

# Linguistic Relativity: Evidence from Native Korean and English Speakers and Factors Affecting Its Extent\*

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**Nam, Hyun-Jeong. 2017. Linguistic Relativity: Evidence from Native Korean and English Speakers and Factors Affecting Its Extent.** *The Journal of Studies in Language* 32.4, 713-732. This study explores how linguistic relativity of a language affects the cognition of its speakers. The findings show compelling evidence supporting linguistic relativity. The way that native Koreans perceive objects was found to be different from that of native English speakers. The factors affecting the extent of linguistic relativity are the test type and the language exposure in the target culture. The linguistic test seems to trigger the path between the language and the cognition more directly than the non-linguistic test where the cognitive activity may bypass any linguistic encoding. The effect of English proficiency did not reach the statistical significance; however, the cultural exposure revealed a positive effect on linguistic relativity. (Dong-A University)

Key words: linguistic relativity, cognition, similarity test, picture naming, language exposure

## 1. Introduction

We, humans, use our languages to communicate with each other and describe the world around us. This undeniable statement raises a fundamental question: given the fact that two languages describe the material world differently, can people speaking one language perceive the world differently from people speaking another language? Considering that languages can be used for cognition, it can be argued that people speaking different languages may think differently.

The issue concerning the effect of language on cognition is known as

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'linguistic relativity' (Whorf, 1956), and also known as the Sapir-Whorf hypothesis. This profound question has long intrigued not only researchers in linguistics but also scholars in anthropology and psychology. The past few decades in particular, have seen vigorous discussions to verify the hypothesis, yet a consensus has not been reached on whether a language completely determines how people think.

The aim of this study is to explore whether the thinking patterns of native Korean speakers differ from those of native English speakers, and further to investigate if Korean speakers' linguistic knowledge and language exposure in an English-speaking culture may influence their cognition. The present study also includes careful considerations of the test types used in empirical research of linguistic relativity.

## 2. Literature Review

### 2.1 Empirical evidence supporting linguistic relativity

The linguistic relativity in a moderate version suggests that a language affects cognition and in a strong version that language determines thought (Whorf, 1956). Wolff and Holmes (2011, p.253) claim that meanings are different across languages, and they affect how speakers of a language "perceive and conceptualize the world", and thus "speakers of different languages think differently".

Since Whorf (1956), linguistic relativity has been supported by many researchers (e.g., Boroditsky, 2001; Bowerman, 1996; Levinson, 1996; Lucy, 1992). Efforts to obtain empirical evidence for linguistic relativity have been made in various domains as follows.

First, spacial relations across languages have been investigated by many researchers. Choi and Bowerman (1991) found semantic categories specific to language in the description of spatial events. In their study, English-speaking toddlers described the containment events as "in" and the support events as "on" with no differentiation of tight- from loose-fit while Korean-speaking toddlers' description as "kkita" was mainly based on tight-fit regardless of the containment and the support events. McDonough, Choi, and Mandler (2003) also examined the spatial

domain of linguistic relativity. They measured the time spent looking at tight- and loose-fit scenes on a computer screen and found the language specific spatial distinctions from pre-linguistic infants. Furthermore, Levinson (1996) obtained the evidence for linguistic relativity in a spatial orientation task. It was found that Tzeltal speakers used absolute reference (e.g., north/south) in spatial description while Dutch speakers used relative spatial reference (e.g., right/left).

Second, conceptualizing time may differ across languages. According to Boroditsky (2001), English speakers describe time using horizontal spatial relations (e.g., forward/before) while Mandarin speakers use vertical metaphors (e.g., up/down) as well as the horizontal spatial relations. It was found that the stimuli in a vertical layout expedited Mandarin speakers' performance, but not the English speakers'.

Third, different distinction of shapes and substances between languages has also been studied. Lucy and Gaskins (2001) suggest that Yucatec Mayan does not have clear distinction of singular and plural forms which is evident in English. In a similarity task, material match was prevalent among Yucatec Mayans while the match was based on its shape for English speakers.

Fourth, Forbes et al. (2008) tested how grammatical gender in languages influences bilinguals' conceptual gender. In a non-linguistic gender attribution task, French-English and Spanish-English bilinguals different from English monolinguals, judged people, animals, and objects' gender in accordance with the grammatical gender that their languages prescribe.

Fifth, color categorization may be different across languages. Roberson, Hanley and Pak (2008) found in a visual search task that Korean speakers but not English speakers categorized colours based on Korean, in particular, *yeondu* (yellow-green) and *chorok* (green).

The last domain of research on linguistic relativity is object naming and classification. Malt, Sloman, and Gennari (2003) observed that English, Chinese, and Spanish speakers used different linguistic categories of various types of container in a naming task (e.g, *jar*, *bottle*, *box*). It should be noted that the group difference was not evident in a similarity judgement task (p.93). This may suggest the test type effect on research concerning linguistic relativity, which will also be examined in the present study.

## 2.2 A more complemented approach to linguistic relativity

The claim of linguistic relativity, the effect of language on thought has been challenged (e.g. Li & Gleitman, 2002; Tsel & Altarribal, 2008; Pinker, 1994). The harshest criticism came from Pinker (1994) using rather an aggressive term “all wrong”(p. 57). However, it is the extreme version known as ‘linguistic determinism’ that has invited the criticism most. In this regard, a moderate view on linguistic relativity seems more convincing. For example, Wolff and Holmes (2011, p.255) suggest that “the connection between thought and the world is tighter than the connection between thought and language”. Casasanto (2008, p.75) implies that “language can shape the way people think even if they do not think in language”.

Another crucial point needed for the more complemented approach to linguistic relativity is that the evidence for or against linguistic relativity obtained from linguistic tests can not be used to verify the hypothesis in the same way as the evidence from non-linguistic tests. There has been some research yielding contradictory results from linguistic and non-linguistic tests. For example, Munnich and Landau (2003) found the effect of language on linguistic representations but not on nonlinguistic representations. Munnich, Landau, and Doshier (2001) also observed the difference between Korean and English speakers in the naming task but merely in the memory test. Similarly, in Ameen, Storms, Malt, and Sloman’s (2005) study French-speaking and Dutch-speaking Belgians revealed the difference in the naming task (linguistic test) but not in the similarity judgements (non-linguistic test).

## 2.3 Research concerning native Korean speakers

There has been some research of linguistic relativity concerning native Koreans. One of such studies is Choe’s (2015). In his picture description and recall test, Korean speakers were found to focus more on background details than English speakers. In addition, Robersona, Hanley, and Pak (2009) examined color categories that are uniquely developed in Korean language. Evidence for linguistic relativity was found in Korean speakers’ categorical color perception.

The linguistic relativity which is actively discussed abroad has not intensely been studied in Korea. Moreover, the majority of the body of research in Korea seems to focus on cross-linguistic difference limited to discrete language domains such as semantics and syntax. Thus, there is a need for extensive research and it should include the comparison of linguistic and non-linguistic evidence in the discussion of linguistic relativity. The aim of the present study is to explore linguistic relativity both in linguistic and non-linguistic tests and the factors affecting its extent.

#### Research questions

1. Is there any difference between native speakers of Korean and native speakers of English in a non-linguistic test?
2. Is there a difference between Korean English learners and native speakers of English in a linguistic test?
3. Does the test type affect the extent of the difference?
4. Do the Korean speaker's linguistic knowledge and language exposure in an English-speaking culture affect the extent of the difference?

### 3. Method

#### 3.1 Participants

A total of 108 participants (81 Native Korean speakers and 27 native English speakers) participated in the study. The Korean participants were 20 mono-lingual Koreans and 61 Korean English bilinguals/learners. Twenty mono-lingual Koreans were senior citizens who had never learned English and 61 Korean English bilinguals/learners were Koreans attending local universities in Korea. The 61 Korean English bilinguals/learners were further divided into three groups according to their English proficiency. The participants' TOEIC scores ranged from 250 to 580 in the low proficiency group, from 700 to 790 in the mid proficiency group, and from 900 to 980 in the high proficiency group. Twenty seven native English speakers were American, British, Australian, Canadian, and Irish nationals. Twenty of those participants were in Korea and seven English speakers were in English-speaking countries while the study was being conducted.

### 3.2 Materials and procedure

A similarity judgement task was adopted for the non-linguistic test (e.g., Lucy & Gaskins, 2001; Malt, Sloman, & Gennari, 2003). Since a naming task (e.g., Ameer, Storms, Malt, & Sloman, 2005; Munnich, Landau, & Doshier, 2001) requires certain knowledge of English and thus can be too demanding for low proficiency participants to complete the task, it was converted into a word choice task for the linguistic test.

The items where (non)linguistic difference may possibly be expected were collected for the test. The items, 'easy chair' and 'jar' were adopted from Malt, Sloman, and Gennari (2003, p.88), and the item 'steering wheel' was from Nam (2014, appendix B). The rest of the items were obtained from the researcher's personal observation and teaching experience.

<Figure 1> List of items for the test

- |     |                    |
|-----|--------------------|
| 1.  | Bell peppers       |
| 2.  | Easy chair         |
| 3.  | Cookie jar         |
| 4.  | Eye of the potato  |
| 5.  | Eye of a needle    |
| 6.  | Camel's hump       |
| 7.  | Corn dog           |
| 8.  | Mole (on the face) |
| 9.  | Plastic bag        |
| 10. | Wood               |
| 11. | Rice               |
| 12. | Steering wheel     |
| 13. | Bubble             |
| 14. | Bow tie            |
| 15. | Cheery tomatoes    |

The tests were conducted with the following procedure. First, in the non-linguistic test (similarity judgement task) a sample guide for the test was provided in a form of visual diagram to help the participants understand the task. The participants were asked to select an item which, they perceive, had any relevance or similarity to the target item (stimulus). For example, a picture of a glass jar on the left (stimulus)

was provided while on the right there were a picture of a glass bottle and a picture of a ceramic jar. The participants were asked to draw a line connecting the two pictures with any ‘perceived’ similarity. In the linguistic test (word choice task) they were requested to choose the better description in English of the target items in the picture.

### 3.3 Data collection and analysis

All responses were collected manually and organized using Microsoft Excel program according to the test types and the language the participants spoke. For analysis, the data were fed to the statistics program SPSS 23. First, independent samples *t*-test was used to examine the difference between native Korean and English speakers. Second, a one-way between-groups analysis of variance (ANOVA) was conducted to compare Korean monolinguals, Korean English bilinguals/learners, and native English speakers. Third, paired-samples *t*-test was conducted to compare the difference of test type (non-linguistic and linguistic test). Fourth, Pearson product-moment correlation coefficient was used to investigate the relationship between language exposure in the English-speaking culture and linguistic relativity.

## 4. Results

As for the research question one, native speakers of Korean and English were compared in the non-linguistic test.

<Table 1> Independent-samples *t*-test: Comparison between Korean and English speakers in the non-linguistic test

		Group Statistics			
Non-linguistic test	Group	N	Mean <sup>1)</sup>	Std. Deviation	Std. Error Mean
Linguistic relativity	English speakers	27	10.93	2.22	.43
	Korean speakers	81	5.17	2.08	.23

## 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	1.48	.23	12.25	106	.00	5.75	.47	4.82	6.68
Equal Variance Not Assumed			11.86	42.28	.00	5.75	.49	4.77	6.73

In Table 1, an independent-samples *t*-test was conducted to compare native speakers of Korean and native speakers of English in the non-linguistic test. There was a significant difference for Korean speakers ( $M=5.17$ ,  $SD=2.08$ ) and for English speakers [ $M=10.93$ ,  $SD=2.22$ ;  $t(106)=12.25$ ,  $p=.00$ , two-tailed<sup>2)</sup>]. The magnitude of the differences in the means was large ( $\eta^2=.59$ ).

<Table 2> Comparison of Korean monolinguals, Korean English speakers, and Native English speakers

	N	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		Min	Max
					Lower	Upper		
1	27	10.93	2.22	.43	10.05	11.80	7	14
2	61	5.48	2.09	.27	4.94	6.01	2	13
3	20	4.25	1.80	.40	3.41	5.09	2	7
Total	108	6.61	3.27	.32	5.99	7.23	2	14

- 1) The similarity judgement task has 15 questions. 15 means that all judgements are influenced by their native languages.
- 2) The significance level of Levene's test is larger than  $p=.05$ , which refers to equal variances assumed.
- 3) Cohen's *d* was used for the effect size statistics. It was calculated by hand using the formula.  $\eta^2 = \frac{t^2}{t^2 + (N_1 + N_2 - 2)}$



A one-way between-groups analysis of variance (ANOVA) was conducted to compare native English speakers (group 1), Korean English bilinguals/learners (group 2), and Korean monolinguals (group 3). There was a statistically significant difference at the  $p < .05$  level in linguistic relativity for the three groups  $F(2, 105) = 80.69, p = .00$ . The difference in mean scores between the groups was very large. The effect size, calculated using eta squared<sup>4)</sup>, was .61. Post-hoc comparisons using the Tukey HSD test indicated that the mean score for Group 1 (native English speakers) ( $M = 10.93, SD = 2.22$ ) was significantly different from Group 2 (Korean English bilinguals/learners) ( $M = 5.48, SD = 2.09$ ) and Group 3 Korean monolinguals ( $M = 4.25, SD = 1.80$ ).

<Table 3> Independent-samples *t*-test: Comparison between Korean English learners and English speakers in linguistic test

Group Statistics									
Linguistic test		N	Mean	Std. Deviation	Std. Error Mean				
Linguistic relativity	English speakers	27	14.41	.64	.12				
	Korean English learners	61	7.49	2.20	.28				
Independent-samples <i>t</i> -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	20.68	.00	15.97	86	.00	6.92	.43	6.06	7.78
Equal Variance Not Assumed			22.49	78.32	.00	6.92	.31	6.30	7.53

4) Eta squared =  $\frac{\text{Sum of squares between groups}}{\text{Total sum of squares}}$

To answer the research question two, Table 3 shows a difference between Korean English bilinguals/learners and native speakers of English in the linguistic test. Since the linguistic test requires English knowledge, Korean monolinguals were excluded in the test. An independent-samples *t*-test was conducted and there was a significant difference in linguistic relativity for Korean English bilinguals/learners ( $M=7.49, SD=2.20$ ) and for native English speakers [ $M=14.41, SD=.64; t(78.32)=22.49, p=.005$ ]. The magnitude of the differences in the means was very large (eta squared<sup>6</sup>)=.86).

<Table 4> Paired Sample Statistics: Comparisons of Korean English learners between non-linguistic and linguistic test

Korean English learners		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Non-linguistic test	5.48	61	2.09	.27
	Linguistic test	7.49	61	2.20	.28

Paired Sample Test

		Paired Differences			95% Confidence Interval of the Difference		t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	Lower	Upper			
Pair 1	Non-linguistic - linguistic test	-2.02	1.99	.25	-2.53	-1.51	-7.92	60	.00

As for the research question three, Table 4 and 5 show the effect of the test types on the extent of linguistic relativity. In Table 4, a paired-samples *t*-test was conducted to compare Korean English learners in the non-linguistic and linguistic test. There was a statistically significant increase in linguistic relativity from the non-linguistic test ( $M=5.48, SD=2.09$ ) to the linguistic test ( $M=7.49, SD=2.20$ ),  $t(60)= -7.92, p<.001$  (two-tailed). The eta squared statistic<sup>7</sup>

5) The significance level of Levene’s test is  $p=.05$  or less, which refers to “equal variances not assumed”.

6) Cohen’s *d* was used for the effect size statistics. It was calculated by hand using the formula.  $\eta^2 = \frac{t^2}{t^2+(N1+N2-2)}$

(.51) indicated a large effect size.

<Table 5> Paired Sample Statistics: Comparisons of English speakers between non-linguistic and linguistic test

English speakers		Mean	N	Std. Deviation	Std. Error Mean				
Pair 1	Non-linguistic test	10.93	27	2.22	.43				
	Linguistic test	14.41	27	.64	.12				

  

Paired Sample Test										
		Paired Differences					t	df	Sig. (2-tailed)	
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference					
					Lower	Upper				
Pair 1	Non-linguistic—linguistic test	-3.48	2.06	.40	-4.30	-2.67	-8.77	26	.00	

A paired-samples t-test was conducted to compare native English speakers in the non-linguistic and linguistic test. As shown in Table 5, there was a statistically significant increase in linguistic relativity from non-linguistic test (M=10.93, SD=2.22) to linguistic test (M=14.41, SD=.64),  $t(26)=-8.77$ ,  $p<.001$  (two-tailed). The eta squared statistic (.75) indicated a large effect size.

In order to answer the research question four regarding the effect of linguistic knowledge and cultural exposure on linguistic relativity, first ANOVA was conducted to investigate the difference of linguistic relativity among Korean English bilinguals/learners with different English proficiency. There was a difference at the  $p<.05$  level in linguistic relativity for low, mid, and high proficiency groups:  $F(2, 58)=2.54$ ,  $p=.09$  in the non-linguistic task and  $F(2, 58)=19.91$ ,  $p=.00$  in the linguistic task. However, the difference did not reach statistical significance. Second, the relationship between language exposure in the English-speaking culture and linguistic relativity was investigated using Pearson product-moment correlation coefficient.

$$7) \text{ eta squared} = \frac{t^2}{t^2 + (N-1)}$$

<Table 6> Correlations between cultural exposure and linguistic relativity in the non-linguistic test

	Cultural exposure	Linguistic relativity in non-linguistic test
Pearson Correlation	1	.35**
Sig. (2-tailed)		.01
N	61	61

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

As shown in Table 6, there was medium, positive correlation between the two variables,  $r=.35$ ,  $n=61$ ,  $p<.001$ , with higher extent of language exposure in the target culture associated with higher extent of linguistic relativity in the non-linguistic test.

<Table 7> Correlations between cultural exposure and linguistic relativity in the linguistic test

	Cultural exposure	Linguistic relativity in linguistic test
Pearson Correlation	1	.45**
Sig. (2-tailed)		.00
N	61	61

The relationship between language exposure in the English-speaking culture and linguistic relativity was also evident in the linguistic test. As shown in Table 7, there was medium, positive correlation between the two variables,  $r=.45$ ,  $n=61$ ,  $p<.001$ , with higher extent of language exposure in the target culture associated with higher extent of linguistic relativity in the linguistic test.

## 5. Discussion

### 5.1 Evidence supporting linguistic relativity

The present study yielded compelling evidence to support linguistic relativity. The way that speakers of one language perceive the world is different from those of another language. The findings of the present

study can be summarized as follows.

As for the first research question, there was a difference between native speakers of Korean and English in the non-linguistic test. In a similarity judgement task where no linguistic cues were provided, there was a difference between the way native Korean speakers perceived the similarity of the items in the pictures and that of native English speakers. For example, the judgement that the item 'a leather easy arm chair' is similar to 'a wooden chair' was made more by native English speakers while the similarity of the item to 'a leather sofa' was perceived more by native Koreans.

The research question two concerning the linguistic relativity in the linguistic test was answered. Since the word naming task in English requires a certain level of English proficiency, many Korean English learners with low English proficiency failed to complete the picture naming task in the preliminary research. Therefore in this study the word choice task converted from the naming task was adopted in the linguistic test. For example, for the picture of 'a leather easy arm chair' the participants were asked to select the word either *chair* or *sofa*. There was a significant difference in linguistic relativity for Korean English learners ( $M=7.49$ ,  $SD=2.20$ ) and for native English speakers [ $M=14.41$ ,  $SD=.64$ ;  $t(78.32)=22.49$ ,  $p=.00$ ].

Smith and Medin (1981, p.8) state, "concepts have a categorization function". Further Györi (2000, p.75) suggests that native language may influence the way people develop the categories. This may explain why the item of 'a corn dog' in the present study was perceived as 'a hot dog' by most of the Korean participants. Although the Korean word  $\text{ 핫도그}$  (a hot dog) is a loanword from English, it is fully integrated into Korean lexicon since the word is commonly used by Korean monolinguals as well. Although Koreans have experienced both a hot dog and a corn dog as a snack in Korea, the refined categories for the two words have not yet developed in the Korean language. Thus the English word *hot dog* was selected by many Koreans due to the native language influence.

Casasanto (2008, p.75) found that spatial metaphors reflecting time may vary in languages, and thus the difference affects the way the time is conceptualized by speakers of different languages. The influence of

metaphorical semantic representation in the native language may also be found in the current study. The finding that the item 'eye of the needle' was perceived as a 'hole of the needle' by many Koreans suggests the influence of metaphorical representation in the native language.

## 5.2 Factors affecting the extent of linguistic relativity

### 5.2.1 Test types

As for the research question three, there was a significant increase in linguistic relativity from the non-linguistic test (Koreans  $M=7.49$ ,  $SD=2.20$ ; English speakers  $M=10.93$ ,  $SD=2.22$ ) to the linguistic test (Koreans  $M=5.48$ ,  $SD=2.09$ ; English speakers  $M=14.41$ ,  $SD=.64$ ),  $t(26)=-8.77$ ,  $p<.001$  (Koreans) and  $t(60)=-7.92$ ,  $p<.001$  (English speakers). The findings indicate that the test type may affect the extent of linguistic relativity. This sensitivity of test type may explain the contradictory results from the linguistic and the non-linguistic test (Ameel, Storms, Malt, & Sloman, 2005; Munnich & Landau, 2003; Munnich, Landau, & Doshier, 2001).

In the present study the evidence from the linguistic test was more conclusive than that from the non-linguistic test. In addition to the evidence from the paired-samples  $t$ -test, the effect size of the independent-samples  $t$ -test was found to be larger in the linguistic test (.86) than the non-linguistic test (.59), which also implies the bigger difference between native Korean and English speakers in the linguistic test than in the non-linguistic test. This is in line with the findings of Munnich, Landau, and Doshier (2001) that the linguistic test (naming task) yielded more significant difference between Korean and English speakers than the non-linguistic test (memory task for spatial locations). Malt, Sloman, and Gennari (2003, p.102) state that "language affects thought when it is used as a tool for thought". Different from the non-linguistic test, the linguistic information provided in the linguistic test may have been used as additional cues for triggering language-specific concepts.

More extreme results according to the test type can be found in Ameel, Storms, Malt, and Sloman (2005). The difference between French-speaking and Dutch-speaking Belgians' responses was notable in

the linguistic test (naming) but insignificant in the non-linguistic test (similarity judgements). Although different from their evidence limited to the linguistic test, the present study yielded weaker yet convincing evidence in the non-linguistic test as well. Since some concepts are more susceptible to language than others (Pavlenko, 2002, p.79), the sensitivity of concepts to language in one study may be different from another.

### 5.2.2 Linguistic knowledge and cultural exposure

The findings regarding linguistic knowledge and cultural exposure diverge greatly. There was a difference among Korean English learners in the low, mid, and high proficiency groups both in the non-linguistic test ( $F(2,58)=2.54, p=.09$ ) and in the linguistic test ( $F(2,58)=19.91, p=.00$ ); however, it did not reach statistical significance.

To understand the findings that linguistic knowledge did not contribute to statistically significant differences, Korean English learners' language exposure in classroom settings should be considered first. Given Casasanto and Bottini's finding (2014, p.477) that the manipulated exposure to a new concept affected participants' spatial representations of time, the exposure may influence the conceptual change. This is in line with Odlin's (2010, p.183) emphasis on the "interdependence of conceptual transfer and relativity studies". In order for the conceptual transfer to emerge in the learning process, new concepts should be introduced and then restructured. The process of conceptual change entails "internalization of L2-based concepts", "restructuring", "convergence", "shift from L1- to L2 based conceptualization", and "attrition of previously learned concepts" (Pavlenko, 2002, p.80). Provided that Korean English learners' exposure to English is limited to 'L1-inducing learning environment in Korea', it may not be sufficient for the restructuring process in cognition (Nam, 2011, p.208). In addition, there is also a possibility that TOEIC score used to gauge their linguistic knowledge in this study may have obtained through strategic test preparation. These may explain why many Korean English learners even with high English proficiency followed L1 cognitive patterns in the test.

Considering that language experience is not limited to learning linguistic knowledge in classroom settings (e.g., Kim, 2015; Park & Oh,

2015), language exposure in the English-speaking culture should also be taken into consideration. The findings in the present study suggest that cultural exposure overrides linguistic knowledge. Although the results of the linguistic knowledge did not reach statistical significance, there was statistically significant evidence for the relationship between cultural exposure and the linguistic relativity ( $r=.35$ ,  $n=61$ ,  $p<.001$ , in the non-linguistic test;  $r=.45$ ,  $n=61$ ,  $p<.001$  in the linguistic test). This suggests that the higher extent of language exposure in the target culture is given, the higher extent of linguistic relativity is expected. Tversky, Kugelmass, and Winter's (1991) study suggesting the cross-cultural difference in cognition is worth noting in this regard. They found that Arabic speakers placed 'dinner', 'lunch', and 'breakfast' from left to right direction while English speakers arranged 'breakfast', 'lunch', and 'dinner' in the reversed order. Further revelations in the present study have indicated that cultural exposure may enable the conceptual transfer to merge.

## 6. Conclusion

In conclusion, there is compelling evidence pointing in the direction of linguistic relativity. The way that native Korean speakers perceive objects was found to be different from that of native English speakers, both in the non-linguistic and the linguistic tests. The factors affecting the extent of linguistic relativity are the test types and language exposure in the target culture. The linguistic test may trigger the path between the language and the cognition more directly than the non-linguistic test where the cognitive activity may bypass any linguistic encoding. For the native Korean speakers, the effect of English proficiency did not reach statistical significance; however, the language exposure in the English-speaking culture revealed a positive effect on linguistic relativity.

It is important to reiterate that the study takes a moderate stance of linguistic relativity as an influence and not as a determinant factor. Although the evidence from this study appears conclusive, it must be tempered with some limitations. Since the TOEIC score used in the



study may not reflect the genuine English proficiency of the participants, future studies may find a better way to evaluate the English proficiency.

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