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## L1 Mediation in L2 Lexical Access: Emerging Evidence from Word Association Tests

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Nam, Hyunjeong. "L1 Mediation in L2 Lexical Access: Emerging Evidence from Word Association Tests." *The Journal of Modern British & American Language & Literature*. 32.3 (2014): 39-65. The word association test (WAT) reveals the density of the network in the L2 learner's lexicon and the organization of the lexical information in the mental lexicon. While the studies concerning Korean L2 learners' word association have yielded valuable insights into the Korean L2 learners' lexical knowledge, such insights have tended towards the types of L2 learners' word associations in comparison with those of native English speakers, rather than directly examining L1-mediated word association in the WATs. Thus, the present study has the goal of investigating the L1 mediation in L2 word association. 106 participants were involved in the study. Apart from the grouping according to L2 proficiency, the study divided the low proficiency group into three groups based on different stimulus-response types (Listen-Speak; Listen-Write; Read-Write). The results suggest that L1 mediated word association may decrease as L2 proficiency increases; L1 mediated word associations may be more salient under oral type of stimulus than written type; and that L2 exposure may help lower the extent of L1 mediation in WATs. (Daegu Haany University)

**Key Words:** Word association, Mental lexicon, L1 mediation, L2 proficiency, Stimulus effect

### I. Introduction

Recent decades have seen the growth of research concerning bilingual mental lexicon (De Groot and Nas 1991; Potter et al., 1984;

Kroll and Stewart, 1994). Although a unanimous consensus has not been reached on the organization of bilingual mental lexicon whether it is either completely separate or integrated, the competing claims have at least reached an agreement about a certain extent of interaction between a bilingual's L1 and L2.

The question of interest in cognitive linguistics in particular has been whether and how L2 lexical knowledge is stored and accessed. Researchers have sought to investigate the bilingual lexicon by using various tasks such as the Stroop task, the visual word-recognition task and the picture/word-naming task. Word association test (hereafter WAT) in particular has widely been used as an effective tool to explore the quality of L2 learners' lexical knowledge (Greidanus and Nienhuis, 2001). However, surprisingly few of these studies have been conducted in Korea. Some studies concerning Korean L2 learners' word association have yielded valuable insights into the Korean L2 learners' lexical knowledge. However, such insights have tended towards the types of L2 learners' word associations in comparison with those of native English speakers, rather than directly examining L1-mediated word association in the WATs (Chad, 2011; Junkyu Lee, 2011; Jungtae Kim, 2011). Thus, the present study aims to investigate the L1 mediation in L2 word association.

## II. Theoretical Background

### 2.1 Bilingual Lexicon

In early theoretical formulation, there were seemingly polarized

views to account for bilingual lexicon. One end of the continuum suggested a shared conceptual store between L1 and L2 (e.g., McCormack, 1977), while the view at the other end was in support of separate conceptual stores for each language (e.g., Kollers, 1963). More moderate views emerged decades later taking a position that bilingual memory is separate yet interconnected (Keatley, Spinks and Gelder, 1994), that it has a subordinate structure (Kroll and Stewart, 1994) or that the issue of bilingual conceptual store may depend on the task used in the study (Durgunoglu and Roediger, 1987).

The question whether L1 and L2 words are directly or indirectly retrieved from the conceptual memory may be more relevant to the present study. It has been suggested that L1 is more strongly connected to the concept than L2 and that L2 conceptual representations are relatively weak in the system (Kroll and Stewart, 1994; Potter et al., 1984). Moreover, De Groot and Nas (1991) found the difference between cognates and non-cognate words; shared conceptual representations for cognates and the separate representations for non-cognate words. Furthermore, research concerning Korean L2 learners' bilingual lexicon has shown that L1 may be accessed as a form of Konglish (false cognate), even including the words originated from German, and then produced in L2 (English) (Hyunjeong Nam, 2011).

The bilingual lexicon either being shared between L1 and L2 or accessed separately has been tested in various ways. Some studies aim to test receptive knowledge using a word-recognition task while others seek to examine productive knowledge using the picture/word-naming task. For example, studies following the Revised Hierarchical Model (Kroll and Stewart, 1994) assessed reaction time of translation. In neurolinguistics, neuro-imaging techniques such as

positron emission tomography (PET) and functional magnetic resonance imaging (fMRI) have also been used.

## 2.2 Word Association Test

Word association test has been widely used not only in psychology but also in linguistics. Starting Meara (1982)'s Birkbeck Vocabulary Project which came into prominence in early 1990, the focus of WATs has been expanded to L2 lexicons (Beglar and Nation, 2013). As Read states (1993:359), it is "a tool in research on the organization of the mental lexicon and the organization of the mental lexicon and the processes by which word knowledge is acquired". Meara (2009) suggests that automatic response to stimulus words effectively mirrors the nature of the associations in the L2 mental lexicon which may be distinct from that of native speakers of English.

There are three types of associations found in WATs. First, paradigmatic association refers to "[t]he two words are synonyms or at least similar in meaning, perhaps with one being more general than the other". Second, syntagmatic association may be observed when "[t]he two words are collocates that often occur together in a sentence". Third, analytic association means that "[t]he associate represents one aspect, or component, of the meaning of the stimulus word and is likely to form part of its dictionary definition" (Read, 1993:359).

## 2.3 Previous Research

The main interest of the studies that have been carried out using WATs has been in—first, the assessment of L2 lexical knowledge and

second, the types of L2 learners' word associations that are different from those of native English speakers (Chad, 2011; Junkyu Lee, 2011; Jungtae Kim, 2011; van Vlack, 2013). The majority of previous research has found that paradigmatic association was observed more in native speakers' responses while syntagmatic and clang association were more prevalent in non-native speakers' responses (Meara, 1982; Namei, 2004; Nissen and Henriksen, 2006). It has also been suggested that there exists a shift in types of associations as L2 proficiency increases (Jiang, 2002; Meara, 1978; Söderman, 1993). For example, numerous studies have yielded evidence of the shift from syntagmatic to paradigmatic according to the advancement of L2 proficiency (Meara, 1982; Namei, 2004; Nissen and Henriksen, 2006; Piper and Leicester, 1980; Schmitt and Meara, 1997; Söderman, 1993). In addition, research has also found that clang association decreases as L2 proficiency increases (Jiang, 2002; Meara, 1978; Söderman, 1993). This finding has been interpreted to mean that the shifts over L2 proficiency indicate the expansion of the size of L2 lexicon over advancement of L2 proficiency (Meara, 1978, 1982; Piper and Leicester, 1980). Another way of understanding the shift is to consider the organization of the L2 mental lexicon. Namei (2004:383) suggests that newly learned words tend to be phonologically organized in the mental lexicon, and thus reveal clang associations in WATs. On the other hand, words which are partially integrated in the mental lexicon seem to be associated based on their syntactic information, leading to syntagmatic responses in WATs while the words fully integrated in the lexicon are linked paradigmatically to one another. However, some researchers have challenged this on the grounds that the difference in the types of word associations between the L2 learners and the native speakers or any difference among different proficiency levels was not

evident (Kudo and Thagard, 1999; Zareva, 2007).

Compared to active and vibrant research overseas, there has been little research concerning Korean L2 learners' lexicon using WATs. In recent research, WATs were used as a lexical judgment task for primary school students in the study of Jinkyong Lee (2008), and also adopted as a 'computerized semantic related judgment task' to evaluate the strength of word associations by reaction time to the stimuli (Junkyu Lee, 2011).

However, since the primary concern of this paper is not with the L2 reception, but rather with L2 production, the following three studies may be more relevant to the discussion in this study. With regard to paradigmatic and syntagmatic associations, no significant difference was observed among different proficiency groups in the studies of Jungtae Kim (2011) and van Vlack (2013), which appears to be inconsistent with most of the previous research overseas. Another incongruence between research overseas and in Korea lies in the word associations based on phonological similarity. This type of word associations was found to be marginal in Kim's (2011) study and Chad (2011), which seems different from the above-mentioned research overseas.

To date, the types of word associations have been the prominent focus of research concerning Korean L2 learners' lexicons; however, the question why the organization of their L2 lexicon is different has remained unanswered. As such, little attention has been given to the possibility of L1 mediation in word associations. Wolter (2006) points out that L1 influence has been overlooked in WATs. Except for a study which includes a journal examiner's comment about L1 factor in the footnote (Junkyu Lee, 2011), there seems only one study (van Vlack, 2013) that articulates the L1 effect to interpret the results.

Given that each stimulus word may induce a different extent of L1 mediated associations, this necessitates the need for a more refined stimuli that may yield manifest evidence of either L1 or L2 mediated associations.

### Research Questions

1. Is there a correlation between L2 proficiency and L1 mediation in word associations?
2. Does the stimulus-response type in the WATs affect the extent of L1 mediated word associations?
3. Does the L2 exposure that the participants have had affect the extent of L1 mediated word associations?

## III. Method

### 3.1 Participants

A total of 106 participants (78 in low proficiency group, 14 in high proficiency group and 14 native English speakers in control group) were involved in the present study. In order to observe the difference between stimulus-response types, 78 low proficiency participants were assigned to a Listen-Write group (32 participants), a Listen-Speak group (20 participants), a Read-Write group (26 participants). The subjects (78 participants) in the low proficiency groups were Korean male and female university students from different majors with a TOEIC score of 595 or below. The subjects (14 participants) in the high proficiency group were Korean university students with a TOEIC

score of 900 or above, Korean professors teaching English in English at university, and Korean-English bilingual adults<sup>1</sup>. The control group consists of 5 Americans and 9 Australians, most of whom were in Australia and were never exposed to Korean language.

### 3.2 Materials and Procedure

A total of 15 words were used as stimuli. They are English words that have been fully integrated into the Korean lexicon with phonological adjustment and thus have similar status to other Korean words in the lexicon. However, since the semantic representations of these words in L1 (e.g., *분드*; glue) differ markedly from those in L2 (e.g., *bond*; tie or connection), the responses in the WATs may reflect whether the stimulus word activates L1 or L2 associates in the mental lexicon.

To date, no similar study using these stimuli in WAT has been carried out, and therefore the stimulus words were collected through the following three sampling processes. First, sampling started from obtaining the five words (*coating, skin, promise, sharp, meeting*) from the previous studies concerning Korean-English false cognates (Hyunjeong Nam, 2010, 2011). The second process involved gathering data from a preliminary survey. The survey involved 8 native English teachers who had some knowledge of Korean and were teaching at private language institutes or colleges. They were asked to report any cases where English words produced by Korean L2 learners caused misunderstanding because the words carried Korean meanings. Then, 10 words (*report, bond, complex, handle, reform, villa, TV<sup>2</sup>, notebook,*

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<sup>1</sup> Average 15.5 years of residence in an English speaking country

<sup>2</sup> Various words associated with TV were reported in the survey and therefore,



*walker, promise*) which were ranked high by the native English teachers were selected.

The study was conducted in the following procedure. For the proficiency effect in the research question one, the participants who showed their interest in the experiments were asked to provide their TOEIC scores. Those whose TOEIC scores were between 600 and 900 were excluded in the study in order to obtain more precise data from the two distinctive proficiency groups (low and high proficiency group)<sup>3</sup>. For the stimulus-response type in the research question two, the WATs were separately provided to Listen-Write group, a Listen-Speak group, and a Read-Write group. The Listen-Write group took the WATs in a classroom, and the participants were asked to hear the stimuli provided only once from the audio clips recorded by a native English speaker, and then to write 5 words that come to their minds on a paper sheet (see Appendix A). The participants in the Read-Write group were asked to read the stimuli on the Microsoft power point screen and then write 5 words that spontaneously come to their mind on the sheet (see Appendix B). For the 5 word associates for written type of responses, five sets of blanks as in 'stimulus word \_\_\_\_\_' were provided for each stimulus on the sheet. The participants in the Listen-Speak group took the WATs individually. The individual subject was asked to hear the stimuli and then tell the researcher the 5 words that spring to his/her mind. Before the test, the participants were informed that there was no right or wrong answer and that the researcher would not respond to any questions from them during the test. Their responses were recorded during the test and then transcribed after the participant left the room.

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the word TV in the center of the associations was selected.

<sup>3</sup> The TOEIC score for grouping was determined based on previous studies.

Following the previous study (van Vlack, 2013), time constraints were placed differently according to the type of responses: 30 seconds for oral response (Listen-Speak type) and 45 seconds for written response (Listen-Write and Read-Write type). For the correlation between L2 exposure and L1 mediated word association in the research question three, the additional questions about the participants' L2 exposure were provided after the WATs.

### 3.3 Data Collection and Analysis

First, the responses were collected manually and organized according to the group using Microsoft Excel program. Second, two Korean speakers examined all the responses to check if they were L1 mediated word associations. Only the cases where both examiners agreed on were counted as the L1 mediated word association. Third, the cases of the L1 mediated word association obtained from the second step were re-examined by two native speakers of English with little knowledge of Korean. When any word associates initially judged as L1 mediated word association by Korean examiners were questioned by even one native English speaker (e.g., *park* obtained from the stimulus *walkers*), the data were excluded in the counting of the L1 mediation at the third screening for more precise results.

For analysis the data were fed to the statistics program SPSS 20. First, descriptive statistics were used for general information such as Mean and standard deviation. Second, independent samples *t*-test was used first, to compare the mean scores of the oral and written types of stimulus and second, to compare the differences between the two proficiency groups. Third, correlation analysis using Pearson product moment correlation coefficient (*r*) was used to check the

relation between L2 proficiency and L1 mediated word association, and the relation between L2 exposure and L1 mediated word association.

## IV. Results and Discussion

### 4.1 Results

The results are presented and discussed in the order of research questions. First, the results concerning L2 proficiency effect on L1 mediation in word associations are indicated in Table 1.

Table 1  
Independent-samples t-test: Proficiency Effect under the Condition of the Same Stimulus-Response Type ('Read-Write' Group in Low Proficiency Group vs. High Proficiency Group)

Group Statistics									
	Proficiency		N	Mean	Std. Deviation	Std. Error Mean			
L1-mediated Word Association	Low		26	18.15	3.75	.74			
	High		14	11.71	8.53	2.28			
Independent-samples T-test									
Levene's Test for Equality of Variances					T-test for Equality of Means				
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference Lower Upper	
Equal Variance	6.69	.014	3.32	38	.002	6.44	1.94	2.52	10.36

Assumed							
Equal							
Variance	2.68	15.75	.016	6.44	2.40	1.35	11.53
Not							
Assumed							

In Table 1, an independent-samples t-test was conducted to compare the L1-mediated word association in the low proficiency group and the high proficiency group under the condition of the same stimulus-response type (the conventional 'read-write' type). There was a significant difference in the extent of L1 mediated word association for the low proficiency group (M=18.154, SD=3.7491) and for the high proficiency group [M=11.714, SD=8.5344;  $t(15.754)=2.687$ ,  $p=.016^4$ ]. The magnitude of the differences in the means was large (eta square  $d^5=.08$ ).

The relationship between participants' L2 proficiency and L1 mediated word association was investigated using Pearson product-moment correlation coefficient as shown in Figure 1 and Table 2.

<Figure 1>

Correlations between L2 Proficiency and L1-mediated Word Association

<sup>4</sup> The significance level of Levene's test is  $p=.05$  or less, which refers to equal variances not assumed.

<sup>5</sup> Cohen's d was used for the effect size statistics. It was calculated by hand using the formula.  $\eta^2 = \frac{t^2}{t^2(N_1 + N_2 - 2)}$

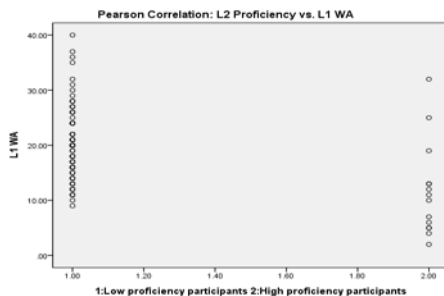


Table 2  
Correlations between L2 Proficiency and L1-mediated Word Association

		L2 Proficiency	L1-mediated Word Association
L2 Proficiency	Pearson Correlation	1	-.427**
	Sig. (2-tailed)		.000
	N	92 <sup>6</sup>	92
L1-mediated Word Association	Pearson Correlation	-.427**	1
	Sig. (2-tailed)	.000	
	N	92	92

\*\* Correlation is significant at the 0.01 level (2-tailed)

There was medium, negative correlation  $r = -.427$ ,  $n = 92$ ,  $p < .001$ , with high levels of L2 proficiency associated with lower levels of L1 mediated word association.

The following results are presented for research question two

<sup>6</sup> Total number of participants in the experimental group (78 participants in low proficiency group and 14 participants in high proficiency group)

concerning the effect of stimulus-response type on the extent of L1 mediated word association.

Table 3  
Descriptive Analysis for Different Stimulus-Response Types in Low Proficiency Groups

Listen-Write Type					
Listen-Write Type	N	Min	Max	Mean	Std.
L1 Mediation	32	9.00	28.00	19.66	5.36
Valid N (listwise)	32				
Listen-Speak Type					
Listen-Speak Type	N	Min	Max	Mean	Std.
L1 Mediation	20	11.00	40.00	25.60	8.59
Valid N (listwise)	20				
Read-Write Type					
Read-Write Type	N	Min	Max	Mean	Std.
L1 Mediation	26	11.00	24.00	18.15	3.75
Valid N (listwise)	26				

According to Table 3, among the different stimulus-response types Listen-Speak type of stimuli ( $M=25.6000$ ,  $SD=8.58640$ ) yielded the most L1 mediated word associations, followed by Listen-Write type ( $M=19.6563$ ,  $SD=5.35579$ ), both of which was oral stimulus.

Table 4  
Independent-samples t-test: Oral Stimulus vs. Written Stimulus

Group Statistics										
	Stimulus Type	N	Mean	Std. Deviation	Std. Error Mean					
L1 Mediation	Oral	52	21.94	7.31	1.01					
	Written	26	18.15	3.75	0.74					
Independent-samples t-test										
		Levene's Test for Equality of Variances		T-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Equal Variance Assumed		8.90	.00	2.48	76	0.06	3.79	1.53	0.74	6.83
Equal Variance Not Assumed				3.02	75.91	0.00	3.79	1.25	1.29	6.28

In Table 4, an independent-samples t-test was conducted to compare the L1 mediated word association between oral and written stimulus type. There was a significant difference in the extent of L1 mediation for the oral stimulus type (M=21.94, SD=7.31) and written stimulus type [M=18.15, SD=3.75;  $t(75.91)=3.03$ ,  $p=.003$ ]. The magnitude of the differences in the means was very large (eta square  $d^7=.11$ ).

The results concerning the effect of L2 exposure on L1 mediated word association (the research question three) are presented below.

<Figure 2>

Correlations between L2 Exposure and L1-mediated Word Association in All Groups

$$^7 \text{ eta squared} = \frac{t^2}{t^2(N_1 + N_2 - 2)}$$



Table 5  
Correlations between L2 Exposure and L1-mediated Word Association in All Groups

		L1-mediated Word Association	L2 Exposure
L1-mediated Word Association	Pearson Correlation	1	-.35**
	Sig. (2-tailed)		.00
	N	92	92
L2 Exposure	Pearson Correlation	-.35**	1
	Sig. (2-tailed)	.00	
	N	92	92

\*\* Correlation is significant at the 0.01 level (2-tailed)

The relationship between participants' L2 exposure (length of residence in an English speaking country) and L1 mediated word association was investigated using Pearson product-moment correlation coefficient. There was medium, negative correlation  $r = -.352$ ,  $n = 92$ ,  $p < .001$ , with high level of L2 exposure associated with lower level of L1 mediated word association. The relationship between participants' L2 exposure in Korea and L1 mediated word association was also



investigated. There was negative correlation ( $r=-.191$ ) with high level of L2 exposure in Korea associated with lower level of L1 mediated word association; however, it was not statistically significant.

Table 6  
Descriptive Analysis for High Proficiency Group

	N	Min	Max	Mean	Std.
L1	14	2.00	32.00	11.71	8.53
L2 Expo in E	14	0.00	26.00	3.41	6.78
L2 Expo in K	14	0.50	12.00	5.50	3.36
Valid N (listwise)	14				

Note. L2 expo in E: length of residence in an English speaking country (per year), L2 expo in K: Exposure to English in Korea (per hour)

Table 7  
Correlations between L2 Exposure and L1-mediated Word Association  
in the High Proficiency Group

		L1-mediated Word Association	L2 Expo in K
L1-mediated Word Association	Pearson Correlation	1.00	-.540*
	Sig. (2-tailed)		.046
	N	14	14
L2 Expo in K	Pearson Correlation	-.540*	1.00
	Sig. (2-tailed)	.046	
	N	14	14

\*\* Correlation is significant at the 0.01 level (2-tailed)

Note. L2 Expo in K: current daily exposure to L2 in Korea (per hour)

Table 7 shows the relationship between participants' current L2 exposure in Korea and L1 mediated word association in the high proficiency group. Although the negative correlation ( $r=-.191$ ) found in all proficiency groups was not statistically significant, there was large, negative correlation  $r=-.540$ ,  $t=14$ ,  $p<.001$ , in the high proficiency group, with high levels of current L2 exposure in Korea associated with lower levels of L1 mediated word association.

## 4.2 Discussion

The findings from the study are interpreted and discussed in the order of the research questions.

### 4.2.1 The Effect of L2 Proficiency on L1 Mediated Word Association

The effect of L2 proficiency has been discussed in many studies (e.g., Meara and Wolter, 2004; Schmitt, 1998; Wolter, 2002) in relation to the types of word association (e.g., syntagmatic, paradigmatic, clang association). Although van Vlack (2013:231) added schematic associations which include "schemas which were culturally encapsulated such as the mountain-sea schema for Koreans" to the existing types of word associations, there have been no studies closely comparable with the present study concerning the proficiency effect on L1 mediated word association rather than types of association.

The results suggest that L2 proficiency effect on L1 mediated word association exists under both conditions where the low proficiency group ( $M=18.15$ ,  $SD=3.75$ ) was compared with the high proficiency

group ( $M=11.71$ ,  $SD=8.53$ ) under the same stimulus-response test (Read-Write type) and where all the different proficiency groups regardless of the stimulus types were involved (negative correlation  $r=-.427$ ,  $n=92$ ,  $p<.001$ ). That is, the higher L2 proficiency the participants had, the lesser the extent of L1 mediated word association they produced in the WATs.

As understood within the Revised Hierarchical Model (Kroll and Stewart, 1994), the association between the concept and the L1 is stronger than the connection between the concept and the L2, and thus the existing association between the L1 and the concept becomes involved in the access of the 'subsequently organized and weak' L2 network in the mental lexicon (see also Sook Kweon, 2012 for Korean L2 learners). The participants in the present study, predominantly in low proficiency groups, must also have stronger association between the concept and the L1, and thus L1 mediation may have been ineluctable in the English WAT. This seems more convincing considering Nam's (2011) finding that more L1 activation in L2 was observed in less proficient Korean L2 learners.

In addition to the extent of L1 mediated word association varying in L2 proficiency, it is worth stating the difference of total number of responses observed in different proficiency groups in the study. It was found that the low proficiency groups produced 85.23% (4986 responses out of 5850) while the high proficiency group produced 98.86% (1038 responses out of 1050) in WATs. Given that the total number of responses shows density of the network in lexicon, being denser in native speakers' (Wilks and Meara, 2002) and L2 proficiency enables the density of the network to be close to that of native speakers (Kruse et al., 1987; Namei, 2004; Zareva, 2007), it is clear that the low proficient participants in the present study had

lesser-dense network in their lexicons. There were some cases where low proficient participants wrote L1 words or spoke L1 words in a low mumble even though they were asked to respond only in L2. These cases were not counted as L1 mediation in the study; however, it may indirectly reveal that the sparse network in L2 for the low proficient participants may possibly lead to the L1 mediation in WATs.

#### 4.2.2 Stimulus Type and L1 Mediated Word Association

Apart from the grouping according to L2 proficiency, the present study divided the low proficiency group into three groups based on different stimulus-response types (Listen-Speak; Listen-Write; Read-Write) in order to observe more noticeable differences, if any. It was found that L1 mediated word associations were observed most under the Listen-Speak type of stimuli ( $M=25.60$ ,  $SD=8.59$ ), followed by Listen-Write type of stimulus ( $M=19.66$ ,  $SD=5.36$ ), both of which were oral stimulus.

Among the research concerning Korean L2 learners' word associations, there is only one study that employed spoken and written type of stimulus in the WAT. van Vlack (2013) found more syntagmatic associations in the writing session, and yet more schematic responses in the oral interview. Although the focus of the present study is not on the types of word associations such as syntagmatic or paradigmatic associations, his findings may be pertinent to the present study concerning L1 mediated word association. That is, the schematic associations involving "culturally encapsulated" schema were observed more in the oral interview than in the written test (van Vlack, 2013:231-232). Given the culturally encapsulated schema is comparable to the L1 mediation in the present study, his finding of schematic associations prevalent in the oral interview is in

line with the finding of L1 mediated word associations more salient under the oral stimulus in the present study.

Different types of tasks require different lexical retrieval processes. For example, the lexical decision task may induce an orthographic–semantic path and the naming task promotes phonological activation (Kim and Davis, 2003). As such, the oral stimulus in the present study may be more responsive to the L1 mediated word association since the phonological similarity between the stimulus words in English and their L1 equivalents (e.g., *complex*: /kəmpleks/ vs. /kompleks/) may trigger other associates in the L1 semantic field. On the contrary, under the written stimulus where the participants read the stimulus words written in English, the L1 mediation was found less. It can be presumed that the orthographic difference between the L2 and L1 (e.g., *complex* vs. 콤플렉스) may inhibit the L1 mediation more effectively in WATs. This can also be explained from Nam's (2011:203) findings that in the oral interview, due to the absence of orthographic information, the language cue may be less efficacious in inhibiting the non–target language, Korean, and moreover the phonological overlap between the false cognates in Korean and English was relied on, which consequently lead to the L1 activation in L2.

#### 4.2.3 L2 Exposure and the L1 Mediated Word Association

For better understanding the quantity and the quality of the L2 exposure, a section of the L2 exposure was divided into the length of residence in an English speaking country (the total year) and the amount of current L2 exposure in Korea (average hour a day). Negative correlation ( $r=-.352$ ,  $n=92$ ,  $p<.001$ ) found in the study suggests that the more L2 exposure in an English speaking country

the participants had, the less the extent of the L1 mediated word associations they produced in the WATs. Although it was not statistically significant, there was also negative correlation ( $r=-.191$ ) in the L2 exposure in Korea for all the proficiency groups. Considering the amount of L2 exposure the low proficient participants had in Korea, which was primarily limited to taking English classes at a university, simple exposure in a classroom may be insufficient to bring more tangible effects (see also Youngsang Kim, 2012 for other factors). However, the effect of L2 exposure in Korea was more noticeable in the high proficiency group (negative correlation  $r=-.540$ ,  $n=14$ ,  $p<.001$ ). It is interesting to note that the seven participants in the high proficiency group were students at the same university as the low proficient participants. Their L2 exposure was different from that of low proficient participants both in quantity (average 9.71 hours a day for the seven high proficient students; 3.26 hours a day for the low proficient students) and in quality (various types of L2 exposure such as communication with English speakers, online text-messaging or chatting, watching drama or movies in English etc.).

The present study suggests that not only the length of residence in an English-speaking country but also the quality of the L2 exposure may be crucial to the extent of L1 mediated word association. The findings are in line with Nam's (2011) study, suggesting the quantity and quality of L2 exposure as one of the factors affecting L1 activation in L2. With this in mind, future research should benefit from taking both the quantity and the quality of L2 exposure into consideration.

## V. Conclusion

In conclusion, the quantitative data generated by the WATs confirmed the first research question – L1 mediated word association may decrease as L2 proficiency increases. Some evidence was also found to support the second hypothesis – L1 mediated word associations may be more salient under oral type of stimulus than written type. The third hypothesis was supported to a lesser degree, suggesting that L2 exposure in an English-speaking country may help lower the extent of L1 mediation in WATs, yet the effect of L2 exposure in Korea was statistically significant only in the high proficiency group.

The word association test reveals the density of the network in the L2 learner's lexicon and the organization of the lexical information in the mental lexicon. Considering the prevalence of the L1 mediated vocabulary learning in Korea, the L1 mediation in WATs seems inevitable. Korean L2 learners often face difficulties accessing L2 lexical items during speech production since the networks in their L2 lexicon seem not to be densely formed due to the lack of L2 lexical information. Moreover, L1 mediation impinges on ongoing access to L2 lexical items. Thus, various types of L2 exposure both in quantity and quality may be useful.

Although the evidence obtained from this study appears to be persuasive, testing limitations must have tempered with the findings. The study could not totally block additional activation from other stimulus words on the same written test sheet. Future studies may consider using the booklet that shows only a single stimulus word at a time (see Chad, 2011).

## Works Cited

- Beglar, D., and P. Nation. "Assessing Vocabulary." *The Companion to Language Assessment Vol I*. Ed. A. J. Kunnan. Malden, MA: Wiley-Blackwell, 2013. 172-84.
- Chad, B. "Using Word Association Tests to Explore Korean EFL Learners' Mental Lexicons." *The Jungang Journal of English Language and Literature*. 53.2 (2011): 277-99.
- De Groot, A. M. B., and G. Nas. "Lexical Representation of Cognates and Noncognates in Compound Bilinguals." *Journal of Memory and Language*. 30.1 (1991): 90-123.
- Durgunoglu, A., and H. Roediger. "Test Differences in Accessing Bilingual Memory." *Journal of Memory and Language*. 26.4 (1987): 377-91.
- Greidanus, T., and L. Nienhuis. "Testing the Quality of Word Knowledge in a Second Language by Means of Word Associations: Types of Distractors and Types of Associations." *The Modern Language Journal*. 85.4 (2001): 567-77.
- Jiang, S. "Chinese Word Associations for English Speaking Learners of Chinese as a Second Language." *Journal of Chinese Language Teachers Association*. 37.3 (2002): 55-70.
- Keatley, C., J. Spinks, and B. Gelder. "Asymmetrical Cross-Language Priming Effects." *Memory and Cognition*. 22.1 (1994): 70-84.
- Kim, J-S., and C. Davis. "Korean Cognate Phonological Activation Task Effects in Masked Cross-script Translation and Phonological Priming." *Journal of Memory and Language*. 49.4 (2003): 484-99.
- Kim, Jung-Tae. "Quantitative Analyses of Word Association by Korean Learners of English." *English Language and Linguistics*. 17.1 (2011): 107-31.
- Kim, Youngsang. "Unraveling EFL Learners' Willingness to Communicate and Variables Germane to the WTC." *The Journal of Modern British & American Language & Literature*. 30.3 (2012): 23-44.
- Kolers, P. A. "Interlingual Word Associations." *Journal of Verbal Learning and Verbal Behavior*. 2.4 (1963): 291-300.
- Kroll, J. F., and E. Stewart. "Category Interference in Translation and Picture Naming: Evidence for Asymmetric Connections between Bilingual Memory Representations." *Journal of Memory and Language*. 33.2 (1994): 149-74.



- Kruse, H., J. Pankhurst, and M. Sharwood Smith. "A Multiple Word Association Probe in Second Language Acquisition Research." *Studies in Second Language Acquisition*. 9.2 (1987): 141-54.
- Kudo, Y., and D. Thagard. "Word Association in L2 Vocabulary." *University of Hawaii Working Papers in ESL*. 17.2 (1999): 75-105.
- Kweon, Soo-Ok. "Investigating Conceptual Mediation in L2 Vocabulary Acquisition Using False Memories." *Korean Journal of Applied Linguistics*. 28.2 (2012): 1-25.
- Lee, Jun Kyu. "Estimating the Strength of Second Language Word Association with Reference to Reaction Times." *Eoneohag*. 61 (2011): 243-61.
- Lee, Jinkyong. "The Assessment of Primary English Learners' Qualitative Vocabulary Knowledge by Word-Association Test." *Modern English Education*. 9.3 (2008): 189-214.
- McCormack, P. D. "McCormack; Bilingual Linguistic Memory: The Independence-interdependence Issue Revisited." *Bilingualism: Psychological, Social and Educational Implications*. Ed. P. A. Hornby. New York: Academic Press, 1977. 57-66.
- Meara, P. "Learners' Word Association in French." *International Studies Bulletin (Utrecht)*. 3.2 (1978): 192-211.
- Meara, P. "Word Associations in a Foreign Language: a Report on the Birkbeck Vocabulary Project." *The Nottingham Linguistic Circular*. 11.2 (1982): 29-38.
- Meara, P. *Connected Words: Word Associations and Second Language Acquisition*. Amsterdam: John Benjamins, 2009.
- Meara, P., and B. Wolter. "V-links: beyond Vocabulary Breadth." *Angels on the English Speaking World*. 4 (2004): 85-96.
- Nam, Hyunjeong. "Konglish, Korean L2 Learners' Unique Interlanguage : Its Definition, Categories and Lexical Entries." *Korean Journal of Applied Linguistics*. 26.4 (2010): 275-308.
- Nam, Hyun-Jeong. "Konglish Phenomenon: L1 Activation in L2." *English Teaching*. 66.4 (2011): 191-211.
- Namei, S. "Bilingual Lexical Development: a Persian-Swedish Word Association Study." *International Journal of Applied Linguistics*. 14.3 (2004): 363-88.
- Nissen, H. B., and B. Henriksen. "Word Class Influence on Word Association Test Results." *International Journal of Applied Linguistics*. 16.3 (2006): 389-408.
- Piper, T. H., and P. E. Leicester. *Word Association Behavior as an Indicator of*

- English Language Proficiency*. ERIC Document ED 227 651, 1980.
- Potter, M. C., K. F. So, B. Von Eckardt, and L. B. Feldman. "Lexical and Conceptual Representation in Beginning and Proficient Bilinguals." *Journal of Verbal Learning and Verbal Behavior*. 23.1 (1984): 23-38.
- Read, J. "The Development of a New Measure of L2 Vocabulary Knowledge." *Language Testing*. 10.3 (1993): 355-71.
- Schmitt, N. "Quantifying Word Association Responses: What is Native-like?." *System*. 26.3 (1998): 389-401.
- Schmitt, N., and P. Meara. "Researching Vocabulary through a Word Knowledge be Defined?." *Vocabulary in a Second Language : Selection, Acquisition, and Testing*. Eds. P. Bogaards and B. Laufer. Philadelphia: John Benjamins, 1997. 209-27.
- Söderman, T. "Word Associations of Foreign Language Learners and Native Speakers: The Phenomenon of a Shift in Response Type and Its Relevance for Lexical Development." *Near-native Proficiency in English*. Ed. H. Ringbom. Abo, Finland: Abo Akademi University, 1993. 91-189.
- van Vlack, Stephen P. "The Lexical System of Korean EFL Learners: Revelations from Word Association Tests." *Korean Journal of Applied Linguistics*. 29.4 (2013): 221-48.
- Wilks, C., and P. Meara. "Untangling Word Webs: Graph Theory and the Notion of Density in Second Language Word Association Networks." *Second Language Research*. 18.4 (2002): 303-24.
- Wolter, B. "Lexical Network Structures and L2 Vocabulary Acquisition: The Role of L1 Lexical/conceptual Knowledge." *Applied Linguistics*. 27.4 (2006): 741-47.
- Wolter, B. "Assessing Proficiency through Word Associations: Is There Still Hope?" *System*. 30.4 (2002): 547-62.
- Zareva, A. "Structure of the Second Language Mental Lexicon: How does it Compare to Native Speakers' Lexical Organization." *Second Language Research*. 23.2 (2007): 123-53.

## Appendix A: Oral Stimulus

After you hear a word, fill in all the blanks with the English words that pop into your head. There are no right or wrong answers. (You will have 30 seconds to respond to each word)

1. \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_.

(The rest is omitted)

## Appendix B: Written Stimulus

Fill in each blank space with the first English word you think of when you read the word. There are no right or wrong answers. (You will have 45 seconds for each word)

1. report\_\_\_\_, report\_\_\_\_, report\_\_\_\_, report\_\_\_\_, report\_\_\_\_
2. sharp\_\_\_\_, sharp\_\_\_\_, sharp\_\_\_\_, sharp\_\_\_\_, sharp\_\_\_\_
3. bond\_\_\_\_, bond\_\_\_\_, bond\_\_\_\_, bond\_\_\_\_, bond\_\_\_\_
4. coating\_\_\_\_, coating\_\_\_\_, coating\_\_\_\_, coating\_\_\_\_, coating\_\_\_\_
5. skin\_\_\_\_, skin\_\_\_\_, skin\_\_\_\_, skin\_\_\_\_, skin\_\_\_\_
6. complex\_\_\_\_, complex\_\_\_\_, complex\_\_\_\_, complex\_\_\_\_, complex\_\_\_\_
7. handle\_\_\_\_, handle\_\_\_\_, handle\_\_\_\_, handle\_\_\_\_, handle\_\_\_\_
8. band\_\_\_\_, band\_\_\_\_, band\_\_\_\_, band\_\_\_\_, band\_\_\_\_
9. reform\_\_\_\_, reform\_\_\_\_, reform\_\_\_\_, reform\_\_\_\_, reform\_\_\_\_
10. villa\_\_\_\_, villa\_\_\_\_, villa\_\_\_\_, villa\_\_\_\_, villa\_\_\_\_
11. TV\_\_\_\_, TV\_\_\_\_, TV\_\_\_\_, TV\_\_\_\_, TV\_\_\_\_
12. meeting\_\_\_\_, meeting\_\_\_\_, meeting\_\_\_\_, meeting\_\_\_\_, meeting\_\_\_\_
13. notebook\_\_\_\_, notebook\_\_\_\_, notebook\_\_\_\_, notebook\_\_\_\_, notebook\_\_\_\_
14. walker\_\_\_\_, walker\_\_\_\_, walker\_\_\_\_, walker\_\_\_\_, walker\_\_\_\_
15. promise\_\_\_\_, promise\_\_\_\_, promise\_\_\_\_, promise\_\_\_\_, promise\_\_\_\_

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