

Reinvestigating the Lower-Level Processing in ESL/EFL Reading

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In recent years, the lower-level skills and knowledge in ESL/EFL reading has been shed light on in the area of ESL/EFL reading research.

Birch (2007) proposes that in recent years, whole language has been characterized as incomplete in that it seems to deemphasize certain aspects of reading and that supplementing whole language with a bottom-up focus can strengthen the whole language approach, making it truly holistic.

Hudson (2007) suggests that becoming a successful second language reader involves overcoming language problems (i.e., bottom-up processing in second language reading) and reading problems (i.e., top-down processing in second language reading).

Koda (2005) suggests that, whether it is in the first language (i.e., L1) or in the second language (i.e., L2) reading involves continual extraction and incremental integration of the text information.

It is probable that lower-level processing (i.e., a word recognition skill; lexical knowledge; grammatical knowledge) plays vital roles in ESL/EFL reading.

In this paper, we will reinvestigate the lower-level processing in ESL/EFL reading.

Key words : lower-level ESL/EFL reading skills, a word recognition skill, lexical knowledge, grammatical knowledge, threshold hypothesis

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1. Introduction

According to Birch (2007), one ideology has dominated second language reading for quite a while. This ideology, usually called *whole language*, has many ideas and practices that have stood the test of time in research and in the classroom. Many English as a Second Language (ESL) and English as a Foreign Language (EFL) readers benefit greatly from this instruction, which generally takes a top-down view of reading, because students learn to take full advantage of their cognitive abilities to comprehend the text. However, she (2007) also proposes that in recent years, whole language has been characterized as incomplete in that it seems to deemphasize certain aspects of reading. A complete, balanced reading ideology (a "truly whole" language ideology) should be big enough to embrace all reading theories and practices. In particular, it should be able to accommodate those researchers and teachers who find that attention to the details of language can also help students learn to read better. That is, supplementing whole language with a bottom-up focus can strengthen the whole language approach, making it truly holistic.

Hudson (2007) has also published the book relating to ESL reading (i.e., *Teaching Second Language Reading*) and in the introduction of that book, he says that becoming a successful second language reader involves overcoming language problems (i.e., bottom-up processing¹ in second language reading) and reading problems (i.e., top-down processing² in second language reading), and the extent to which language is a problem varies with the type of cognitive processing that is required by the particular reading task. To sum up, he also makes much of the function of lower-level processing in second language reading as Birch (2007) does.

Koda (2005) suggests that, whether it is in the first language or in the second language, reading involves continual extraction and incremental integration of the text information. Successful L1/L2 reading comprehension, therefore, depends on both linguistic knowledge and the skills to utilize the background knowledge for text-meaning construction. She (2005)

says that theories of L2 reading therefore, should elucidate the specific linguistic knowledge and processing skills that underlies successful reading comprehension in a given language.

To sum up, we can say that, in recent years, the lower-level skills and knowledge in ESL/EFL reading has been shed light on in the area of ESL/EFL reading research. Thus, in this paper, on the basis of above-mentioned situations, we will reinvestigate the lower-level processing in ESL/EFL reading.

2. What Are Component Skills and Knowledge of ESL/EFL Reading?

Reading is such a complex process. Many researchers (e.g., Carpenter and Just, 1986; Rayner and Pollatesek, 1989; Grabe, 1991; Bernhardt, 1991; Samuels and Farstrup, 1992; Davies, 1995; Urquhart and Weir, 1998; Anderson, 1999; Oakhill and Beard, 1999; Stanovich, 2000; Grabe and Stoller, 2002; Koda, 2005; Birch, 2002, 2007) have attempted to explore and explain the reading process by analyzing the process into a set of component skills and strategies. This has led the researchers (e.g., Grabe, 1991; Bernhardt, 1991; Davies, 1995; Urquhart and Weir, 1998; Stanovich, 2000; Grabe and Stoller, 2002) to propose the following areas: 1) Lower-level processes: a word recognition skill (i.e., rapid visual recognition of letter features, letter identification and generation of grapheme-phoneme correspondence and lexical meanings), lexical knowledge (i.e., the association of words to their semantic representation), a grammatical knowledge (i.e., the identification of syntactic structures); 2) Higher-level processes: integration of textual information, resolving the ambiguities in the text, linking words with their co-reference, integrating positional unit across sentences, generating and updating schema or representation of the text as a whole, and integrating textual information with one's prior knowledge.

3. How Do ESL/EFL Readers Process the Text?

Birch (2007) suggests that we need to understand how expert English readers cope with reading an alphabetic system to know how to help beginning EFL/ESL readers master the same system. What knowledge do English readers acquire or learn in order to decode the text? What processing strategies do they use? She (2007) proposes that one idea which has been important in recent years is that good readers just pass their eyes quickly across the text, focusing on a few letters of words here and there and forming predictions based on

background knowledge. For good readers to pass their eyes quickly, it is necessary for them to develop good word recognition skills.

3.1 Word Recognition

3.1.1 The Function of Word Recognition Skill

Koda (2005) states that word recognition refers to the processes of extracting information from graphic displays of words. Individual words are critical building block in text-meaning construction, and efficiency in converting graphic symbols into sound, or meaning, information is indispensable in comprehension. Consequently, how this competence develops is a chief concern among L1/L2 researchers. Word recognition has attracted the attention of psychologists as well, because words are the ideal unit for analysis of study of cognition. Words can readily be segmented into their constituents at multiple levels — such as graphemes, phonemes, and morphemes — and therefore allow systematic investigations of how language is represented in the mind. A multitude of studies with both children and adults have tackled the core issue in word recognition: how information, "packaged" in a word, is perceived, extracted, sorted, and retrieved. Thus, it follows from what has been discussed that word recognition is the lowest-level reading skills.

3.1.2 ESL/EFL Reading is not a Guessing Game

Goodman (1973) says that in his model, the reader need not (and efficient reader does not) use all of the textual cues. The better the reader is able to make correct predictions, the less confirming via the text is necessary. According to this point of view, the reader reconstructs meaning from written languages by using graphophonic, syntactic, and semantic systems of the language, but he/she merely uses cues from these three levels of language to predict meaning, and most important, confirms those predictions by relating them to his/her past experiences and knowledge of the language.

Goodman (1973, 1996) does emphasize the role of prediction in reading. According to him (1973, 1996), it must be understood that, in the reading process, accurate use of all cues available would not only be slow and inefficient but also would actually lead the reader away from his/her primary goal which is comprehension. Because our expectation of what is coming next in the text, based on the meaning we are constructing, is so strong that all we need to see is some of what we expected, enough to confirm our prediction. To sum up, according to Goodman (1973, 1996), the reader makes continuous use of minimal information selected from a complex but incomplete and ambiguous text; draws on his/her knowledge of

the language and world; uses strategies of predicting and inferring where the text is leading him/her to. For Goodman, reading is really a *guessing game*. Reflecting the strong prominence of this view (i.e., the top-down view of reading) in the 1970s and early 1980s, word recognition received limited attention in reading research.

Berndhardt (1998) proposes that it is risky to begin a discussion of ESL/EFL reading with "letters, words, sentences, and paragraphs", since such a beginning implies that ESL/EFL reading is about "letters, words, sentences, and paragraphs". However, she (1998) also says that indeed ESL/EFL reading is "about" much more (e.g., guessing and activating schema or background knowledge, etc.), but it must also be said that without "letters, words, sentences, and paragraphs" reading does not exist. That is, if we do not sample any information, we do not understand what is written on a page of the print. Thus, as she (1998) mentions, at the outset, it is important to dispel a prevalent myth — it is not true that *fluent readers* glide over a page of print catching letters and words here and there. In fact, according to Carpenter and Just (1977), fluent, native readers of English see approximately 84 percent of all content words in a text and approximately 17 percent of all function words. Another way of saying this is that they look at most of the words on a page. Admittedly, the easier the text is, the fewer words native readers need to look at directly. On the other hand, the harder the text is, the more words they need to process. An eye movement protocol of a native reader of English serves to illustrate this phenomenon.

Koda (2005) also points out that, as we have already mentioned in this section, in top-down conceptualization, reading is seen as *psycholinguistic guessing game*, where the reader's primary task is to generate hypotheses about the forthcoming content of the text. Text information, in this interpretation, seems only to confirm the hypotheses. In short, in top-down conceptualization, the source of for text-meaning construction is the stored knowledge in the reader's own mind. She (2005) also states that, reflecting the strong predominance of this view in the 1970s and early 1980s, word recognition received limited attention in reading research. However, according to Koda (2005), nonetheless, the tide turned. Subsequent research provided little support for the top-down claims, and emphasis on information extraction competencies returned. As we have already discussed in the previous paragraph, Berndhardt (1998) states, eye movements studies, for example, repeatedly show that virtually every content word receives direct visual fixation (Balota, Pollasek and Rayner, 1985; Just and Carpenter, 1980, 1987), and the absence of even a single letter can be disruptive, heavily diminishing reading efficiency (McConkie and Zola, 1981; Rayner and Bertera, 1979). Contrary to the earlier predictions of the top-down conceptualization, the newer findings

clearly showed that most text words are thoroughly processed during reading. Moreover, developmental studies uniformly demonstrated that poor readers have difficulty in deriving information from print, and deficient word recognition is directly linked to poor reading comprehension (Perfetti, 1985; Stanovich, 1988). Thus, it is certain that word recognition has much to do with ESL/EFL reading comprehension.

3.1.3 The Importance of a Word Recognition Skill in ESL/EFL Reading

There is considerable evidence for postulating a relationship between word recognition and reading comprehension.

Shankweiler and Liberman (1972 cited from Stanovich 1982, p.85), Guthrie and Tyler (1976), Lesgold and Perfetti (1978), and Perfetti (1985) conduct the studies from which they conclude that incomplete word recognition skills lead to poor reading comprehension among beginning readers or less skilled readers.

Perfetti and Hogaboam (1975, 1978), Gibson and Levin (1975), Lomax (1983), Cunningham et al. (1990), and Hoover and Gough (1990) conduct the experiments and conclude that the development of reading comprehension is largely due to the development of word recognition skills and a lower process such as recoding.

Lesgold, Resnick, Roth and Hammond (1981), and Stanovich (1982) demonstrate that there is a strong relationship between word recognition speed and reading ability, particularly in children. According to Stanovich (1982), this relationship indeed holds for fluent adult readers, less strongly.

Curtis (1980), Singer and Course (1981), and Stanovich et al. (1984) find that word recognition skills and linguistic comprehension consistently make significant independent contributions to reading comprehension of elementary schoolchildren.

Chabot et al. (1984) and Stanovich (1991) conduct the experiments and conclude that deficiencies in word recognition subprocesses may be important sources of variability in reading achievement even at the college level adults.

Hall et al. (1986) state that the most salient differences between skilled readers and children just beginning to read are the abilities to recognize every single written word (i.e., word recognition skills).

Segalowitz et al. (1991) state that less skilled L1 readers lag behind skilled L1 readers in terms of the efficiency with which lower level processing (i.e., word recognition) is carried out. Moreover, in L1 reading, less skilled monolinguals make greater compensatory use of contexts to assist word recognition than skilled readers do. Therefore, training should aim to

develop automatic word recognition skills as is seen in skilled readers and thereby decrease the need for compensatory use of context. They (1991) say that this can free up resources from being devoted to lower level processing, thus giving readers added resources for developing an integrated text base in memory and for integrating the content of the text with prior knowledge. They also state that the results of their research support the idea that the locus of L2 reading problems in skilled bilinguals is at the level of word recognition and local assembly of idea units rather than the level of integrating information over large stretches of the text or with establishing links with prior knowledge.

Rasinski (2000) states that the less-skilled reader has to devote so much time and attention to word recognition that cognitive resources which could have been used for comprehension must be reallocated to word recognition and, as a result, comprehension suffers.

Moreover, many researchers propose (e.g., Jackson and McClelland, 1975; Gough, 1981; Stanovich, 1982; Lomax, 1983; Perfetti, 1986) that it is probable that word recognition also causes individual difference of reading ability (i.e., word recognition skills are related to reading abilities).

So far, we have observed how important such a low-level skill as word recognition is to reading comprehension. Judging from the results of the previous researches, we can argue that word recognition is strongly related to not only to L1 reading comprehension abilities but also to L2/FL reading comprehension abilities.

3.2 Lexical Knowledge

3.2.1 The Function of Lexical Knowledge in Reading

No text comprehension is possible, either in one's native language or in a foreign language, without understanding vocabulary of the text. This is not to say reading comprehension and lexical comprehension are the same, or that reading quality is determined by lexical knowledge alone. As we have discussed in the section 3.1.2, reading comprehension (both in L1 and in L2/FL) is also affected by textually relevant background knowledge and the application of general reading strategies, such as predicting the content of the text, guessing unknown words in context, making inferences, recognizing the type of text and text structure, and grasping the main idea of the paragraph. And yet, it has been consistently demonstrated that reading comprehension is strongly related to lexical knowledge, more strongly than to the other components of reading (e.g., grammatical knowledge, formal discourse structure knowledge, background knowledge and so on) (Laufer, 1997; Anderson, 1999).

3.2.2 The Role of Lexical Knowledge in L2/FL Reading

A similar picture of vocabulary (i.e., lexical knowledge) as a good predictor of reading success has emerged also from L2/FL studies.

Laufer (1991) found good and significant correlations between two different vocabulary tests (the *Vocabulary Level Tests* by Nation [1983] and the *Eurocentres Vocabulary Test* by Meara and Jones [1989]) and reading scores of L2 learners. The correlations were .5, significant at the level of $p < .0001$, and .75, significant at the level of $p < .0001$, respectively. Even higher correlations are reported by Koda (1989) between lexical knowledge (tested by a self-made test) and two reading measures (i.e., cloze and paragraph comprehension). These correlations are .69, $p < .0002$ and .74, $p < .0001$.

Coady, Magoto, Hubbard, Graney, and Mokhtari (1993) conducted two experiments that showed that increased proficiency in high-frequency vocabulary also led to an increase in reading proficiency. Vocabulary materials were so successful that in the second experiment, no control group, which was to be taught without the materials, could be set up, since all the students wanted to use them (i.e., the vocabulary materials).

Shimamoto (1998) investigated the correlation between the university students' lexical knowledge and the score of *TOEFL* reading comprehension test. She found significantly strong correlation between them and concluded that the reader's lexical knowledge was the best predictor of his/her EFL reading ability.

Droop and Verhoeven (2003) suggest that, with regard to the role of children's lexical knowledge in learning to read in L2/FL, a strong relation is observed between the size of their vocabularies and their reading comprehension scores.

Laufer (1997) also claims that lexical knowledge has been to be the best predictor of success in L2/FL reading, better than grammatical or general reading ability. According to her (1997), whatever the effect of reading strategies is, it is short-circuit if the vocabulary is below the threshold, i.e., the minimum of 3,000 word families, or 5,000 lexical items.

Anderson (1999) states that lexical development is one of the most critical areas of second language reading. He (1999) also says that vocabulary is the fuel that ignites the fire of reading and comprehending what one reads.

According to Koda (2005), research consistently demonstrates that lexical knowledge correlates more highly with reading comprehension than other factors, including morphosyntactic knowledge and reading strategies. She (2005) also states that successful L2/FL reading comprehension is heavily dependent on knowledge of individual word meanings. The widely recognized relationship between lexical and reading comprehension

attests to the crucial role which lexical knowledge plays in text understanding in L2 readers.

Birch (2007) proposes that lack of vocabulary remains one of the major obstacle for ESL or EFL reading comprehension.

From what has been discussed above, we can certainly confirm that lexical knowledge plays a very important role in L1 and L2/FL reading comprehension.

3.3 Grammatical Knowledge

3.3.1 The General Function of Grammatical Knowledge

Nunan (1999) states that, for most people, the essence of language lies in grammar. When someone is said to lack skills in a language, or when the popular press describes what it sees as the declining standard of English, they are generally referring to an actual or perceived decline in the ability of individuals to express themselves grammatically. Ur (1998) says that there is no doubt that a knowledge of grammatical rules is essential for the mastery of a language: we cannot use words unless we know how they should be put together. Leaver, Ehrman, and Shekhtman (2005) describes that knowledge of target-language grammar, sometimes called structure (or forms), and syntax (or word order), is an important aspect of L2/FL acquisition. They also say that, for L2/FL acquisition, grammar is as important as vocabulary. They (2005) assert that words alone are not enough to communicate. The words must come, in most languages, in a certain order and take a certain shape, or they will not be understood and our message will not be conveyed. For example, if someone said to us, "the book sees I", we would not understand what the speaker meant unless we knew the context. If the speaker used the correct word order (i.e., syntax) in English, "I sees the book", we would understand much better, but we might think he/she meant, "I seize the book" because "sees" is not the correct form (i.e., grammar) to use with the word "I". Similarly, unless we understand the grammar and syntax of a second/foreign language, we will miss the message (and, with more sophisticated levels of grammar and syntax, the nuances, which can sometimes be very important, too).

To sum up, we can conclude that grammar plays a crucial role in acquiring a language.

3.3.2 The Role of Grammatical Knowledge in L2/FL Reading

Leaver, Ehrman, and Shekhtman (2005) assert that, to be able to read well, we need to know a lot of words, and that we also need to know the grammatical rules. Adams (1980) notes that a reader have to be able to recognize the words and to analyze the syntax in order to understand a written text. Dubin, Grabe, and Eskey (1986) states that appropriate

grammatical and lexical development can not be ignored in L2/FL reading instruction. Grabe (1991) considers structure knowledge (i.e., a sound understanding language structure) to be an important item of general component skills and knowledge of reading. He (1991) says that readers recognize and get meaning from words that they see in print, and then use their knowledge of the structure of the language (i.e., grammatical knowledge) to begin forming a mental notion of the topic. Urquhart and Weir (1998) say that, in addition to words being recognized, the significance of the relationships between the words (e.g., syntax) needs to be extracted by the reader. Grabe and Stoller (2002) suggest that L2/FL readers need some foundation of L2/FL grammatical knowledge for effective reading comprehension. They (2002) also assert that, arguments that L2/FL readers do not need knowledge of grammar, occasionally voiced in the L2/FL literature, are clearly wrong.

These assertions lead to the conclusion that grammatical knowledge is a crucial factor for ESL/EFL reading.

4. Implication for ESL/EFL Reading Instruction: The Threshold Hypothesis

Koda (2005) states that the conviction that L2/FL proficiency is a vital prerequisite to efficient L2 reading is widely accepted. Clarke's short-circuit hypothesis (1980), for example argues that limited control over the language short-circuits the good reader's system causing him/her to revert to poor reader strategies when confronted with difficulty of confusing task in second language. Similarly, Yorio (1971) maintains that the guessing or predicting ability which is necessary to pick up the correct cues is hindered by the imperfect knowledge of the language. This hypothesis has been strongly supported by recent L2/FL reading studies. Cziko (1980) and Cummins (1980) undertook research in the same direction at the same time. Alderson (1984) addressed the question of whether L2 reading was a language problem or a reading problem and came to the tentatively qualified conclusion that it appeared to be both a language problem and a reading problem, but with firmer evidence that it was a language problem, for low levels of L2/FL competence, than a reading problem. In so doing, he (1984) lent support to the threshold hypothesis. After Alderson (1984), a number of studies related to the threshold hypothesis have been conducted and they have supported the threshold hypothesis (e.g., Laufer and Sim, 1985a, 1985b; Devine, 1988; Hacquebord, 1989; Bossers, 1989, 1991; Carrell, 1991; Bernhardt and Kamil, 1995; Grabe and Stoller, 2002).

In addition, recent empirical studies (e.g., Bossers, 1991; Carrell, 1991; Bernhardt and Kamil,

1995), further demonstrates that L2/FL knowledge, in point of fact, explains 30% to 40% of L2/FL reading variance. Thus, limited L2/FL knowledge explicitly inhibits L2/FL learners from using their previously acquiring L1 reading skills in their L2/FL reading.

Our discussion so far has confirmed Alderson (1984)'s assertion in terms of the function of lower-level L2/FL reading knowledge and skills (i.e., the threshold hypothesis). In the section 3.1.2, Bernhardt (1998) proposes that it is risky to begin a discussion of ESL/EFL reading with "letters, words, sentences, and paragraphs", since such a beginning implies that ESL/EFL reading is about "letters, words, sentences, and paragraphs". She (1998) also says that indeed it is "about" much more (e.g., guessing and activating schema or background knowledge, etc.). Thus, in this paper, we have confirmed that L2/FL reading is a language problem for low levels of L2/FL competence, and both a language and a reading problem for moderate levels of L2/FL competence.

These facts imply that in Japanese junior and senior high schools, when the students learn to read EFL textbooks, their lower-level reading skills and knowledge (i.e., word recognition skills, lexical knowledge and grammatical knowledge) should be trained repeatedly in order to utilize these skills and knowledge automatically (i.e., with little mental resource). In addition, when they learn to read EFL textbooks, they should be trained to activate and utilize their upper-level reading skills and knowledge (e.g., guessing and activating schema or background knowledge, etc.).

Notes.

1. Bottom-up models of reading argue that a reader constructs the text from the smallest to the whole units (from letters to words to phrases to clauses to sentences of the text: the reader piles up comprehension of smaller units) and that the process of constructing the text from those small units becomes so automatic that the reader is not aware of how it operates.
2. In top-down models of reading, the reader expects the meaning of each word or sentence by using an amount of knowledge he/she possesses. The reader draws on his/her own intelligence and experiences — the prediction he/she can make, based on the schemata he/she has acquired — to understand the text.

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