

## Second Language Reading and the Role of Grammar

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### ABSTRACT

The paper reviews research on second language (L2) reading, focusing on the various factors involved, i.e., orthography, vocabulary, grammar, background knowledge, and metacognitive strategies. Based on the overview of L2 reading research, how grammar makes a unique contribution to L2 reading comprehension is emphasized. The discussion includes analysis of the distinctive roles served by background knowledge and linguistic knowledge, the comparative roles of L1 reading ability and L2 proficiency, and the relative weight of vocabulary and grammar in accounting for L2 reading comprehension. The paper concludes with issues for further consideration and suggestions for future studies on the relationship between grammatical knowledge and L2 reading comprehension.

### INTRODUCTION

Current theories on reading comprehension generally involve conceptual representations with several mutually constraining layers. There are typically a local-level representation (i.e., text-model) based on text-based information and a global-level representation (i.e., situation-model) where the content of the text becomes integrated into the reader's larger conceptual structure (Kintsch, 1988; Kintsch & van Dijk, 1978). Throughout the construction of these different levels of semantic structures, the reader's knowledge of grammar constrains the entire reading process. More specifically, parsing process guided by grammar operates on locally assembled text segments, and thus global text comprehension can be severely impaired if readers generate inaccurate and/or incomplete local text representation (Koda, 2007). Hence, even though reading comprehension is mostly conceptual, it still is affected by the knowledge of grammar either directly or indirectly.

When the issue turns to second language (L2) reading<sup>2</sup>, the role of grammar becomes more complex. For one, L2 reading differs from L1 reading in that L2 readers "start to read in the second language before achieving the kind of grammatical maturity and the level of oral vocabulary that L1 readers attain before they begin to read" (Shiotsu, 2009, p. 16). Thus, L2 learners must learn how phrases are constructed and cases are assigned to the constructed phrases in a new language (Koda, 2007). On top of that, there is little consensus among researchers

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<sup>2</sup> L2 reading is defined as receiving and interpreting information encoded in L2 via the medium of print (Urquhart & Weir, 1998).

regarding the extent to which the acquisition of knowledge of grammar among L2 learners is assisted by innate linguistic ability (Gass & Schacter, 1989).

However, the role of grammar in L2 reading has not received much attention by researchers (Alderson, 1984; Nassaji, 2007; Shiotsu & Weir, 2007; Urquhart & Weir, 1998). On the one hand, this may be attributable to the very nature of reading as a receptive language skill for comprehending the messages of the texts. Thus, knowledge of structure was regarded to have less to do with comprehending a text than levels of other components such as vocabulary, background knowledge, and reading strategies. On the other hand, the 30-year long dominance of Communicative Language Teaching (CLT) that puts a near-exclusive emphasis on macro-language skills and communicative functions has somewhat downgraded the need to address the issue of the role of grammar in L2 reading (Han & D'Angelo, 2009; Urquhart & Weir, 1998). This problem has been further magnified by the over-adoption of L1 reading research in L2 reading studies, with the distinct complexity of L2 reading left largely unattended (Bernhardt, 2005).

That said, this paper aims to discuss the role of grammar in L2 reading. First, factors involved in L2 reading will be reviewed for a clearer understanding of how each of the factors interplay in the process of L2 reading comprehension. Then, based on the overview, how the knowledge of grammar contributes to L2 reading comprehension will be discussed with an appraisal of related literature. Finally, issues for further consideration and suggestions for future studies will be laid out.

## **FACTORS INFLUENCING L2 READING**

A number of studies have been conducted to explore the unique complexity of L2 reading, focusing on isolated factors such as word recognition skills, language proficiency, background knowledge, and metacognitive abilities. While such a componential approach has limitations in accounting for the actual reading processes due to the heavy reliance on off-line data (Shiotsu & Weir, 2007; Urquhart & Weir, 1998), it can potentially show how distinct constituents of L2 reading interact with and constrain each other, and in so doing, cause individual differences among L2 readers (Carr & Levy, 1990). Thus, a thorough understanding of the distinctive role sub-served by each of the factors should precede the discussion of how grammar makes a unique contribution to L2 reading comprehension. Based on that recognition, in this section an overview of the factors influencing L2 reading will be presented briefly to describe how L2 reading comprehension works in order to construct the basis for discussing the role of grammar in L2 reading.

### **Orthography**

To create the desired condition for efficient text processing, L2 orthography – knowledge about the system of written symbols of an L2 – should be automatized through repeated exposure to written materials in L2 (Haynes & Carr, 1990; Shiotsu, 2009). However, developing sensitivity to orthographic regularity of the L2 often poses a challenge to L2 readers, as they need to grasp the multifaceted nature of orthographic information, including knowing individual written symbols and their permissible sequencing patterns, as well as mapping the written symbols onto corresponding speech codes (Shiotsu, 2009). On top of that, the unique and

habitual processing skills used for the L1 writing system may exert crosslinguistic influence on the acquisition of L2 orthography (Haynes & Carr, 1990).

A number of studies have explored how the disparity between L1 and L2 orthographic systems affects L2 reading (Frost, Katz, & Bentin, 1987; Haynes & Carr, 1990; Koda, 1992; Pollatsek, Bolozky, Well, & Rayner, 1981; Turvey, Feldman, & Lukatela, 1984). First, the direction of L1 reading appears to have an effect on the direction of visual perception in L2 reading. For example, readers whose L1 proceeds from left to right (e.g., English) were shown to have a larger visual span to their right of eye fixation, whereas languages read from right to left (e.g., Hebrew) tend to develop superior visual perception to the left (Pollatsek et al., 1981). Thus, while it is only speculative at this stage, the habitual processing direction for L1 reading may have crosslinguistic influence on the acquisition of the L2 orthographic system that entails a different direction of reading (Haynes & Carr, 1990; Pollatsek et al., 1981). Punctuation and spacing conventions also seem to affect L2 reading comprehension. When the boundaries between syllables or words are not perceptually obvious or are indicated in different ways from the L1, readers with an undeveloped L2 orthographic knowledge are more likely to have difficulties in integrating the isolated syllables, identifying grammatical morphemes, and comprehending them as meaningful language (Koda, 1992).

In addition, the differential degrees of sound-letter correspondence between L1 and L2 writing systems also affect the acquisition of L2 orthography. For example, orthographically shallow languages with fairly regular grapheme-phoneme correspondence, such as Hebrew, Finnish, and Italian, prefer sub-lexical and rule-based recoding skills owing to the phonemic transparency of the writing system. On the other hand, orthographically deeper languages such as Danish, French, and English entail not only rule-based recoding skills but also lexical codes due to the phonemic opaqueness of the writing systems (Turvey, Feldman, & Lukatela, 1984). Thus, if the L2 is orthographically deeper than the L1, L2 readers are likely to have difficulties ascribed to their tendency to resort to rule-based recoding skills without the necessary lexical approach to the L2 orthographic system (Frost, Katz, & Bentin, 1987).

Further evidence of crosslinguistic influence on the acquisition of L2 orthography comes from studies on word recognition speed by L2 readers with diverse L1 writing system backgrounds (Brown & Haynes, 1985; Haynes & Carr, 1990; Koda, 1992; Shiotsu, 2009). For example, logographic (non-alphabetic) languages such as Japanese and Chinese favor holistic visual perception through direct recognition of word forms and meaning, as each written symbol represents a whole word or a morpheme. By contrast, alphabetic languages such as Arabic, Spanish, and English necessitate not only visual perception of individual symbols but also phonological recoding skills that mediate meaning retrieval. The psycholinguistic differences in orthographic processing can be observed in findings where L2 readers whose L1 is logographic performed better on speeded same-different matching tasks<sup>3</sup> but worse on timed oral reading tasks than readers whose L1 writing systems are alphabetic (Brown & Haynes, 1985; Haynes & Carr, 1990; Koda, 1992; Shiotsu, 2009).

Fluent L2 orthographic processing (e.g., fast L2 word recognition) is crucial for L2 readers to reach an adequate capacity in order to comprehend the text at a deeper and richer level (Brown & Haynes, 1985; Haynes & Carr, 1990; Koda, 1992; Shiotsu, 2009). Eye-tracking research on L2 reading has also revealed that skilled L2 readers fixate on virtually every word (Just & Carpenter, 1992; Stanovich, 1980), which supports the importance of fast and accurate

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<sup>3</sup> In same-different matching tasks, subjects are required to decide whether pairs of words, orthographically regular non-words, irregular letter strings, and digits are the same or different as fast as they can.

word recognition for proficient orthographic processing. Moreover, if the initial data-driven processing over-taxes the memory of L2 readers, efficient higher-level syntactic processing may not operate, leading to a shallow understanding of the text.

## Vocabulary

It is well-documented that vocabulary and L2 reading share a reciprocal relationship (Pulido, 2007a, 2007b, 2009; Pulido & Hambrick, 2008; Stæhr, 2008; Strother & Ulijn, 1987). Empirical studies on the relationship between vocabulary size and L2 reading comprehension have consistently produced a strong correlation between the two, ranging from 0.50 to 0.85 (Laufer, 1992; Stæhr, 2008). This has led researchers to view vocabulary development as a prerequisite for successful L2 reading comprehension, as well as a strong predictor of L2 reading ability. For L2 reading, it is widely accepted that the 2,000 most frequent vocabulary items are crucial for basic L2 reading as they cover approximately 80% of the words in a text in general (Cobb, 2007). Admittedly, the core vocabulary argument involves some problematic assumptions in that it counts each form as a single word and fails to account for multiple meanings and functions a word may represent in distinct contexts (Henriksen, 1999). However, recent findings from text analyses with computers and large corpora substantiate the importance of careful consideration on the lexical coverage (Cobb, 2007), as unknown words should appear at a density lower than the “frustration level” (Fry, 1981), where the level of L2 reading comprehension significantly drops due to the increasing number of unknown vocabulary (e.g., 5 or more new words in a group of 25 words). Some researchers further suggest that if L2 readers encounter more than one unknown word in every twenty running words, they are likely to fail to gain adequate comprehension (Hu & Nation, 2000; Laufer, 1992).

While sufficient vocabulary size is important for L2 reading comprehension, extensive vocabulary also develops as a byproduct of engaging in L2 reading (Krashen, 1989; Pulido & Hambrick, 2008). Vocabulary learning through reading entails an array of bootstrapping processes of (1) noticing an unfamiliar word, (2) recognizing the need to discover the meaning of the word, (3) inferring the meaning from context with the aid of linguistic and non-linguistic cues, and (4) integrating the new lexical item into one’s developing vocabulary knowledge, which all necessitate a certain level of surplus attentional resource (Pulido, 2007a, 2007b, 2009). With regard to the importance of mental effort in vocabulary learning, Laufer and Hulstijn (2001) proposed the *Involvement Load Theory* whose components are *need*, *search*, and *evaluation*. More specifically, *need* refers to the need to fulfill the task, *search* pertains to inferring the meaning of an unknown word, and *evaluation* involves judgment of semantic and grammatical fit of the derived meaning within the context (Laufer & Hulstijn, 2001). That is, the theory stresses the importance of a cognitive involvement for vocabulary development through reading and predicts that the greater the involvement load, the deeper and more elaborate processing for word retention (Laufer & Hulstijn, 2001; Pulido, 2009). Thus, if comprehension taxes an L2 reader’s limited working memory<sup>4</sup> capacity, or an unknown word is not noticed or is considered to be irrelevant to the comprehension task, the word would be processed only superficially without leading to long-term retention for vocabulary development (Pulido, 2009).

As vocabulary learning occurs largely through L2 reading, factors that affect L2 reading

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<sup>4</sup> Working memory is where information is, for a brief interval, in the immediate consciousness for storage for later retrieval and where incoming data is processed with operational resources (Baddeley & Hitch, 1974; Hitch & Baddeley, 1976).

comprehension, such as text-processing efficiency and contextual information, also modulate vocabulary learning. For example, Pulido and Hambrick's (2008) study showed that a larger sight vocabulary size enabled more efficient text processing for better L2 reading comprehension, which in turn resulted in greater vocabulary growth. Such a chain relationship may be responsible for the so-called "Matthew Effect" (Stanovich, 1986), "the rich get richer" phenomenon (Pulido, 2009, p. 65), and "the vicious circle and virtuous circle" (Pulido & Hambrick, 2008, p. 178). In terms of the effect of contextual information, Webb's (2008) study showed that the effect of context overrode that of the frequency of unknown words on vocabulary learning. However, Pulido's (2007b) study indicated that too much contextual information might render the text readily comprehensible and prevent learners from noticing gaps in their L2 lexical repertoire and feeling the need to establish form-meaning connections for new lexical items. Another emerging issue is the possible erroneous word inference that results from the deceptive or insufficient contextual information (Beck, McKeown, & McCaslin, 1983; Bensoussan & Laufer, 1984). Given these findings, more investigations are needed to illuminate a variety of variables involved in vocabulary learning through L2 reading.

## **Grammar**

Even though grammatical competence is presumed to be indispensable for identifying syntactic relations of sentence components, there has been little research on how readers' knowledge of grammar contributes to L2 reading comprehension (Alderson, 1984; Shiotsu & Weir, 2007; Urquhart & Weir, 1998). Most studies addressing the role of grammar in L2 reading explored the issue by measuring the correlation between learners' grammatical knowledge and their L2 reading comprehension ability (Urquhart & Weir, 1998). For example, Alderson (1993) reviewed the data from the English Language Testing Services (ELTS) Revision Project and found a considerable overlap between scores on the grammar test and the reading test, which led him to propose a significant role of grammar in L2 reading. In a similar vein, in Kuhn and Stahl's (2003) review of theories and research on reading instruction, training L2 readers to parse sentences into meaningful phrases and providing them with already syntactically segmented texts were revealed to promote L2 reading comprehension to a significant level. That is to say, the abilities to identify syntactic roles of words, dissect sentences into meaningful chunks, and recognize the syntactic structure of a sentence seem to contribute to the construction of meaning from the text.

Further evidence of the role of grammar in L2 reading comes from studies that compared the relative importance of grammar with that of other L2 reading components, such as background knowledge and vocabulary (Barnett, 1986; Barry & Lazarte, 1995, 1998; Shiotsu & Weir, 2007). Barry and Lazarte investigated the effect of additive embedded clauses on the recall performance of two groups of L2 Spanish readers: those with high topic knowledge and those with low topic knowledge. The results of this study showed that syntactic complexity of sentence structures overruled the advantage of having text-related prior knowledge. Based on the results, Barry and Lazarte suggest that grammatical competence is crucial to constructing propositions across clauses without taxing the limited working memory capacity and to bringing relevant background knowledge into the reading task. Also, in Barnett's (1986) study that explored the relative contribution made by grammar and vocabulary to L2 reading, grammatical knowledge was shown to have a comparable effect on L2 comprehension to that of vocabulary knowledge. On that account, Barnett asserts that undue emphasis on vocabulary growth or inferencing skills

at the expense of ignoring the importance of grammar may not suffice to promote the development of L2 reading ability. In a more recent study conducted by Shiotsu and Weir (2007), where the scope of grammar was clearly delineated as encompassing the knowledge of inflectional morphology, verb forms, and transformations, grammatical knowledge again emerged as a stronger predictor of L2 reading ability.

In accounting for the importance of grammatical knowledge in L2 reading, it is also useful to review some crosslinguistic studies on the divergent syntactic strategies used by L2 readers from various L1 backgrounds (Jackson, 2007, 2008; Koda, 1993). In Koda's research on transferred L1 syntactic strategies in L2 reading, American, Chinese, and Korean learners of Japanese relied on different syntactic cues to comprehend the given Japanese texts. More specifically, Korean learners, whose native language utilizes particles as the major signaling device of syntactic relations among words, relied on Japanese particles to a significantly greater extent than American and Chinese learners, whose native languages depend on word order. Similar results were found in Jackson's research on how American learners of German use semantic information, word order, and case marking when comprehending a list of German sentences. The results demonstrated that L2 German readers relied more on semantic information and word order than case marking, which supports the notion that there is interference from syntactic strategies used for L1. Of particular interest with these findings is that the L2-specific grammatical features (i.e., particles in Japanese and case marking in German) were indispensable for accurate L2 reading comprehension (Jackson, 2007, 2008; Koda, 1993). The role of grammar in L2 reading comprehension will be revisited and examined more thoroughly in the next section of the paper.

## Background Knowledge

Comprehension goes well beyond decoding, as readers' background knowledge has a strong influence on meaning construction (Anderson & Pearson, 1984). Consider the following two sentences used by Anderson and Pearson to illustrate the effects of background knowledge on comprehension:

- a. Princess Anne broke the bottle on the ship.
- b. The waitress broke the bottle on the ship.

Only the readers who are familiar with the notion of "ship christening" can understand the different actions and circumstances described in each of the sentences above – the first describing a princess who broke a bottle on the bow of the ship to bless its launching, and the second describing a waitress who broke a bottle probably in the ship's dining room. However, if one is not familiar with "ship christening," such differences in the meaning might not be perceived and understood. That is to say, the meaning of a text may not always be in the text *per se*, but is assembled by the readers as they evoke relevant background knowledge and relate it to the text (Carrell & Eisterhold, 1983).

To explain the role of background knowledge in reading comprehension, research has often resorted to *schema theory*, a conceptualization as to how background knowledge functions in a host of cognitive processes (Nassaji, 2007; Richgels, 1982). A *schema* is a representational structure of background knowledge on a given topic, and it consists of a set of categorical slots that specify various attributes the schema possesses (Rumelhart & Ortony, 1976). For example,

under the “ship christening” schema, there could be a variety of slots such as “involves a new ship,” “to bless the ship,” “done by a celebrity,” “done just before launching,” and “a bottle broken on the bow” (Anderson & Pearson, 1984). When one attempts to understand new information, only the schema or the slot that has direct relevance to the input is selected and activated among others, and the level of understanding hinges upon the congruency between the instantiated schema and the input (Alba & Hasher, 1983; Anderson & Pearson, 1984). If the text does not give sufficient detailed information, the slots in the activated schema serve as default values and are assigned to fill in the missing parts for a coherent understanding (Anderson & Pearson, 1984).

Thus, within the context of a schema-theoretic view, new information can be comprehended only when the reader already has pertinent background knowledge; hence, the reader is considered to make a greater contribution than the text itself in the process of comprehension (Carrell & Eisterhold, 1983; Richgels, 1982). The manifested importance of background knowledge, along with its intuitive appeal, has been the strong rationale for researchers and instructors to raise the usefulness of activating background knowledge to facilitate L2 readers’ comprehension. For instance, Melendez and Pritchard (1985) provide practical guidelines on how to apply schema theory into pre-reading, during-reading, and post-reading activities in L2 reading classrooms. Williams (1987) further argues that the pre-reading phase can activate not only L2 readers’ prior knowledge, but also promote their motivation to read, which may result in an enhanced level of L2 reading comprehension.

Given the significant role of background knowledge in reading comprehension, L2 readers’ unfamiliarity with the target language culture becomes a meaningful issue in L2 reading research and instruction (Carrell, & Eisterhold, 1983). As widely acknowledged, there are two types of schema: *formal schema*, background knowledge of the rhetorical organization of different types of texts, and *content schema*, background knowledge of the content area of texts (Carrell & Eisterhold, 1983), with each of the schema interacting with the reader’s cultural background knowledge. With reference to the effect of culture-specific content schema, Steffenson, Joag-Dev, and Anderson’s (1979) study showed that L2 readers read faster and recalled more when they read a passage about their native culture than when they read a culturally unfamiliar passage. Similarly, in Sasaki’s (2000) study, L2 readers who read a text with culturally familiar names showed significantly better performance on a free recall task than learners who read the same text with the only difference of culturally unfamiliar names. In regard to formal schema, Carrell’s (1983) study revealed that L2 readers who read texts violating the expected rhetorical structure in their L1 reading generated poorer recall products both in terms of quality and quantity. That is, as each culture develops distinctive rhetorical structures, L2 readers from different cultural backgrounds may have difficulty in grasping the expected text structures required in the target language culture. These findings provide instructors with a sobering message that they need to take L2 readers’ varying cultural backgrounds into account in order to facilitate their L2 reading comprehension.

However, as commented by Carrell (1983), the extent to which the two types of schema are culture-specific should be evaluated with caution. Mandler, Scribner, Cole, and DeForest (1980) have suggested that while certain formal schemata could be culture-specific, some could well be universal across different cultures. In a similar vein, Carrell (1983) makes a remark that especially in the case of English for Special Purposes (ESP) or English for Academic Purposes (EAP), individual learner’s knowledge of the subject matter area may not always be culture-specific. That said, any lack of familiarity with the topic or format of a given L2 text need not be

equated with a lack of culture-specific background knowledge. In other words, ESP and EAP may largely be learnable for L2 readers regardless of their cultural backgrounds, thus reflecting the usefulness of instruction in this area.

## **Metacognitive Strategies**

Metacognitive strategies for self-regulation of one's cognition (Baker & Brown, 1984) also influence L2 reading performance. Metacognitive strategies entail recognizing organizational patterns of the task or given information, actively monitoring cognitive processes, and having strategic regulation and orchestration of mental processes to achieve particular objectives, such as understanding texts, identifying specific information, and remembering propositions (N. Anderson, 1999; Grabe, 1991). Given that, reading strategies can be defined as the reader's "deliberate, planned, intentional, goal-directed, and future-oriented" (Phakiti, 2003, p. 29) manipulation of the reading process to improve reading comprehension, and they differ from reading skills in that skills are operated beyond the reader's consciousness or intentional control (N. Anderson, 2009).

To probe the differential patterns in the use of strategies by skilled and less-skilled L2 readers, verbal reports including retro- and introspective protocols and surveys such as Survey of Reading Strategies (SORS) and Metacognitive Awareness of Reading Strategies Inventory (MARS) are often employed, and research findings have revealed that skilled and cognitively more matured L2 readers tend to use more reading strategies and use them more effectively (MacLean & d'Anglejan, 1986; Mokhtari & Sheory, 2002). Considerable research has also been conducted to examine the feasibility and effectiveness of strategy instruction to promote L2 reading comprehension (Carrell, 1985; Carrell, Pharis, & Liberto, 1989). In Carrell's (1985) study, explicit instruction on the hierarchical structure of rhetorical organization was shown to have a significant effect on the L2 readers' recall performance. Moreover, Carrell et al.'s (1989) research revealed that semantic mapping (SM) training, i.e., displaying the categories and relationship among information from the text graphically, and experience-text-relationship (ETR) training, i.e., relating texts to readers' own prior knowledge, significantly improved L2 reading comprehension. Yet, given the numerous variables involved in strategy use and its differential effectiveness for L2 reading, such as L1 reading experience, learning styles, motivation, and reading goals, more investigations are needed to uncover the underlying mechanism as to how metacognitive knowledge promotes comprehension (Caverly & Orland, 1991).

The above overview of the factors influencing L2 reading comprehension suggests that L2 reading is a complex psycholinguistic process where a variety of associated variables come into play. Admittedly, there seems to be no clear-cut distinction among the factors. In other words, various sources of knowledge are anchored onto one another and linked to an associative knowledge network, and thus activated in conjunction with other connected knowledge simultaneously when comprehending a text (Kintsch, 1988). For example, readers' background knowledge may chiefly be activated when the readers perceive and recognize the meaning of the relevant lexical items that carry the cultural concepts. Also, setting a boundary between grammatical knowledge and vocabulary knowledge is highly problematic, due to the interface between syntactic and semantic dimensions (Perfetti, 1999). Nevertheless, exactly how each factor contributes to L2 reading in distinctive ways needs to be examined first to better understand how such factors are interconnected and constrain each other in the process of L2 reading comprehension.



## THE ROLE OF GRAMMAR IN L2 READING

This section discusses the relationship between grammatical knowledge and L2 reading through a review of theories and empirical evidence. More specifically, the discussion will focus on differentiating the role of grammar and the role of background knowledge in L2 reading, and in particular, the relative weight of vocabulary and grammar for L2 reading comprehension

### Background Knowledge vs. Linguistic Knowledge

It is undeniable that inferential processes capitalizing on background knowledge, which include both content and formal schemata, play a significant role in L2 reading comprehension, as L2 readers need to select and instantiate pertinent schema to make sense of the intra-textual vagueness in the passage and to infer the para-textual information for a coherent understanding (Anderson & Pearson, 1984; Carrell & Eisterhold, 1983). The importance of background knowledge in L2 reading has received much attention by researchers (Alba & Hasher, 1983; Anderson & Pearson, 1984; Carrell & Eisterhold, 1983; Kintsch & van Dijk, 1978), and empirical findings have supported its role as a major constituent of L2 reading comprehension (Hudson, 1982; Lee, 1986; Sasaki, 2000; Steffenson, et al., 1979). For example, Lee's (1986) study revealed that L2 readers utilized background knowledge to a significant degree when engaging in a recall task, which led him to claim that "the need for teaching reading as a skill rather than to limit the role of reading to reinforcing grammar and vocabulary is evident" (p. 353). Coady (1979) further asserts that background knowledge can compensate for deficiencies in L2 grammatical knowledge. In the same vein, based on a series of studies on the effect of syntactic simplification, Ulijn and his colleagues (Strother & Ulijn, 1987; Ulijn, 1981; Ulijn & Kempen, 1976) suggest that poor L2 reading comprehension results from a lack of conceptual knowledge rather than from the insufficiency of the knowledge of L2.

However, the assumption that background knowledge can offset deficiencies in linguistic knowledge poses several problems for the following reasons. First, as *the dual-process model of reading* (Posner & Snyder, 1975) states, the quality of compensatory and expectancy-based reliance on background knowledge is by no means comparable to that of automatic and autonomous activation of background knowledge based on the efficient data-driven processing. More specifically, L2 readers with inefficient decoding skills due to inadequate L2 knowledge tend to skip and ignore the textual information, and resort to their background knowledge more extensively to fill in the gaps in their understanding (Bernhardt, 1986; Stanovich, 1980). In this case, the conscious-attention mechanism taxes their limited working memory capacity, which results in the slowed down reading speed and superficial and incomplete L2 reading comprehension. In other words, the problem they encounter in L2 reading seems more language-related – that is, hinging upon the quality of bottom-up linguistic processing such as decoding skills – than cognitively or metacognitively related. Furthering this line of logic, when it comes to adult learners with developed cognitive and metacognitive abilities, it seems unlikely that less-skilled L2 readers are in an unfavorable position in convening background knowledge than skilled L2 readers or L1 readers.

By contrast, L2 readers with developed L2 knowledge are relatively impervious to either presence or absence of contextual information, as their automatized L2 knowledge enables them

to activate relevant prior knowledge concurrently without attending to contextual cues (Hudson, 1982; Ridgway, 1995; Stanovich, 1980). For instance, in Hudson's (1982) study on the effect of pre-reading activity on L2 reading comprehension, advanced L2 readers benefited from the induced schema to a lesser degree than beginning L2 readers. Ridgway (1995) further proposes that the background knowledge effect may be detected only from L2 readers between the two threshold levels of L2 competence. Below the lower threshold, a laborious decoding process inhibits higher-level inferential processing; above the upper threshold, automatized L2 knowledge allows autonomous inferential processing (Ridgway, 1995). That said, the ultimate difference between skilled and less-skilled L2 readers may reside in the differential levels of L2 knowledge, instead of in the ability to activate text-related background knowledge.

Further evidence regarding the importance of linguistic knowledge comes from the multidimensional nature of L2 reading comprehension, the rationale being that background knowledge cannot warrant successful L2 reading comprehension as a whole. More specifically, linguistic knowledge and background knowledge seem to make distinctive contributions to different types of reading outcomes: the former for text-bound comprehension, and the latter for conceptually-driven interpretation of the text (Kintsch, 1988; Perfetti, 1999). Kintsch's (1988) *construction-integration model* serves as a useful framework to account for the divergent types of comprehension. According to Kintsch, a construction phase is where the text-based propositions are extracted through lexical-syntactic processes, and an integration phase pertains to integrating the propositions with the reader's background knowledge. Kintsch further asserts that the initial construction phase is important for understanding the principal meaning relationships in the text, as the ensuing integration phase is an automatic resonance process operating in context-free fashion (Nassaji, 2007). In other words, linguistic knowledge not only enables fast and accurate text-model construction, but also permits spontaneous inferential processes that boost deeper levels of comprehension.

Empirical findings substantiate the dissociable roles of background knowledge and linguistic knowledge in L2 reading comprehension (Alptekin, 2006; Barry & Lazarte, 1995, 1998). As mentioned in the preceding overview, Barry and Lazarte's (1995) study showed that the effect of background knowledge in recalling text-based propositions gradually disappeared as syntactic complexity of the texts increased. Interestingly, in Barry and Lazarte's (1998) subsequent study on the role of background knowledge in inferential ability, high-prior knowledge readers generated richer situation-models by resorting to inferencing process. Simply put, while linguistic knowledge appeared to affect extraction of propositions from the text, conceptual knowledge promoted higher-level inferential processes.

However, of greater interest is Barry and Lazarte's (1998) finding that the richer and more accurate situation-models are resulted from an increased amount of within-text inference, not from inference using information outside the text. In other words, while within-text inference grounded in solid textbase comprehension seems to promote better understanding by tying the propositions together, elaborative inference may interrupt the storing process to compensate the incomplete understanding with background knowledge. Alptekin's (2006) recent study on the effect of text nativization – pragmatic and semantic adaptation of the textual cues into the L2 readers' own culture – also demonstrated that background knowledge induced by culturally familiar terms facilitated inferential comprehension, but did not permeate through textbase comprehension. As such, the intuitively appealing assumption that background knowledge can somehow compensate for L2 readers' inadequacy in textual processing is not supported by empirical findings, at least with regard to textbase comprehension (Alptekin, 2006; Barry &

Lazarte, 1995, 1998; Nassaji, 2007).

## **L1 Reading Ability vs. L2 Proficiency**

As a natural corollary of the previous discussion on the importance of linguistic knowledge in L2 reading, this section will tackle a narrower issue, i.e., isolating the contribution made by L2 proficiency from that of transferred L1 reading ability. With regard to this issue, researchers have put forward different hypotheses while laying differential weight on L1 reading ability and L2 proficiency (Alderson, 1984; Clarke, 1980; Coady, 1979; Cummins, 1980; Goodman, 1973). *The Transfer Hypothesis*, proposed by Goodman (1975), states that L2 reading necessitates transfer of previously learned skills used for L1 reading, and therefore poor L2 reading is primarily caused by poor reading habits transferred from L1. This is congruent with Coady's (1979) *Reading Universal Hypothesis*, which suggests that reading processes are largely the same across languages, and that the differences between L1 and L2 reading are only negligible. Another hypothesis along this line is Cummins's (1980) *Language Interdependence Hypothesis*. Based on his studies on bilingualism, Cummins claims that there exists a common underlying proficiency between L1 and L2, which provides the ground for a fair degree of correlation between L1 and L2 reading ability (Carey & Cummins, 1979).

While it seems to be undeniable that L1 reading ability accounts for a certain degree of L2 reading (Alderson, 1984; Carey & Cummins, 1979), when it comes to lower-level processes, the role of L1 reading ability is somewhat reduced (Alderson, 1984). For example, in Clarke's (1980) study, the variance between the skilled and less-skilled L1 readers' performance on L2 cloze tests diminished considerably when confronted with more difficult L2 cloze test items, which led him to suggest that limited control over the language (L2) "short circuits" the transfer of skilled L1 readers' reading strategies to L2 reading tasks (i.e., *the Short-Circuit Hypothesis*). Based on this assumption, Clarke further asserts that L2 reading teachers should assist L2 readers in acquiring the fundamental L2 competence to facilitate comprehension of the local information from the text. The importance of L2 proficiency in L2 reading can also be found in Alderson's (1984) *Language Threshold Hypothesis*. He suggests that a certain minimum level of competence in L2 allows L2 readers to transfer their L1 reading ability and to engage in more effective higher-level processes.

The conflicting hypotheses have been subject to empirical studies, and it was found that L2 proficiency has generally had a greater predictive power of L2 reading ability than L1 reading ability (Carrell, 1991; Bernhardt & Kamil, 1995; Brisbois, 1995; Lee & Schallert, 1997; Taillefer, 1996). For example, in Bernhardt and Kamil's (1995) study, L2 proficiency accounted for upwards of 30% of L2 reading ability, while that of L1 reading ability was 20%. Based on the results, Bernhardt and Kamil assert that L2 reading is "not merely an impoverished version of L1 reading" (p. 31) but requires unique L2 knowledge such as L2 lexical and grammatical flexibility. Brisbois's (1995) study provides clearer evidence of the role of the threshold. In her study, L1 reading ability contributed to nearly twice the variance for upper level L2 readers as it did for low L2 proficiency readers. In other words, the effect of L1 reading ability increased correspondingly as L2 proficiency improved.

Several associated variables that affect the relative roles of L2 proficiency and L1 reading ability have also emerged. In Alderson, Bastien, and Madrazo's (1977) study, understanding easier L2 texts correlated with L2 proficiency to a lesser degree than that of more difficult L2 texts. Also, in Taillefer's (1996) study, the amount of variance in L2 reading comprehension

accounted for by L2 proficiency decreased considerably in a less complex reading task (i.e., scanning). The results of these studies support Bossers's (1992) assertion that "L1 reading ability would be more prominently involved in L2 reading in the case of a more simple text" (p. 184), and that L2 proficiency may make a more marked contribution to a difficult L2 reading task (Taillefer, 1996). However, it should also be noted that complexity and difficulty have been somewhat conflated and used interchangeably by researchers (Alderson, 1984; Bossers, 1992; Taillefer, 1996). Thus, more studies with stricter construct definitions are required to examine the impact of diverse dimensions of L2 reading tasks on the role of L2 proficiency.

The typological difference between L1 and L2 also seems to affect the threshold level of L2 proficiency to capitalize on L1 reading ability. In a study conducted by van Gelderen et al. (2004), L1 reading ability had a stronger influence than L2 proficiency on L2 reading comprehension. However, as aptly noted by van Gelderen et al., the typological proximity between L1 (Dutch) and L2 (English) could have lowered the threshold of L2 proficiency and eased the transfer of L1 reading ability. In a similar vein, that the role of L1 reading ability in L2 English reading was strong for L1 Spanish readers in Carrell's (1991) study but weak for L1 Turkish readers in Bossers's (1992) study also indicates that L2 readers' L1 should be taken into consideration. In other words, if the two languages are typologically close, L1 reading ability may be transferred more easily owing to the lower threshold of L2 proficiency for the transfer of L1 reading ability.

That said, although research findings have consistently supported the importance of L2 proficiency in L2 reading, the concept of the threshold, or the linguistic ceiling (Clarke, 1980), is still in need for clarification. First of all, while the terms imply that the relationship between L1 and L2 reading ability will suddenly appear after reaching the threshold of L2 proficiency, such an abrupt transfer of L1 reading ability in L2 reading has not been manifested in the previous research. As Lee and Schallert (1997) pinpointed, it seems to be entirely possible to assume that the relationship between L1 and L2 reading ability is simpler and linear without such an inflection point. Van Gelderen et al.'s (2004) study also showed that the relationship between L1 and L2 reading strengthened rather gradually as the subjects' L2 proficiency developed subsuming skills involved in L1 reading. Moreover, the findings reviewed earlier showed that the threshold level is prone to fluctuate corresponding to a variety of factors such as typological distance between L1 and L2 and linguistic or cognitive complexity of the reading task. Thus, it seems to be more appropriate to interpret the threshold not as an absolute and context-independent one that L2 readers must surpass, but rather as a more flexible and context-dependent one susceptible to change in response to other related factors in the reading task.

## **Vocabulary vs. Grammar**

Following the previous discussion that revealed L2 proficiency serving a significant role in L2 reading, the present section will attempt to compare the unique contribution made by knowledge of grammar and that of vocabulary. The respective weight of vocabulary and grammar in L2 reading still remains inconclusive mainly due to the marked contrast in research findings (Shiotsu & Weir, 2007).

As mentioned earlier, Ulijn asserted that poor L2 reading is not due to the deficiency in L2 grammar, but inadequate knowledge of vocabulary that bears semantic information (Strother & Ulijn, 1987; Ulijn, 1981; Ulijn & Kempen, 1976). This speculation is supported by findings from Brisbois's (1995) and Haynes and Carr's (1990) studies, where vocabulary knowledge was

shown to be a better predictor of L2 reading ability than grammar. For example, in Brisbois's study that employed regression analysis of scores on a multiple-choice grammar test and a cloze task to measure vocabulary knowledge, vocabulary scores accounted for the variance in L2 reading ability up to 27%, but that of grammar did only up to 3%. Similarly, in Haynes and Carr's (1990) study that involved regression analysis of L2 readers' performance on a multiple-choice grammar test and a sentence-completion task for measuring vocabulary, L2 reading ability correlated better with the vocabulary test scores than those of the grammar test. Yet, when it came to the timed L2 reading in Haynes and Carr's study, the reverse pattern emerged, showing grammar playing a bigger role than vocabulary. The robust role of grammar in speeded L2 reading is of particular interest, as it contradicts the argument proposed by Ulijn that L2 reading depends little on grammatical knowledge but much on lexical-conceptual knowledge. In other words, as Alderson (1984) has suggested, when efficient lower-level processing becomes crucial, the importance of grammar seems to materialize more clearly.

On the other hand, there is also research showing that grammar has a comparable or a stronger effect on L2 reading (Alderson, 1993; Barnett, 1986; Shiotsu & Weir, 2007; van Gelderen, et al., 2004). For example, Barnett studied the relative weights of vocabulary and grammar in L2 reading using cloze items, half depending on vocabulary and the other half depending on grammar. The results of ANOVA revealed that vocabulary and grammar had almost symmetrical effects on L2 reading comprehension, which led Barnett to assert the need for a balanced emphasis on vocabulary and grammar in L2 reading instruction. Also, in more recent studies conducted by van Gelderen et al. (2004, 2007) and Shiotsu and Weir (2007), which employed SEM analysis of scores from multiple-choice vocabulary and grammar tests, each of the latent grammar and vocabulary variables accounted for a significant amount of variance in the latent L2 reading comprehension variable. Based on the results, it is asserted that "the role of vocabulary appears somewhat overstated while that of grammar understated" (Shiotsu & Weir, 2007, p. 104).

Interestingly, the studies upholding grammar as a better predictor than vocabulary show a couple of methodological strengths over those supporting vocabulary as a stronger factor in L2 reading. First of all, unlike Brisbois (1995) and Haynes and Carr (1990), vocabulary was measured in a more contextualized manner than grammar (Barnett, 1986; Shiotsu & Weir, 2007; van Gelderen et al., 2004). For instance, in Brisbois (1995)'s and Haynes and Carr's (1990) studies, grammar test items were taken from test batteries to measure general language proficiency, whereas vocabulary tests asked the subjects to figure out the meaning of the words within the provided reading passages (i.e., the cloze test in Brisbois's study and the sentence-completion task in Haynes and Carr's study). Thus, the vocabulary tests could have measured overlapping constructs in L2 reading with the possible result of vocabulary appearing to be a better predictor of L2 reading ability than grammar. On the contrary, Barnett (1986) used a cloze test to measure vocabulary and grammar simultaneously, and Shiotsu and Weir (2007) employed multiple-choice fill-in-the-blank tasks for both vocabulary and grammar tests. Thus, the little difference in the context-embeddedness between vocabulary and grammar tests in these studies might have reduced the advantage vocabulary tests could have enjoyed in correlating with L2 reading and allowed more accurate estimation of the relative role of grammar in L2 reading.

On top of that, it should be noted that Brisbois's (1995) and Hynes and Carr's (1990) studies did not include a detailed description of the construct of grammatical knowledge, even though it is crucial to evaluate the results and interpretations of each study. Yet, as pointed out by many researchers (Alderson, 1993; Urquhart & Weir, 1998), how to determine the scope of

grammar is a thorny issue mainly due to the overlap between the knowledge of grammar and vocabulary (Perfetti, 1999). Thus, a clear operationalization of grammar is imperative to isolate the contribution made by grammar from that of vocabulary, if possible. For example, in van Gelderen et al.'s (2004, 2007) and Shiotsu and Weir's (2007) research, where grammar was shown to account for a greater portion of the variance in L2 reading comprehension, the construct of grammar was clearly defined as knowledge of inflectional morphemes, verb conjugations and sentence transformations.

Lastly, while Brisbois (1995) and Haynes and Carr (1990) employed conventional multiple regression analysis, van Gelderen et al. (2004, 2007) and Shiotsu and Weir (2007) adopted a more sophisticated approach, i.e., structural equation modeling (SEM). As noted by Shiotsu and Weir, SEM allows researchers to take latent variables into account and partial out possible measurement errors caused by extraneous factors, and thus affords to predict the role of grammar and vocabulary in L2 reading more accurately and with greater confidence. Given the robustness of the methodology in these studies (Barnett, 1986; Shiotsu & Weir, 2007; van Gelderen et al., 2004), the overriding role of vocabulary and the long-neglected importance of grammar in L2 reading seem to warrant more empirical investigations with a clearer construct operationalization.

## CONCLUSION

This paper presented a brief overview of research on L2 reading and a discussion revolving around the role of grammar in L2 reading. Although evidence of the importance of grammar in L2 reading emerged in the course of the discussion, it is by no means substantial enough to provide a clear picture concerning to what extent knowledge of grammar is required for L2 reading comprehension. Thus, more empirical studies are imperative to spell out the precise nature of the relationship between grammar and L2 reading.

In addition, previous literature on reading comprehension has led to a wide variety of terms being used to identify an array of reading outcomes, such as local and global comprehension (Kintsch & van Dijk, 1978), text-model and situation-model (Kintsch, 1988), and text meaning and text interpretation (Perfetti, 1999). Perfetti's distinction of comprehension and interpretation somewhat resembles that of Kintsch's text-model and situation-model, respectively. More specifically, text meaning refers to text-based representation, and text interpretation refers to a mental model created by an inferencing activity. Given these divergent types of comprehension with presumably varying degrees of required syntactic involvement, empirical research will be necessary to take into account the distinctive roles of grammar for different types of L2 reading outcomes. For example, the role of grammar may materialize more clearly for local and text-based reading comprehension, as the construction of text-model (or text meaning, according to Perfetti) hinges on the fast and accurate recognition and computation of linguistic codes in the text.

On top of that, as revealed in the above discussion, future studies may need to address the differential contributions made by grammar to L2 reading tasks with varying cognitive and/or linguistic complexity. For example, Urquhart (1987) suggested that different reading outcomes can be generated from the reading process according to the different reading purposes or the nature the text. Then, it may be possible to assume that the role of grammar may vary in response to the standards and conditions of a particular reading task and the text. Also, the potential

relationship between the role of grammar in L2 reading and the typological proximity between L1 and L2 may need to be taken into consideration for a more accurate account of the role of grammatical knowledge in L2 reading comprehension. Last but not least, both research on the on-line processes wherein grammar functions during L2 reading, and longitudinal studies on developmental changes resulting from the contribution of grammar to L2 reading will be necessary to better support and accelerate L2 reading development and L2 acquisition through reading.

## ACKNOWLEDGEMENTS

I would like to thank Professor ZhaoHong Han for her invaluable support and guidance throughout the process of writing this paper. My thanks also go to Monika Ekiert, Charles Combs, and Adrienne Wai Man Lew from Professor Han's doctoral seminar, and the anonymous reviewers of this paper for their insightful feedback.

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