on the existing

discipline-related knowledge; that is, the higher the discipline-related knowledge, the lower the linguistic threshold will be.

2.4. Research Carried out on the Interaction between Background Knowledge and Learners' Proficiency

In addition to the role of background knowledge in EFL and ESL reading comprehension, the potential interaction between background knowledge and learners' proficiency also concerns researchers in EFL/ESL reading.

One crucial point of research in this area has been to clarify whether L1 and L2 readers process text in the same way, since the L2 reader may be faced with the problem of language competence ceiling which affects text processing. That is, the bidirectionality of L1 text processing (top-down/bottom-up) cannot effectively occur.

Research findings are inconclusive. On the one hand, there is evidence for the view that L2 readers process text with a bottom-up bias, ie, text-based processing, and on the other, research shows that L2 readers seem to be directed in a top-down direction. This is not surprising, since there are numerous factors affecting text processing (namely, proficiency level, age, literacy, oral orientation of society, etc.).

Among those who present evidence for a bias towards a bottom-up direction in L2 processing are Carrell (1983), Clarke (1979), Czico (1978), Hammadou (1991), Horiba (1996, 2000), Taillefer (1996) and Martino and Hoffman (2002). Carrell's (1983) study showed that higher proficiency students recalled more from content-unfamiliar texts than from content-familiar ones. Her results suggest that ESL readers seem to be totally dependent on decoding linguistic skills, therefore not utilising processes which activate content schematic knowledge because of their lack of systemic competence. Clarke's (1979) and Czico's (1978) data have also revealed that L2 reading comprehension is based on decoding skills because systemic competence places a ceiling on their reading skills. These researchers argue that the good reading skills of the L1 reader are not directly transferred to L2 reading, for the restricted command of the systemic

knowledge on the part of the L2 reader causes what Clarke (1979) has called a "short circuit" in the good reader's system. Nevertheless, both Cziko (1978) and Clarke (1979) found evidence that good L1 readers still did better than poor L1 readers at the same level of L2 systemic competence when reading an L2 passage. That seems to show that something other than linguistic competence is operating, ie, good L1 readers are activating schematic knowledge.

Hammadou (1991) sought to investigate whether prior knowledge of a topic enables better inferencing and whether, in turn, this was mediated by general proficiency levels of L2. Hammadou showed that less advanced learners were not able to compensate for lower language proficiency by being familiar with the topic.

Horiba (1996, 2000) and Taillefer (1996) found that L2 readers drew heavily on their linguistic ability when they were reading various L2 texts. Taillefer (1996) found that as the reading task became more cognitively complex, the role of linguistic ability became even more crucial. Taillefer also found that as the L2 learner became more linguistically proficient, other variables, such as the use of L1 higher-level reading strategies, did not become more important than L2 language proficiency in extracting meaning from text. In other words, as the learners in these studies became more proficient, reliance on textual and linguistic processes did not decrease. These studies suggest that linguistic deficiency constrains the reading comprehension process and that limited language proficiency leads to inefficient processing of the text.

Martino and Hoffman (2002) compare a range of reading–related abilities in two groups of college freshmen with higher and lower reading comprehension abilities. Reading comprehension ability groups were formed using American College Test reading scores. The groups were compared on measures of oral language vocabulary and syntax, phonemic awareness and print decoding skills. Results indicated that abilities that appear to relate to reading comprehension include recognition of the order of phonemes in spoken syllables, recognition of words that are good semantic and syntactic fits for sentence frames, recall of meanings for spoken words and conversion of printed to spoken words. This study seems to indicate that a threshold in

L2 knowledge must be reached before transfer of general abilities such as the use of prior knowledge can operate.

Another group of researchers present results that suggest a bias in the top-down direction in L2 reading comprehension: Steffensen et al. (1979) and Carrell (1981), whose works were reviewed above, Johnson (1981), Hudson (1982), Koh (1984) and Mohammed and Swales's (1984). Johnson (1981) shows that the schematic knowledge of the text has more effect than its linguistic complexity level on the reading comprehension of her subjects (intermediate and advanced ESL students). They tended to have problems in reading unadapted texts (ie. not syntactically and semantically simplified) when they were not familiar with the cultural content schema of the text. However, the same was not true when comprehending a passage with whose cultural content schemata they were familiar.

Likewise, Koh (1984) showed that the ESL readers (Singaporean students) she used in her research performed better when reading texts whose content schematic area was related to their field of study, independently of their systemic knowledge proficiency in English. Her results clearly indicate that ESL readers with low systemic knowledge of English perform significantly better when reading texts with whose content schematic area they are familiar.

Hudson (1982) set up an experiment to investigate the role of schematic knowledge in L2 reading comprehension. More particularly, he was concerned with showing the effects of externally induced content schemata on L2 reading and its relationship with the L2 reader's linguistic proficiency level. This is roughly the same issue addressed by Koh (1984), although in her research design content schemata were not externally induced but already part of the subjects' background knowledge. Contrary to Koh's (1984) results, which show that L2 readers perform better when reading texts with whose content schematic area they are familiar, irrespective of their linguistic proficiency level, Hudson's (1982) findings reveal that content schemata inducement had a stronger effect on the reading comprehension of his ESL subjects at the beginning and intermediate levels of linguistic proficiency. He posits that this seems to show that different levels of linguistic proficiency affect the ability to use schematic knowledge

and that schema inducement can override the lack of systemic knowledge on the part of the reader.

Mohammed and Swales's (1984) study describes a procedure for investigating the reading of instructions (using a video-camera set up). The experimental task was the setting of a digital alarm clock using the manufacturer's instructions. The performance of a small sample of subjects was studied against two parameters: degree of competence in English and the extent of experience in scientific fields. Results show that once a threshold in English reading ability has been passed, field-familiarity is a much stronger indicator of rapid and successful text processing than native-like competence in the language.

Carrell (1984) suggests five possible causes for this unidirectional bias, especially in L2 text processing: schema availability (ie., the reader does not possess appropriate schemata to interpret the text), schema activation (ie., failure in activating schemata because there are not enough clues in the text, for example), cognitive style (ie., some readers may be stimulus-bound in processing any bit of incoming information and therefore may have difficulty with concept-driven processing), skill deficiencies (both linguistic and reading skill deficiencies) and conception about reading (ie., some readers may have a conception of reading as a decoding activity imposed by the classroom situation, ie., meaning is in the text). However, what is apparent in her paper is that she is dealing with the problem at the level of individual differences which are true of both L1 and L2 readers. Furthermore, the evidence she provides to support her points is derived from L1 and L2 reading comprehension research. Therefore, although her research does not say much about the unidirectionality of text processing in L2 reading comprehension, it indicates possibilities for explaining the existence of this unidirectional bias.

Among the more recent studies, Nassaji (2003) investigated the role of higher–level syntactic and semantic processes and lower–level word recognition and graphophonic processes in adult English as a second language reading comprehension. In particular, the study examined the extent to which these processes can discriminate skilled from less–skilled readers in a sample of fairly advanced ESL readers. Measures of reading

comprehension, syntactic, semantic, word recognition, phonological, and orthographic processing skills were used. One–way discriminant function analysis revealed that lower–level component processes, such as word recognition and graphophonic processes, in addition to higher–level syntactic and semantic processes, contributed significantly to the distinction between skilled and less–skilled ESL readers. According to Nassaji, these findings suggest that efficient lower–level word recognition processes are integral components of second language reading comprehension and that the role of these processes must not be neglected even in highly advanced ESL readers.

As Nassaji explains, this study demonstrated an important relationship between the various components of reading skills and ESL reading comprehension. Lexical knowledge showed the strongest contribution to the discrimination between skilled and less-skilled readers with a sample of fairly advanced ESL readers. However, the contribution of efficiency of word recognition and graphophonic processes was also significant. This latter finding suggests, in Nassaji's opinion, a clear link between the efficiency of these component processes and skill in ESL reading comprehension.

Donin, Graves and Goyette (2004) carry out a within-subject cross-language study of text comprehension in adult second language learners. Text comprehension and sentence reading time measures were obtained for matched narrative and procedural texts in English and French from adult learners of French as a second language at two levels of French proficiency. The language of the text and readers' L2 proficiency affected reading times, while text type did not. The recall data, however, were more complex. In general, the participants recalled more information from the texts they read in English and more information from the descriptive narrative texts than from the procedural texts. Analyses of the recall performance suggest that, while linguistic proficiency may limit the representation that an individual can construct of a text, the constructed representation reflects the individual's conceptual base as well as strategic processing.

Keshavarz, Reza Atai and Ahmadi (2007) investigated the effects of linguistic simplification and content schemata on reading comprehension

and recall. The participants, 240 Iranian male students of English as a foreign language, were divided into 4 homogeneous groups, each consisting of 60 participants (30 with high proficiency and 30 with low proficiency). To elicit data, the study used 2 types of texts: content-familiar and content-unfamiliar. Each type appeared in 4 versions: original, syntactically simplified, lexically simplified, and syntactically-lexically simplified. Each participant group was tested on 1 of the linguistic versions of the content-familiar and content-unfamiliar texts. Data analyses showed a significant effect of the content and EFL proficiency, but not of the linguistic simplification, on reading comprehension and recall. Their findings show that content schemata have a greater effect than linguistic simplification on both EFL reading comprehension and recall. Therefore, content is of great importance. The findings of the present study are compatible with previous studies (e.g. Clarke 1979; Czico 1978; Carrell, 1983), indicating the existence of a language proficiency threshold above which content and proficiency interaction appears.

We can see that early studies show contradictory results. Thus, on the one hand, there is evidence for text-based processing, and on the other, research shows that L2 readers seem to be directed in a top-down direction. Recent studies defend that the readability of a text should be regarded as the interaction of a multitude of factors (the individual's conceptual base, his linguistic proficiency, as well as his strategic processing) and demonstrate an important relationship between the various components of reading skills and ESL reading comprehension. However, some results are still contradictory. While some findings show that content schemata have a greater effect than linguistic proficiency on both reading comprehension and recall, others indicate that efficient lower-level word recognition and graphophonic skills are not only important factors in beginning reading, but are integral components of fluent and skilled reading as well.

3. Conclusion

We have tried to carry out a thorough analysis of the literature on the effect of readers' background knowledge on reading comprehension. We offer the

following relevant findings from the main issues researchers have been concerned with in this area.

The extent to which background knowledge affects reading has been widely explored in research on native speakers and on participants studying English as a foreign and as a second language. The results of the studies analysed highlight the fact that background knowledge has a prominent role in reading comprehension. Despite contradictory results on the respective effect of background knowledge and linguistic proficiency on both reading comprehension and recall, research defends that the readability of a text should be considered as the interaction of a multitude of factors (the individual's conceptual base, his linguistic proficiency, as well as his strategic processing) and demonstrate an important relationship between the various components of reading skills and reading comprehension.

Despite previous disparate results of the research on the effect of discipline-related knowledge on English reading, recent studies show that successful EAP reading comprehension depends to a great extent on discipline-related knowledge and English-language proficiency. There is also a strong compensatory effect between these variables for successful EAP reading and students with low-level English proficiency can successfully read academic passages if they have reached a linguistic threshold and have discipline-related knowledge.

Despite the relevant conclusions extracted from the studies analysed, more research is needed that takes into account the discrepancies in both research methods and procedures in the studies carried out so far. Moreover, there is also a need for more in-depth studies that explore some of the results obtained. Finally, research is also needed that tries to reach some relevant conclusions on the basis of the findings presented to improve reading comprehension from a pedagogical perspective.

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