Japanese EFL Learners’ Implicit Knowledge of Prenominal Adjective Orders: A Priming Study

Kunihiro KUSANAGI and Junya FUKUTA

By the use of the priming paradigm, this study attempted to reveal whether or not highly proficient Japanese learners of English as a foreign language (Japanese EFL Learners) possess implicit knowledge of the constraints on prenominal adjective orders. Recent studies on real-time sentence processing and implicit grammatical knowledge in a second language (L2) have focused in depth on the real-time utilization of syntactic and morphosyntactic information of a target language. However, the counterpart of semantic constraints such as the order of prenominal adjectives (a nice small pen vs. a small nice pen) has remained quite obscure. In the present study, thirty-two participants (sixteen native speakers for the control group, the others for the experimental group) engaged in different sentence-level priming experiments with the following conditions: (a) the primes with the preferred prenominal adjective orders and the stimuli with the same pattern (P-P), (b) the preferred primes and the violated stimuli (P-V), (c) the violated primes and the preferred stimuli (V-P), and (d) the violated primes and the stimuli with the same pattern (V-V). The results revealed that the Japanese EFL learners did not exhibit the priming effect or the effect of the order violations, unlike the control group. This suggests that the Japanese EFL learners were very insensitive to the violations of the semantic constraints, and thus their implicit knowledge of these constraints can be said to remain rudimentary; nevertheless their proficiency levels were high, at least in the Japanese EFL setting. The difficulty of learning about semantic constraints and some pedagogical implications were also discussed.

Key words: Implicit Knowledge, Prenominal Adjective Orders, Priming

1. Background

It is not a matter of dispute that second language (L2) learners’ grammatical performance is inconsistent, complex, and dependent on the situation, task-related factors, and the structures themselves, unlike the performance of first language (L1). In order to recapitulate such L2 learners’ inconsistent grammatical performance, researchers have long attempted to establish dichotomous distinctions of linguistic knowledge, such as (a) learned vs. acquired knowledge, (b) explicit vs. implicit knowledge, (c) declarative vs. procedural knowledge, and (d) non-integrated vs. integrated knowledge (see summary by Jiang, 2007).

The present study adopted the framework of explicit and implicit ones, which can be the broadest in the literature of L2 knowledge representation (Ellis, 2005). In a typical viewpoint, explicit knowledge usually refers to linguistic representations which entail controlled, conscious, and analytical grammatical processing. Thus, this type of knowledge is considered to require a longer time and heavier cognitive resources to utilize, and to
be verbally reportable. Meanwhile, implicit knowledge by definition is supposed to enable spontaneous, speedy, automatic (or native-like), and sometimes heuristic language processing. Some researchers, such as Krashen in his early arguments, insist that implicit knowledge is solely responsible for naturalistic language use, and thus the goal of foreign language learning is to attain implicit knowledge in the same manner as native speakers. However, the other side postulates that L2 knowledge in use is fundamentally heterogeneous, and L2 language proficiency composes both types of knowledge (cf. Ellis, 2005).

In regard to their development, it is widely recognized that the attainment of explicit and implicit knowledge strongly depends on the structures in the target language (e.g., Ellis, 2005, among others). In addition, the structure dependencies in both types of knowledge are quite different. For instance, it is well known that highly proficient Chinese learners of English tend to overlook number agreement errors in their real-time reading comprehension, while they show the almost ceiling effect in off-line grammaticality judgment tasks (Jiang, 2007). Kusanagi and Yamashita's study (2013) investigated the effects of two linguistic factors—structural differences and inflectional regularity of nouns—on the performance of timed and untimed grammaticality judgment tasks, targeting highly proficient Japanese learners of English. The results showed that the two linguistic factors affected the performance of the two tasks differently. This suggests that the linguistic factors which cause learning difficulties are different between explicit and implicit knowledge.

Viewpoints on learning difficulty in implicit knowledge may largely overlap the studies on L2 grammatical processing. In the processing view, there is a consensus that L2 learners’ real-time grammatical processing is slower and less accurate than that of native speakers (e.g., Frank-Mestre, 2002). Additionally, as Jiang’s study (2007) showed a typical case, L2 learners with some specific L1s have tendencies to exhibit reduced online sensitivity to morphosyntactic errors. Also, L2 learners sometimes show none of or non-target-like preferences for syntactic ambiguity resolution in their real-time reading (e.g., Clahsen & Felser, 2006).

Reviewing the findings above, Clahsen and Felser (2006) established the Shallow Structure Hypothesis (SSH) which assumes that L1 and L2 grammatical processing are fundamentally different in terms of the on-line utilization of linguistic information. SSH suggests that L2 grammatical processing relies much more on lexical, semantic, and pragmatic information, than on morphological, morphosyntactic, and syntactic information. Unlike L2 learners, native speakers utilize more detailed representations of the morphological and syntactic aspects in their real-time grammatical processing. However, some other researchers insist that grammatical processing in L2 is fundamentally identical to the counterpart of L1 (e.g., Hopp, 2010). Also, it can be safely stated that roles of other factors such as working memory capacity (e.g., Coughlin & Tremblay, 2012), L1 influence (e.g., Sabourin & Store, 2008), and task effects (e.g., Lim & Christianson, 2013) should be investigated in more detail, in order to discuss this theoretical conflict more deliberately.

The present study is not another one discussing the conflict. Rather, this study tackles a relatively hidden problem of L2 grammatical acquisition studies. The claim of the present study is that the arguments mentioned above have solely depended on the evidence of L2 learners’ real-time underutilization of syntactic and morphological information. However, that of semantic, lexical and pragmatic ones remains somehow obscure. It is plausible to assume that L2 learners also underutilize even non-structural
or non-morphological constraints in their real-time grammatical processing in the same way with the syntactic and morphological aspects. In the explicit/implicit framework, this viewpoint can also be paraphrased by stating that L2 learners’ deficits of syntactic and morphological representations in their implicit knowledge are relatively widely covered in the literature, meanwhile surprisingly little attention has been paid to non-structural and non-morphological kind of knowledge. This experimental study is the first to attempt to fill this huge gap.

Firstly, the next section will review the previous studies on L2 learners’ insensitivity to non-structural and non-morphological constraints. Then, the target linguistic phenomenon of this study, *prenominal adjective orders* in English, will be introduced. The priming method, which this study adopted, will also be explained in the literature review. The designs and the results of the priming experiments with Japanese EFL learners and native speakers will be reported in chapters three and four.

2. Literature Review

2.1. Learners’ Real-Time Insensitivity

Several studies by Kusanagi have addressed the question above. Kusanagi (2013a) examined Japanese EFL learners’ processing of English nouns and noun phrases (*irreversible binomials*, examples are given in 1a. and 1b). In English, some binomials show very conventional and highly abstract patterns for ordering nouns. In (1a), the phrase *men and women* is quite frequent and natural, but the reverse-ordered phrase as in (1b) is rarely seen in target-like usage of English. Note that there is a set of semantic and phonological constraints for the orders in respective languages.

(1a)  men and women
(1b)  * women and men

The phrase acceptability judgment tasks of Kusanagi (2013a) revealed that violations of the preferred orders did not affect the reaction time and the judgment accuracies of L2 learners, while the reversed orders triggered significantly slower reaction times and less accurate responses of native speakers.

Next, Kusanagi, Leung, Bando, Fukuta, and Sugiura (2013) conducted an eye-tracking study, which examined L2 learners’ real-time collocation processing. For Japanese EFL learners, collocation errors such as *do a mistake for make a mistake*, and *best partner for ideal partner* are common. These errors violate the lexical features involved in a collocational phrase. For instance, in a malformed collocation, *do a mistake*, the verb *do* cannot take the direct object such as *a mistake* at least in the target-like usage of English. The eye-tracking study revealed that even the highly proficient participants read the target-like and the malformed versions of collocations with almost the same reading times. This suggests that L2 learners are very insensitive to the violations of conventional patterns or lexical constraints.

Moreover, an extension of this line of studies, Kusanagi (2014) investigated how English *flat adverbs* are processed during Japanese EFL learners’ real-time reading (examples of flat adverbs are given in 2a and 2b).
The reading time data of the self-paced reading tasks in Kusanagi (2014) revealed that the participants did not clearly differentiate the two forms of adjectives. This suggests that the lexical properties of functional categories in L2 learners' knowledge are fragile, and they cannot rapidly process these phrases.

Taken together, these studies were all about the linguistic phenomena without the effects of the syntactic aspects, and robustly showed L2 learners' insensitivity in their real-time grammatical processing.

2.2. Prenominal Adjective Orders in English

Simpler evidence for the insensitivity to such non-syntactic constraints can be the case of prenominal adjective orders in English (Kusanagi, 2013b). As multiple adjectives modify a noun and form a complex noun phrase (NP), it is known that there are semantic constraints on the order of the adjectives (see Hetzron, 1978; Martin, 1969; Langacker, 2008; Wulff, 2003 for details) as you can see in (3a) and (3b).

(3a) A nice small cup
(3b) ?? A small nice cup

This phenomenon can be explained by an example of the schema below (based on Kemmerer, Tranel, & Zdanczyk, 2009). Firstly, assume that there are semantic classes or features which each adjective assigns, based on the properties of the referential concepts of the adjectives themselves as in (4).

(4)

Semantic Classes: [VALUE] [SIZE] [DIMENTION] [PHYSICAL PROPERTY] [COLOR]

Examples:

<table>
<thead>
<tr>
<th>Orders</th>
<th>Good</th>
<th>Big</th>
<th>Tall</th>
<th>Hot</th>
<th>Red</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

In this account, the adjectives such as good or nice precede the other types of adjectives such as big or tall because of the priority of the semantic classes; [VALUE][SIZE]. The multiple adjective NPs violating the constraints will trigger extremely low acceptability of native speakers’ off-line judgments (e.g., Danks & Glucksberg, 1971). Additionally, remember that this phenomenon is not determined by the level of phrase structures. As in the tree in (5), NP_2 and NP_3 here are equivalent syntactically. L1 psycholinguistic researchers have paid much attention to this phenomenon since 1960 (e.g., Dunks & Glucksberg, 1971). Recently, the focus is moving from its off-line acceptability to on-line processing performance. By the use of the self-paced reading paradigm, Kennison (2010) reported that violations of the semantic constraints of prenominal adjective orders caused reading difficulty in native speakers' comprehension processes. Specifically, the analysis showed that the delays of reading instantly emerged when the native speakers read the violated-ordered phrases.
Kusanagi (2013b) is a partial replication study of Kennison (2010). Kusanagi (2013b) conducted two independent experiments; one using paper-based order selection tasks, and the other using self-paced reading tasks, both targeting highly proficient Japanese EFL learners (N = 46). In the former experiment, the participants showed sufficient performance in selecting the preferred orders of prenominal adjectives. Despite that, the participants failed to exhibit real-time sensitivity, which contrasted with the results of Kennison’s study. This means that the Japanese EFL learners may have processed the orders, accessing their fully-stored explicit knowledge; meanwhile in the real-time condition, they failed to utilize the information on semantic classes. Or, a simpler explanation is that the representation of the constraints was null in their implicit knowledge.

2.3. Priming Method for Exploring Linguistic Knowledge

This study extends the insights of the previous study by Kusanagi (2013b), using a relatively new experimental method in this field, sentence-level priming. The priming effect generally refers to the implicit memory effect of preceding stimuli on a response to another stimulus. The phenomenon occurs when particular representations are activated by preceding stimuli, and is said to occur following any category of stimulus, such as perceptual, conceptual, lexical, semantic, or syntactic ones. The sentence-level effects of priming have been commonly adopted in many psycholinguistic studies on speech production (see review by Pickering & Ferreira, 2008 for syntactic priming), and some recent studies also examined the priming effects of structural factors in real-time reading comprehension (e.g., Kim, Carbary, & Tanenhaus, 2013; Tooley & Traxler, 2010).

The sentence-level priming experiments in production studies have shown that speakers tend to reconstruct a sentence by employing the most recently activated words and the corresponding syntactic structure in the speakers' mental lexicon. For instance, when some verbs are activated in their lexicon, related types of syntactic structure and subcategorization information on the verbs can also be activated concurrently. As a result, even when speakers simply hear a particular syntactic form, the subsequent production can be facilitated: they tend to be likely to choose a production for the target sentence that is compatible with the structure of the prime sentence. This priming effect has also been widely acknowledged in reading comprehension. Reading-time studies, on the other hand, usually examine whether or not priming facilitates the speed of sentence processing. It has been well documented that reading times can be increased when the target contains the same verb as the prime (Tanenhaus & Trueswell, 1995; Traxler & Tooley, 2008). This is considered to be because lexically-based constraints override structural information (MacDonald, Pearlmutter, & Seidenberg, 1994; Kim, Carbary, & Tanenhaus,
However, note that, as for the syntactic domain, the priming effect has been observable only when item-related biases were taken into account (Kim, Carbary, & Tannenhaus, 2013).

L1 syntactic priming effects of various types are generally believed to exhibit their evidence in the absence of the speaker’s awareness or intention (Bock, 1986). Moreover, the priming method was recently introduced to the field of L2 studies as a new psycholinguistic tool to capture how and to what extent L2 learners possess their implicit knowledge of specific grammatical structures (e.g., Morishita, 2013).

On the basis of the rationale of the priming method in general, which was introduced above, the current study used sentence-level “semantic” priming in real-time sentence reading, rather than that of syntactic one. The semantic priming usually concerns whether the prime and the target stimulus are of the same semantic category, or share features. In the case of L2, however, it is still uncertain whether learners represent semantic categories or certain features in their implicit knowledge. This study will be the first one to answer this question, specifically focusing on the constraints of prenominal adjective order in English with Japanese EFL learners.

3. Research Questions

This study addressed the two research question as follows:

RQ1: Do native speakers of English exhibit the priming and violation effects of prenominal adjective orders?
RQ1: Do highly proficient Japanese learners of English as a foreign language exhibit the priming and violation effects of prenominal adjective orders?

The previous studies by Kennison (2010) and Kusanagi (2013a, 2013b, 2014) lead us to predict that the priming effects and the effect of violations of the semantic constraints will not be evident in the case of Japanese EFL learners, while native speakers will show evidence of both the effects.

4. The Present Study

4.1. Participants

The number of participants was thirty-two. Group one consisted of native speakers of English (n = 16), and group two was for Japanese learners of English (n = 16). The participants in group one lived in Japan at the time of the experiment and were all from the United States. The participants in group two were undergraduate and graduate students at a Japanese university, and usually learned and used English for professional and academic purposes. Their academic majors included English literature, international economics, international development and linguistics. They all spoke Japanese as L1, and no one spoke other languages more fluently than Japanese and English. Questionnaires were used to determine their self-reported proficiency (TOEIC score and self-ratings on the four types of skills) before the experiments. After finishing the experiment, they all received financial compensation for their participation. Their demographic information is summarized in Table 1.
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4. 2. Materials

In total, forty-eight sentences were created. The stimuli contained the complex NP (Adj₁ + Adj₂ + N) of which adjectives had the following combinations of the semantic classes: (a) VALUE-SIZE, (b) VALUE-COLOR, (c) SIZE-COLOR, (d) SIZE-VALUE, (e) COLOR-VALUE, and (f) COLOR-SIZE. The last three combinations became violations of the semantic constraints in English. In order to minimize the structural effects of stimuli on the experiment, all of the stimuli had exactly the same tree structure as in (6). The sentence length of all stimuli was the same (11 words). The words used in the stimuli were all chosen from the 1000–2000 levels of the JACET8000 vocabulary list, in order to reduce the lexical demands for reading.

(6)

```
S
  | NP₁
  |   | Det₁
  |   | The
  |   | fat
  | NP₂
  |   | N₁
  |   | man
  |   | saw
  | VP₁
  |   | V
  | NP₃
  |   | Det₂
  |   | a
  |   | nice
  |   | small
  |   | cup
  | PP
  |   | in
  |   | Det₃
  |   | the
  |   | shop
  | NP₄
  |   | N₂
  | VP₂
  |   | p
  | NP₅
  |   | N₃
```

4. 3. Tasks

The self-paced reading task (moving-window and phrase-presentation) with the priming method was adopted in the present study. A computer-based experiment program was created using Hot Soup Processor 3.2., a programming language. In the experiment, a Windows laptop with 15-inch screen was used. The tasks firstly presented a prime in the form of sentences. After reading the presented prime, the participants pressed the button on the reaction device they held. Then the positions for each phrase were presented by the underlines on the screen. Then, once the button was pressed, the first word immediately appeared and the program started recording the reading time.
Each time the button was pressed, the displayed phrase disappeared, and the next phrase appeared. The reading times for each phrase were measured in milliseconds. After reading each stimulus, yes/no questions about the contents of stimuli, not primes, were presented in order to check the participants' comprehension levels. The sequence of the experimental program is graphically summarized in Figure 1.

In order to compare the reading times, the present study set three interest regions. Region One was the subjective NP (Det + Adj + N) such as the beautiful woman (see also the tree diagram in 6). Region Two was for a local verb phrase (VP) which consisted of V + Det + Adj + Adj + N, such as saw a nice blue cup. Region Three was a preposition phrase (PP), which consisted of P + Det + N as in the shop. In the self-paced reading part, the sets of the three regions were displayed individually.

![Figure 1. Flow chart representing the sequences of the experimental program.](image)

4. Analysis

As a main analysis method, this study adopted ANOVAs. Table 2 summarizes all of the potential variables in the measurement.

The comparison of the within-participant factor, Group, is not an interest of the current study, since most of the previous studies have repeatedly reported the differences of real-time grammatical performance between L1 and L2 (see Frank-mestre, 2002), especially in the case of reading time. Thus, the factor was removed from the design of the ANOVAs. Next, the differences among the regions are also not of interest to us, since the regions have different lengths of phrases (three words vs. five words vs. three words). Thus, we will only see the results of the main interest region (region Two) in which the effects of priming will appear.

| Table 2. The Potential Variables in the Measurement |
|---------------------------------|-----------------|-----------------|-----------------|-----------------|
| Independent variable            | Dependent variable | |
| Variable 1                      | Variable 2       | Variable 3      | Variable 4      | Reading Times   |
| Group (categorical)             | Region (categorical) | Prime (categorical) | Stimuli (categorical) | (continuous)    |
| Native Speakers                 | Region one: NP   | Preferred       | Preferred       |                 |
| L2 Learners                     | Region two: Local VP | Violation     | Violation       |                 |
|                                | Region three: PP |                 |                 |                 |
Hence, the present study separately conducted two ANOVAs (for group one and two), whose design types were two-by-two (prime by stimuli), and within-participant. Thus, the conditions of the ANOVAs are (a) preferred primes and preferred stimuli (P-P), (b) preferred primes and violated stimuli (P-V), (c) violated primes and preferred primes (V-P), and (d) violated primes and violated stimuli (V-V). The present study performed only participants’ analysis.

5. Results and Discussion

Table 3 presents the descriptive statistics of the results, including those of region one and region three for reference. The accuracy scores of reading comprehension checks were quite high ($M = 98.02, SD = 0.03$), by which we can confirm that the participants’ reading was sufficient for statistical analysis.

### Table 3. Means, SDs, and 95% CIs for the Population Means of the Reading Time Data

<table>
<thead>
<tr>
<th>Group</th>
<th>Condition</th>
<th>Region 1</th>
<th>Region 2</th>
<th>Region 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>$M$ (SD)</td>
<td>$95%$ CI</td>
<td>$M$ (SD)</td>
</tr>
<tr>
<td>NS</td>
<td>P-P</td>
<td>873 (256)</td>
<td>[999, 748]</td>
<td>1,225 (309)</td>
</tr>
<tr>
<td></td>
<td>P-V</td>
<td>830 (225)</td>
<td>[940, 719]</td>
<td>1,367 (396)</td>
</tr>
<tr>
<td></td>
<td>V-P</td>
<td>856 (330)</td>
<td>[1,017, 694]</td>
<td>1,346 (329)</td>
</tr>
<tr>
<td></td>
<td>V-V</td>
<td>881 (332)</td>
<td>[1,039, 723]</td>
<td>1,321 (302)</td>
</tr>
<tr>
<td>NNS</td>
<td>P-P</td>
<td>836 (193)</td>
<td>[931, 742]</td>
<td>1,453 (374)</td>
</tr>
<tr>
<td></td>
<td>P-V</td>
<td>782 (183)</td>
<td>[871, 692]</td>
<td>1,458 (383)</td>
</tr>
<tr>
<td></td>
<td>V-P</td>
<td>842 (266)</td>
<td>[972, 712]</td>
<td>1,468 (360)</td>
</tr>
<tr>
<td></td>
<td>V-V</td>
<td>975 (293)</td>
<td>[1,119, 831]</td>
<td>1,458 (271)</td>
</tr>
</tbody>
</table>

Note. $N = 32$.

Firstly, the reading times of the main interest region by group one were submitted to a two-way ANOVA. The result was that the main effect of prime did not reach statistical significance, $F(1, 15) = 1.19, p = .29, \eta^2_p = .07$, and that of stimuli was also not statistically significant, $F(1, 15) = 1.74, p = .21, \eta^2_p = .10$. However, the interaction showed the statistical significance with a relatively larger effect size, $F(1, 15) = 7.68, p = .01, \eta^2_p = .34$. Since the interaction was statistically significant, the simple main effects were examined. The results showed that the simple main effect of prime on the preferred stimuli was statistically significant, $F(1, 15) = 14.10, p < .01, \eta^2_p = .48$, while that on the violated stimuli was not, $F(1, 15) = 0.64, p = .43, \eta^2_p = .04$. The simple main effect of the stimuli on the preferred primes was also statistically significant, $F(1, 15) = 6.56, p = .02, \eta^2_p = .30$, but that on the violated primes did not reach statistical significance, $F(1, 15) = 0.20, p = .66, \eta^2_p = .01$. These results indicate the priming effect on the preferred conditions was evident. Figure 2 graphically represents the results of the ANOVA.
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Next, the reading times of group two were also submitted to an ANOVA with the same design. The ANOVA showed that both the main effects of prime and stimuli were not statistically significant, $F(1, 15) = 0.02, p = .90, \eta^2_p < .01, F(1, 15) < 0.01, p = .96, \eta^2_p < .01$, for each. Moreover, the interaction of the two factors was not statistically significant, $F(1, 15) = 0.01, p = .91, \eta^2_p < .01$. Also, all of the effect sizes were extremely small ($\eta^2_p$s < .01). Figure 3 graphically represents the results of the ANOVA. Note that none of the effects was evident in the data of L2 learners.

Taken together, the results of the present study can be summarized by saying that only the priming effect was evident in the data of native speakers. This observation fully supports the previous studies by Kusanagi, who insists that implicit knowledge of the semantic constraints on prenominal adjectives is deficient, or L2 learners face persistent difficulty in utilizing the semantic information in their real-time reading.

Considering the priming method, if L2 learners implicitly know the semantic classes (e.g., VALUE, or SIZE) of adjectives, or the processing module for the semantics-driven NP formation works, these representations or the module should be activated by the
primes and the results should have shown the priming effects. However, again, this study found the priming effect only in the data of native speakers, and L2 learners’ data did not show any effects.

It has been generally acknowledged that L2 learners have a tendency to show their real-time insensitivity to violations of syntactic and morphological constraints, and there is some domain-specificity in real-time utilization of linguistic information (SSH). This study challenges this view, since the participants in the present study clearly showed serious insensitivity to the semantic classes as well as other constraints such as number agreement (e.g., Jiang, 2007). It is possible to infer that at least at the level of the participants in this study, the claims on domain-specificity do not fully account for L2 grammatical processing or attainment of implicit knowledge. Be reminded that the previous studies by Kusanagi (2013a, 2014) and Kusanagi et al. (2013) presented evidence with other linguistic phenomena to support this claim.

However, some possible factors should be considered to explain the difficulty of learning the semantic constraints of prenominal adjective orders for Japanese EFL learners. Firstly, it is necessary to take L1 cross-linguistic influences into account. Since this study did not treat L1 influences as an experimental factor, future studies should directly address these effects. Secondly, the amount of input will be a strong factor to acquire this type of constraint. Since this linguistic phenomenon appears less frequently in usual language use (and also EFL textbooks), Japanese EFL teachers may not teach about it explicitly and deductively in formal classroom instruction. If input-based language acquisition accounts are valid, the learning difficulty of the constraints may be caused by their input itself. In order to investigate this possibility, it would be useful to consider the developmental sequences of learners’ knowledge of the constraints.

With regard to its methodology, this study clearly revealed the asymmetry of the priming effects between native speakers and L2 learners. The present study presented almost the first evidence for the sentence-level semantic priming effect on real-time reading of L2 learners. Since this method has only recently been introduced to the field of L2, and has not been widely adopted yet, replication studies of the present study, needless to say, are desired. However, it can be safely stated that the application has the potential to shed light on inquiry of L2 implicit knowledge, especially on other semantic or pragmatic constraints.

Although the present study revealed the learning difficulty of the constraints, this does not lead to a conclusion that it is fundamentally impossible for L2 learners to understand the constraints. Rather, as Kusanagi (2013b) reported that L2 learners showed sufficient performance in the paper-based tasks, it can be said that L2 learners do possess explicit knowledge of the constraints. It will be more pedagogically strategic to foster their explicit knowledge in the classroom settings, recognizing their potential learning difficulty in attaining implicit knowledge of these constraints. Although the roles of explicit knowledge are various, one can state with certainty that explicit knowledge can compensate for the lack of implicit knowledge in language use. Of course, it will be also important to introduce and teach the constraints to the students who have no explicit knowledge about the constraints. Future studies should also examine the effect of formal instruction.

The results and implications of the present study should be taken cautiously, since the study has methodological shortcomings, as described below. Firstly, the sample sizes for each group were not sufficient. A replication study with larger sample sizes is desired. Second, this study did not observe the effects of the combinations of semantic classes
precisely. This viewpoint will be important to consider in future studies.

6. Conclusion

Using the sentence-level semantic priming method, this study presented the empirical evidence that Japanese EFL learners’ implicit knowledge of the semantic constraints on prenominal adjective orders is, unlike native speakers, quite rudimentary, and they face difficulty to acquire the constraints as their implicit knowledge. Relatively little attention has been paid to L2 explicit and implicit knowledge of semantic constraints. However, since the nature of L2 learners’ grammatical knowledge is complex, investigating various linguistic phenomena will be an alternative strategy to further explore the nature of L2 knowledge. The present study may be the basis for further studies which will address this issue.

References


Authors
Kunihiro KUSANAGI
Graduate School, Nagoya University/JSPS Research Fellow
Kusanagi@nagoya-u.jp

Junya FUKUTA
Graduate School, Nagoya University/JSPS Research Fellow
fukuta@nagoya-u.jp