

論 文

## Increasing Exposure to English Linguistic Cues Through Reading: A Way to Improve Comprehension

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### Introduction

For many adult Japanese EFL learners, learning English, a language that consists of different delineation patterns than their first language, presents various obstacles. However, some adult L2 learners are able to achieve a high level of L2 proficiency with apparent ease, whereas others have a hard time mastering even the basics of English.

As with any language, English language ability is composed of four skills: listening, speaking, reading, and writing. These four language skills involve both specific language processing abilities and general cognitive activities. Among the four skills, the act of reading in the L2 is thought to be most strongly linked with cognitive abilities. In listening and speaking there are other clues to language meaning that occur through intonation, body language and facial expressions. However, reading requires the learner to assess words and comprehend sentence meanings through only written signs. While most L2 linguistic knowledge needs to be acquired, the ability to process the L2 effectively and efficiently depends to great extent on cognitive, non-linguistic skills which are centered within working memory (Nakano, Oku, & Hashiuchi,

2002). These non-linguistic skills have already been acquired and developed to varying degrees by learning the first language, and are therefore available to the L2 learner to use while reading in the L2.

Working memory (WM) allows an individual L2 learner to utilize both declarable knowledge such as vocabulary and grammar and procedural knowledge about language construction in order to integrate both prior-knowledge and incoming information as language processing takes place. As a result, WM, as a part of long-term language memory in the mental lexicon, may be a key factor in achieving L2 proficiency. Owing to a biological critical period (e.g., Long, 1990), the L2 adult learner has to depend to a greater extent on general learning mechanisms and principles (e.g., Oku, 2002a), which means that the role of WM operations in performing linguistic tasks may be stronger in L2 than in L1.

This paper suggests a strategy for developing an awareness of English linguistic cues in WM through reading methods. This paper is divided into five sections. Section I provides a brief summary of working memory within Fodor's concept of modularity, its architecture and the role it plays in the reading process. Section II describes WM components in terms of language aptitudes. Section III outlines how English linguistic cues can work as mediators in WM, and how they can correspond with stages of L2

acquisition by means of semantic-syntactic connections brought about through reading. Section IV describes reading as a strategy for improving L2 proficiency. Finally, section V offers conclusions regarding the validity of this strategy.

### **I. Working Memory within Fodors Modularity**

Even though human beings use different languages, they have essentially the same cognitive architecture and mental processes (Seed, 1997). However, language is a guide to “social reality”. The words for social institutions and customs are rooted in culture, and as a result, an individual’s mental lexicon is determined by his/her own cultural and linguistic backgrounds. Every text is interpreted through his/her own prior knowledge.

Fodor’s modularity (1983) considers that an individual’s mental lexicon is made up of a number of distinct, specialized, structurally idiosyncratic language modules that communicate with cognitive structures via limited semantic-syntactic connections. Each module contains semantic information that can be accessed in order to undergo lexical processing within a person’s mental lexicon. In other words, language processing requires an interface between language and other aspects of cognition, for example, general knowledge, contextual information, etc. In order to implement language processing of written words, encapsulated modules of information must be accessed, penetrated, and linked to others by way of syntax-semantic connections (e.g., Jackendoff, 2002). Being able to interpret text requires that the L2 learner has to make certain lexical decisions regarding the meaning of ambiguous words, a process that must link words to semantic-syntactic associations. In the framework suggested by Fodor, mental lexicon is involved in the whole processing of linguistic

information. However, when lexical items connect with and excite corresponding nodes within mental lexicon, the point is known as working memory (Shingulton, 1999).

Assessment tests of foreign language aptitude (e.g., Carroll, 1962) always include a means to estimate grammatical knowledge and skills. Thus an L2 learner’s ability to parse complex syntactic structures correctly and efficiently and achieve syntactic comprehension (e.g., Jackendoff, 2002) has been considered an essential component of foreign language proficiency. The linearity of language, that is the ability to understand from a text what is happening, when and to whom, requires that the reader simultaneously store the intermediate and final products of computations as he/she constructs and integrates ideas within WM from the stream of successive words in a text. Being able to process language correctly means that for adult L2 learners, WM must play an important role in penetrating the distinct language modules suggested by Fodor(1983) in order to produce a linearity of linguistic comprehension.

### **II. A Determinative of Language Aptitude**

The resources stored in working memory play an integral role of adult language processing (e.g., Baddely, 1986; Ellis, 1994; Grass & Selinker, 1994; Crutcher, 1998; Gathercole & Thron, 1998; Miyake, & Freidman,, 1998; Oku, 2001b; Jackendoff, 2002). Working memory can be thought of as a computational area or workplace (Miyake, & Freidman,, 1998) where task-relevant processing and storage activities take place dynamically. In this way, the capacity and capabilities of WM can play an important role in determining the acquisition of L2 proficiency (e.g., Sparks, Ganschew,I. & Patton, J. 1995).

By accessing linguistic resources, WM functions as the learner's language aptitude (e.g., Carroll, 1962) which consists of three important components: language analytic capability, memory ability, and phonetic coding ability (Skehan, 1989). Housed in WM, the functioning of these components yields the limits to information processing capacity for language, including both computational and storage components, and determines WM constraints. In other words, WM constraints consist of the maximum activation ability one has accessible for processing and storage functions. A resource shortage in WM (i.e. low ability in any of the three components) can lead to inefficient processing and faster memory decay (Miyake, & Freidman, 1998). Individuals with smaller WM capacities are often in a more disadvantaged position than those with larger capacities, particularly when the task demands exceed capacity limits.

For Japanese learners of English, the most powerful determinant of L2 proficiency is considered to be the component of language analytic capability. This capability is necessary in order to produce a linear comprehension of English. In order to cope with a new language system that operates differently than the L1, it is necessary for each linguistic module to be penetrated by means of a semantic-syntactic connection of associations between words and forms. Since there is a direct relationship between language analytic capability and working memory, Japanese English learners must develop language analytic ability in order to improve L2 proficiency. Access to a strong language analytic ability offers an explanation as to how some learners are able to attain native-level proficiency even if their studies are relatively short-term (e.g., Bialystok & Hakuta, 1994). Having larger WM resources enables some learners to access relevant information quickly and efficiently. Specifically, these

learners have been able to develop language analytic capability, the ability to either instinctively or experimentally, unconsciously recognize each word in a sentence and comprehend the whole meaning of the sentence. Developing language analytic capability can influence the efficiency with which adult learners can learn and use an L2.

The next section outlines how language analytic capability influences L2 semantic-syntactic comprehension that is an important aspect of L2 proficiency, and suggests four mediators that can act within WM to promote L2 language processing.

### **III. Developing Mediators within Working Memory**

Within WM, there four essential linguistic resources that operate as effective mediators: L1 WM, L2 WM, appropriate linguistic cues, and syntactic comprehension (Miyake, & Friedman, 1998), in order to produce a linearity of linguistic comprehension when complex linguistic sentences are read. The first two mediators are defined as follows, where span is understood as a measure of the individual's operational linguistic capacity up until WM constraints are met: L1 WM is the listening and reading span for L1 (Japanese); L2 WM is the listening and reading span for L2 (English). For native Japanese speakers, L1 WM, the amount and complexity of linguistic information that can be processed and understood, is larger than that of L2WM. Increasing the listening and reading span of L2 WM is a way to improve L2 comprehension.

There is evidence to show that language transfer exists within various linguistic aspects, including both oral and written forms of L2 production and comprehension. Examples of language transfer can be seen in morphosyntactic systems (e.g., Hakuta, 1976;

Yanco, 1985; Zehler, 1982), communicative strategies (e.g., Cohen, Olshtain & Rosenstein, 1986), and pragmatics (e.g., Irujo, 1986). L1 linguistic-oriented features not only influence L2 acquisition (e.g., Flynn, 1996; White, 1989), but also constrain the cognitive procedures used in L2 processing (e.g., Kilbron & Ito, 1989; Koda, 1997). It is clear that the L1 WM capacity for language is closely related to both L2 WM capacity and L2 language comprehension skills, as well as to the speed and efficiency of the acquisition of L2 knowledge itself.

Turning to basic language structure, the typical Japanese sentence follows a pattern of subject-object-verb (SOV), but in English, the standard pattern is subject-verb-object (SVO). In addition, while English is an isolated language, Japanese is an agglutinative language. Unlike English, word order in Japanese does not indicate the grammatical usage of nouns in sentences, nor are nouns inflected for grammar case. Grammatical usage is indicated by particles that follow the noun, the important ones which are ga, wa, o, and

no. The L1 WM of Japanese English learners is used to more flexibility in word order and depends highly on case markings (indicated by particles like ga, and o), less on animacy, and even less on word order. This contrasts with L2 WM which is highly dependent on two global cues: the word order cue and the morphological agreement cue (Miyake, & Freidman., 1998). These differences are shown in the following examples of five basic sentence patterns: Table( Word Order and Particle Use in English and Japanese Sentences).

It is apparent that there are different linguistic cues for each language. For Japanese English learners, the important linguistic cues are word order, animacy (both nouns, first noun and second noun animate), and agreement (verb agrees with both nouns, first noun and second noun). These linguistic cues get the learners to realize their syntactic comprehension within English sentences. Syntactic comprehension (or language analytic capability) is the ability to decode linearity from linguistic forms within complex English

Table : Word Order and Particle Use in English and Japanese Sentences

English 5 basic patterns	English	Japanese patterns	Japanese
S V	I work.	S V	私は働く。
S V O	He reads a book.	S O V	彼が本を読む。
S V C	Mary became a scientist.	S C V C S V	メアリーは科学者になった。 科学者にメアリーはなった。
SV IO DO	You gave her a gift.	S IO DO V S DO IO V DO IO S V IO DO S V	あなたは彼女に贈り物をした。 あなたは贈り物を彼女にした。 贈り物を彼女にあなたはした。 彼女に贈り物をあなたはした。
S V O C	They call him Tom.	S O C V S C O V O C S V O S C V	彼らは彼をトムと呼ぶ。 彼らはトムと彼を呼ぶ。 彼をトムと彼らは呼ぶ。 彼を彼らはトムと呼ぶ。

sentences (i.e., who did what to whom) (Miyake, & Freidman, 1998). The effective use of these global cues requires that the learner temporarily maintain previously read words in the correct order while continuing to process input. However, out of the aforementioned cues, the most powerful cue is word order because native speakers of English rely more heavily on the word order cue than others such as the animacy and agreement cues (Miyake, & Freidman, 1998).

Increasing the awareness of English word order cues can have a direct and positive influence on English language acquisition and use. The frequent recognition and utilization of L2 linguistic cues can play a role in developing L2 WM capacity, and may eventually lead to a unification of the L1 WM and L2 WM into a larger, more powerful WM. In this sense, L2 linguistic cues function as mediators working within WM to help develop L2 WM. One way to improve access to and awareness of L2 cue mediators is to read regularly. Reading materials that offer the L2 learners many opportunities to recognize and use English-oriented cues to mature their cognitive skills within WM resources can be an effective way to develop the ability to comprehend syntactically complicated sentences. It has been found that L2 learners with larger L2 reading spans are more skilled at comprehending complex sentence structures than those with smaller reading spans (e.g., King & Just, 1991). The following section describes how reading can be an effective and efficient way to improve L2 comprehension.

#### **IV. Reading to Improve L2 Proficiency**

Reading is a language skill that requires a high level of cognitive activity. It comprises various processes that interact simultaneously, including letter

identification, lexical access to intersentential integration, and the activation of relevant background knowledge. Reading involves both language-processing skills and general cognitive skills (e.g., the activation of background knowledge). While most L2 knowledge needs to be consciously acquired, non-linguistic cognitive skills have already been acquired to varying degrees in the first language, and so are available to the L2 learner and can be accessed through WM resources.

Unlike digit-span or word-span tests that reveal aspects of short-term language memory (Ikeno, 2002), the measurement of WM capacity reveals both linguistic storage and processing aspects. The capacity of WM has been measured effectively by the Reading Span Test (RST) (e.g., Osaka & Osaka, 1994), in which people read aloud increasingly longer sets of unrelated sentences and attempt to recall the final words after each set. In addition, WM capacity, as indexed by RST scores, has been shown to have a significant relationship with various text integration skills (Ikeno, 2002). In order to improve L2 proficiency, the transfer of some L1 reading skills to the process of L2 reading needs to take place. This reading ability transfer has been referred to cross-linguistic reading transfer (e.g., Bernhardt & Kamil, 1995; Bossers, 1991; Briskois, 1995; Carrel, 1991; Ikeno, 2002; Schoonen, et al., 1998; Taillefer, 1996).

It is hypothesized that WM capacity can influence the effective execution of reading processes and is especially relevant to complicated linguistic processing. Within WM, both the processing and storage of relevant information exploit the same resource supply. If there are insufficient resources, two major problems occur. First, the processing system is sabotaged and secondly, a gradual loss of indispensable information occurs. Specifically, when a given task demands a large drain on resources, the

processing of new information will not be as fast or as efficient. Also, due to a limited activation supply, the forgetting of crucial pieces of information will occur (Miyake, & Freidman,, 1998). For these reasons, the direct transfer of L1 reading skills can occur only when a certain amount of L2 knowledge has already been acquired (Bossers, 1991). From the view point of WM capacity, however, there exist no theoretical WM constraints since reading transfer is assumed to increase to the degree that the functional capacity of WM increases. This is due to the automatization of lower-level linguistic processes and/or the sheer increase in WM capacity.

In other words, being able to read fluently enables L2 learners to reinforce the cognitive processes that associate L1 and L2 knowledge structures with one another by creating a meaningful connection between L2 vocabulary and existing L1 knowledge. Through the process of reading, the L2 learner increases access to English linguistic cues (mediators), which via cognitive and linguistic processes, enable the L2 learner to link L1 knowledge and L2 working memory to achieve greater English proficiency.

As a final point, it is important to reiterate that Japanese is an orthographic system based on logography in which a one-to-one correspondence between a graphic representation and a meaning exists. The way the Japanese language is structured influences the way it is studied and learned, particularly with respect to reading and writing. Japanese learners of English are much more familiar with Japanese linguistic cues and can readily use those cues to access L1 WM. However, the process of learning English involves learning a whole new set of linguistic cues. For Japanese students, reading English texts and exposure to other written materials is one of the most effective and efficient ways to develop an awareness of English-oriented cues. In turn, a greater awareness of

these cues strengthens the mediators acting within L2WM. Experiencing a variety of different syntactic comprehensions as text is read provides an opportunity for L2 WM capacity to increase, and positively influences the effective execution of the reading process, as well as promoting a merge with L1 WM to produce a large and efficient WM.

## V. Conclusion

The purpose of this paper is to suggest how English linguistic cues can work as effective and efficient mediators in WM to influence L2 adult learners' ability to learn how to analyze and comprehend complex L2 sentence structures and to introduce a strategy to develop these mediators for acquiring L2 proficiency. It has been shown how working memory, as a part of long-term language memory in the mental lexicon, is a key factor in L2 reading comprehension ability. With regards to intermediate L2 adult learners, the ability to access WM components is just as important, if not more important than knowledge of L2 vocabulary and grammar (Miyake, & Freidman,, 1998). At relatively early stages of L2 acquisition, reading performance in L2 is more strongly linked to newly-learned L2-specific knowledge such as declarable knowledge like vocabulary and grammar rules. However, as the L2 proficiency level increases, the contribution of L2-specific components decreases, and the relative contribution of non L2-specific knowledge such as the procedural and cognitive skills centered within WM increases (Miyake, & Freidman,, 1998). One way to improve procedural knowledge is to improve the mediators of WM resources, namely through an increased awareness of L2 linguistic cues by means of greater exposure to various linguistic usages. Cue usage depends on how probabilistically informative

each cue is in making meaningful syntactic distinctions. But Japanese-oriented local cues (the case marking and animacy cues) are less significant in WM than more global L2 cues like word order and morphological agreement. So L2 learners must adjust familiar Japanese-oriented cues to fit with English-oriented cues. The major drawback is that L1 orthographic competence shapes L2 lexical processing, "Language consists of grammaticalised lexis, not lexicalised grammar" (Lewis, 1993).

The reality is that the Japanese logographic reader is used to recognizing as many signs as there are words and morphemes in the language (Koda,1997). In order to compensate for this, the L2 learner must increase exposure to the new language. It has been suggested that for learners, L2 reading spans and L2 reading comprehension are correlated. L2 reading skills are highly correlated with large L2 WM reading spans, at least among relatively advanced adult L2 readers (Miyake, & Freidman, 1998). Knowledge of a language demands mastery of its vocabulary as well as much of its grammar. The only way to master the lexical system is the same as that recommended for mastering the syntactic system: the learner must experience considerable exposure to the language (Wilkins, 1974). For this reason, it is recommended that reading used as a strategy is to develop a greater awareness of English linguistic cue usages, leading to improved comprehension in the L2, and with the ultimate goal of achieving L2 proficiencies as native English speaker .

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