Decomposition of Morphologically Complex Words in L1 and L2: Evidence from Masked and Cross-Modal Priming Experiments of a Korean Verbal Suffix


This paper reports results from two types of priming experiments (i.e., masked and cross-modal priming experiments) which compare Chinese L2 learners' morphological processing of a Korean verbal suffix -ko with adult native speakers of Korean. L1/L2 differences were found in both the masked and cross-modal priming experiments: Full priming effects were found in the masked priming experiment and partial priming effects in the cross-modal priming experiment in L1, while weak or no priming effects were found in both types of priming experiments of L2. These findings indicate that L2 learners of Korean are less sensitive to morphological structure than native speakers and dependent on the lexical storage of the full form. This study also provided evidence for the non-difference between the masked priming

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I. Introduction

The question of how morphologically complex words are represented in the mental lexicon has attracted many researchers' interests, producing a considerable body of behavioral, brain imaging, and electrophysiological studies concerning morphological processing by native speakers. Most of the debates on the status of morphologically complex words have been centered on two main models: the Decomposition model (Pinker & Ullman, 2002) and the Full-listing model (McClelland & Patterson, 2002). The Decomposition model states that the processing of a morphologically complex word involves decomposing the word into its stem and its affix, while the Full-listing model claims that the morphologically complex word is recognized as an unanalyzed whole, in other words, a single indecomposable word. Under the Decomposition model, for example, an English past-tense form *walked* is decomposed into its stem (*walk*) and its affix (*-ed*). However, the past-tense form is recognized as undecomposable whole forms under the Full-listing model. Many previous studies regarding morphologically complex words in L1 have provided positive evidence for the Decomposition model, claiming that native speakers employ morphologically structured representations when processing inflected or derived words in real time (Clahsen, 1999; Marslen-Wilson, 2007; Pinker, 1999; Pinker & Ullman, 2002).

Many recent studies of morphological processing have begun to investigate morphologically complex words in L2 and have been interested in L1/L2 differences in language processing (Ahn, H.-D., et al.; Clahsen & Felser, 2006a, 2006b; Lee, D. 2011; Neubauer & Clahsen, 2009; Silva & Clahsen, 2008). Morphological processing in L2 appears to
be different from L1 processing, since L1 processing is usually slower and less automatized than L1 processing. In order to explain the differences between L1 and L2, some researchers have claimed that L1 and L2 processing basically share the same system, but that the influence of native language or slower and more memory-demanding processing in L2 causes the L1/L2 differences (Hernandez, Li, & MacWhinney, 2005; Indefrey, 2006; McDonald, 2006; Perani & Abutalebi, 2005; Weber & Cutler, 2003).

However, some other researchers have explained the L1/L2 differences by positing fundamental differences between L1 and L2 (Clahsen & Felser, 2006a, 2006b; Silva & Clahsen, 2008; Ullman, 2001, 2004, 2005; Ullman, Babcock, & Brovetto, 2008). Clahsen and Felser (2006a) proposed the 'shallow-structure hypothesis', which claims that L2 learners do not make use of abstract syntactic structure during online processing and that they rely more on lexico-semantic information, associative patterns, and other surface cues for interpretation. Ullman's (2004, 2005) declarative/procedural model also maintained that maturational changes occur during childhood and adolescence and L2 processing is largely dependent upon the lexical memory system, which makes reliance on the procedural system occur to a much lesser extent than L1 processing. Thus, L2 learners do not fully use decomposition or morphological parsing in their processing of morphologically complex words, mainly relying on full-form storage.

This study examines and compares the processing of morphologically complex words in L1 and L2. The processing of Korean verbal suffix -ko is compared between Korean L1 speakers and Chinese advanced adult L2 learners of Korean. Korean is an agglutinative language which includes many different types of nominal and verbal suffixes, while Chinese is an isolating language which is characterized by very limited use of inflectional suffixes. Thus, a series of experimental studies which investigated the processing of different nominal and verbal suffixes are necessary, and the present study is expected to shed more light on the issue of L2 morphological processing of Korean words.

On the other hand, this study employs two different priming
techniques: masked priming and cross-modal priming. Masked priming experiments presents a prime word and a target word which are both visual, while, in cross-modal priming experiments, the prime word is given visually and the target word is given auditorily. These two priming techniques are believed to reveal different priming effects for different types of prime-target pairs. In other words, priming effects are said to be found for both semantically transparent and opaque prime-target pairs in masked priming experiments. In cross-modal priming experiments, however, priming effects are not found for semantically opaque pairs (Neubauer & Clahsen, 2009). Marslen-Wilson (2007) and some other researchers contrasted the two priming techniques by distinguishing between access representations, which are modality specific and encode form-level information, and central lexical entries, which are modality independent and incorporate more abstract information (Marslen-Wilson, Tyler, Waksler, & Older, 1994; Neubauer & Clahsen, 2009). They suggested that masked priming is related to access-level representations and cross-modal priming is to central-level representations.

Basnight-Brown et al. (2007) further observed that L2 learners showed similar amounts of facilitation for -ed primes as L1 speakers in cross-modal priming, while Silva and Clahsen (2008) and Neubauer and Clahsen (2009) observed no facilitation for regularly inflected prime words in masked priming by the various L2 groups. As noted in Marslen-Wilson et al. (forthcoming), masked priming is thought to be driven almost entirely by the properties of early segmentation processes, while overt priming (where the prime is fully visible or audible) is believed to be influenced by the central lexical representations of complex forms. The present study addresses the issue of such distinction by comparing masked priming effects and cross-modal priming effects in L1 and L2 processing of morphologically complex words in Korean. This study is expected to reveal in which representation L2 morphological processing is similar to or different from L1 morphological processing.
II. Masked Priming Experiments

This section presents experimental method and results of the masked priming experiments for L1 and L2 morphological processing.

2.1 Participants

2.1.1 L1 Participants

The participants of the masked priming experiment of the study consisted of fifty native speakers of Korean (26 males and 24 females). All of them were graduate and undergraduate students of a university located in Seoul and were paid for their participating in the experiment. All the participants had normal or corrected-to-normal vision and no hearing problems. The mean age of the participants was 24.

2.1.2 L2 Participants

Forty Chinese learners of Korean (14 males and 26 females) participated in the masked priming experiments. They were learning Korean at a language institute of a university located in Seoul, Korea. They were taking Korean Level 5 and 6 classes of the Korean language program, which are regarded as advanced levels of the Korean language program. They were also paid for their participation, and all the participants had no sight or hearing problems. The mean age of the L2 participants was 23.6. All the Chinese learners of Korean started to learn Korean after they came to Korea and their average length of stay in Korea was 32.7 months.

3) All of the participants had passed Level Four of the TOPIK (Test of Proficiency in Korean).
2.2 Materials

The materials used for the masked priming experiments in L1 and L2 were identical. The materials included three different priming conditions depending upon the types of prime-target pairs: (1) Identical condition, in which the primes and the targets are identical, (2) Morphological condition, in which a stem plus a verbal suffix -ko are presented as a prime, and (3) Unrelated condition, in which the primes and the targets are not related at all. An example of a prime-target pair in each of the three conditions is presented in Table 1.

<table>
<thead>
<tr>
<th>Condition</th>
<th>Prime-Target</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Identical</td>
<td>kata – kata</td>
<td>ka--ta 'go-ENDING'</td>
<td></td>
</tr>
<tr>
<td>Morphological</td>
<td>kako – kata</td>
<td>ka-ko 'go-SUFF'</td>
<td></td>
</tr>
<tr>
<td>Unrelated</td>
<td>sakwa – kata</td>
<td>sakwa 'apple'</td>
<td></td>
</tr>
</tbody>
</table>

The test materials were made by E-prime software and included 50 experimental prime-target pairs for the three conditions. In addition, a total of 150 filler prime-target pairs, some of which were non-words, were added for all the three conditions. The targets in each condition

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4) According to Silva and Clahsen (2008), the RT differences between the three conditions are used as a measure of priming. 'Full priming' occurs when there is no RT differences between Identical condition and Morphological condition, and the RTs are significantly shorter in Identical condition and Morphological condition than in Unrelated condition. On the other hand, 'partial priming' occurs when the RTs for Morphological condition are longer than for Identical condition but shorter than for Unrelated condition. 'No priming' is obtained when the RTs for Morphological condition and Unrelated condition do not significantly differ from each other.

5) In order to control the effects of semantic and phonological similarity, this study included two more conditions of Semantic and Phonological and the results revealed that the semantic or phonological similarity did not cause any statistically significant differences.
were disyllabic with all the targets identical in length. All the target words used in the three conditions were proved to have high familiarity to the participants through a familiarity check and also a high frequency was proved through preliminary frequency checks performed prior to the experiments. The order in which the test items and fillers was presented were randomized for each participant.

2.3 Procedure

The participants of the study performed a lexical decision task individually, in which they were asked to respond as quickly and accurately as possible whether the word presented on the computer screen is a word or a non-word by pressing a "YES" button or a "NO" button on the keyboard. They were seated in front of a computer and were given instructions for the experiment. They were told to focus on the ‘###’ sign in the center of the computer monitor. After the focus point disappeared, they were told that a word would appear in its place. If they thought the word is a correct word in Korean, they were told to press a button on the keyboard for ‘yes’. If they thought the word was not a Korean word, they were told to press another button on the keyboard for ‘no’.

After 500 ms, the focus point disappeared and the prime word appeared on the monitor for 30 ms. After 80 ms, the target word appeared on the monitor screen for 500 ms. It was the target word that they were asked to make a lexical decision on. The target word disappeared after 500 ms or as soon as a response button was pressed.

Reaction times (RTs) were measured from the onset of target display. To prevent the chance of purely orthographic priming the target word and prime word were presented in different fonts.

Prior to the actual experiments, the participants were guided through 20 trial items. They were also given an opportunity to ask questions if they were unsure about the instructions or procedure of the experiment.

6) The target words all have high frequency of more than 1,000 according to the Yonsei Corpora developed by Yonsei University in 1998.
Both the participants’ answers to the lexical decision task and the time it took for them to respond were recorded by E-prime software. The entire experiment took about thirty minutes either for the L1 or the L2 experiments.

2.4 Data Analysis

The present study was composed of two types of statistical analyses. One is the subjects analysis ($F_1$), in which means were obtained for each subject and submitted to a repeated measures of ANOVAs, and the other was the items analysis ($F_2$), in which means were obtained for each item and also submitted to a repeated measures of ANOVAs. There were one between- and one within-subject variables in the subjects analysis, and the between-subject variable was used to counterbalance the variable sequences in which the three levels of conditions (i.e., the types of prime-target pairs) might occur. The type of prime-target pairs (i.e., three levels of condition, Identical, Morphological, and Unrelated) was the within-subject variable. The dependent variable was the RT for the lexical decision task. In the items analysis, the type of prime-target pairs was used as the within-subject variable for the repeated measures ANOVA, and the frequency of each item was submitted as a covariate of the analysis in order to control the probable effects of frequency differences among the items. The RTs for each item by each participant were examined for outliers and RTs which were deviated from more than 2.5 standard deviation from the mean RT of each condition were excluded from the analysis. The statistical analysis for this study was tested at the significance level of .05.

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7) The present study adopted a Latin Square design in order to control the probable effects of the sequence of the three conditions in the prime-target pairs.
2.5 Results

2.5.1 L1 Experiment

The mean RTs and SDs for each condition in the masked priming experiment in L1 are shown in Table 2 and the comparison of RTs between the conditions are displayed in Figure 1. As mentioned before, the RTs for each item were examined for outliers, and 5.34% of them were excluded from the analysis. Incorrect responses (i.e., the participants' wrong decisions on word/non-word targets), which were about 6.10% of all the participants' responses, were also excluded from the analysis. Table 2 and Figure 1 show that the Identical condition and the Unrelated condition have the shortest and the longest RTs, respectively, and the RT for the Morphological condition was in-between.

<table>
<thead>
<tr>
<th>Condition</th>
<th>Mean (ms)</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Identical</td>
<td>535.90</td>
<td>55.31</td>
</tr>
<tr>
<td>Morphological</td>
<td>544.96</td>
<td>53.98</td>
</tr>
<tr>
<td>Unrelated</td>
<td>573.63</td>
<td>53.16</td>
</tr>
</tbody>
</table>

Table 2
Mean RTs and SDs by Condition for L1 Masked Priming Experiment
The repeated measures ANOVA showed that there was a significant difference in the RTs for the three conditions ($F(2, 96) = 18.212, p = .000$), and pair-wise post-hoc comparisons (Tukey HSD) showed that statistically significant differences were found between Identical and Unrelated ($p = .000$) and between Morphological and Unrelated ($p = .000$). However, no significant difference was found between Identical and Morphological ($p = .142$).

The items analysis produced the same results with the subjects analysis. There was a significant difference in the RTs for the three conditions ($F(2, 90) = 12.043, p = .000$), and pair-wise post-hoc comparisons (Tukey HSD) showed that statistically significant differences were found between Identical and Unrelated ($p = .000$) and between Morphological and Unrelated ($p = .000$). No significant difference was found between Identical and Morphological ($p = .279$).

### 2.5.2 L2 Experiment

The mean RTs and SDs for each condition in the masked priming experiment in L2 are presented in Table 3 and the comparison of RTs
between the conditions are graphically displayed in Figure 2. The RTs for each item were examined for outliers, and 11.50% of them were excluded from the analysis. Incorrect responses, which were about 11.75% of all the participants’ responses, were also excluded from the analysis. Table 3 and Figure 2 show that the Identical condition and the Unrelated condition show the shortest and the longest RTs, respectively, and the RT for the Morphological condition was very close to the Unrelated condition.

Table 3
Mean RTs and SDs by Condition for L2 Masked Priming Experiment

<table>
<thead>
<tr>
<th>Condition</th>
<th>Mean (ms)</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Identical</td>
<td>884.23</td>
<td>159.79</td>
</tr>
<tr>
<td>Morphological</td>
<td>871.78</td>
<td>168.17</td>
</tr>
<tr>
<td>Unrelated</td>
<td>933.62</td>
<td>171.23</td>
</tr>
</tbody>
</table>

Figure 2
Mean RTs by Condition for L1 Cross-modal Priming Experiment

The repeated measures ANOVA showed that there was a significant difference in the RTs for the three conditions for the subjects analysis.
Pair-wise post-hoc comparisons (Tukey HSD) showed that statistically significant differences were found between Identical and Unrelated ($p = .018$) and between Morphological and Unrelated ($p = .038$). However, no significant difference was found between Identical and Morphological ($p = .594$).

The items analysis produced similar results. There was a significant difference, which can be regarded as marginal) in the RTs for the three conditions for the items analysis ($F(2, 90) = 3.191$, $p = .046$), and pair-wise post-hoc comparisons (Tukey HSD) showed that statistically significant differences were found between Identical and Unrelated ($p = .045$) and between Morphological and Unrelated ($p = .012$). However, no significant difference was found between Identical and Morphological ($p = .154$).

III. Cross-Modal Priming Experiments

This section presents experimental method and results of the cross-modal priming experiments for L1 and L2 morphological processing.

3.1 Participants

2.1.1 L1 Participants

Fifty native speakers of Korean (31 males and 19 females) participated in the cross-modal priming experiment of the study. They were recruited from graduate and undergraduate students of a university located in Seoul and were paid for their participating in the experiment. All the participants had normal or corrected-to-normal vision and no hearing problems. The mean age of the participants was 25.5.

2.1.2 L2 Participants

The L2 participants of the cross-modal priming experiments were
fifty Chinese learners of Korean (7 males and 43 females) who were learning Korean at a language institute of a university located in Seoul, Korea. They were taking Korean Level 5 and 6 classes of the Korean language program, which are regarded as advanced levels of the Korean language program. They were also paid for their participation, and all the participants had no sight or hearing problems. The mean age of the L2 participants was 23.5. All the Chinese learners of Korean had first been exposed to Korean after they came to Korea and their average length of stay in Korea was 37 months.

3.2 Materials

The test materials used for the cross-modal priming experiments were identical with those for masked priming experiments. As in the masked priming experiments, there were three different priming conditions (i.e., Identical, Morphological, and Unrelated), and 50 experimental prime-target pairs and additional 150 filler prime-target pairs were included.

3.3 Procedure

The procedure for the cross-modal priming experiment was almost identical with the masked priming experiment, except that the primes were auditorily presented to the participants. The primes were recorded prior to the experiment on a digital tape recorder by a female native speaker of Korean.

The participants were seated in front of a computer and a monitor, and they were given instructions for the experiment. They were told to focus on the '+' sign in the center of the computer screen. After the focus point disappeared, they were told that a word would appear in its place. If they thought the word is a correct word in Korean, they were told to press a button on the keyboard for 'yes'. If they thought the word was not an existing word in Korean, they were told to press another button on the keyboard for 'no'.
After 450 ms, the focus point disappeared and the auditory prime was given through the participant's headphone. After 50 ms, the target word appeared on the screen for 500 ms. The target word disappeared after 500 ms or as soon as a response button was pressed. RTs were measured from the onset of target display.

A practice session was given to the participants prior to the actual experiment, and both the participants' answers to the lexical decision task and the time it took for them to respond were recorded by E-prime.

3.4 Data Analysis

The data analysis for the cross-modal priming experiments was exactly the same with the masked priming experiments. It included two types of statistical analyses: the subjects analysis ($F_1$) and the items analysis ($F_2$). The repeated measures of ANOVAs with one between- and one within-subject variables in the subjects analysis, and one within-subject variable in the items analysis. The RTs for each item by each participant were examined for outliers and RTs which were deviated from more than 2.5 standard deviation from the mean RT of each condition were excluded from the analysis. The statistical analysis for this study was tested at the significance level of .05.

3.5 Results

3.5.1 L1 Experiment

The mean RTs and SDs for each condition in the L1 cross-modal priming experiment are shown in Table 4 and the comparison of RTs between the conditions are graphically displayed in Figure 3. The RTs for each item was examined for outliers, and 4.12% of them were excluded from the analysis. Incorrect responses, which were about 1.16% of all the participants' responses, were also excluded from the analysis. Table 4 and Figure 3 show that the Identical condition and the
Unrelated condition show the shortest and the longest RTs, respectively, and the RT for the Morphological condition was in-between.

<table>
<thead>
<tr>
<th>Condition</th>
<th>Mean (ms)</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Identical</td>
<td>478.72</td>
<td>76.881</td>
</tr>
<tr>
<td>Morphological</td>
<td>505.34</td>
<td>76.16</td>
</tr>
<tr>
<td>Unrelated</td>
<td>568.01</td>
<td>68.72</td>
</tr>
</tbody>
</table>

The repeated measures ANOVA showed that there was a significant difference in the RTs for the three conditions ($F(2, 90) = 80.889$, $p = .000$), and pair-wise post-hoc comparisons (Tukey HSD) showed that statistically significant differences were found between every condition: between Identical and Unrelated ($p = .000$), between Identical and Morphological ($p = .001$), and between Morphological and Unrelated ($p = .000$).

The results for the items analysis showed similar results. There was
a significant difference in the RTs for the three conditions ($F(2, 90) = 5.621, p = .000$). Pair-wise post-hoc comparisons (Tukey HSD) showed that statistically significant differences were also found between every condition: between Identical and Unrelated ($p = .000$), between Morphological and Unrelated ($p = .000$), and between Identical and Morphological ($p = .003$).

3.5.2 L2 Experiment

The mean RTs and SDs for each condition in the cross-modal priming experiment are shown in Table 5 and the comparison of RTs between the conditions are graphically displayed in Figure 4. The table and figure show similar results with the masked priming experiment. The Identical condition and the Unrelated condition show the shortest and the longest RTs, respectively, and the RT for the Test condition was in-between. The RTs for each item was examined for outliers, and 5.23% of them were excluded from the analysis. Incorrect responses, which were about 15% of all the participants’ responses, were also excluded from the analysis.

<table>
<thead>
<tr>
<th>Condition</th>
<th>Mean (ms)</th>
<th>SD</th>
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</thead>
<tbody>
<tr>
<td>Identical</td>
<td>726.56</td>
<td>106.28</td>
</tr>
<tr>
<td>Morphological</td>
<td>749.83</td>
<td>124.44</td>
</tr>
<tr>
<td>Unrelated</td>
<td>793.78</td>
<td>110.53</td>
</tr>
</tbody>
</table>
The repeated measures ANOVA showed that there was a significant difference in the RTs for the three conditions ($F_1(2, 90) = 9.218, p = .000$), and pairwise post-hoc comparisons (Tukey HSD) showed that statistically significant differences were found between Identical and Unrelated ($p = .000$), and between Morphological and Unrelated condition ($p = .018$). However, no significant difference was found between identical and Morphological ($p = .110$).

The items analysis showed the same results. That is, there was a significant difference in the RTs for the three conditions ($F_2(2, 90) = 12.629, p = .000$), and pairwise post-hoc comparisons (Tukey HSD) showed that statistically significant differences were found between Identical and Unrelated ($p = .000$) and between Morphological and Unrelated ($p = .004$), but no significant difference between Identical and Morphological ($p = .117$).

**IV. General Discussion**

The results of all the experiments in this study (i.e., masked and cross-modal priming experiments in L1 and L2) are summarized in
Table 6, which shows comparisons between L1 and L2 in each masked and cross-modal priming experiment. The table shows that there is no difference between L1 and L2 in the masked priming experiments and a slight difference between L1 and L2 in the cross-modal priming experiments. Full priming effects were found in the masked priming experiments for both L1 and L2, while only in L2 found full priming effects in the cross-modal priming experiments, in which partial priming effects were found for L1. These results may indicate that both L1 and L2 speakers of Korean employ morphologically structured representations when they process Korean words including verbal suffix -ko. Although the cross-modal priming experiments revealed partial priming effects for L1 (and full priming effects for L2), L2 learners as well as L1 speakers appeared to decompose the words into its stem and its suffix.

Table 6
Summary of L1 and L2 Experimental Findings

<table>
<thead>
<tr>
<th></th>
<th>Significant difference between</th>
<th>Priming results</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Masked</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>L1</td>
<td>Identical and Unrelated</td>
<td>Full priming</td>
</tr>
<tr>
<td></td>
<td>Morphological and Unrelated</td>
<td></td>
</tr>
<tr>
<td>L2</td>
<td>Identical and Unrelated</td>
<td>Full priming</td>
</tr>
<tr>
<td></td>
<td>Morphological and Unrelated</td>
<td></td>
</tr>
<tr>
<td><strong>Cross-modal</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>L1</td>
<td>Identical and Morphological</td>
<td>Partial priming</td>
</tr>
<tr>
<td></td>
<td>and Unrelated</td>
<td></td>
</tr>
<tr>
<td>L2</td>
<td>Identical and Unrelated</td>
<td>Full priming</td>
</tr>
<tr>
<td></td>
<td>Morphological and Unrelated</td>
<td></td>
</tr>
</tbody>
</table>

What is surprising about the results is L2 learners’ no less reliance on morphological decomposition than native speakers of Korean. Furthermore, the cross-modal priming experiments produced partial priming for L1, which may evidence L1 speakers’ less use of morphological decomposition on the processing of the verbal suffix -ko.
Considering that full priming is indicative of morphological decomposition, the lack of full priming in L1 processing suggests that it relies less on morphological decomposition than L2 processing. No less reliance on morphological decomposition by L2 learners exemplified in this study is not congruous with the results from many previous studies (Clahsen, Felser, Neubauer, Sato, & Silva, 2010; Neubauer & Clahsen, 2009). As mentioned before, for example, Clahsen and Felser's (2006a) 'shallow-structure hypothesis' claims that L2 learners do not make use of abstract syntactic structure during online processing, and that they rely more on lexico-semantic information, associative patterns, and other surface cues for interpretation. Also, Ullman (2004, 2005) maintained that, different from L1 processing, maturational changes occur during childhood and adolescence and L2 processing is largely dependent upon the lexical memory system, which makes reliance on the procedural system occur to a much lesser extent than L1 processing. Accordingly, the results of the present study can be interpreted to provide evidence that L2 learners fully use or do not lack decomposition or morphological parsing in their processing of morphologically complex words, not entirely relying on full-form lexical storage.

This study, on the other hand, is interested in levels of representation in L1 and L2 morphological processing. Many previous studies have addressed the issue in L1 and L2 morphological processing (Basnight-Brown et al., 2007; Clahsen, Felser, Neubauer, Sato, & Silva, 2010; Neubauer & Clahsen, 2009; Silva & Clahsen, 2008), and distinguished two levels of representation (i.e., between access representations, which are modality specific and encode form-level information, and central lexical entries, which are modality independent and incorporate more abstract information). The previous studies have proposed that the masked priming taps an early stage of lexical processing in which formal access representations are activated and the cross-modal priming is concerned with semantic properties in the central lexicon. Few studies, however, have directly compared the effects of masked priming with those of cross-modal priming in L1 or
L2. This study is different from the previous studies in that it included both masked priming and cross-modal priming experiments in one study and compared their effects both in L1 and L2. So it was expected to reveal in which representation L2 morphological processing is similar to or different from L1 morphological processing.

The present study, however, does not seem to reveal the difference between the two types of priming techniques. That is to say, both in L1 and L2 processing, little difference was found between masked priming and cross-modal priming experiments. In L1 processing, full priming effects were found in the masked priming experiment and partial priming effects in the cross-modal priming experiment. In L2 processing, furthermore, full priming effects were found in both the masked and the cross-modal priming experiments. These results indicate that the observed L1/L2 differences in this study are not confined to either level of processing (i.e., at the early stages of form-level access or at the central level of lexical entries). However, the difference between masked and cross-modal in L1 processing, full priming in masked and partial priming in cross-modal, needs to be explored in future studies with more priming experiments of morphologically complex words in both L1 and L2.

V. Conclusion

This study explored the issue of how the processing of morphologically complex words in L2 is different from L1. The morphological processing of a Korean verbal suffix -ko by native speakers of Korean is compared with Chinese L2 learners’ processing of the verbal suffix. The results of the study showed full priming effects in the masked priming experiments in L1 and partial priming effects in the cross-modal priming experiments. In L2 experiments, full priming effects were found in both the masked and the cross-modal priming experiments. These findings indicate that L2 processing of Korean verbal suffix -ko is not different very much from L1 processing, L2 learners of Korean being no less sensitive to morphological structure.
than native speakers and not dependent on the lexical storage of the full form. This is not consistent with the findings of many previous research studies regarding L1/L2 differences in the processing of morphologically complex words.

The Korean language is an agglutinative language which has many different types of inflectional endings and morphological case markers, each of which can show different degrees of decomposition or dependence on lexical storage by L2 learners. However, the experimental evidence on L2 morphological processing in Korean is relatively scarce, and therefore, future studies which will target many different types of verbal or nominal suffixes are required to get the whole picture of morphological processing of L2 as well as L1.

The present study addressed the issue of L1/L2 differences at two stages or levels of representation: early stages of form-level representations or central lemma-level representations. The results of the masked and cross-modal priming experiments in the present study showed little difference between the two experimental techniques. In other words, L2 morphological processing in Korean was not different from L1 either in the masked priming experiments or in the cross-modal priming experiments. Despite the belief that masked priming taps access-level representation and cross-modal priming central-level ones (Marslen-Wilson, 2007) and that L1/L2 differences are confined to either level of representations, the present study failed to provide positive evidence for the claims. Thus, the distinction between masked priming and cross-modal priming in explaining L1/L2 differences needs to be explored through future extensive studies concerning more types of morphologically complex words in L1 and L2.

Finally, the results of the present study seem not to be enough to provide any pedagogical implications for L2 learners or teachers. L2 learners' processing of inflectional morphology are constrained by many different factors including inflectional morphology of the learners' L1, their L2 proficiency level, their amount of exposure to L2, age of their first exposure to L2, and so on. The present study, however, was conducted with only the advanced level Chinese learners of Korean.
Thus, in order to provide pedagogical insight for Korean L2 learners or teachers, future studies are needed, examining the morphological processing of L2 learners with different native language backgrounds, proficiency levels, and some different Korean language backgrounds.

References


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Examples in: Korean
Applicable Languages: Korean
Applicable: Tertiary

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