

L1 INFLUENCE ON ENGLISH WORD MEANING INFERENCE

BY

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THESIS

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## ABSTRACT

L2 English learners are known to use some language cues (e.g. context, phonology, or affixes) to infer the meanings of unknown words. Some prior studies (Bellomo, 2009; Kieffer & Lesaux, 2012; Koda, 2000; Ramirez et al., 2011) have found that learners' L1 may influence the performance; however, their participants' L1 and proficiency levels were not carefully controlled, and they mainly used qualitative or classroom-based methods. Therefore, this study compared the word learning ability between high proficiency L2 English learners of L1-Korean (a language with rich derivational morphology) and L1-Chinese (a language with only a small amount of derivational morphology) by using the reaction-time technique. English pseudo-words were used in this study, and learners had to infer the meaning of those words by using the morphological cues (i.e. re-, mis-, -ness, -able, un- and -er) and/or the contextual cues provided. Learners' accuracy and reaction time were recorded; based on previous research it was predicted that L1-Korean L2-English learners would be faster than L1-Chinese L2-English learners in identifying morphological cues in words because of the existence of rich derivational morphology in Korean. However, the results of this study indicated that Korean participants did not have an advantage over Chinese participants in word learning using morphological cues.

*To My Father and Mother*

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## CHAPTER 1

### INTRODUCTION

When reading an English text, it is common for L2 English learners to encounter novel words. In this circumstance, learners will analyze the language cues they have at hand (e.g. context, word sound or word structure) to try to infer the meaning of these words. Therefore, understanding how learners use these cues can help us learn more about how language learners learn novel words, and this study will examine learners' word learning process in two situations: (a) when only morphological cues are present and (b) when there are both morphological cues and context. Note that morphological cues here refer to derivational affixes within English words, which can influence lexical meaning.

Since learners' L1 already had recognized effects on L2 development (Gass & Selinker, 1992; Odlin, 1989), L1 may also influence learners' word learning ability. A major focus of this study is how learners use morphological cues to infer word meaning, and thus an interesting topic to explore is whether learners' L1 morphological features can influence their ability to use English derivational affixes to learn novel words. Korean, like English, has rich derivational morphology; while in Chinese, derivational affixes are only a small part of its word formation. Because of this difference, this study aims to compare L2 English learners of L1-Korean and L1-Chinese.

Many previous studies already studied L2 English learners' knowledge or use of English

derivational affixes in word learning (Bellomo, 2009; Bensoussan & Laufer, 1984; Chern, 1985; Choi, 2015; Frantzen, 2003; Hamada, 2014; Kieffer & Lesaux, 2012; Koda, 2000; Lam et al., 2012; Liu & Nation, 1985; Osborne & Mulling, 2001). However, most of these studies did not cross-linguistically compare two or more L1 groups, either just one L1 group (Chern, 1985; Choi, 2015; Frantzen, 2003; Lam et al., 2012; Osborne & Mulling, 2001), roughly categorized like comparing performances between Latin-based and non-Latin-based language groups (Bellomo, 2009), or not controlled (Bensoussan & Laufer, 1984; Hamada, 2014; Liu & Nation, 1985). Also, some of these studies did not carefully control their participants' English proficiency levels, which can be a confounding factor in word-learning research. Therefore, to understand whether only the L1 itself can influence learners' performance, this study aims to compare two L1 groups (i.e. L1-Korean and L1-Chinese) with their English proficiency and length of residence in the U.S. controlled.

Even though aforementioned research already provided us much insight in L2 English learners' word solving strategies, they did not examine the real-time processing of learners with unknown words; they mostly applied qualitative methods or within-classroom tasks in their studies. With the increased use of psycholinguistic methods in SLA research, understanding how L2 learners process language cues in real-time is now possible.

In this study, the word-learning ability of L1-Korean L2-English and L1-Chinese L2-English learners will be compared in two psycholinguistic tasks using novel words.

Participants will be tested on (1) their ability to use morphological cues to infer word meanings out of context (e.g. *redipe* may mean doing something again because of the *re-* affix) and (2) their ability to use morphological cues to infer word meanings within context (e.g. *microth* may mean doing something incorrectly because of the *mis-* affix and the context in the sentence *Chris may not be a good helper in the kitchen because he tends to microth ingredients accidentally*). Thus, it is hoped that this research will help us understand more about how learners' L1s influence their ability to use English morphological cues to infer meanings of novel words when their English proficiency levels are controlled.

## CHAPTER 2

### LITERATURE REVIEW

#### 2.1 Word Learning

##### 2.1.1 Use of Contextual and Morphological Cues in Word Learning

There have been many studies done on how L2 English learners learn new words. Some of them showed that learners will use morphological cues (Bellomo, 2009; Osburne & Mulling, 2001) and contextual cues (Bensoussan & Laufer, 1984; Frantzen, 2003) in learning new words, while some pointed out learners may also use both at the same time (Chern, 1985; Hamada, 2014). In Bellomo (2009), he showed that learners can break down novel words into morphemes to guess meaning, while Osburne & Mulling (2001) found that learners did notice morphological components within words (e.g. *-ness* and *-ily*) to judge the part of speech to which a novel word belonged. With the contextual cues, learners in Bensoussan & Laufer (1984) were able to guess word meaning out of a given context, and Frantzen (2003) found that context can help learners infer and memorize word meaning better. As for both the morphological and contextual cues, learners in Chern (1985) reported using both cues as word learning strategies in interviews; in Hamada (2014), she indicated that L2- English learners reported noticing both cues within her word-learning experiments.

In these previous studies, some found that learners' L1 will influence their ability to use

morphological and/or contextual cues in word learning. In Bellomo (2009), he compared L2 English learners of Latin-based L1s (e.g. Spanish) and non-Latin-based L1s (e.g. Japanese), and he found that the former group scored higher in tests of learning morphologically complex words. Also, in Kieffer & Lesaux (2012), they found that L1-Spanish, L1-Vietnamese, and L1-Filipino minority students in the U.S. performed differently on using morphological cues to learn L2-English word meaning.

On the contrary, in all these studies aside from Hamada (2014), learners' English proficiency level was not considered. Hamada (2014) found that learners' English proficiency level may also play a role, though she did not control the L1 population of her participants. She found that learners of lower proficiency relied more on morphological cues than contextual cues in word learning, regardless of their L1s. Though she did not control her L1 groups, her study pointed out that learners' English proficiency can influence their decisions of using certain cues.

Based on previous literature, aside from learners' ability to use morphological cues to infer word meaning, this study will examine learners' word learning performance when both the morphological and contextual cues are present, compared to when there are only contextual cues. Besides, contextual cues usually appear in many word learning situations, since learners often encounter unknown words during reading. By having different kinds of conditions, this study can understand more about learners' ability and decisions in using those

cues by comparing their performance across these conditions.

### **2.1.2 Morphological Awareness in Word Learning**

To use morphological cues efficiently to learn English words, it is important for learners to build their morphological awareness, which is to understand word formation rules in English and be able to decode morphologically complex words to help with comprehension (Kuo & Anderson, 2006; McBride-Chang et al., 2005). In this case, if learners can identify the derivational affixes within unknown words, they can use the information to infer meaning of the whole word.

Previous studies (Koda, 2000; Ramirez et al., 2011) have found that learners' L1 can influence their English morphological awareness. In Koda (2000), she found that L1-Korean participants had shorter reaction time than L1-Chinese participants in performing the separability judgment task, in which participants decided whether a given word can be divided into two or more morphemes. As for Ramirez et al. (2001), they found that L1-Spanish students performed better than L1-Chinese students in the derivation production task, in which participants had to derive the given word based on context but also their knowledge of derivational morphology (e.g. participants were given the word *magic* and the sentence *The performer was a good \_\_\_\_\_*, and the participants should come up with the word *magician* to fill in the blank). It was assumed the results of these two studies (Koda, 2000; Ramirez et al., 2011) resulted from the linguistic difference between the L1s, since

Korean and Spanish have richer derivational morphology than Chinese. However, since Spanish is also typologically closer to English, it may not be necessarily just Spanish morphology that was at work; in that sense, Korean is a better counterpart for comparing to Chinese (both languages are very different from English, but only one has morphology). Therefore, Koreans and Chinese will be used as the two L1 groups in this study, and it is hypothesized that the two L1 groups will perform differently in word learning tasks.

## 2.2 Derivational Morphology in English, Korean and Chinese

English has a rich derivational affix system. In English, derivational affixes are bound morphemes attached to other words to derive new words. Derivational affixes can change the lexical meaning of the original word (e.g. *re-*) or the part of speech of the original word (e.g. *-ness*) (Celce-Murcia & Larsen-Freeman, 1999). In addition, a base word can have affixes attached either at the front as prefixes (e.g. *refund*) or at the back as suffixes (e.g. *beautiful*), and there can also be two suffixes at the same time (e.g. *playfulness*).

Korean, also an alphabetic language like English, has derivational affixes to form new words like English does (e.g. “pel” (to earn) into “pel-i” (earning) by adding the suffix /-i/), though its orthographic characteristic (Hangul) is more similar to Chinese. On the contrary, in Chinese, most characters are bound roots (words that bear meaning but cannot appear by themselves; e.g. *nǚ*, which means female/girl by itself, but it has to appear with other characters to form vocabulary, like *nǚ xing*, which means the female gender), with only a

small amount of word-forming affixes, which function like the derivational affixes in English (Packard, 2000). An example provided is *-huà* (similar to *-lize* in English), which is a verbalizing suffix to turn nouns or adjectives into verbs (e.g. *guó jì huà* meaning *internationalize* in English). Since Chinese does not have rich derivational morphology, context rather than morphology provides most information in word learning. Therefore, it is hypothesized that when L1-Chinese learners learn a language with rich derivational morphology, they will have difficulty in identifying affixes within words and using these morphological cues to infer meanings of novel words.

In Koda (2000), she used a separability judgment task to test L1-Chinese and L1-Korean participants' morphological sensitivity of English words. In her experiment she used both real words and pseudo-words, and within each there were high-salience prefixed words (e.g. real word *resolve*, pseudo-word *relook*), low-salience prefixed words (e.g. real word *revolve*, pseudo-word *revest*) and monomorphemic words (e.g. real word *regime*, pseudo-word *refume*). Participants were asked to press Yes/No on whether they thought the words can be divided into two or more morphemes, and their response times were recorded. She found that Korean participants had shorter reaction times than Chinese participants across all conditions. However, she did not discuss its possible implications for those two groups of learners' word learning ability, and therefore this study aims to examine whether those two language groups can identify affixes to guess word meaning, whether in isolation or within context.

### **2.3 Declarative Knowledge & Automaticity**

Linguistic knowledge can be divided into two parts, declarative knowledge and procedural knowledge (Segalowitz 2003). Declarative knowledge refers to the understanding of linguistic structures and rules, which for L2 learners, are what they need to learn to acquire a second language. In this study, learners' declarative knowledge includes understanding of common English derivational affixes, their meaning and their use. As for procedural linguistic knowledge, it means the language users can produce accurate linguistic structures without being explicitly aware of the rules. Usually native speakers of a language have the procedural knowledge of that language, while high-proficiency L2 learners are still regarded as only having declarative knowledge.

If learners can practice a type of knowledge, whether it is declarative or procedural, in a “spontaneous, effortless, fast, and errorless” way, it means they reach automaticity (DeKeyser, 2007c). Therefore, measuring accuracy and response time can help decide whether L2 learners' knowledge is automatized. Note that DeKeyser pointed out being automatic in retrieving declarative knowledge does not mean the knowledge becomes implicit; it just means learners have low error rate and high speed in using the knowledge, and at the same time they can still be conscious of the rules of the knowledge.

Since the participants in this study will have learned English for several years, they should have a decent amount of declarative knowledge in English derivational morphology,

and therefore this study is going to compare between different language groups of how successful they use English affixes to guess word meaning. In accordance with the criteria for automaticity, participants' performance will be compared based on their accuracy rates and reaction time.

## **2.4 Psycholinguistic Methods in SLA Research**

Since the 1990s, the use of psycholinguistic methods has gradually gained interest in second language research (Jiang, 2012). Some psycholinguistic methods may place a processing time-constraint on participants (e.g. timed grammaticality judgment task) or prevent participants from focusing on the target structures (e.g. self-paced reading), and thus participants' use of explicit knowledge or conscious problem-solving strategies can be minimized (Keating & Jegerski, 2015). Therefore, using psycholinguistic methods in experiments can be a good way to measure learners' automatized knowledge.

Previous research in L2 morphological learning was mainly qualitative or classroom-based. Some examples were interviewing participants for their word-solving strategies (Chern, 1985; Frantzen, 2003; Osborne & Mulling, 2001), having participants try guessing meanings of unknown words (Bensoussan & Laufer, 1984; Chern, 1985; Liu & Nation, 1985), sentence completion task (Lam et al., 2012; Osborne & Mulling, 2001), classroom intervention studies with pre-tests & post-tests (Bellomo, 2009; Frantzen, 2003).

There has also been a line of psycholinguistic studies that used lexical decision tasks.

Many lexical decision experiments of morphologically complex words (including compounds, derived words and inflected words) were run with both English native speakers and L2 English learners (see Clahsen et al., 2010 for an overview). In these experiments, the masked priming technique was used, in which a morphologically related primed word will be shown before the target word appeared, and the participants had to decide whether the target word was a real word or not. Participants' response times were recorded and then compared within or across language groups. Previous findings showed that in L2 groups, the priming effects of morphologically related words in general were less significant than those in L1 groups. However, lexical decision tasks do not tap into learners' knowledge of word meaning, and therefore from these tasks we do not know whether learners were able to infer word meaning by using derivational affixes in real time.

Therefore, in this study, participants will be asked to use the cues provided (only morphological cues or both morphological cues and contextual cues at the same time) to decide what the target words mean. As in the lexical decision tasks, their responses and response time will be recorded to see how successful they process those cues, both in terms of accuracy and speed. By using psycholinguistic tasks, it is hoped to understand L2 English learners' automaticity of retrieving their English affixal knowledge to learn word meaning within and without context.

## CHAPTER 3

### RESEARCH QUESTIONS

Based on the linguistic difference between Korean and Chinese, the first thing to test is whether having an L1 with rich derivational morphology (i.e. Korean) will help L2 English learners be more efficient in identifying morphological cues within novel words. Also, learners' English proficiency level will be measured in this study to ensure their proficiency levels are held constant across the two L1 groups:

*1) When having similar English proficiency level, does having an L1 with rich derivational morphology influence L2 English learners' ability to use English morphological cues to infer meanings of novel words presented in isolation?*

The first research question only focuses on how learners identify and use morphological cues within novel words, but most of the time learners encounter novel words when they are reading, during which the words are embedded within a passage. Therefore, how well learners use contextual cues, and how the presence of both the contextual cues and the morphological cues will influence learners' use of those cues to infer word meaning will be studied. In this case, the context already provides enough information to infer word meanings, but it is interesting to see whether having additional morphological cues can speed-up the process, and also whether learners having an L1 with rich derivational morphology can have

more advantage.

2) *When contextual cues are present, does having morphological cues in addition to contextual cues aid word learning? And if so, does having an L1 with derivational morphology lead to greater use of morphological cues in context?*

To measure participants' processing of morphological and contextual cues in real time, the reaction time technique will be used in the experiments. Participants' accuracy in identifying word meaning and their response time will be recorded for analysis. By comparing how successful and fast different L2 English groups with similar proficiency levels use cues to infer word learning, this study can examine their automatized skill of identifying affixes within words in isolation or within context.

## CHAPTER 4

### METHODS

To answer the two research questions, this study utilizes two tasks that test participants' ability to infer the meanings of novel words based on morphological and/or contextual cues. The materials were normed with 6 native English speakers prior to being implemented. All participants are asked to do a language background questionnaire, and the L2 English participants are also asked to do an English cloze-test to identify their English proficiency level.

#### 4.1 Materials

##### 4.1.1 Pseudo-words

First, since the main goal for the participants in this study was to learn new words, in order to prevent participants' word knowledge and word frequency (i.e. high-frequency words and low-frequency words) from influencing the results, pseudo-words were used in this research. All pseudo-words were generated by a pseudo-word generator "Wuggy" (<http://crr.ugent.be/programs-data/wuggy>) based on English word formation rules. All the pseudo-words were in two syllables, which included either one English derivational affix or none: for the target words, one of the syllables was an existing derivational affix of English (e.g. *regrimp*, where *re-* is a real affix of English); for distractors and control words, neither

syllable corresponded to an existing derivational affix (e.g. *legrimp*). Also, the pseudo-words were controlled for length, ranging from 6 to 10 letters in length, with a mean of 7.35.

#### 4.1.2 Affixes

In this study, six derivational affixes of English were used in the creation of the target pseudo-words, and those affixes were some of most common ones which most English learners will understand. The six affixes were *re-*, *mis-*, *-ness*, *un-*, *-er* and *-able*. Table 1. below shows real English words that are derived with these affixes as well as some pseudo-words created for this study. The six affixes were then used to generate pseudo-words by using Wuggy.

**Table 1. Used Affixes with Examples**

<b>Affix</b>	<b>Derivation</b>	<b>Real-word Example</b>	<b>Pseudo-word Example</b>
<i>re-</i>	verb to verb	play → replay	<i>refleak</i>
<i>mis-</i>	verb to verb	place → misplace	<i>misdipe</i>
<i>-ness</i>	adjective to noun	sad → sadness	<i>lirchness</i>
<i>un-</i>	adjective to adjective	happy → unhappy	<i>unspeen</i>
<i>-er</i>	verb to noun	teach → teacher	<i>calder</i>
<i>-able</i>	verb to adjective	wash → washable	<i>flundable</i>

#### 4.2 Norming

Before being implemented in real experiments, all items were normed with L1-English

native speakers first. Six L1-English native speakers were recruited from the MATESL program in the University of Illinois at Urbana-Champaign to participate in the norming. The normers were first asked to do a language background questionnaire indicating their age range, whether they are early bilinguals and whether they have taken any linguistics courses. Next, the normers were given all test items in papers (as in Appendix A and Appendix B), and they were asked to circle their responses with a pen on the papers. The normers were not time-pressured; however, all normers finished within 30 minutes. Since all 6 normers reached almost 100% accuracy rate on all target items (only the target items have correct answers), no changes were made before the items appeared in the real experiments.

### **4.3 Tasks and Procedure**

In this study, there were two experimental tasks: “Single-word Learning Task” and “Contextual Word Learning Task”. Within these two tasks, each pseudo-word was presented with two definitions, and the participants had to choose one of them. The two tasks were implemented via E-prime, and both response choices and reaction times were recorded. To answer the first research question, the Single-word Learning Task measured the participants’ ability to use morphological cues to infer word meanings within single words. In addition to identifying the correct meanings, their reaction times of responding to the items were measured to examine how well the participants automatize their knowledge of English affixes in word learning. As for the Contextual Word Learning Task, which was used to answer the

second research question, it measured the participants' ability to infer word meanings either (1) with both morphological and contextual cues or (2) with only contextual cues. The difference between the participants' reaction times in these two conditions was also compared.

Participants were asked to come to the Second Language Acquisition Lab in UIUC to do the experiments. Before they began, all participants filled out a consent form. Then, they did the two experimental tasks, the English cloze test (non-native participants only), and the language background questionnaire. The ordering of the two experimental tasks was counterbalanced across all participants. As for the compensation, the native participants received USD\$5, and the non-native participants received either USD\$10 or extra credits in ESL courses for their participation.

In each experimental task, the participants were given instruction of the task by an investigator at the beginning and then did 4 practice items before they started with the real task. Both the practice items in the Single-word Learning Task and the Contextual Word Learning Task did not include any English morphological cues to prevent the participants from learning what to expect in advance. All tasks were implemented via E-Prime on a lab computer; the participants saw the test items one at a time on a computer screen and pressed the keys on a keyboard to make responses. The participants were allowed to take a break between the tasks.

### 4.3.1 Single-word Learning Task

In this task, participants were given a list of 60 English pseudo-words; half of them included morphological cues (i.e. target items) while the other half did not (i.e. distractors). The 30 target words were created with six affixes (*re-*, *mis-*, *-able*, *-ness*, *un-* and *-er*), and each affix helped generate five tokens. The participants thus saw each word with two choices of definitions below on the computer screen. For instance, a sample target word was *refleak*, and the target response for this word was *a.* because of the affix *re-* (as in (1)); while a sample distractor was *botheek*, which was just a two-syllable pseudo-word without any recognized English derivational affixes, and the participants' responses for this word may just be random (as in (2)).

(1) *refleak*

- a. to order (something) from left to right again
- b. to order (something) from left to right first

(2) *botheek*

- a. to write (something) from top to bottom directly
- b. to write (something) from top to bottom slowly

The participants saw an item like (1) or (2) above on the screen, and they had to press the key for either *a.* or *b.*. To make the responding more convenient based on the keyboard arrangement, participants were asked to press the key *c* for choosing *a.* and the key *n* for

choosing *b.*. A written instruction was put on the computer desk in case the participants were confused.

In this task, it was hypothesized that the native participants among all three groups will have the highest accuracy levels and the shortest reaction times responding to the target items. As for the two other groups, it was predicted that the Korean participants will have higher accuracy rate and shorter reaction time than the Chinese participants. Based on the linguistic difference, since Korean is a language with rich derivational morphology, the Korean participants may be more successful and faster than the Chinese participants in noticing morphological cues within English pseudo-words.

#### **4.3.2 Contextual Word Learning Task**

This task was implemented to test the participants' ability to learn new words within context when morphological cues were either present or absent. It had two conditions: in condition 1, all items contained derivational affixes (as *regrimp* in (3)). A total of 24 tokens were created, with 4 tokens per affix; in condition 2, 24 tokens were created, and none of the items contained any derivational affixes (as *legrimp* in (4)). The same sentences were used across the two conditions, with counterbalancing across two test lists (i.e. List 1 and List 2) in order to avoid repetition of the same sentences. The distribution of the lists was carefully controlled to ensure that the participants of similar backgrounds (i.e. same L1 and similar proficiency levels) produced equal amount of data from the two lists. Each list thus included

12 items with morphological cues, 12 items without morphological cues, and 12 fillers. The fillers were simply sentences in neutral context without any morphological cues, with which the participants' responses may just be random since both choices may apply (as in (5)).

(3) Emily had her car washed yesterday, but she had to *regrimp* it because she drove it through a muddy road this morning.

Q: What does *regrimp* mean?

- a. To wash (something) three times in a row quietly
- b. To wash (something) three times in a row again

(4) Emily had her car washed yesterday, but she had to *legrimp* it because she drove it through a muddy road this morning.

Q: What does *legrimp* mean?

- a. To wash (something) three times in a row quietly
- b. To wash (something) three times in a row again

(5) A worker is coming to *peflack* the boxes and help us clean the party room later this afternoon.

Q: What does *peflack* mean?

- a. To place (something) in a corner of a kitchen carefully
- b. To place (something) in a corner of a kitchen quickly

Notice that the only difference between (3) and (4) was the target words (one being

*regrimp* and the other being *legrimp*). Also, in both of these two items, the context supported one of the two choices (i.e. *b*), while the morphological cue *re-* in (3) further supported the answer. All the items in this task were in pairs like (3) and (4), in which the context supported the target response and the morphological cue in one of the sentences further supported the answer.

As for the predicted results, it was also hypothesized that among all three groups, the native participants will have the highest accuracy levels and the shortest reaction times responding to the target items. However, in items including morphological cues (as in (3)), it was predicted that the Korean participants will have higher accuracy rate and shorter reaction time than the Chinese participants. Since Korean is a language with rich derivational morphology, the Korean participants may be more successful in noticing morphological cues within English novel words. In addition, it was predicted that Chinese and Korean participants may perform equally in terms of accuracy and reaction time for items without morphological cues (as in (4)).

Finally, it was predicted that all participants will have higher accuracy levels and shorter reaction times when there were additional morphological cues (as in (3)). However, it was also predicted that the aiding effect (in terms of both accuracy and reaction time) will be greater for the Korean participants than the Chinese participants because the Koreans are more adept at using morphological cues.

### **4.3.3 The English Cloze Test**

The non-native participants also did an English cloze test between the two experimental tasks to identify their English proficiency levels. Though participants were asked for their most recent standardized test results, having all participants take the same test within approximately the same month can provide a more accurate view of their proficiency levels. As for the test type, the choice of using a cloze test was because of its stability and reliability in measuring L2 learners' proficiency levels in second language research, which was shown in previous research statistically comparing participants' cloze test results with their standardized test scores (Oller, 1973, & Tremblay, 2011). The cloze test was adapted from American Kernel Lessons: Advanced Students' Book by O'Neill, Cornelius, and Washburn (1981). It was a forced-choice test, and for each item (40 in total) the participants had to choose one best answer out of three. The advantages of using a forced-choice test were that it took only a short amount of time for participants to complete and easy for researchers to quantify the test results. In Ionin, Montrul & Crivos (2013), it was found that the cloze test was reliable (i.e. Cronbach  $\alpha = 0.817$ ). Since the native speakers in Ionin et al. (2013) scored at ceiling, there was no need to continue testing native speakers on the cloze test.

### **4.3.4 The Language Background Questionnaire**

All participants were asked to fill out a language background questionnaire. The native participants and the non-native participants received different versions. In terms of the native

participants, it was used to identify whether they were bilingual native speakers and some other languages they had learned. As for the non-native participants, they were asked to provide information about their English learning experience (e.g. year of learning English, environments of learning English, and length of residence in an English-speaking country) as well as other languages they had learned to identify some possible linguistic factors which may influence the results (e.g. learning a third language including affixal morphology).

#### **4.4 Participants**

Twenty-one L1-Chinese L2-English learners, 20 L1-Korean L2-English learners and 20 English native speakers participated in this study. All participants were at least 18 years old. Seven Chinese participants were between 18-20 years old, 13 were between 20-25 years old, and 1 was between 25-30 years old. As for the Korean participants, there were 4 between 20-25 years old, 9 were between 25-30 years old, 5 were between 30-35 years old, and 2 were between 35-40 years old. All non-native participants have had no more than 6 years of residence in the U.S., aside from one Korean participant (age 35-40) indicating having more than 10 years of residence.

As for learning a third language, 16 Korean participants and 6 Chinese participants indicated they have learned other languages aside from their native language and English. Among those who indicated the languages they learned, 4 Korean participants learned Japanese (ranging from 6 months to 4 years), 2 learned French (ranging from 2 years to 3

years), 2 learned German (ranging from 6 months to 1 year), and 3 learned Chinese (ranging from 3 months to 3 years). As for the Chinese participants, 3 have learned Japanese all for 1 year, 2 learned French (ranging from half an year to 3 years), and 1 learned Spanish for 1 year.

## CHAPTER 5

### RESULTS

First, to compare the English proficiency levels between the two non-native groups, descriptive statistical analysis and a t-test were run on their cloze test results. As for the statistical results of the two main experimental tasks (i.e. Single-word Learning Task and Contextual Word Learning Task), descriptive statistical analysis and ANOVA tests were run to compare the results across all language groups.

#### 5.1 The English Cloze Test

First, to compare the English proficiency between the L1-Chinese and the L1-Korean groups, a descriptive statistical analysis was run with their cloze test results. Within the L1-Chinese group, the mean score was 33.67/40 (the lowest 28 and the highest 37) and the SD was 2.834. As for the L1-Korean group, the mean score was 32.5/40 (the lowest 28 and the highest 38) and the SD was 2.911. Also, an independent sample t-test was run with the cloze test results between the two groups. It was found that the difference between the two groups was not significant,  $t(39)=1.299$ ,  $p=.20$ ,  $r=.20$ . The statistical analysis indicated that there was no substantial difference in the English proficiency between the two groups.

#### 5.2 Single-word Learning Task

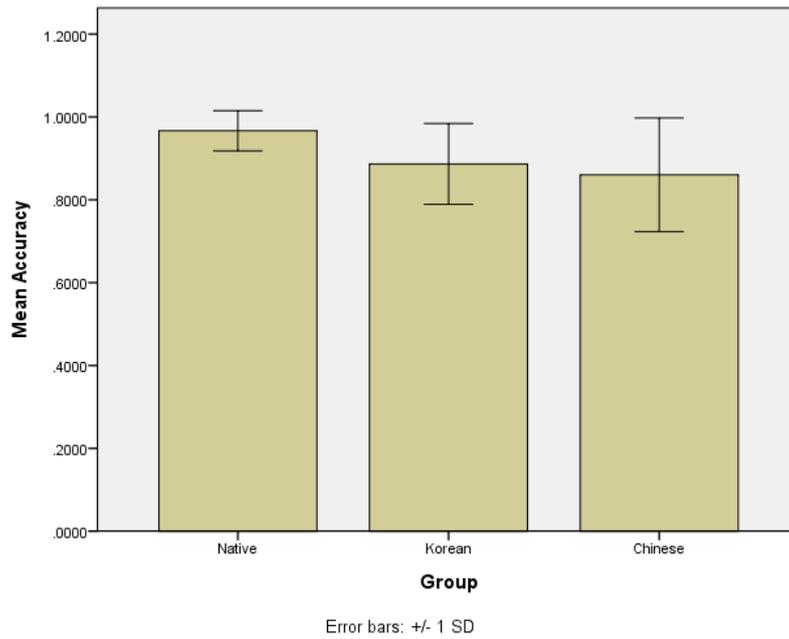
In terms of the Single-word Learning Task, first a descriptive statistical analysis was run

across the three language groups on their accuracy rates and reaction times. With the accuracy, only the target items were analyzed because there were no correct answers in fillers. As for the reaction time, also only the target items were analyzed and only those with the correct responses were included in the analysis, as suggested in Jiang (2012). The major focus of this study was to see whether L2 learners can use morphological cues to correctly identify word meaning, and only correct responses indicated that learners successfully processed those cues; therefore, only the reaction time of correct responses should be analyzed to examine how automatized their skill in processing language cues was.

Based on the descriptive statistical results (see Figure 1. and Figure 2.), it was found that the native participants had the highest accuracy rate (M: 96.67%; SD: 0.048) and the shortest reaction time (M: 4733.86; SD: 1720.49) among all three groups, as predicted. Besides, the L1-Korean participants had higher accuracy rate than the L1-Chinese participants. However, contrary to the prediction, the L1-Chinese participants had shorter reaction time than the L1-Korean participants.

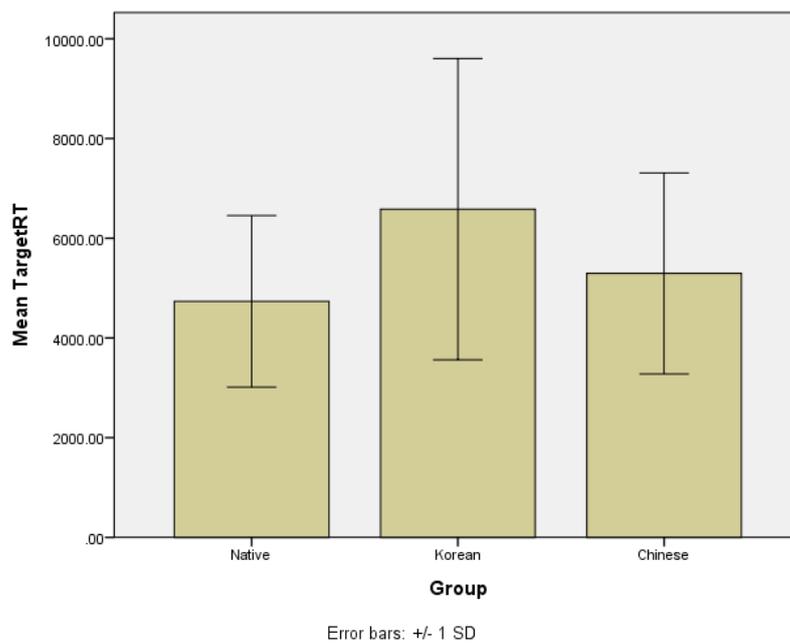
**Figure 1. Descriptive Statistical Results of the Single-word Learning Task: Target Items**

**Accuracy (proportion accurate responses)**



**Figure 2. Descriptive Statistical Results of the Single-word Learning Task: Target Items**

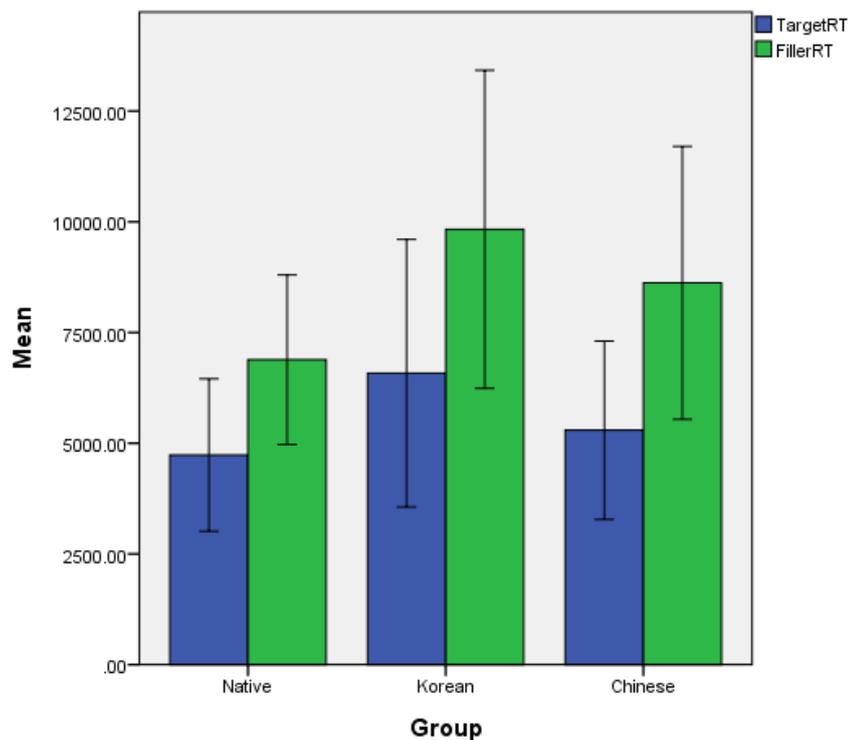
**RT (in milliseconds)**



It may be possible that the unexpected results resulted from L1-Chinese participants' generally faster reading speed of all the items in this task (including both the target items and the fillers); therefore, it was decided to run a descriptive analysis on the fillers' reaction time as well to compare the two non-native groups' reading time. It was found that the native participants also had the shortest reaction time, the Chinese in the middle, and the Koreans having the longest (see Figure 3.). As a result, the unexpected results may be partly explained by the faster reading speed of the L1-Chinese participants compared to the L1-Korean participants.

**Figure 3. Descriptive Statistical Results of the Single-word Learning Task: with Filler**

**Items RT (in milliseconds)**



Error bars: +/- 1 SD

In addition, a one-way independent ANOVA was run on the accuracy rates, which includes only the target items because fillers did not have correct answers, and with the type of L1 as the between-subject variable. A post-hoc test, Tukey, was also run to avoid Type 1 error. Based on the results, it was found that type of L1 had a significant effect on accuracy,  $F(2,58)=5.999$ ,  $p<.01$ . Also, post-hoc comparisons between the native participants and the L1-Chinese participants ( $p<.01$ ) and between the native participants and the L1-Korean participants ( $p<.05$ ) were significant on the Tukey test, while post-hoc comparisons between the L1-Chinese participants and the L1-Korean participants were not significant ( $p=.688$ ).

On the other hand, a mixed ANOVA was run on the reaction times, with the type of L1 as the between-subject variable and the morphology (the difference between the targets and the fillers) as the within-subject variable (to see whether having morphological cues led to shorter reading time). Based on the results, there was a significant main effect of morphology,  $F(1,58)=170.44$ ,  $p<.01$ , with all language groups having shorter reaction time with the targets than the fillers; the effect size was 0.746, and the power level was very high (=1.0). There was also a significant effect of type of L1,  $F(2,58)=4.582$ ,  $p<.05$ ; however, the effect size was small (=0.136), which meant the type of L1 was not a significant cause of the results. Besides, post-hoc comparisons between the native participants and the L1-Korean participants' reaction times were significant on the Tukey test ( $p<.01$ ), while there was no significant effect between either the natives and the L1-Chinese or the L1-Chinese and the L1-Korean.

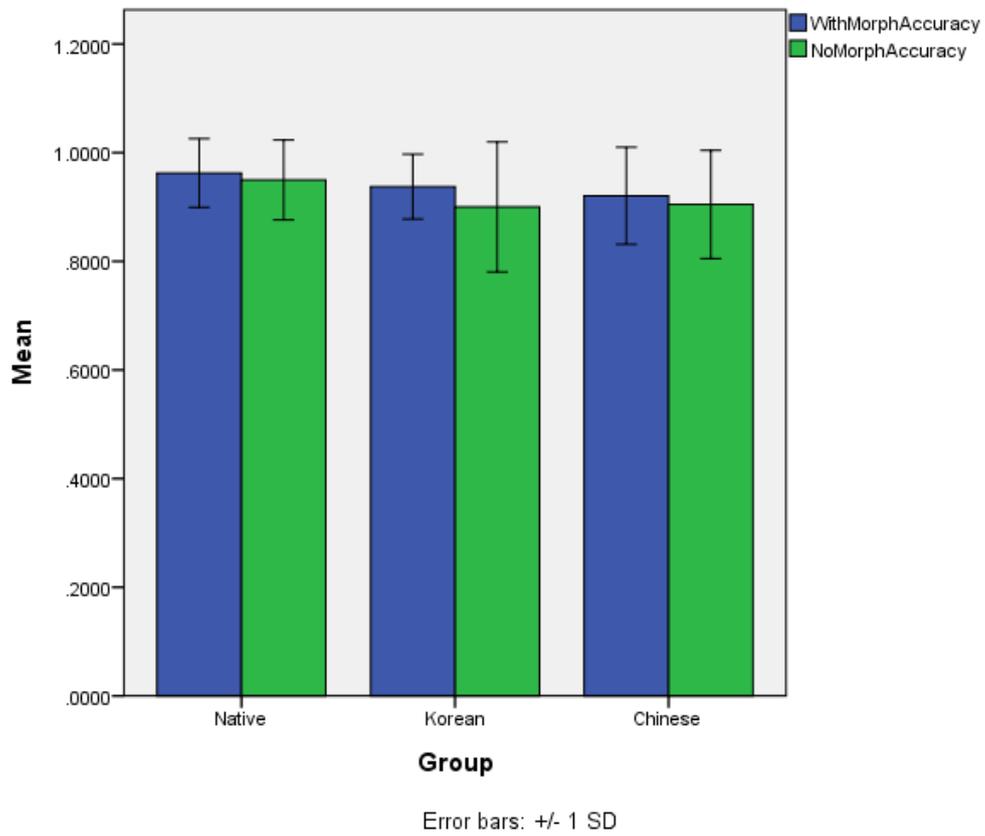
Also, there was no interaction between morphology and type of L1, which means that all groups were equally influenced by morphological cues.

### **5.3 Contextual Word Learning Task**

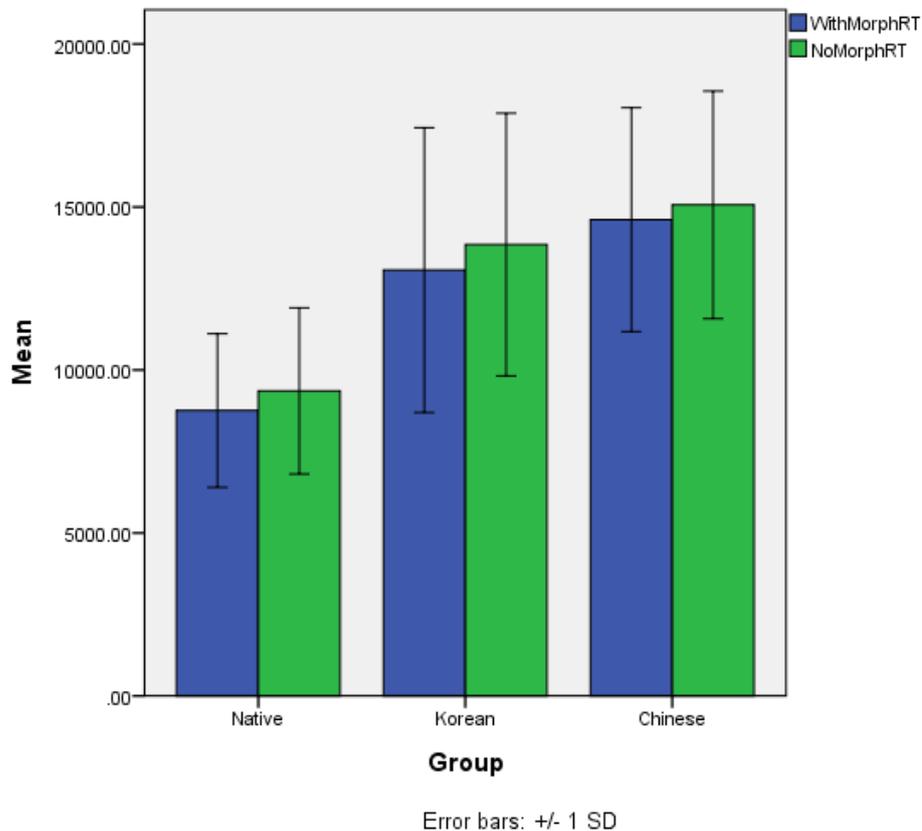
As for the Contextual Word Learning Task, a descriptive statistical analysis was also run on the accuracy rates and reaction times across the three language groups and the two conditions (see Figure 4. and Figure 5.). Only target items were included in the analysis, and for reaction time, only those with correct responses were analyzed. It was found that when there were morphological cues, all language groups had higher accuracy rates and shorter reaction times compared to when there were no morphological cues. Also, as predicted, in items with morphological cues, native participants had the highest accuracy rate and the shortest reaction time among all three groups, while L1-Korean participants had higher accuracy rate and shorter reaction time than L1-Chinese participants. As for the items without morphological cues, native participants also had the highest accuracy rate and the shortest reaction time among all three groups, while the accuracy rates were approximately the same between L1-Chinese and L1-Korean participants, though L1-Korean participants had shorter reaction time than L1-Chinese participants.

**Figure 4. Descriptive Statistical Results of the Contextual Word Learning Task:**

**Accuracy (proportion accurate responses)**



**Figure 5. Descriptive Statistical Results of the Contextual Word Learning Task: RT (in milliseconds)**



In addition, two mixed ANOVAs were run: one on the accuracy and the other on the reaction time, with both having type of L1 as the between-subject variable and morphology (with/without morphological cues) as the within-subject variable. A post-hoc test, Tukey, was also run alongside the mixed ANOVAs to compare across different language groups.

In terms of accuracy, there was no main effect of morphology,  $F(1,58)=2.591$ ,  $p=.113$ ,  $r=.043$  nor a main effect of type of L1,  $F(1,58)=2.386$ ,  $p=.101$ ,  $r=.076$ . Besides, there was no significant interaction between morphology and type of L1 ( $p=.723$ ). The possible reason for

this may be because all language groups performed near ceiling in both conditions (the lowest accuracy rate being 90%, with L1-Chinese participants on items without morphological cues).

On the other hand, with reaction time, there was a main effect of morphology,  $F(1,58)=4.656$ ,  $p<.05$ , with all three groups having shorter reaction time on items with morphological cues than items without morphological cues; however, the effect size was small ( $=.074$ ), which meant morphology was not a main cause of the results. Also, there was a main effect of type of L1,  $F(1,58)=17.36$ ,  $p<.01$ , with a medium effect size ( $=.374$ ).

However, despite a medium effect size, the post-hoc Tukey test compared across language groups showed that there were only significant differences between native participants and the non-native participants (with L1-Chinese participants:  $p<.01$ ; with L1-Korean participants:  $p<.01$ ), with the native participants having the shortest average reaction time and the L1-Chinese participants having the longest average reaction time; there was no significant difference between L1-Chinese and L1-Korean participants ( $p=.372$ ). In addition, there was no significant interaction between morphology and type of L1 ( $p=.893$ ) either.

## CHAPTER 6

### DISCUSSION

#### 6.1 Single-word Learning Task

In this task, as predicted, English native participants had the highest accuracy rate and the shortest reaction time among all three groups. However, while the L1-Korean participants had higher accuracy rate than the L1-Chinese participants, the L1-Chinese participants had shorter reaction time than the L1-Korean participants on both the target and filler items.

In terms of the explanation for the L1-Chinese group's shorter reaction time, one possible reason may be because the L1-Chinese participants also had average shorter reaction time than the L1-Korean participants on filler items, which indicated that L1-Chinese participants in this study had faster word reading speed in average than the L1-Korean participants. However, L1-Chinese participants' faster reading speed did not lead to a higher accuracy rate.

Besides, there was no significant difference between the RT results of the two non-native groups. One explanation provided by Koda (2000) may be the use of pseudo-words, which she found that the reaction time difference between L1-Korean and L1-Chinese participants was smaller in pseudo-words compared with real words (while the L1-Korean participants were still faster than the L1-Chinese participants). However, the reason only pseudo-words were used in the first place was to prevent participants' word

knowledge from influencing the results and to imitate the situations when the words were completely unknown to the participants. Also, it is harder to select suitable real words for high-proficiency participants because it is difficult to decide whether they already know those words; if they already knew what the words mean, the effect of morphological cues will not be able to be detected. Therefore, in Koda's study, it was possible that the real-word results were influenced by learners' vocabulary knowledge.

## **6.2 Contextual Word Learning Task**

In this task, as predicted, all three language groups' accuracy rates were higher when there were morphological cues than when there were not. Even though the L1-Korean participants had higher accuracy and shorter reaction time than the L1-Chinese participants when there were morphological cues, the difference was not significant.

This result may be explained by the proficiency level of the participants. Based on the cloze test results, both the L1-Korean participants (M: 32.5/40) and L1-Chinese participants (M: 33.67/40) in this study can be regarded as high proficiency learners. Being high proficiency English learners, the participants tend to have had much experience learning the language and are adept at English reading. Therefore, it is possible these learners can successfully identify word meaning if sufficient cues are provided, and in this case, the contextual cues.

On the contrary, both morphology and L1 had an effect on reaction times. As predicted,

all three groups had shorter reaction times when there were morphological cues compared to when there were not. However, though the type of L1 ( $\eta^2=.374$ ) had a much bigger effect size than morphology ( $\eta^2=.074$ ), which meant participants' L1 was a more likely cause of the reaction time difference than morphology, significance was only found between (1) native participants and L1-Chinese participants and (2) native participants and L1-Korean participants, and the reaction time results between the two non-native groups were not significantly different. Since all language groups also performed at ceiling in terms of accuracy, it is possible that having an L1 with rich derivational morphology does not significantly aid word learning within contexts, especially with high-proficiency learners.

However, using reaction time technique for the Contextual Word Learning task can be a problem. Since the technique only provides the overall time spent on the whole item, and this study only compared the average reaction times between groups, it was possible that other effects like learners' reading speed (which was a speculated confounding factor in the Single word Learning Task) were masked. Still, based on the average reaction time results of this task, it seemed most learners still read through the sentences even when the target words included morphological cues, and this probably indicated that context plays an important role in L2 learners' word learning process if it is present.

### **6.3 General Discussion**

In sum, to answer the first research question, having an L1 with rich derivational

morphology did not significantly aid the use of morphological cues in identifying word meaning without context. The results indicated that the differences of accuracy and reaction time results between the two non-native groups were not significant. As for the second research question, having morphological cues within context helped with word learning, which was shown with the increase of accuracy rates and the decrease of reaction times in all three language groups. However, in items when both the morphological and contextual cues were present, the L1-Korean participants did not have an advantage over the L1-Chinese participants; as for the items with only contextual cues, the two non-native groups performed similarly on accuracy and speed.

As for whether participants' third languages may influence the results, based on the information provided, it seemed learning a third language with rich derivational morphology (e.g. French and German) did not help Korean participants perform significantly better than Chinese participants in this study, in addition to the advantage Koreans should have from their native language (of those 11 Koreans who indicated which languages they have learned, 8 learned a third language with rich derivational morphology while 3 learned one without). However, the information from the background questionnaire was not very complete (some did not indicate what languages they learned), and the range of years they had learned the languages were pretty broad. As a result, if a third language should be considered as a factor, a careful control should be done on the language types, years of learning, and proficiency.

In previous literature, it was found that L1 can have an influence on L2 English word learning ability. However, according to this study, participants' high English proficiency and reading speed seemed to override the effect of L1, especially in the Single-word Learning Task. Also, in both conditions of the Contextual Word Learning Task, there was no big difference in accuracy and reaction time between the two non-native groups. It was believed that learners' high English proficiency did play a role in the results, and comparing learners of high and low English proficiency may provide information on how English proficiency affects L1 influence.

#### **6.4 Future Studies**

As suggested in the discussion, future experiments should include learners of lower English proficiency. Also, aside from learners' proficiency, learners' reading speed may also be measured. Learner's proficiency levels will still be measured by an independent English cloze test within the experiment. Therefore, the data analysis will not only compare across different L1 groups but also different proficiency groups (i.e. high and low) within each language group. As for reading speed, a possible test may be having participants try to read as much as they can of an article within one minute first. After one minute, participants have to summarize orally what they have read in few sentences. Since reading speed could be a possible factor influencing the results of the Single-word Learning Task, it can be a good idea to measure this factor.

Besides, for the Contextual Word Learning Task, simply comparing the accuracy rates may be the better choice. Though the results in the Contextual Task showed that native speakers and high English proficiency learners reached similar accuracy rates, there may be difference between different L1 groups of lower English proficiency. In order to answer the Research Question 2 (i.e. *When contextual cues are present, does having morphological cues in addition to contextual cues aid word learning?*), there seems to be no more suitable tasks.

Finally, the selection of affixes can be more carefully and scientifically done in future studies. In this study, the affixes were selected simply based on the author's understanding of some of the more common English affixes. However, the different extents of appearance and use of different affixes may influence the results, especially when using a sensitive technique like reaction time. For instance, *re-* and *-er* appear more as pseudo-affixes compared to others (e.g. *result* and *hamster*), and it is possible that participants may hesitate when they see those affixes instead of applying its meaning directly with unknown words. Also, it would be interesting to compare the results (both the accuracy and the reaction time) across different affixes. For instance, whether more common affixes can cause higher accuracy rates and shorter reaction time compared to less common affixes

## **CHAPTER 7**

### **CONCLUSION**

The purpose of this study was to learn whether having an L1 with rich derivational morphology (in this case, Korean compared to Chinese) can help L2 English learners learn the meaning of unknown words by better identifying the morphological components. In this study, participants' accuracy and response time were compared in two experimental tasks: (1) the Single-word Learning Task, in which the learners identified word meaning based on morphological cues only and (2) the Contextual Word Learning Task, in which the learners used both morphological and contextual cues. The overall results were that for high proficiency English learners, having an L1 with rich derivational morphology did not significantly provide an advantage in using derivational affixes in word learning.

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## APPENDIX A: SINGLE-WORD LEARNING TASK ITEMS

### 1. **refleak**

- a. to order (something) from left to right again
- b. to order (something) from left to right first

### 2. **taband**

- a. being bad at peeling bananas as an adult
- b. being good at peeling bananas as an adult

### 3. **lesraint**

- a. to read (something) from the very beginning
- b. to read (something) to the very end

### 4. **unspen**

- a. not being good at helping people thread eyebrows
- b. being good at helping people thread eyebrows

### 5. **botheek**

- a. to write (something) from top to bottom directly
- b. to write (something) from top to bottom slowly

### 6. **flundable**

- a. able to squeeze things down to one-third of one's size
- b. able to be squeezed down to one-third of one's size

### 7. **shofland**

- a. able to be inserted into an one-centimeter crack
- b. able to insert things into an one-centimeter crack

### 8. **misfleak**

- a. to order (something) from left to right incorrectly
- b. to order (something) from left to right quickly

### 9. **speenness**

- a. a person who is good at helping people thread eyebrows
- b. the property of being good at helping people thread eyebrows

**10. cartheam**

- a. a person who is good at running across streets
- b. the skill of being good at running across streets

**11. wirtbease**

- a. to hang a big clock from the ceiling well
- b. to hang a big clock from the ceiling badly

**12. calder**

- a. a person who manages lizard farms by the sea
- b. the skill of managing lizard farms by the sea

**13. podent**

- a. to wash (something) only in water once a week
- b. to wash (something) only in water twice a week

**14. goband**

- a. being surprised about taking care of three babies
- b. being annoyed about taking care of three babies

**15. lirchness**

- a. a person who is excited about celebrating Christmas
- b. the property of being excited about celebrating Christmas

**16. gloker**

- a. the skill of taking people to the moon every month
- b. a person who takes people to the moon every month

**17. redipe**

- a. to paint only one-third of (something) again
- b. to paint only one-third of (something) alone

**18. shecknent**

- a. able to be heated up to five-hundred degree Fahrenheit
- b. able to heat things up to five-hundred degree Fahrenheit

**19. unlirch**

- a. being excited about celebrating Christmas
- b. not being excited about celebrating Christmas

**20. molant**

- a. to cook (something) over a small fire carefully
- b. to cook (something) over a small fire carelessly

**21. phrasid**

- a. a cloth which helps people remove coffee stains
- b. a liquid which helps people remove coffee stains

**22. lornpact**

- a. a story of being upset about leaving your country
- b. a song of being upset about leaving your country

**23. misdipe**

- a. to paint only one-third of (something) quickly
- b. to paint only one-third of (something) incorrectly

**24. dristable**

- a. able to sit on things twenty-four hours a day
- b. able to be sat upon twenty-four hours a day

**25. chipent**

- a. to move (something) in a very big barn busily
- b. to move (something) in a very big barn easily

**26. balkmant**

- a. a vehicle which helps people travel across deserts

- b. a person who helps people travel across deserts

**27. shiment**

- a. to package (something) in plastic bags noisily
- b. to package (something) in plastic bags quietly

**28. untand**

- a. being positive about waking up at six am
- b. not being positive about waking up at six am

**29. portrant**

- a. able to roll things up into a ball in ten seconds
- b. able to be rolled up into a ball in ten seconds

**30. mispling**

- a. to stuff (something) in corners of rooms incorrectly
- b. to stuff (something) in corners of rooms quickly

**31. debarm**

- a. being sensitive about kids making noise
- b. being insensitive about kids making noise

**32. repling**

- a. to stuff (something) in corners of rooms again
- b. to stuff (something) in corners of rooms first

**33. cambable**

- a. able to be hanged five feet above the ground
- b. able to hang things five feet above the ground

**34. castdose**

- a. a book teaching people how to open a lock fast
- b. a video teaching people how to open a lock fast

**35. tarder**

- a. the skill of holding baskets for people in markets
- b. a person who holds baskets for people in markets

**36. tandness**

- a. a person who is positive about waking up at six am
- b. the property of being positive about waking up at six am

**37. straftunct**

- a. a tool for helping people sit steadily on a branch
- b. the skill of helping people sit steadily on a branch

**38. tultable**

- a. able to be placed on roofs without any tools
- b. able to place things on roofs without any tools

**39. rebroot**

- a. to plant (something) alongside buildings again
- b. to plant (something) alongside buildings alone

**40. sudbume**

- a. to rub (something) onto a hand clockwise
- b. to rub (something) onto a hand counter clockwise

**41. coscops**

- a. the skill of helping people prepare several dishes
- b. a tool for helping people prepare several dishes

**42. unrimp**

- a. not being fond of wearing pink and gold clothes
- b. being fond of wearing pink and gold clothes

**43. misbroot**

- a. to plant (something) alongside buildings incorrectly
- b. to plant (something) alongside buildings quickly

**44. criggand**

- a. to pull (something) out of a river in no time
- b. to pull (something) out of a river over a long time

**45. bebyon**

- a. being grateful for not missing a bus in the morning
- b. being nervous about missing a bus in the morning

**46. tancole**

- a. to arrange (something) in a triangle shape beautifully
- b. to arrange (something) in a triangle shape randomly

**47. wolter**

- a. a person who helps people get on and get off horses
- b. the skill of helping people get on and get off horses

**48. rimpness**

- a. a person who is fond of wearing pink and gold clothes
- b. the property of being fond of wearing pink and gold clothes

**49. plearnstip**

- a. the skill of helping people plant vegetable seeds
- b. a tool for helping people plant vegetable seeds

**50. panture**

- a. to trim trees into heart shapes while singing
- b. to trim trees into heart shapes while dancing

**51. misprike**

- a. to stick (something) 5-cm deep into the ground incorrectly
- b. to stick (something) 5-cm deep into the ground quickly

**52. flustow**

- a. the skill of helping people float in the air for one minute

- b. a tool for helping people float in the air for one minute

**53. mareash**

- a. being happy about exercising three times a week
- b. being annoyed about exercising three times a week

**54. caidness**

- a. a person who is tired of wearing a diamond ring
- b. the property of being tired of wearing a diamond ring

**55. meller**

- a. a person who puts up beach umbrellas in resorts
- b. the skill of putting up beach umbrellas in resorts

**56. reprike**

- a. to stick (something) 5-cm deep into the ground first
- b. to stick (something) 5-cm deep into the ground again

**57. uncaid**

- a. not being thankful of spending Thanksgiving with family
- b. being thankful of spending Thanksgiving with family

**58. raudoon**

- a. to play (something) three times in a studio alone
- b. to play (something) three times in a studio together

**59. bregable**

- a. able to soak things in iced water for an hour
- b. able to be soaked in iced water for an hour

**60. dibedth**

- a. to fold (something) into flower shapes in no time
- b. to fold (something) into flower shapes over a long time

## APPENDIX B: CONTEXTUAL WORD LEARNING TASK ITEMS

### List 1

1. **Scrubbing mud off shoes can be a tricky thing, so we have a *corlerd* when there are many people.**

Q: What does *corlerd* mean?

- a. a person who helps scrub the mud off your shoes
- b. a tool which helps scrub the mud off your shoes

2. **Lily's car was washed, but she had to *regrimp* it because she just drove it through a muddy road.**

Q: What does *regrimp* mean?

- c. to wash (something) three times in a row again
- d. to wash (something) three times in a row happily

3. **Lisa is *unlaste* because she believes everyone should put in the same amount of time into work.**

Q: What does *unlaste* mean?

- a. not being happy with other people leaving work early
- b. being happy with other people leaving work early

4. **In preparation of our daughter's wedding, I think we need to hire a *touthim* in our villa.**

Q: What does *touthim* mean?

- a. the skill for taking care of lawns during summers
- b. a person who takes care of lawns during summers

5. **Rachel spends much time looking for concert information because she is *lanseist* and wants to go.**

Q: What does *lanseist* mean?

- a. being excited about going to an outdoor concert

b. being crazy about going to an outdoor concert

**6. Chris may not be a good helper in the kitchen because he tends to *miscroth* ingredients accidentally.**

Q: What does *miscroth* mean?

- a. to mix (something) in a glass bowl carefully
- b. to mix (something) in a glass bowl incorrectly

**7. Her friend just gave us a crystal decoration; it is not only beautiful but also *spundault*.**

Q: What does *spundault* mean?

- a. able to hang things on a wall with a hook
- b. able to be hanged on a wall with a hook

**8. A worker is coming to *peflack* the boxes and help us clean the party room later today.**

Q: What does *peflack* mean?

- a. to place (something) in a corner of a kitchen carefully
- b. to place (something) in a corner of a kitchen directly

**9. This town may be a good place to live in because of the mild weather and the people's *grinkwird*.**

Q: What does *grinkwird* mean?

- a. the property of being warm-hearted towards strangers
- b. a person who is warm-hearted towards strangers

**10. My roommates always *hirgrait* phone messages, so I can not tell what the phone number is.**

Q: What does *hirgrait* mean?

- a. to write (something) down quietly on one's hand
- b. to write (something) down incorrectly on one's hand

**11. It would be nice to have Nancy help us prepare the family dinner because of her *bandot*.**

Q: What does *bandot* mean?

- a. the ability to cook three dishes at the same time
- b. the skill of cooking three dishes at the same time

**12. To become a successful scientist, persistence and *bloveness* are two very important factors.**

Q: What does *bloveness* mean?

- a. the property of being patient with experimenting
- b. a person who is being patient with experimenting

**13. In the kitchen, the waiters are asked to *neavent* the soup so it can be served right away.**

Q: What does *neavent* mean?

- a. to pour (something) from a bucket into bowls quickly
- b. to pour (something) from a bucket into bowls together

**14. Tom has to *replouse* the plants later this morning because today's weather is too dry.**

Q: What does *replouse* mean?

- a. to water (something) with a garden hose alone
- b. to water (something) with a garden hose again

**15. The vitamin pills are *spaidstunt*, so they can be taken easily by children and old people.**

Q: What does *spaidstunt* mean?

- a. able to be swallowed at a single gulp with water
- b. able to swallow things at a single gulp with water

**16. After having worked out for two hours straight in a gym, Andrew *eueleted* sport drinks.**

Q: What does *euelete* mean?

- a. to drink two bottles of (something) eagerly
- b. to drink two bottles of (something) quickly

**17. Next month in our museum, we plan to invite a *fliedin* to talk about ancient Chinese coins.**

Q: What does *fliedin* mean?

- a. a person who collects and studies coins for a living
- b. the skill of collecting and studying coins for a living

**18. Maria's pet hamster is *unhoint*, so be careful not to feed it with these two kinds of vegetables.**

Q: What does *unhoint* mean?

- a. being happy about eating carrots and parsley
- b. not being happy about eating carrots and parsley

**19. Many classmates think John is the brightest student in our math class because of his *tarloud*.**

Q: What does *tarloud* mean?

- a. the ability to solve difficult math questions easily
- b. the skill of solving difficult math questions easily

**20. This container is *drateable*, so it is safe to use it to cook raw chicken within a microwave.**

Q: What does *drateable* mean?

- a. able to heat things up in a microwave for half an hour
- b. able to be heated up in a microwave for half an hour

**21. The boss will be really angry at people who *curpift* charts he just put on in the meeting room.**

Q: What does *curpift* mean?

- a. to paste (something) on a white wall incorrectly
- b. to paste (something) on a white wall attentively

**22. We choose to take public transportation during rainy days because David is *epscard*.**

Q: What does *epscard* mean?

- a. not being good at driving cars during rainy days
- b. being good at driving cars during rainy days

**23. Since there will be many visitors coming next week, the housekeepers will *vartmant* all the rooms.**

Q: What does *vartmant* mean?

- a. to clean (something) with a vacuum cleaner carefully
- b. to clean (something) with a vacuum cleaner efficiently

**24. Jenny should relax a bit on her job; she is *sefloet* and therefore gives herself a lot of pressure.**

Q: What does *sefloet* mean?

- a. being angry about not finishing everything on time
- b. being upset about not finishing everything on time

**25. In this office, we emphasize *ficeness*, which will be a key factor in deciding new employees.**

Q: What does *ficeness* mean?

- a. a person who is good at reading statistical graphs
- b. the property of being good at reading statistical graphs

**26. You can ask for Ray's help with the exhibition posters; he is the *deshig* of our company.**

Q: What does *deshig* mean?

- a. a person who prints out colored posters in companies
- b. a tool which prints out colored posters in companies

**27. To make a third copy of this agreement, we need to have you *remeash* another piece of it.**

Q: What does *remeash* mean?

- a. to sign (something) with a black pen sadly
- b. to sign (something) with a black pen again

**28. Richard is *unwinct*, so we think he may not be the best candidate for the big marathon.**

Q: What does *unwinct* mean?

- a. being capable of running three miles without much effort
- b. not being capable of running three miles without much effort

**29. Tim is interested in learning card games, so we decided to give him a *flurtip* as a present.**

Q: What does *flurtip* mean?

- a. a video that teaches people how to play cards
- b. a book that teaches people how to play cards

**30. Jill may become a good *fleepem* in the future because she is good with handcrafts and loves flowers.**

Q: What does *fleepem* mean?

- a. the skill that makes flower baskets for different parties
- b. a person who makes flower baskets for different parties

**31. The kettle is *bristable*, so it is very convenient and safe to use because it can be cleaned easily.**

Q: What does *bristable* mean?

- a. able to be cleaned with every kind of chemical detergents
- b. able to clean things with every kind of chemical detergents

**32. Becky gets upset about the state of the files in the binders because some people**

***genpriel* them all the time.**

Q: What does *genpriel* mean?

- a. to put (something) in a loose-leaf binder incorrectly
- b. to put (something) in a loose-leaf binder immediately

**33. I will get a *grosube* to help paint our ceilings; it is kind of dangerous for an old man to do it.**

Q: What does *grosube* mean?

- a. a person who helps paint your house ceilings white
- b. a tool which helps paint your house ceilings white

**34. You need to *replash* the table before we have dinner because I just put some boxes on it.**

Q: What does *replash* mean?

- a. to clean (something) with a piece of wet cloth again
- b. to clean (something) with a piece of wet cloth sadly

**35. We need to have a *mirelay* in the house for some big events near the end of this December.**

Q: What does *mirelay* mean?

- a. a room for people to hang coats in a house
- b. a closet for people to hang coats in a house

**36. Diane's *tamblard* may result from her love with water scenery as well as her being a swimmer.**

Q: What does *tamblard* mean?

- a. a person who loves to live in a cottage by the water
- b. the property of loving to live in a cottage by the water

List 2

- 1. Scrubbing mud off shoes can be a tricky thing, so we have a *corlerd* when there are many people.**

Q: What does *corlerd* mean?

- c. a person who helps scrub the mud off your shoes
- d. a tool which helps scrub the mud off your shoes

- 2. Lily's car was washed, but she had to *legrimp* it because she just drove it through a muddy road.**

Q: What does *legrimp* mean?

- a. to wash (something) three times in a row again
- b. to wash (something) three times in a row happily

- 3. Lisa is *belaste* because she believes everyone should put in the same amount of time into work.**

Q: What does *belaste* mean?

- a. not being happy with other people leaving work early
- b. being happy with other people leaving work early

- 4. In preparation of our daughter's wedding, I think we need to have a *touther* in our villa.**

Q: What does *touther* mean?

- a. the skill for taking care of lawns during summers
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- 5. Rachel spends much time looking for concert information because she is *lanseist* and wants to go.**

Q: What does *lanseist* mean?

- c. being excited about going to an outdoor concert
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**6. Chris may not be a good helper in the kitchen because he tends to *roscroth* ingredients accidentally.**

Q: What does *roscroth* mean?

- a. to mix (something) in a glass bowl carefully
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**7. Her friend just gave us a crystal decoration; it is not only beautiful but also *spundable*.**

Q: What does *spundable* mean?

- a. able to hang things on a wall with a hook
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Q: What does *tambness* mean?

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- b. the property of loving to live in a cottage by the water

## APPENDIX C: LANGUAGE BACKGROUND QUESTIONNAIRE

### Native Speaker Version

1. Your Number: \_\_\_\_\_
2. Your Gender:  Male;  Female
3. Your Age:  15-20;  20-25;  25-30;  30-35;  35-40
4. Your Major: \_\_\_\_\_
5. Are you a bilingual native speaker (e.g. English-Spanish bilingual)?  
\_\_\_\_\_
6. Have you learned any language(s) aside from your native language and English? If yes, for how many years?  
\_\_\_\_\_
7. Have you taken any formal linguistics courses (e.g. syntax or semantics)?  
\_\_\_\_\_

### Non-native Speaker Version

1. Your Number: \_\_\_\_\_
2. Your Gender:  Male;  Female
3. Your Age:  15-20;  20-25;  25-30;  30-35;  35-40
4. Your Major: \_\_\_\_\_
5. Your Country of Origin: \_\_\_\_\_
6. Your Native Language(s): \_\_\_\_\_
7. Have you learned any language(s) aside from your native language and English? If yes, for how many years?  
\_\_\_\_\_
8. How long have you studied English?

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9. How long have you received formal English education (i.e. in schools or language institutions)?

---

10. How long have you been in the U.S.?

---

11. How long have you received formal English education (i.e. in schools or language institutions) in the U.S.?

---

12. What was your most recent TOEFL/IELTS score?

---

13. Please describe how you learned English vocabulary and what kinds of instruction you received for learning English vocabulary.

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## APPENDIX D: ENGLISH CLOZE TEST

For each blank in the following passage, please circle one of three options given. Please choose the option appropriate for the context. Please choose one option only for each blank.

Joe came home from work on Friday. It was payday, but he wasn't \_\_\_(1) **even / more / ever**\_\_\_ excited about it. He knew that \_\_\_(2) **then / when / while**\_\_\_ he sat down and paid his \_\_\_(3) **checks / bills / salary**\_\_\_ and set aside money for groceries, \_\_\_(4) **driving / pay / gas**\_\_\_ for the car and a small \_\_\_(5) **deposit / withdrawal / money**\_\_\_ in his savings account, there wouldn't be \_\_\_(6) **quite / not / too**\_\_\_ much left over for a good \_\_\_(7) **pleasure / leisure / life**\_\_\_.

He thought about going out for \_\_\_(8) **eat / dinner / eating**\_\_\_ at his favorite restaurant, but he \_\_\_(9) **just / only / very**\_\_\_ wasn't in the mood. He wandered \_\_\_(10) **around / at / in**\_\_\_ his apartment and ate a sandwich. \_\_\_(11) **In / For / After**\_\_\_ a while, he couldn't stop himself \_\_\_(12) **for / from / about**\_\_\_ worrying about the money situation. Finally, \_\_\_(13) **he / she / it**\_\_\_ got into his car and started \_\_\_(14) **drive / driven / driving**\_\_\_.

He didn't have a destination in \_\_\_(15) **head / mind / fact**\_\_\_, but he knew that he wanted \_\_\_(16) **be / to be / being**\_\_\_ far away from the city \_\_\_(17) **which / there / where**\_\_\_ he lived. He turned onto a quiet country \_\_\_(18) **road / house / air**\_\_\_. The country sights made him feel \_\_\_(19) **as good / better / best**\_\_\_. His mind wandered as he drove \_\_\_(20) **past / in / to**\_\_\_ small farms and he began to \_\_\_(21) **try / think / imagine**\_\_\_ living on his own piece of \_\_\_(22) **house / land / farm**\_\_\_ and becoming self-sufficient. It had always \_\_\_(23) **being / been / be**\_\_\_ a dream of his, but he \_\_\_(24) **having / have / had**\_\_\_ never done anything to make it \_\_\_(25) **a / one / some**\_\_\_ reality. Even as he was thinking, \_\_\_(26) **their / his / her**\_\_\_ logical side was scoffing at his \_\_\_(27) **favorite /**

**practical / impractical** \_\_\_ imaginings. He debated the advantages and \_\_\_ **(28) cons / disadvantages / problems** \_\_\_ of living in the country and \_\_\_ **(29) growing / breeding / building** \_\_\_ his own food. He imagined his \_\_\_ **(30) farmhouse / truck / tractor** \_\_\_ equipped with a solar energy panel \_\_\_ **(31) at / out / on** \_\_\_ the roof to heat the house \_\_\_ **(32) in / for / over** \_\_\_ winter and power a water heater. \_\_\_ **(33) She / He / They** \_\_\_ envisioned fields of vegetables for canning \_\_\_ **(34) either / and / but** \_\_\_ preserving to last through the winter. \_\_\_ **(35) Whether / Even / If** \_\_\_ the crops had a good yield, \_\_\_ **(36) maybe / possible / may** \_\_\_ he could sell the surplus and \_\_\_ **(37) store / save / buy** \_\_\_ some farming equipment with the extra \_\_\_ **(38) economy / cost / money** \_\_\_.

Suddenly, Joe stopped thinking and laughed \_\_\_ **(39) at / out / so** \_\_\_ loud, "I'm really going to go \_\_\_ **(40) through / away / in** \_\_\_ with this?"

Adapted from American Kernel Lessons: Advanced Students' Book. O'Neill, Cornelius and Washburn (1981).