

Syntactic Priming Effect across English and Korean in Transitive Utterances*

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Park, Boon-Joo. 2008. Syntactic Priming Effect across English and Korean in Transitive Utterances. *The Linguistic Association of Korea Journal*, 16(4), 247-265. The current study investigates syntactic priming effects across languages between Korean and English in Korean native speakers(L1) who speak English as a second language(L2). The target structures were transitive alternate structures (active vs. passive) both in English and in Korean. The experimental paradigm involved repetition of an auditory stimulus, followed by picture description. Significant effects were found for transitive constructions in English and Korean. An important aspect of the present study is that syntactic priming effect appeared between two languages that differ in word order, case-marking system, and other grammatical constructions. This study shed lights on further universal accounts of syntactic priming.

Key Words: syntactic priming effect, cross-language priming, transitive structure, Korean-English bilinguals.

1. Introduction

The syntactic priming effect can be defined as a tendency that the same syntactic structures are used by speakers from one utterance to the next utterance during the production of language. For example, if the previous utterance contains a passive or dative construction, the same syntactic structure tends to appear in the following utterance. In the language production studies, the phenomenon has been found in a

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number of studies in various paradigms such as data from natural conversational settings (Levelt & Kelter, 1982; Schenkein, 1980) and data from experimental settings (Bock, 1986; Bock & Griffin, 2000; Branigan, Pickering, Liversedge, Stewart, & Urbach, 1995; Pickering, Branigan, & McLean, 2002; Hartsuiker & Kolk, 1998a, 1998b). In addition, the evidence has been found in not only within-language priming (Bock, 1986; Bock, 1989; Bock & Loebell, 1990; Hartsuiker & Kolk, 1998a; Park, 2008 etc) but also cross-linguistic priming paradigm (Hartsuiker & Kolk, 1998b; Hartsuiker et al. 1999; Hartsuiker, Pickering, & Veltkamp, 2004; Loebell & Bock, 2003; Meijer & Fox Tree, 2003; Desmet & Declercq, 2006; Schoonbaert, Robert, & Pickering, 2007).

The current study attempts to explore if the syntactic priming effects occurs in cross-language priming paradigm between Korean and English. The important aspect of the present study is that Korean and English are typologically dissimilar languages which have rarely investigated in the previous studies. For example, there are more variations between Korean and English than the languages (German-English, Spanish-English, or Dutch-English) which have been explored in the previous studies, such as word order (SOV vs. SVO), case-marker, and alphabetical system.

2. Literature Review

2.1. Syntactic priming effect within-language

Early studies on syntactic priming have been conducted mainly within language paradigm in the first language (L1) production (Bock, 1986; Bock, 1989; Bock & Loebell, 1990, etc). Bock and her colleagues used a picture description task combined with a recognition task to investigate the syntactic priming effect, in which the participants were asked to repeat after the experimenter and to describe a picture, followed by recognition task asking whether the sentences and pictures occurred previously. This methodology has been considered as an effective method with regards to reducing participants' attentions on

their language production and the target structures and to measure their unconscious language processing. In Bock's (1986) study, active and passive transitive and dative alternative forms were investigated. The results showed significant main effects in both transitive and dative utterances, and dative structures showed a stronger priming effect than transitive structures did.

Later cross-linguistic studies have investigated syntactic persistence in other languages (Hartsuiker & Kolk, 1998a,1998b; Hartsuiker et al.1999). For example, Hartsuiker and Kolk (1998b) conducted one study in Dutch. Compared to English, Dutch allows greater variety in word order in the passive and dative. The word order is different from English in the passive and dative structures such as verb-final passive and medial dative. The examples are shown in (1).

(1) a. Verb-final Passive (P2)

De wandelaar wordt door de modder bevuild.

The walker is by the mud dirtied

'The walker is by the mud dirtied.'

b. Medial Dative (MM)

De zeeman schrijft aan zijn vriendin een lange brief.

the sailor writes a long letter to his girlfriend.

'The sailor writes his girlfriend a long letter '

Hartsuiker and Kolk (1998b) attempted to explore the priming effects on three types of transitives such as active, passive (P1), and verb-final passive(P2) constructions, and three types of datives such as prepositional dative (PP), double-object dative (DO), and medial dative (MM) constructions. In their finding, significant priming effects were obtained on dative structures especially DO and MM, and weak priming effects were observed on passives. The results were similar to the results from other studies in English (Bock, 1986, 1989; Bock & Loebell, 1990). However, they did not obtain significant priming effects for transitive pictures (i.e. no increase in the rate of production of passives). Hartsuiker and Kolk (1998b) attributed this result to cross-linguistic

differences. They suggested that, compared to English, Dutch has a weaker correlation between having a patient in a subject position and putting passive morphology in appropriate word order. Also, pragmatic impact was proposed. Compared to dative alternation, passivization might be more influenced by pragmatic factors. According to Cornelis' (1997) explanations, which Hartsuiker and Kolk (1998b) cited, there are differences in passivization between English and Dutch such as allowing a subjectless passive in Dutch (e.g., *Er werd gelachen*, lit 'There was laughed') and the more flexible word order in passive in Dutch than in English. For example, having a by-phrase at the beginning of a passive structure is allowed in Dutch passives (cited in Hartsuiker and Kolk, 1998).

2.2. Syntactic priming effect across languages

Moreover, recent studies have investigated the syntactic priming effect in cross-language priming paradigm with bilinguals. They explored whether syntactic representations are shared or not in bilinguals. A few studies have shown some evidence of syntactic priming effects using a cross-language prime: English-German (Loebell & Bock, 2003), English-Dutch (Desmet & Declercq, 2006; Scheenbaert et al., 2007), and English-Spanish (Meijer & Fox Tree, 2003; Hartsuiker et al., 2004).

For an instance, Hartsuiker, et al. (2004) conducted a cross-language syntactic priming study with English-Spanish bilinguals. They hypothesized that priming effects across languages showed shared syntactic information between the two languages. Hereby, they investigated if syntactic priming occurred between languages in Spanish-English Bilinguals. The methodology used in this experiment was a dialogue pattern of picture describing pattern between the native participant of Spanish and the confederate (a native English speaker). The script of sentences were provided for the confederate and the confederate pretended to describe the pictures but he/she read aloud in Spanish. On the other hand, the participant described the pictures to the confederate in English. Based on the linguistic similarity between the

two languages (English and Spanish) in active and passive constructions, they investigated if syntactic priming occurred between languages. The prime sentences consisted of Spanish active and passive transitive sentences and Spanish intransitive sentences (active sentences without direct objects) and active sentences with object-verb-subject word order (different from English). Reliable cross-linguistic syntactic priming effects were shown in the results. Spanish-English bilinguals tend to produce higher frequency of English passive sentences following a Spanish passive sentence than following a Spanish intransitive or active sentence. This result indicated that people who spoke two languages in which the elicited structure was similar (e.g. English-Spanish) were more likely to use the same syntactic processes/structures. Meijer and Fox Tree (2003) also found syntactic priming for dative priming from English-Spanish bilinguals in a sentence recall task.

Also, Loebell and Bock (2003) investigated the effect with English and German bilinguals. They investigated the syntactic priming across languages both German primes with English picture descriptions and vice versa. The significant priming effects appeared for the dative (stronger in double-object dative than in prepositional dative). However, the effects were not significant in the passive structure. Loebell and Bock (2003) proposed two factors that might be attributed to: one, frequency effect which might influence the more frequently produced form, and two, the cross-linguistic differences between languages, because the main verb occurs at the end of sentences in German.

A more recently, Schoonbaert et al.(2007) conducted a cross language syntactic priming experiment on dative alternations with English-Dutch bilinguals by using a dialogue game. They manipulated verb types (identical vs. unrelated) within languages, within L2 (Experiment 1) and within L1 (Experiment 3) to see the *lexical boost* effect, in which the identical verbs would boost the syntactic priming effects or not. Also, they also explored the translation-equivalent effect between languages (L1 to L2, L2 to L1). They found the reliable priming effects within languages, in L2 production as well as L1

production. Also they found that the identical verbs boosted the syntactic priming effects. Regarding between languages, they found the priming effects from L1 to L2 were stronger with translation equivalent verbs than those with unrelated verbs. As for the priming effects from L2 to L1, although the syntactic priming effects were observed, any translation-equivalence boost was not effective in the direction from L2 to L1.

Thus far the empirical evidence from cross-linguistic priming studies has shown that the syntactic representation is shared in the bilinguals. A question can be raised such as, what if cross-linguistic priming is between languages which are not similar in syntactic information?

With attempt to investigate this question, the current study is designed to test syntactic priming effects in a cross-language priming paradigm with Korean-English bilinguals (Korean-as-L1 and English-as-L2 speakers). This study investigates whether priming effects can occur between two languages which have transitive constructions (active and passive) but differ in word order, case-marking system, and other grammatical constructions as shown examples in (2) below.

- (2) a. The Active in English
 Mary caught Tom
 Mary-NOM Tom-ACC
- b. The Active in Korean
 Mary-ka Tom-ul chop-ess-ta.
 Mary-NOM Tom-ACC catch-PAST-DECL
- c. The Passive in English
 Tom was caught by Mary
 Tom-NOM Mary-Oblique case
- d. The Passive in Korean
 Tom-i Mary-eykey chop-hi-ess-ta.
 Tom-NOM Mary-Oblique case catch-PASSIVE-PAST-DECL
 'Tom was caught by Mary'

A finding of a persistence effect could suggest that syntactic representation might be shared across languages in the Korean dominant English bilinguals. The research questions are: 1) will a syntactic priming effect appear in the production of English(L2) transitive structures with priming in Korean(L1)? and 2) will a syntactic priming occur in the vice versa paradigm such as picture description in Korean(L1) with priming in English (L2)?

3. Method

3.1 Participants

Thirty undergraduate and graduate students (male = 16, female = 14) at the University of Arizona participated. The subjects ranged in age from 18 to 36 years with an average age of 23.16 years. Participants were paid \$10 for taking part in the 40-50 minute-long experimental session. All of the participants were native speakers of Korean who were studying at the University of Arizona as international students. They had been in the US for less than 6 years, with an average length of residence of 4.79 years according to the questionnaire survey (see Appendix I).

3.2 Materials

The experiment consisted of two sessions. One session was designed to describe the presented pictures in English(L2) followed by listen-and-repeat Korean(L1) priming sentences (English (L2) priming session hereafter). The other session was designed to elicit picture descriptions in Korean(L1) followed by listen-and-repeat English(L2) priming sentences (Korean (L1) priming session hereafter).

The whole materials for the experiment consisted of practice items (sentences and pictures), prime sentences, target pictures, and filler items(sentences and pictures). As for the English materials in English

(L2) priming session, the practice items were comprized of 7 sentences and 7 pictures, which did not include any of the experimental priming sentences or target pictures. The prime sentences were arranged to form two counterbalanced lists of 16 transitive sentences (8 Actives and 8 Passives). Additional 20 sentences and 20 pictures were inserted as filler items before and after the target items; however priming sentences and target pictures were presented consecutively. Filler items did not contained the target structures at all. The syntactic structures for the filler items contained mainly intransitive structures.


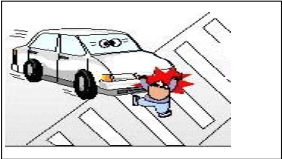
Regarding the Korean materials for Korean (L1) priming session, the practice items included 7 sentences and 7 pictures. The prime sentences contained of two counterbalanced test lists of 16 transitive sentences (8 active and 8 passive structures). Similar to the English materials, 20 sentences and 20 pictures were inserted as filler items. Target pictures in English and Korean were not the same. Also, the target pictures did not contain any information the same events and same structures in the prime sentences.

The examples of priming sentences and target pictures are shown in Table 1 for priming sentences and Figure 1 for target pictures. Appendix II included a complete list of priming sentences.

Table 1. Examples of Priming Sentences in English and Korean.

Priming Sentences in English	Priming Sentences in Korean
Active	
The government increased the price of gas.	<i>Kyungchal-i doduk-ul chap-ess-ta.</i> (‘A policeman caught the burglar’)
Passive	
The price of gas was increased by the government	<i>Doduk-i kyungchal-eykey chap-hi-ess-ta.</i> (‘The burglar was caught by a policeman’)

Figure 1. Example of Target Pictures

Target Picture	
	
<u>Picture elicitation in English</u> A ball hit a boy (Active), or A boy was hit by a ball (Passive)	<u>Picture elicitation in Korean</u> Cha-ga aiy-lul chiy-ess-ta.(Active), or (‘A car hit a child.’) Aiy-ga cha-ey chiy-i-ess-ta (Passive) (‘A child was hit by a car.’)

The pictures and sound files for sentences were inserted into slides using Microsoft Power Point software and were presented on a computer screen. All of the sentence stimuli were digitally recorded by a native speaker of English for English priming sentences and a native speaker of Korean for Korean priming sentences. The fluency and naturalness of intonation and pronunciation were checked.

3.3 Procedure

The experiment was conducted in a sound-resistant computer booth individually. All of the stimuli items were displayed on a computer screen. The priming sentences were presented auditorily and the pictures were presented in picture slides. Recognition task followed right after both priming sentence and picture presentation. The entire session was recorded on the tape-recorder. The presentation of slides was self-paced and participants could move onto the next slide when they completed the task required. The experiment consisted of two sessions: English(L2) priming session and Korean(L1) priming session. The order of these two sessions were presented randomly. A five-minute break was provided between the two sessions.

As shown in the example of procedure in Table 3, in the priming task

(listen-and-repeat task), a participant listened to the sentence by clicking the sound icon on the slide with computer mouse and repeated aloud the sentence. If participants failed in listening the sentence clearly and had difficulty in repeating the sentence aloud, they were allowed to listen again up to three times, but they were encouraged to repeat aloud just once. When the task of listen-and-repeat a sentence was completed, the recognition was followed. The participants were required to respond out loud to the question of "Has this sentence been presented before in this experiment?" The participants moved onto the next slide when they completed the task.

Table 3. Examples for Procedures in English

PRIME SENTENCE TRIAL

- Auditory presentation by clicking the sound icon

1. Subjects hear the prime sentence

" The students baked the cookies for their teacher."

2. Subjects repeat the prime sentence.

"The students baked the cookies for their teacher."

RECOGNITION DECISION (Sentence)

3. Subjects respond out loud either "yes" or "no"

PICTURE TRIAL (SENTENCE ELICITATION)

4. Subjects describe the target picture.



A ball hit a boy (Active) or
A boy was hit by a ball (Passive)

RECOGNITION DECISION (Picture)

5. Again, subjects indicate whether this picture has been presented before in the experiment.

Next, the picture description task was followed. Participants were told to describe the event shown in the picture using one complete grammatical

sentences. They were encouraged to avoid sentences 'there is...' in English or '*-issta*' in Korean as well as phrases or sentence fragments. They were encouraged to use action verbs to describe the event. Then, again, the slide for picture recognition task was presented and participants responded orally 'YES' or 'NO' in English, and '*yeah*(Yes)' or '*aniyo*(No)' in Korean.

3.4 Data Analysis

The recorded picture descriptions were transcribed and then coded according to which structure the participant used for describing the target pictures. In other words, description of the target pictures were also scored according to syntactic structures such as Active(AC), Passive(PA), and Other(OT). As for the pictures description in English, the requirement to be coded as 'Active(AC)', it had to contain an agent in subject position, a verb, and a patient in object position.. A sentence coded as a passive structure contained a patient in subject position and a verb phrase including a passive verb.

With regard to the picture description in Korean, 'Active(AC)' structure had to contain an agent in a subject position, a patient in object position, and a verb, in which the word order is different from active structure in English. In order for the utterance to be coded as 'Passive(PA)' structure, it had to contain a patient in a subject condition, and a verb phrase including a passive verb, which included the corresponding passive morpheme.

A repeated measures analysis of variance(ANOVA) was conducted. The proportions per each participant and per item were subjected to repeated measures analysis of variance, by subjects and by items (F1 and F2 respectively).

4. Results and Discussion

Among data from thirty participants, six sets of data were not qualified to the purpose of the current study, picture description in cross language. In fact, the participants used the same language as the language in the primes,

not the cross language response intended in the present study. Therefore, the analyzable data were 15 participants' data for English(L2) production with Korean(L1) priming and 19 subjects' data were analyzable for Korean (L1) production from English (L2) priming.

First of all, as for the result of production in English (L2) followed by Korean (L1) priming. The results showed that the overall syntactic priming effect was found in the transitive alternate construction in the condition of L1 priming in English. Table 4 shows the percentage of active and passive utterance produced in the two transitive priming condition across languages.

Table 4. Picture Description in English (L2) with Korean(L1) Priming

Prime Type	Korean(L1)	Types in Picture description in English(L2)		
		Active	Passive	Other
	Active	58	36	6
	Passive	48	43	9
Difference (Priming Effect)		+10*	+7*	

Note: * means significant at $p=0.05$ level

As shown in Table 4, the priming effect occurred in L2 picture description in English with L1 priming sentence in Korean (L1). In other words, participants produced more primed structure. They produced more active structure in picture description in English followed by Korean active priming sentence than by Korean passive priming sentence by 10%. A repeated measures ANOVA showed a significant main effect of prime type on the percentages in the by subjects ($F(1,13) = 11.732, p < .05$) and a marginally significant effect in the by items ($F(1,14) = 3.820, p = .071$).

The passive structure showed a similar pattern with that of active structure, Korean passive priming sentence facilitated the frequency of English passive utterances in picture description. Participants produced more English passive structures followed by Korean passive prime sentences by 7% than the case by active prime sentences. A repeated ANOVA showed a significant main effect of prime type on the proportions of passive utterances by subject-analysis ($F(1,13) = 10.348, p < .05$). Item analysis showed a main effect approaching significance ($F(1,14) = 3.545, p = 0.081$).

Regarding the other condition of L1 production (Korean) with L2 priming (English). That is to say, participants described pictures in Korean(L1) stimulated with priming sentences in English(L2). The results is shown in Table 5 below.

Table 5 Picture Description in Korean (L1) with English (L2) Priming

		Types in Picture description in Korean(L1)		
Prime	Type English(L2)	Active	Passive	Other
	Active	66	34	0
	Passive	49	50	1
Difference(Priming Effect)		+17*	+16*	

Note: * means significant at $p=0.05$ level

As shown in Table 5, the significant priming effects were observed in the utterance in L1 with L2 priming symmetrically with L2 production with L1 priming in Table 4. Participants produced more Korean active structures followed by English active prime sentences rather than the case of English passive prime sentences by 17%. A repeated measures ANOVA yielded a significant main effect on the active utterance forms both by subject-analysis ($F(1,17) = 12.139, p < .05$) and by item-analysis ($F(1,14) = 5.604, p < .05$).

With respect to the passive utterances in Korean, participants produced more Korean passive utterances facilitated by English passive prime sentences rather than English active prime sentences. The difference was 16%. ANOVA showed a significant main effect of prime type only by subject analysis ($F(1,17) = 12.214, p < .05$), not by item analysis ($F(1,14) = 2.409, p > 0.1$)

As shown in the results above, the English-L2-speakers showed symmetrical priming effects in transitive structures. Significant priming effects occurred both in L1 production with L2 priming and in L2 production with L1 priming, which means priming effects were observed across languages between Korean and English, because transitive alternative utterances were facilitated by the priming type in both directions: from English(L1) to Korean(L1) and Korean(L1) to English(L2).

The findings in the current study indicate that the typological differences between two language did not appear to influence on the priming effect. Regardless those dissimilar features, transitive structures showed priming effects across language priming between the two languages.

Also, as for the matter of the direction from priming to production, whether L2 to L1 or L1 to L2, the magnitude from L2 to L1 is a little stronger than the direction from L1 to L2 ; however, the priming effect does not seem to be influenced much.

5. Concluding Remark

This study has investigated whether the syntactic priming effect occurs in cross-language paradigm between Korean and English with Korean native speakers who have English as second language speakers. Robust syntactic priming effects were observed in transitive utterances of both Korean and English with cross-language priming.

In addition, this finding indicates that Korean-dominant English bilinguals have shared syntactic information in their language processing as far as transitive structure is concerned. The differences in the word order, case-marking, and alphabetic system did not interfere with the syntactic priming effect of transitive structures between Korean and English.

The findings of syntactic priming effect can be related to second language acquisition in several ways. Syntactic persistence can help learners to produce or comprehend specific syntactic structures implicitly, as several studies implied (Bock and Griffin, 2000; Chang , Dell, Bock, and Griffin., 2000; Loebell and Bock, 2003 Serger,1994). For example, Loebell and Bock (2003) explain structural repetition phenomena in terms of implicit learning, defining it as "a kind of incidental, procedural learning" through cognitive or perceptual processing operations (p.793). Also, Ellis(1994) define implicit learning as acquiring knowledge in natural, simple, and without conscious operations. The procedures and findings from the studies on syntactic priming effect seem to meet those

characteristics of implicit learning. Since syntactic priming effect is implicit in nature, the learners will have easy access to the relevant linguistic structures in their language process and language uses. Therefore, if two languages share syntactic information without many variations such as transitive structures between Korean and English, second language learners may learn the syntactic structure implicitly or may acquire the syntactic information between L1 and L2 with being stimulated by a certain syntactic structure.

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Appendix I

Questionnaire on Language History and Proficiency

Name : _____ Age: _____ Date: _____

Please rate your language proficiency from 1 (very poor) to 7 (perfect):

First Language: _____

very poor						perfect
1	2	3	4	5	6	7

Second Language: _____

very poor						perfect
1	2	3	4	5	6	7

Third Language: _____

very poor						perfect
1	2	3	4	5	6	7

Where and at what age did you start learning these languages?

First Language:

Second Language:

Third Language:

In what context and with whom have you used the languages? (For examples: academia, family, friends, boy/girl friend, work)

First Language:

Second Language:

Third Language:

Appendix II

English Priming Sentence

Active

The government increased the price of gas.
The chairperson suggested the coffee break.
The mayor welcomed the visitors.
The policeman chased the burglar.
A child ate an ice-cream cone.
A rock star sold the dealer many music albums.
The frustrated man kicked the bending machine.
My friend dropped the vase on the ground.
A small dog chased the thief.

Passive

The vase was dropped on the ground by my friend.
The table was cleaned by her father.
The heater was repaired by the maintenance man.
The missing coin was found by a cleaning lady.
The jogger was tripped by a tree root.
The country was ruled by the socialist party.
A market is dominated by a big company.
My jacket was misplaced by my roommate.

Korean Priming Sentence

Active

경찰이 도둑을 잡았다.
개가 아이를 물었다.
베토벤은 교향곡 합창을 작곡했다.
젊은이들은 빠른음악을 많이 부른다.
언니가 동생의 인형을 빼앗았다.
고양이가 생쥐를 잡아먹었다.
유명한 작가가 이 소설을 썼다.
사람들이 쓸만한 물건을 버린다.

Passive

그 빌딩이 부동산 업자에 의해 팔렸다.
영희가 철수에게 안겼다.
아이들 옷이 수영강사에 의해 숨겨졌다.
공이 축구선수에 의해 차였다.
꽃이 아이들에 의해 꺾였다.
고기요리가 손님에 의해 주문되었다.
그 사건이 기자에 의해 알려졌다.
썩은이가 치과의사에 의해 뽑혔다.

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