

L2 Learners' Sensitivity to Verb-based Cues and the Complementizer 'that' in Sentential Complement Structures*

Ji Hyon Kim

Hankuk University of Foreign Studies

[Abstract]

The present study examines whether Korean L2 learners of English are able to use verb-based cues and the complementizer *that* to judge the acceptability of sentences with sentential complement structures in English. L2 learners of English participated in an acceptability judgment task, in which the experimental sentences are manipulated for verb bias of the main verb and presence of the complementizer *that*. Results show that acceptability ratings are significantly higher when the complementizer *that* precedes the sentential complement for direct object (DO)-bias and Equi (EQ)-bias verbs, but not for sentential complement (SC)-bias verbs. These results suggest that the L2 learners are able to efficiently combine the two cues in a way similar to the patterns shown by native English speakers in previous studies. The interactive use of the two cues suggests that the L2 learners has acquired relative cue validities as predicted by the Competition Model (McDonald, 1987). However, the L2 learners in this study also show differences from native speakers of English in that

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they are not yet sensitive to graded differences in verb bias cues.

Key Words: verb-based cues, complementizer, Competition Model, statistical frequencies, acceptability judgment task

1. Introduction

In English the same verb may take different types of arguments, resulting in different syntactic structures. Consider a sentence beginning with *The father announced the wedding* At this point, two different continuations of the sentence are possible, as shown in (1) below.

- (1) The father announced the wedding ...
 - a. ... yesterday.
 - b. ... would have to be canceled.

In (1a), *the wedding* has the syntactic role of the direct object of the main verb *announced*, whereas in (1b) *the wedding* is the subject of the embedded clause. Therefore, readers will encounter a temporary ambiguity at the underlined noun phrase (NP) in the sentence *The father announced the wedding would have to be canceled*. This type of temporary ambiguity is referred to as the direct object (DO)/sentential complement (SC) ambiguity and arises mainly because in English, it is possible to omit the complementizer *that* before a sentential complement.

Studies have shown that readers typically experience more difficulty for sentences such as (1b) compared to sentences like (1a). Online experimental studies have

reported that readers tend to slow down at the disambiguating verb of the embedded clause (Garnsey, Pearlmutter, Myers & Lotocky, 1997; Pickering & Traxler, 1998; Sturt, Pickering, & Crocker, 1999), suggesting that they had initially predicted a direct object continuation of the sentence. When the disambiguating verb *would* is encountered, this initial interpretation must be discarded and revised, so that the ambiguous NP *the wedding* is now the subject of the embedded clause. In contrast, an increase in reading times was not observed for sentences in which the complementizer *that* was present before the embedded clause, which eliminates the temporary ambiguity and the possibility that *the wedding* may be the direct object of the main verb.

However, it is not the case that readers always experience difficulty with temporarily ambiguous sentences such as (1b). Previous studies have established that verb bias is a reliable cue that native speakers of English use to predict how a sentence will unfold (Dussias & Cramer Scaltz, 2008; Ferreira & Henderson, 1990; Garnsey et al., 1997; Kennison, 2001; Traxler, 2005). Verb bias refers to the frequency with which a verb takes a direct object or sentential complement. Consider the sentences in (2) below.

(2a) The photographer accepted the money could not be paid. (DO-bias)

(2b) The factory owner suspected the workers would not stay. (SC-bias)

The main verb *accept* in (2a) is a DO-bias verb, which indicates that it is more likely to take a direct object than a sentential complement. In contrast, the main verb *suspect* in (2b) is a SC-bias verb, which occurs more frequently with a sentential complement than an NP direct object. Therefore, readers are able to use verb bias information to predict a sentential complement continuation after the verb *suspected*, so that less difficulty is experienced for (2b) compared to (2a).

This study investigates whether Korean L2 learners of English are able to use verb bias and complementizer cues in sentences with DO/SC temporary ambiguity and whether these cues are combined in an optimally efficient manner. The next section presents an overview of the previous research on this topic.

2. Background

2.1. Verb Bias

In a seminal study investigating the use of verb bias cues by native English speakers, Garnsey et al. (1997) conducted a self-paced reading study using sentences with DO/SC ambiguity like those shown in (3).

(3a) The art critic wrote the interview had been a complete disaster. (DO-bias)

(3b) The bank guard confessed the robbery had been his own idea. (SC-bias)

In order to determine the verb bias preference of the main verbs to be used in the experimental stimuli, 100 verbs were tested in a norming study with 108 native English speakers. The participants were presented with sentence-initial fragments consisting of a proper noun followed by one of the 100 verbs, e.g., *Debbie remembered _____*). Verbs were classified as DO-bias if they were used at least twice as often with direct objects as with sentential complements, and the reverse was true for SC-bias verbs. Verbs which did not result in one type of continuation being at least twice as frequent as the other and verbs for which the difference between DO and SC continuations did not exceed 15% were classified as EQ-bias.

When verbs categorized as DO-bias or SC-bias were used in sentential complement structures, results showed that native English speakers were able to use verb bias and complementizer cues to predict the upcoming structure. Reading times at the disambiguating region (verb of the embedded clause) were longer in the ambiguous condition where the complementizer *that* was omitted when the main verb was DO-bias, but not when the main verb was SC-bias. Garnsey and colleagues concluded that for native English speakers, either cue alone was enough to prevent processing difficulty, resulting in an interaction between verb bias and complementizer cues. These findings were replicated and confirmed in various follow-up studies (Kennison, 2001; Novais-Santos, Gee, Shah, Troiani, Work & Grossman, 2007; Pickering, Traxler & Crocker, 2000; Wilson & Garnsey, 2009).

Other studies have assessed how factors such as verb bias affect complementizer use in spoken and written production (Ferreira, 2003; Ferreira & Dell, 2000; Lee & Gibbons, 2007). In a memory-based sentence production task, Ferreira and Schotter (2013) tested how often native English speakers produce the complementizer *that* before the sentential complement in sentences including DO-bias, EQ-bias and SC-bias verbs. Speakers produced the complementizer *that* most often in sentences with DO-bias verbs and least often with SC-bias verbs, with EQ-bias verbs in between. These results were consistent with corpus-based evidence (Jaeger, 2010). In a subsequent written production task, the use of the complementizer *that* was affected more by the strength of SC-bias than DO-bias, suggesting that speakers were more sensitive to how difficult it was for them to produce a certain structure, i.e., how rarely a structure is used, rather than how difficult it was for the listener to understand the sentence.

2.2. L2 Studies in Verb Bias

Studies investigating L2 learners' sensitivity to verb bias and complementizer cues have reported a slightly different pattern from L1 speakers. Dussias and Cramer Scaltz (2008) examined whether Spanish verbs shared the same biases as their English translations. When Spanish monolingual speakers participated in a written sentence completion task using the Spanish translation equivalents of the English verbs used in Garnsey et al. (1997), fewer than half of the verbs had the same verb bias in both Spanish and English. In spite of this discrepancy in cross-linguistic verb bias, when Spanish L2 learners of English completed the norming task in English, 16 of the 20 verbs which were categorized as SC-bias for native English speakers had SC-bias for L2 learners also. These results suggest that it is possible for L2 learners to learn new verb bias preferences for L2 verbs even when the same verb has conflicting biases across languages.

A recent study by Kim (2021) investigated whether L2 learners of English were sensitive to graded differences in the verb bias preference of English verbs. In a written sentence completion task, the proportion of sentence completions in which the NP following the main verb was used as the direct object was positively correlated with the verb's DO-bias preference and negatively correlated with the verb's SC-bias preference. These results suggest that the L2 learners' were able to use verb bias information as a graded variable when determining the type of structure they used in written sentence production. However, the L2 learners' use of the complementizer *that* differed from the pattern shown for native English speakers (Ferreira & Schotter, 2013). Whereas native English speakers showed a tendency to use the complementizer *that* more often with DO-bias verbs, the L2 learners in this study used the complementizer more often with SC-bias verbs. These results suggest that

L2 learners treated the complementizer *that* as a cue which is required for SC-bias verbs to strengthen predictions for the upcoming sentential complement, whereas for native English speakers, the use of both cues was redundant. This difference in the patterns of verb bias and complementizer use shown by L1 and L2 speakers has also been reported in processing studies.

Qian, Lee, Lu, and Garnsey (2019) examined whether Mandarin L2 learners of English were able to use verb bias and complementizer cues to process sentences with temporary DO/SC ambiguity in a self-paced reading task. Mandarin has the same SVO word order as English, so that the verb may be used as a predictive cue for the upcoming structure. However, Mandarin does not have a word or particle that functions like the complementizer *that* in English. Reading times at the disambiguating embedded verb showed significant effects of verb bias and complementizer presence, but no interaction between the two factors. L2 learners experienced less difficulty at the disambiguating region when the complementizer *that* was present and when the main verb had SC-bias, but the effects of these cues was additive, and not interactive. Unlike the native English speakers, for which either cue alone was sufficient to predict an upcoming sentential complement and prevent difficulty, L2 learners required both cues to be present.

A similar study by Lee, Lu, and Garnsey (2003) investigated whether Korean L2 learners were able to use verb bias and complementizer cues predictively. Unlike Mandarin, which has the same default word order as English, Korean has a canonical SOV word order. Therefore, it is not possible to use the verb to predict the upcoming sentence structure in Korean, as the verb occurs in sentence-final position. In contrast, Korean has an obligatory particle *-ko* which is used at the end of an embedded clause. The results showed that in contrast to the Mandarin speakers in Qian et al. (2019), the Korean L2 learners showed a significant interaction between

verb bias and complementizer presence at the disambiguating verb. However, the nature of this interaction differed from the native English speaker group. Whereas the native English speaker group was able to benefit from either one of these cues, the Korean L2 learners with lower proficiency need both cues to be present and agree, so that reading times were fastest when the complementizer *that* was present and the verb was SC-bias. These results are consistent from the additive effects of the two cues reported in Kim (2021).

An interim summary of the previous studies investigating the use of verb bias and complementizer cues by native English speakers and L2 learners suggests that the two groups use these cues differently. Native speakers seem to combine the two cues to result in the most efficient heuristic, so that either SC-bias or the presence of *that* is sufficient to signal an upcoming sentential complement. In contrast, the L2 learners in the previous studies (Lee et al., 2013; Kim, 2021; Qian et al., 2019) were sensitive to verb bias and complementizer cues, but the two were not redundant and both were needed in order to prevent difficulty.

Qian et al. (2019) discussed the discrepancy in patterns of verb bias and complementizer use between L1 and L2 speakers in the framework of the Competition Model (Bates & MacWhinney, 1987; Matessa & Anderson, 2000; McDonald, 1987). The Competition Model states that L2 learners focus on individual cues in the beginning stages of learning. As the amount of cumulative exposure to different cues increases, L2 learners will eventually learn to combine the two cues based on conflict validity, i.e., which cue has more predictive power when the predictions made by the two cues conflict. In this vein, the complementizer *that* has higher conflict validity than verb bias, as the presence of the complementizer can override DO-bias in a sentential complement construction. Qian et al. (2019) concluded that the L2 learners in their study and Lee et al. (2013) were still in the

early stages of learning, and had not yet learned to optimally combine the two cues.

The present study aims to explore these predictions further through an acceptability judgment task with Korean L2 learners of English. If the L2 learners were still at the beginning stages of learning the two cues, it may be possible that enough data regarding the conflict validity of the two cues has not yet been accumulated to affect disambiguation strategies in rapid online processing. However, it is possible that L2 learners with advanced proficiency may show sensitivity to the combined cues in a task that is cognitively less demanding. Furthermore, participants are not tested directly for their comprehension of sentences in acceptability judgment tasks, whereas in most online processing tasks, test sentences are followed by comprehension questions. If these predictions are correct, an interaction should be observed between verb bias and complementizer presence. The difference in acceptability ratings between sentences with and without the complementizer *that* is predicted to be the largest for DO-bias verbs and smallest for SC-bias verbs, with EQ-bias verbs in between.

3. Method

3.1. Participants

53 Korean L2 learners of English who were undergraduate students attending a Korean university were recruited for the present study. A language background questionnaire was administered to select L2 learners with intermediate to high English proficiency. The questionnaire asked the participants for information such as their recent TOEIC scores, language background, and experience living in an

English-speaking country. The present study aimed to test L2 learners who had a high level of English proficiency, so participants whose TOEIC scores were below the average score of 780 were excluded from the main experiment. Participants who had stayed in English-speaking countries for more than one year were also excluded from the main experiment in order to ensure that the participants were relatively homogeneous in regards to their exposure to L2 input (Dussias & Sagarra, 2007; Juffs, 1998). This led to the exclusion of 12 participants. The remaining L2 learners (mean age 22.02) took part in the main experiment. The mean TOEIC score of the participants was 910 ($SD=67.36$).

3.2. Materials and Design

Twelve DO-bias, twelve EQ-bias and twelve SC-bias verbs selected from Garnsey et al. (1997) were used to construct thirty-six pairs of sentences with sentential complement structures. Table 1 below presents the verbs in each of the three verb bias categories.

Table 1. Verbal Stimuli by Verb Type

DO-bias	EQ-bias	SC-bias
accept	announce	suspect
write	guarantee	prove
print	predict	confess
emphasize	declare	suggest
hear	doubt	believe
warn	guess	conclude
understand	deny	realize
confirm	fear	admit

acknowledge	know	assume
discover	regret	claim
assert	fear	imply
protest	confide	decide

Each pair of sentences consisted of an ambiguous version (without the complementizer *that*) and an unambiguous version (with the complementizer *that*). All sentences were composed of a subject noun phrase followed by a main verb that was DO-bias, SC-bias or EQ-bias. In the ambiguous version of the sentence, the main verb was directly followed by a noun phrase which was the subject of the embedded clause. In the unambiguous version, the main verb was followed by the complementizer *that* and then the embedded subject. The disambiguating region of the temporarily ambiguous sentences consisted of auxiliary verbs such as *had*, *would* and *could*. Sample experimental sentences from each verb bias category are presented below in (4).

(4) DO-bias verb

Ambiguous: *The art critic wrote the interview had been a disaster.*

Unambiguous: *The art critic wrote that the interview had been a disaster.*

(5) SC-bias verb

Ambiguous: *The intelligent scientist proved the theory had not been tested.*

Unambiguous: *The intelligent scientist proved that the theory had not been tested.*

(6) EQ-bias verb

Ambiguous: *The desk clerk guessed the name had been written in a hurry.*

Unambiguous: *The desk clerk guessed that the name had been written in a hurry.*

The 36 pairs of critical sentences were distributed over two lists according to a Latin Square design, so that all participants saw an equal number of ambiguous and

unambiguous sentences and no participant saw the same sentence in both the ambiguous and unambiguous version. 14 distractors were also added to each list. The distractors were ungrammatical sentences in which the main verb was an obligatorily intransitive verb used in a transitive construction, e.g., **The magician disappeared the rabbit during the show*. Each list contained a total of 50 sentences which were pseudo-randomized so that no more than two critical sentences from the same verb bias group appeared consecutively and no more than two critical sentences appeared in a row.

3.2. Procedure

The L2 learners were randomly assigned to one of the two lists. Each participant completed the acceptability judgment task in a quiet room. The participant was instructed to read each sentence and rate it for acceptability on a scale of 1 (not acceptable at all) to 5 (very acceptable). Instructions were given in English orally and in writing at the beginning of the experiment, and additional clarification was given in Korean if participants asked questions regarding how to complete the task. The participants were not given specific time restrictions in which to complete the acceptability judgment for each sentence, but were instructed to read each sentence only once and rate its acceptability as quickly and accurately as possible. The entire experiment took 20 to 25 minutes to complete.

4. Results

Data from one participant who rated all of the sentences as either 1 or 5 were

excluded from further analysis. The acceptability judgment ratings from the remaining 40 participants were analyzed in a 3x2 repeated measures ANOVA with verb bias (DO-bias, EQ-bias, SC-bias) and ambiguity (ambiguous, unambiguous) as the main factors. Sentences in the ambiguous conditions were sentences where the complementizer *that* was omitted so that the NP directly following the main verb could be interpreted as the direct object of the main verb or the subject of the sentential complement. Sentences in the unambiguous condition had the complementizer *that* preceding the sentential complement so that the NP following the main verb could not be parsed as the direct object. Table 2 below presents the average acceptability ratings obtained for each of the verb bias groups according to the presence of the complementizer *that*.

Table 2. Mean Acceptability Rating by Verb Type
(standard deviation in parentheses)

	DO-bias	EQ-bias	SC-bias
unambiguous condition	3.84 (0.46)	3.62 (0.66)	3.62 (0.34)
ambiguous condition	3.44 (0.46)	3.29 (0.41)	3.76 (0.44)

As shown in Table 2, for verbs in the DO-bias and EQ-bias category, the L2 participants rated sentences as more acceptable when the complementizer *that* preceded the subject NP of the embedded clause. The mean rating was .40 higher for DO-bias verbs and .33 higher for EQ-bias verbs when the complementizer *that* was present compared to when it was absent. Acceptability ratings for sentences in which the main verb belonged to the SC-bias category showed a different pattern. For SC-bias verbs, participants gave a higher acceptability rating to sentences where the complementizer *that* was absent. The mean rating for the ambiguous condition was .14 higher than the unambiguous condition.

The results of the ANOVA confirmed the pattern of different effects of complementizer presence according to verb bias. The main factor of verb bias was significant ($F(2,40)=5.35, p=.007$), as was the main factor of ambiguity ($F(1,40)=9.68, p=.003$). The interaction between the two factors was also significant ($F(2,40)=5.89, p=.002$). In order to examine the nature of the interaction between verb bias and ambiguity, pairwise comparisons were conducted for each verb bias group. The difference in acceptability ratings between the ambiguous condition and the unambiguous condition was significant for the DO-bias verb group ($t(22)=2.86, p=.005$) and the EQ-bias verb group ($t(22)=2.26, p<.05$), but not significant for the SC-bias verb group ($t(22)=.88, p=.38$).

In order to investigate whether the L2 participants were sensitive to graded differences in verb bias preferences, correlation analyses were conducted with the mean rating obtained for each verb by complementizer presence and the verb's DO-preference and SC-preference reported in the norming data by Garnsey et al. (1997). Results showed that the acceptability ratings given for each verb by the L2 learners when the complementizer *that* preceded the embedded clause were not correlated with the verb's DO-preference ($r=-.06, p=.73$) or SC-preference ($r=.24, p=.16$). Acceptability ratings in the ambiguous condition, in which the complementizer *that* was omitted, were not significantly correlated with the verb's DO-preference ($r=-.17, p=.32$) or SC-preference ($r=.09, p=.59$) either.

The next analyses aimed to examine whether the differences in acceptability ratings were a result of the L2 learners' sensitivity to the probabilistic frequencies of the different structures or because the participants viewed certain structures as ungrammatical. The mean acceptability ratings for the ungrammatical distractor sentences were calculated and compared with the mean ratings for the critical sentences. The mean acceptability rating obtained for the ungrammatical distractors

was 1.92 ($SD=0.38$) and the mean rating for the critical sentences was 3.59 ($SD=0.40$). The difference between the two types of sentences was statistically significant ($t(90)=17.03$, $p<.0001$). A second analysis compared the acceptability ratings obtained for only the sentences with DO-bias and SC-bias verbs in the conditions with no complementizer ($M=3.36$, $SD=.44$) with the distractor sentences. The results showed that the acceptability ratings for these two conditions which received the lowest ratings among the critical stimuli were also significantly higher than the ungrammatical distractor sentences ($t(36)=10.25$, $p<.0001$).

5. Discussion

Previous studies in sentence processing and production have reported discrepancies in the use of verb bias and complementizer cues by L2 learners and native English speakers. In processing of temporarily ambiguous sentences, native English speakers seem to optimally combine the two cues, so that either an SC-bias main verb or presence of the complementizer *that* is sufficient to prevent difficulty. Similar patterns were reported in studies of spoken and written production. The complementizer *that* was used less often with SC-bias verbs, showing that native English speakers treated the complementizer as a redundant cue when verb bias clearly predicted that a sentential complement would follow. In contrast, L2 learners derived the most benefit when verb bias and complementizer cues both agreed in predicting an upcoming sentential complement, suggesting that the L2 learners had not yet learned how to effectively combine the two cues like native speakers.

The present study manipulated the factors of verb bias and complementizer use in an acceptability judgment task to investigate whether Korean L2 English learners

with high-intermediate proficiency would be able to use the two cues optimally in an offline task. If L2 learners are able to use verb bias and complementizer cues in the optimally efficient manner like native speakers, the difference in acceptability ratings for sentences with and without the complementizer *that* was predicted to be largest for DO-bias verbs and smallest for SC-bias verbs, with EQ-bias verbs in between.

The pattern of results obtained in the present experiment was consistent with these predictions. L2 learners rated sentences as more acceptable when the complementizer *that* was present for verbs that did not predict a sentential complement. On the other hand, no difference in acceptability ratings was found for SC-bias verbs as a function of complementizer presence. In fact, acceptability ratings were numerically higher when the complementizer *that* did not precede the sentential complement, although this difference did not reach statistical significance. These results present a different pattern from previous studies. Whereas previous studies examining L2 learners' use of verb bias and complementizer cues showed that L2 learners' use of the two cues was additive rather than interactive (Qian et al., 2019; Lee et al., 2013; Kim, 2021), the results of the present study suggest that L2 learners are capable of optimally combining the two cues in an offline acceptability judgment task.

A possible explanation underlying the different patterns obtained in the present study may be related to the cognitive demands of the experimental task that was used. Online sentence processing is a cognitively demanding task, in which incoming words must be parsed and incorporated into the existing syntactic structure while predictions about the upcoming structure are made at the same time. Production is also a task that has been viewed as cognitively demanding for L2 learners.

In relation to the Competition Model (Bates & MacWhinney, 1987; McDonald, 1987), the L2 participants seem to be at a stage where they have acquired sufficient

information about verb bias and complementizer cues and their relative cue validities to employ them in a manner similar to native speakers in a cognitively less demanding task. The pattern of the L2 learners' acceptability ratings showed that either SC-bias or presence of the complementizer *that* was sufficient for them to rate a sentence as more acceptable. In addition, the higher ratings for sentences in which the complementizer was present suggests that the L2 learners had also learned that complementizer presence has a higher conflict validity than verb bias in English. In contrast to previous studies suggesting that L2 learners used the two cues in an additive fashion, so that both were required in order to facilitate processing, the L2 participants in this study exhibited an optimal, efficient use of the two cues. Higher acceptability ratings were given to sentences in which the complementizer *that* precedes the sentential complement, even when verb bias information predicts a direct object.

However, the L2 learners in the present study are still in the progressive stages of learning about the different types of cues and their relative cue validities. Therefore, they are not yet able to spontaneously combine the two cues in the optimally efficient way of native speakers during rapid online processing of temporarily ambiguous sentences. As the L2 learners continue to accumulate information regarding verb bias and complementizer use, the prediction is that they will ultimately progress to a stage where they will be able to optimally combine the two cues during online processing in a manner similar to that of native English speakers.

The lower acceptability ratings for sentences with DO-bias or EQ-bias verbs when the complementizer *that* does not precede the sentential complement do not imply that the L2 learners treated these sentences as ungrammatical constructions. Analyses showed that the ungrammatical distractor sentences received reliably lower ratings compared to the critical test sentences and also when compared with only the test

conditions which received the lowest ratings. These results suggest that the L2 participants in this study were able to distinguish sentences that were grammatical but less likely to occur and sentences that violated the grammatical rules of English.

However, the L2 learners also showed differences from native speakers in their use of verb bias and complementizer cues. Despite the interactive pattern of use of the two cues in the acceptability judgment task, the acceptability ratings did not show a reliable correlation with each verb's strength of DO-bias or SC-bias. These results suggest that while the L2 learners had learned enough about the two cues so that verb bias or complementizer presence alone was sufficient to signal the relative probability of the sentential complement structure, their sensitivity to verb bias was not as fine-grained as the sensitivity that native speakers possess. It is possible that the L2 learners in this study were still in the process of accumulating data that would help them learn about the finer-grained differences in verb bias.

The findings of the present study contribute to the existing literature on L2 learners' use of verb bias and complementizer cues by showing that the relative cognitive load presented by the task may be a factor affecting how the L2 learner uses the two types of cues. For language learners who are still in the intermediate stages of learning about the interaction between the cues, the online processing tasks used in previous studies (Lee et al., 2013; Qian et al., 2019) may have been too cognitively demanding for them to spontaneously make use of the two cues in the optimally efficient way. Instead, they might opt for a "safe and easy" way, in which a more complex structure is predicted only if both cues unambiguously point in the same direction.

6. Conclusion

The results from an acceptability judgment task reported in the present study showed that Korean L2 learners of English were able to make use of verb bias and complementizer cues in a manner that resembled that of native English speakers. For English sentences in which a sentential complement followed the main verb, higher ratings were given when the complement *that* preceded the embedded clause and when the main verb was SC-bias. However, the presence of both cues did not result in higher ratings. The two cues were employed in an optimally efficient manner so that one cue was sufficient to increase perceived acceptability. In addition, when the predictions made by the two cues conflicted, sentences were rated as more acceptable when the complementizer *that* was present, suggesting that the L2 learners had learned that the complementizer cue has higher conflict validity than verb bias in English.

Overall, the present study suggests that L2 learners are able to use verb bias and complementizer cues interactively when performing a task that is less cognitively demanding. The L2 learners had learned to optimally combine the two cues even though their native language Korean is a verb-final language in which the verb cannot be used to predict the upcoming sentence structure. Whether L2 learners will ultimately be able to transfer the interactive use of the cues observed in the present study to online processing as the amount of exposure to the predictive values of the two cues increases is a topic for further investigation.

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국문초록

제2언어 학습자에서 살펴본 영어 동사 편향 정보와 보문소 that의 관계

김 지 현

단독 / 한국외대

본 연구에서는 보문 구문을 포함한 영어 문장의 문법의 타당성을 판단하는 실험을 40명의 제2언어 학습자를 대상으로 실시하였다. 실험에 사용된 문장의 주 동사는 직접 목적어 편향 (DO-bias), 보문 편향 (SC-bias), 중립 편향 (EQ-bias)으로 나누어졌으며, 각 동사는 보문소 that이 포함된 문장과 포함되지 않은 문장, 두 가지 조건으로 실험에 포함되었다. 그 결과, 직접목적어 편향과 중립 편향의 동사가 쓰인 문장에서는 보문소 that이 포함된 문장이 더 높은 문법적 타당성 평가를 받았으나, 보문 편향 동사가 쓰인 문장에서는 보문소 that의 유무에 따른 유의미한 차이가 나타나지 않았다. 이와 같은 실험 결과를 토대로 높은 영어 능숙도를 보이는 제2언어 학습자의 경우, 선행 연구에서 보고된 영어 원어민 화자와 유사하게 동사편향과 보문소 정보를 활용할 수 있다고 볼 수 있다. 두 가지 정보의 상호작용은 Competition Model (McDonald, 1987)에서 이야기하는 신호 타당성 (cue validity)의 학습 결과라 할 수 있겠다. 그러나 본 연구에서는 동사편향 정보의 연속성에 대한 유의미한 결과가 나타나지 않았다는 점에서 제2언어 학습자와 원어민 화자의 동사편향성 활용에 차이를 보이기도 했다.

주제어: 동사 편향 정보, 보문소, 경쟁 모델, 통계 빈도, 타당성 판단 과제

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이름: 김지현

소속: 한국외국어대학교 영어통번역학부 부교수

주소: 한국외국어대학교 영어통번역학부

경기도 용인시 처인구 모현읍 외대로 81 (어문관 226)

이메일: kimjhyon@hufs.ac.kr