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What Restricts or Boosts the Use of Internally-Headed Relative Clauses in Korean?*

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Lee, Jieun; Kim, Say Young & Song, Sanghoun. (2023). What restricts or boosts the use of internally-headed relative clauses in Korean?. *The Linguistic Association of Korea Journal*, *31*(3), 113-137. This study examines what factors may restrict or boost the use of internally-headed relative clauses (IHRCs) in Korean. Although previous studies showed that the distribution of IHRCs in Korean is heavily restricted, Korean IHRCs are found in naturally occurring data. To understand the factors that suppress or boost the use of IHRCs, this study focused on the effect of the construction that is functionally similar to IHRCs on the one hand, and the constructions that are structurally similar to IHRCs on the other hand. Specifically, the influence of these factors was tested with a structural priming task. The task was performed using a PowerPoint Presentation and fifty-five native Korean speakers participated in this task. The results showed that the use of IHRCs can be curtailed by externally- headed relative clauses (EHRCs), which are functionally similar to IHRCs. In addition to this, the use of IHRCs can be boosted by structurally similar perception verb constructions and complement clauses. This case study shows how similarity affects the use of low-frequent constructions like IHRCs in Korean and offers new perspectives for studying their limited distribution.

Key Words: internally-headed relative clauses; similarity; structural priming effect; statistical preemption

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1. Introduction

This paper examines factors that restrict or boost the use of Korean internally-headed relative clauses (IHRCs). By considering these factors, we will explain why Korean IHRCs are rarely found but nevertheless used in naturally occurring data. To begin with, we can examine the example below.[1)]

(1) *John-un [Mary-ka naka-lyeko ha-nu-n kes]-ul pwuthcap-ass-ta.*
John-TOP Mary-NOM go.out-be.about.to-IPFV-REL KES-ACC catch-PST-DECL
'John caught Mary, who was about to go out.'[2)]

In (1), the embedded clause in brackets can be regarded as an IHRC by applying two criteria. First, what is described in the embedded clause provides information about the head noun *Mary*, which is the primary function of a relative clause (RC) (Dixon, 2010). Second, the head noun appears in an RC that is marked by the nominative case marker *ka* matching its grammatical role in the embedded clause, and not by the accusative case marker *lul*, which matches its grammatical role in the embedding clause.

Thus far, studies on Korean IHRCs have primarily focused on their highly limited distribution. To understand their restricted use, three different research approaches have been taken: attempts to explain their formal restrictions using a set of rules (Chung & Kim, 2003; Grosu & Landman, 2012; Jhang, 1994; Y.-B. Kim, 2002; M.-J. Kim, 2007, 2008a, 2008b, 2009; J.-B. Kim, 2016; J.-R. Lee, 2006; J.-E. Lee, 2021a; Yeom, 2015); descriptions of how they are used with naturally occurring data (Cho, 2014, 2016; J.-E. Lee, 2020, 2021b; S.-H. Song, 2021); and rejections of their existence as an independent construction in Korean along with explanations of how the interpretation of IHRCs is construed (Cha, 2005; Chung, 1999; Jo, 2003; N.-K. Kim, 1984; Y.-H. Kim, 2013; Mun, 2012, 2017; H.-J. Park, 2019; C.-W. Park, 2022a, 2022b; Ryu, 2022; Yeon & Park, 2021). The first approach primarily focuses on grammatical restrictions in the formation of IHRCs in Korean such as the aspectual feature of embedded predicates, the semantic feature of the head noun, its grammatical role in an RC, and the grammaticalization of *kes* 'thing'. The second

1) Yale Romanization is adopted for the transcrption of the Korean examples presented in this study.
2) The abbreviations used in this paper are: ACC = accusative, CONTIN = continuous, DECL = declarative, IPFV = imperfective, LNK = linker, NOM = nominative, REL = relative clause, PFV = perfective, PRS = present, PST = past, TOP = topic.

approach empirically shows that uses of IHRCs are found in both naturally occurring spoken and written corpora in Korean with unique pragmatic functions that support the legitimate existence of IHRCs in Korean. The third approach also demonstrates that there are idiosyncrasies among examples of Korean IHRCs to such a degree that IHRCs may be a result of mere interpretation.

Although these three approaches have greatly enhanced our understanding of the use of IHRCs in Korean, two issues should be further explored. First, constructions that are functionally similar to IHRCs may restrict the use of IHRCs. Second, constructions that are structurally similar to IHRCs may boost the use of IHRCs. To begin with, the existence of constructions such as externally-headed RCs (EHRCs) that are functionally similar to IHRCs may restrict the use of IHRCs as in (2).

(2) *John-un* *naka-lyeko ha-nu-n* *Mary-lul* *pwuthcap-ass-ta.*
John-TOP go.out-be. about to-IPFV-REL Mary-ACC catch-PST-DECL,
'John caught Mary, who was about to go out.'

EHRCs, the primary RC type in Korean, share their function with IHRCs: both EHRCs and IHRCs add information about the head noun. Unlike IHRCs, however, EHRCs are not as heavily restricted as IHRCs in Korean. For instance, EHRCs do not restrict the grammatical role of head nouns in the main clause. In fact, only a few languages restrict the role played by the head noun in the main clause (Song, 2001). On other hand, Korean IHRCs particularly focus on the role of the head noun in the main clause. The head nouns of IHRCs in Korean take on a subject or object role in the main clauses (Kim & Song, 2022; J.-E. Lee, 2020; Mun, 2012) with a few exceptions (M.-J. Kim, 2008; Mun, 2012). Since EHRCs can represent the function of an RC with fewer usage restrictions, Korean speakers are likely to choose EHRCs over IHRCs to express the meaning/function of RCs.[3] This, in turn, may contribute to the restricted use of IHRCs. To put it differently, to understand how IHRCs are used we need to consider statistical preemption (or competition in context) (Boyd & Goldberg, 2011; Clark, 1987; Foraker et al., 2009; Goldberg, 1995, 2006, 2019; Kim & Yang, 2017; Marcotte, 2005; Ramscar, 2002; Robenalt & Goldberg, 2015, 2016). Statistical preemption occurs when speakers have access to a more familiar way of expressing their intended meaning in a given context. In such a situation,

3) For studies analysing IHRCs as non-restrictive RCs, see Jung (1995), Y.-B. Kim (2002), and M.-J. Kim (2004c) for Korean, and Fuji (1998), Shimoyama (1999, 2002), and C. Kitagawa (2005) for Japanese.

a less familiar way of expressing the same message can be curtailed by the existence of a more familiar alternative. For instance, statistical preemption may explain why the example in (3a) is less acceptable (or unacceptable) than (3b); the construction in (3b) has already been learned by native English speakers for the intended message-in-context (Goldberg, 2019, p. 76).

(3) a. ?Explain me something.
b. Explain something to me.

Considering how statistical preemption works in the acceptability judgments of the examples above, we can predict that the existence of EHRCs would affect the use of IHRCs in a similar way. Against this background, this study examines whether there is statistical preemption caused by EHRCs.

Second, the use of IHRCs can be boosted by structurally similar perception verb constructions and complement clauses. This is because constructions with structural similarity to IHRCs, such as complement clauses (CCs) in (4) and perception verb constructions (PVCs) in (5), may boost the use of IHRCs.

(4) *John-un* *Mary-ka* *naka-lyeko ha-nu-n*
John-TOP Mary-NOM go.out-be.about.to-IPFV-REL
kes-ul *al-ass-ta.*
KES-ACC know-PST-DECL
'John knew that Mary was about to go out.'

(5) *John-un* *Mary-ka* *naka-lyeko ha-nu-n*
John-TOP Mary-NOM go.out-be.about.to-IPFV-REL
kes-ul *po-ass-ta.*
KES-ACC see-PST-DECL
'John saw Mary about to go out.'

The CC in (4) and the PVC in (5) share the encoding strategy with the IHRC in (1). That is, they are both encoded by the (quasi-) nominalizer *-(u)n/nun kes* (N.-K. Kim 1983; M.-J. Jo, 2003; Mun, 2017).[4] Although they share an encoding strategy with IHRCs, PVCs and CCs occur far more frequently (J.-E. Lee, 2018). In light of the structural similarity

4) See also Ransom (1988) and Horie (1993) for the varying degrees of grammaticalization of the IHRCs.

and the different frequency, we can predict that the use of IHRCs may be boosted by the use of CCs and PVCs. As a matter of fact, this prediction is supported by structural priming effect tests conducted in previous studies, demonstrating that a construction can be activated in one's mind when one is exposed to semantically or structurally similar constructions that will boost their use (Bock & Loebell, 1990; Bock, 1986; Chang et al., 2006; Goldwater et al., 2011; Hare & Goldberg, 1999). We can refer to Bock and Loebell (1990) to observe an example of the priming effect based on structural similarity. In their experiments, active sentences including a locative by-phrase in (6a) primed the production of passive sentences with an agentive by-phrase in (6b), and sentences including a directional prepositional phrase in (7a) primed the production of the prepositional dative construction in (7b).

(6) a. The 747 was landing by the airport's tower.
b. The 747 was alerted by the airport's tower.
(Bock & Loebell, 1990, p. 18)
(7) a. The wealthy widow drove an old Mercedes to the church.
b. The wealthy widow gave an old Mercedes to the church.
(Bock & Loebell, 1990, p. 7)

Bock and Loebell (1990) support the idea that a structural priming effect may occur between two distinctive grammatical constructions that share structural features on the surface level. It would thus be worth examining whether the use of IHRCs is primed by the use of CCs and PVCs, which will be investigated in this study.

The aspects to be explored regarding the use of Korean IHRCs can be summed up into two research questions as in (8). Considering research question (8b), we narrow our focus to IHRCs that share structural similarity with CCs/PVCs: that is, IHRCs whose head nouns take object roles in the embedding clauses, as in (1) (hereafter object IHRCs). In the rest of the paper, IHRCs refer to object IHRCs unless there is an additional explanation.

(8) a. Does the existence of functionally similar constructions (EHRCs) affect the use of IHRCs in Korean?
b. Does the existence of structurally similar constructions (CCs/PVCs) affect the use of IHRCs in Korean?

To answer the questions in (8), we conducted a structural priming task examining whether the use of EHRCs restricts the use of IHRCs and whether the use of CCs/PVCs boosts the use of IHRCs. Our hypothesis to each question is as follows. First, the use of IHRCs can be curtailed by EHRCs, which are functionally similar to IHRCs. Second, the use of IHRCs can be boosted by CCs/PVCs, which are structurally similar to IHRCs.

2. A Structural Priming Task

A structural priming task was conducted for two purposes. First, we tested whether there was a statistical preemption between EHRCs and IHRCs, which are functionally similar but structurally different in Korean. Second, we examined whether CCs/PVCs boosted the use of IHRCs since Korean they are structurally similar to IHRCs. We investigated 1) whether IHRCs are recalled as EHRCs primed by EHRCs and 2) whether EHRCs are recalled as IHRCs primed by CCs/PVCs.

2.1. Participants

Fifty-five native Korean speakers participated in this task. Most were university students in South Korea. After being instructed about the task, they signed the written consent for participation in this study and it was approved by the Institutional Review Board of Korea University. They were each paid $10 as compensation for participation.

2.2. Material and Design

We used 18 sets consisting of six test sets. Each set includes four sentences: one target sentence, two prime sentences, and one contrast sentence. An example is given in (9). In this set, one IHRC is given as a target sentence, followed by two EHRCs as prime sentences and one contrast sentence. The contrast sentence did not include any constructions related to either the target or prime sentences.[5)]

5) Control stimulus was inserted to decrease recency effects (Baddeley & Hitch, 1993).

(9) a. Target sentence: IHRC
Chelswu-nun *[Yenghuy-ka* *ilena-se*
Chelswu-TOP Yenghuy-NOM stand up-and
naka-lyeko ha-nu-n *kes]-ul* *pwuthcap-ass-ta.*
go.out-be.about.to-IPFV-REL KES-ACC catch-PST-DECL
'Chelswu caught Yenghuy, who stood and was about to go out.'
b. Prime sentence: EHRC
Chelswu-nun *ilena-se* *naka-lyeko ha-nu-n*
Chelswu-TOP stand up-and leave-be.about.to-IPFV-REL
Yenghuy-lul *pwuthcap-ass-ta.*
Yenghuy-ACC catch-PST-DECL
'Chelswu caught Yenghuy, who stood and was about to go out.'
c. Prime sentence: EHRC
Chelswu-nun *ilena-se* *naka-lyeko ha-nu-n*
Chelswu-TOP stand up-and leave-be.about.to-IPFV-REL
Yenghuy-lul *pwulu-ess-ta.*
Yenghuy-ACC call-PST-DECL
'Chelswu called Yenghuy, who stood and was about to go out.'
d. Contrast sentence
gyul-i *sangkhumha-ko* *masiss-ø-ta.*
tangerine-NOM refresing-and delicious-PRS-DECL
'The tangerine is refreshing and delicious.'

In order to test whether the recall of target sentences is affected by prime sentences, we divided the six test sets into three subgroups as in (10). The first two are for testing the first hypothesis of this study and the last one for testing the second hypothesis. Each subgroup included two test sets based on the grammatical role of a head noun taking on a subject or object role in an RC. Examples of head nouns playing a subject role in an RC are provided in Appendix A.

(10) a. Whether IHRCs are recalled as EHRCs primed by EHRCs
b. Whether EHRCs are recalled as IHRCs primed by IHRCs
c. Whether EHRCs are recalled as IHRCs primed by CCs/PVCs

In this way, we created three subgroups of materials with six different IHRCs. In three of which the head noun takes a subject role in an RC, and in three it takes an object role. We divided 53 participants into three subgroups: two groups of 18 and one group of 17. Each group was given subgroup materials 1, 2, and 3. A set of examples is presented in Appendix B. In addition, we used 12 filler sets, which did not have any constructions related to IHRCs, EHRCs, CCs, or PVCs. To distract the participants, each sentence was accompanied by irrelevant pictures, and an unrelated question was asked before the recall.

2.3. Procedure

The task was performed using a PowerPoint Presentation. At a set of research locations, the participants sat side by side with the researcher in front of a computer screen. Participants started the task with three practice trials to familiarize themselves with the task. After three training sessions, they were presented with six test sets and 12 filler sets, mixed in a random order. On average, they took approximately 20-25 minutes to complete the task. The details of each set are illustrated in Figure 1.

Each set was comprised of 10 slides. The first eight slides consist of four pairs of slides. Each pair includes two slides: the first slide contains a written stimulating sentence and an audio recording, and the following slide contains a written instruction asking participants to repeat the immediately preceding sentence. After these four pairs of eight slides, participants were given the ninth slide in which a written word is given with quotation marks on the top of the slide and a written question is given in the middle of the slide, asking participants to answer whether the word in quotation marks appeared in the previous slides by saying either 'yes' or 'no'. Lastly, participants were given a tenth slide in which they were asked to answer the written question by asking them to say the first sentence in each set. The whole task was recorded by using the recording function of PowerPoint Presentation.

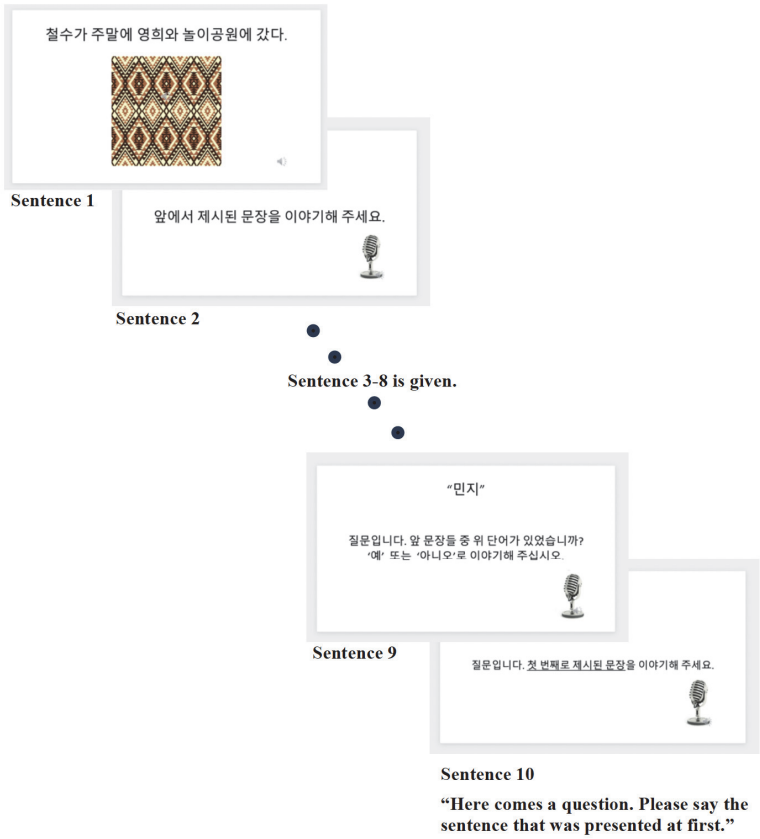

Figure1. An Example of a Structural Priming Task

3. Results

The results from 52 participants were analysed. As summarized in Table 1, when EHRCs were given as prime sentences, IHRCs were recalled as EHRCs by 72.12% of the participants. By contrast, when IHRCs were given as prime sentences, EHRCs were recalled as IHRCs by 24.04%. Additionally, when CCs and PVCs were given as prime sentences, EHRCs were recalled as IHRCs by 26.92%.

Table 1. The Result of Structural Priming Task

Target Sentence	Prime Sentence					
	IHRC		EHRC		CC/PVC	
IHRC	–		IHRC	14/104 (13.46%)	–	
			EHRC	75/104 (72.12%)		
			Adverb clause	10/104 (9.62%)		
			CC/PVC	0/104 (0%)		
			ETC	5/104 (4.81%)		
			No response	0/104 (0%)		
EHRC	IHRC	25/104 (24.04%)	–		IHRC	28/104 (26.92%)
	EHRC	73/104 (70.19%)			EHRC	53/104 (50.96%)
	Adverb clause	0/104 (0%)			Adverb clause	0/104 (0%)
	CC/PVC	2/104 (1.92%)			CC/PVC	12/104 (11.54%)
	ETC	0/104 (0%)			ETC	7/104 (6.73%)
	No response	4/104 (3.85%)			No response	4/104 (3.85%)

These results have two implications regarding the use of IHRCs in Korean. First, the use of Korean IHRCs may be restricted by EHRCs, constructions that are functionally similar to IHRCs. Second, the use of IHRCs can be boosted by CCs/PVCs, frequent constructions that are structurally similar to IHRCs. These two results confirm the respective hypotheses of this study. The remainder of this section discusses these results in detail.

To begin with, Table 2 provides examples of cases in which participants produced EHRCs instead of IHRCs when the EHRCs were used as prime sentences. We can make two observations as in (11) based on Table 2:

(11) a. IHRCs whose head nouns take object roles in RCs are more likely to be recalled as EHRCs than IHRCs whose head nouns take subject roles in RCs.
b. Only IHRCs whose head nouns take subject roles in RCs are recalled as adverbial clauses.

First, when the head noun takes the object role in an RC, the use of IHRCs was more restricted than when the head noun takes the subject role in an RC. More specifically, in examples (a), (b), and (d), the head nouns take on object roles in RCs, and in examples (c), (e), and (f), they take subject roles. As shown in Table 2, the examples in (a) and (b) were more susceptible to prime sentences than those in (e) and (f). One exception to (11a) is (c), in which the example was slightly more resistant to be expressed as an IHRC than the one in (d).[6] Second, IHRCs whose head nouns function as subjects in RCs were recalled as adverbial clauses even when EHRCs were given as prime sentences. In total, IHRCs were recalled as adverbial clauses in 10 cases: four cases regarding example (e) and (f) respectively, and two cases regarding example (c). In all cases, the adverbial ending *-ca* 'when/as soon as' was used as in (12).

(12) *Chelswu-nun* *Yenghuy-ka* *nemeci-lyeko ha-ca*
Chelswu-TOP Yenghuy-NOM fall-was.about.to-when
pwuthcap-a *cwu-ess-ta.*
catch-LNK give-PST-DECL
'Chelswu caught Yenghuy when she was about to fall.'

6) One way to understand the uniqueness of the sentence (c) is to consider the possibility such that '*ca-ko iss-nu-n* NP' became a use pattern with high token frequency forming a strong entrenchment in the speaker's mind, which should be confirmed by examining corpus data.

Table 2. Examples of recalled EHRCs with EHRCs Given as Prime Sentences

Recalled EHRCs	Prime sentence: EHRCs
(a) *Chelswu-nun Yenghuy-ka pes-e noh-ø-un yangmal-ul* Chelswu-TOP Yenghuy-NOM take.off-CONT-PFV-REL socks-ACC *seythakki-ey neh-ess-ta.* washing.machine-into put.in-PST-DECL 'Chelswu put the socks that Yenghuy took off into the washing machine.'	15
(b) *Chelswu-nun Yenghuy-ka kkulhi-e noh-ø-un miyekkuk-ul* Chelswu-TOP Yenghuy-NOM boil-CONT-PFV-REL seaweed.soup-ACC *mek-ess-ta.* eat-PST-DECL 'Chelswu ate the seaweed soup that Yenghuy made.'	14
(c) *Chelswu-nun ca-ko iss-nu-n Yenghuy-lul* Chelswu-TOP sleep-CONT-IPFV-REL Yenghuy-ACC *kkaywu-ess-ta.* wake.up-PST-DECL 'Chelswu woke up Yenghuy, who was sleeping.'	14
(d) *Chelswu-nun Yenghuy-ka deychi-e noh-ø-un.* Chelswu-TOP Yenghuy-NOM broil-CONT-PFV-REL *namwul-ul pokk-ass-ta.* boiled.and.seasoned.vegetable-ACC saute-PST-DECL 'Chelswu sauted the vegetable that Yenghuy broiled.'	13
(e) *Chelswu-nun ilena-se naka-lyeko ha-nu-n* Chelswu-TOP stand up-and go.out-be.about.to-IPFV-REL *Yenghuy-lul pwuthcap-ass-ta.* Yenghuy-ACC catch-PST-DECL 'Chelswu caught Yenghuy, who stood and was about to go out.'	11
(f) *Chelswu-nun nemeci-lyeko ha-nu-n Yenghuy-lul* Chelswu-TOP fall-be.about.to-IPFV-REL Yenghuy-ACC *pwuchap-a cwu-ess-ta.* catch-LNK give-PST-DECL 'Chelswu caught Yenghuy, who was about to fall.'	8
Total	75

Next, Table 3 provides examples of the cases in which EHRCs were recalled as IHRCs when IHRCs and CCs/PVCs were given as prime sentences. Based on Table 3, three observations can be made:

(13) a. EHRCs whose head nouns take subject roles in RCs are more often recalled as IHRCs than those whose head nouns take object roles in RCs.
b. CCs/PVCs are better prime sentences than IHRCs
c. Certain examples are more readily recalled as IHRCs.

First, when head nouns take subject roles in RCs, the use of IHRCs seems to be less restricted than when they take object roles in RCs. More specifically, in examples (a), (b), and (c), the head nouns take subject roles, and in examples (d), (e), and (f), they take object roles in RCs. As shown in Table 3, when head nouns take subject roles in RCs, EHRCs are recalled as IHRCs being primed by IHRCs more often than when head nouns take object roles in RCs. Second, although both IHRCs and CCs/PVCs functioned as prime sentences at a similar rate (24.04% and 26.92%, respectively; see Table 1), CCs/PVCs appear to be better priming stimuli. This is because when IHRCs were given as prime sentences, there was a chance that participants would produce IHRCs by recency effects (Baddeley & Hitch, 1993). Since CCs/PVCs are used far more often than IHRCs, it should not be surprising that the former is a better booster for IHRCs. Third, certain examples are produced more readily as IHRCs. For instance, although the examples in (a), (b), and (c) are all subject RCs, the examples in (a) and (b) were produced approximately three and two times more often than those in (c). It is notable that *pwuthcap-* 'catch' was used as a main verb both in (a) and (b).[7)]

Table 3. Examples of recalled IHRCs with IHRCs and CCs/PVCs given as Prime Sentences

Recalled IHRCs	Prime sentences		Total
	IHRCs	CCs/PVCs	
(a) *Chelswu-nun [Yenghuy-ka ilena-se naka-lyeko ha-nu-n kes]-ul pwuthcap-ass-ta.* Chelswu-TOP Yenghuy-NOM stand.up-and go.out-be.about.to-IPFV-REL KES-ACC catch-PST-DECL 'Chelswu caught Yenghuy, who stood and was about to go out.'	10	10	20

7) Note, the verb *cwu-* 'give' in (b) functions as a light verb.

Recalled IHRCs	Prime sentences		Total
	IHRCs	CCs/PVCs	
(b) *Chelswu-nun [Yenghuy-ka nemeci-lyeko ha-nu-n* Chelswu-TOP Yenghuy-NOM fall-be.about.to-IPFV-REL *kes]-ul pwuthcap-a cwu-ess-ta.* KES-AC catch-LNK give-PST-DECL 'Chelswu caught Yenghuy, who was about to fall.'	4	9	13
(c) *Chelswu-nun [Yenghuy-ka ca-ko iss-nu-n* Chelswu-TOP Yenghuy-NOM sleep-CONT-IPFV-REL *kes]-ul kkaywu-ess-ta.* KES-ACC wake.up-PST-DECL 'Chelswu woke up Yenghuy, who was sleeping to wake up.'	4	3	7
(d) *Chelswu-nun [Yenghuy-ka yangmal-ul* Chelswu-TOP Yenghuy-NOM socks-ACC *pes-e noh-ø-un kes]-ul* take.off-CONT-PFV-REL KES-ACC *seythakki-ey neh-ess-ta.* washing.machine-into put-PST-DECL 'Chelswu put the socks that Yenghuy took off into the washing machine.'	3	2	5
(e) *Chelswu-nun [Yenghuy-ka namwul-ul* Chelswu-TOP Yenghuy-NOM vegetable-ACC *dechi-e noh-ø-un kes]-ul pokk-ass-ta.* broil-CONT-PFV-REL KES-ACC saute-PST-DECL 'Chelswu sauted the vegetable that Yenghuy broiled.'	3	1	4
(f) *Chelswu-nun [Yenghuy-ka miyekkuk-ul* Chelswu-TOP Yenghuy-NOM seaweed.soup-ACC *kkulhi-e noh-ø-un kes]-ul mek-ess-ta.* make(soup)-CONT-PFV-REL KES-ACC eat-PST-DECL 'Chelswu ate the seaweed soup that Yenghuy made.'	1	3	4
Total	25	28	53

4. Discussion

So far, we have investigated Korean IHRCs to test our hypotheses on the two research questions. The first question explored whether the presence of functionally similar constructions (such as EHRCs) influences the use of IHRCs in Korean. The findings indicated that EHRCs may restrict the use of Korean IHRCs. The second question

examined whether the existence of structurally similar constructions (such as CCs/PVCs) affects the use of IHRCs in Korean. The results of the priming test revealed that CCs/PVCs may enhance the use of Korean IHRCs.

The findings supported our hypothesis for each question. First, IHRCs recalled as EHRCs with EHRCs as prime sentences were about three times more frequent than those in which EHRCs were recalled as IHRCs with IHRCs as prime sentences. This finding suggests that Korean speakers would use EHRCs rather than IHRCs when they have a communicative need for an RC. Second, in 28 out of 104 cases, EHRCs were recalled as IHRCs with CCs/PVCs provided as prime sentences. This finding supports our prediction that IHRCs can be activated by structurally similar constructions. Considering that CCs/PVCs are frequently used, it is likely that they may boost the use of IHRCs in Korean.

The results of the priming tests may also provide empirical support for aptly locating Korean IHRCs on the continuum of complex sentence types. The results show that IHRCs may be connected to EHRCs, CCs/PVCs, and adverbial clauses in Korean speakers' mental spaces through functional and/or structural similarities. On the one hand, IHRCs share functional similarity with EHRCs and certain adverbial clauses, although they are structurally different. Previous studies have suggested a connection between IHRCs and adverbial clauses, arguing that time, reason, and concession relations hold between IHRCs and the main clauses (Y.-B. Kim, 2002; M.-J. Kim, 2004, 2008b; Lee, 2021a, 2021b).[8] Our findings align with this observation made in previous studies: IHRCs were recalled as adverbial clauses marked by *-ca* 'as soon as' in 10 cases, even when EHRCs were given as prime sentences. By contrast, IHRCs share structural similarities with CCs/PVCs marked by *-(u)n/nun kes*, a quasi-nominalizer in Korean. The structural priming tests conducted in this study showed that the use of IHRCs may be boosted by the occurrence of CCs/PVCs through this structural similarity.

The findings of this study can be mapped onto the continuum of complex sentence types given by Croft (2001, p. 322), as shown in Figure 2, in which the meaning/function of IHRCs in Korean corresponds to a triangle crossing relative clauses, complements, and adverbial clauses.[9] Croft (2001) provides Japanese IHRCs as examples of complement

8) See Kuroda (1976) and Horie (2011) for a discussion of the adverbial clause meaning of Japanese IHRCs.

9) The solid lines represent strong examples of languages as evidence of the in-between constructions' existence. The dotted lines, by contrast, represent that there is no strong example of language.

clauses, RCs, and adverbial clauses.

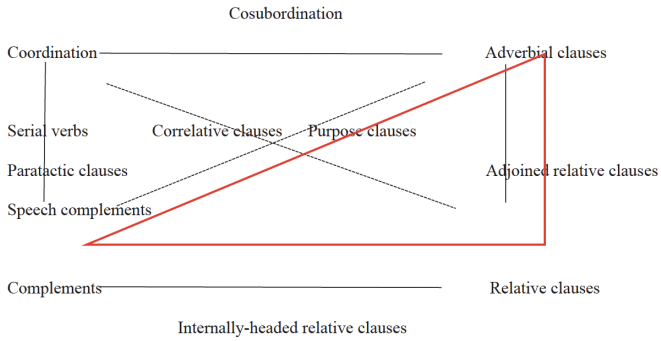

Figure 2. The Continuum of Complex Sentence Types

Our findings empirically support that Korean IHRCs are potential candidates for polysemous constructions, similar to Japanese IHRCs (Kuroda 1976; Fuji 1998; Horie, 2011).[10] This study suggests that IHRCs, EHRCs, CCs/PVCs, and adverbial clauses exist in a network in Korean speakers' mental space. Based on the findings of this study, future studies can further investigate this potential network using a variant of self-paced reading, such as the maze task (Forster et al., 2009; Ungerer, 2021), which may provide us with a measurable distance between two nodes in the network.

5. Conclusion

In this article, we investigated IHRCs in Korean focusing on the factors that suppress or boost their use. Specifically, we examined whether the constructions with functional similarity to IHRCs and the constructions with formal similarity to IHRCs influence the use of IHRCs in Korean. These factors were explored by conducting a structural priming effect task. The results are as follows. First, the use of IHRCs can be curtailed by EHRCs, which are functionally similar to IHRCs. Second, the use of IHRCs can be boosted by CCs/PVCs, which are structurally similar to IHRCs. This study may contribute to the relevant area by providing a case study of potential factors influencing the use of infrequent constructions like IHRCs in Korean.

10) In Horie (2011), Korean IHRCs are represented as spanning across complement clauses and RCs.

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Appendix A. Examples that are Used in Priming Effect Task in which the Head Noun Takes a Subject Role in an RC.

(1) Whether IHRCs are recalled as EHRCs being primed by EHRCs

a. IHRC

Chelswu-nun	*[Yenghuy-ka*	*ilena-se*
Chelswu-TOP	Yenghuy-NOM	stand up-and
naka-lyeko ha-nu-n		*kes]-ul*
go.out-be.about.to-IPFV-REL		KES-ACC
pwuthcap-ass-ta.		
catch-PST-DECL		

'Chelswu caught Yenghuy, who stood and was about to go out.'

b. EHRC (1)

Chelswu-nun	*ilena-se*	*naka-lyeko ha-nu-n*
Chelswu-TOP	stand up-and	leave-be.about.to-IPFV-REL
Yenghuy-lul	*pwuthcap-ass-ta.*	
Yenghuy-ACC	catch-PST-DECL	

'Chelswu caught Yenghuy, who stood and was about to go out.'

c. EHRC (2)

Chelswu-nun	*ilena-se*	*naka-lyeko ha-nu-n*
Chelswu-TOP	stand up-and	leave-be.about.to-IPFV-REL
yenghuy-lul	*pwulu-ess-ta.*	
Yenghuy-ACC	call-PST-DECL	

'Chelswu called Yenghuy, who stood and was about to go out.'

d. Contrast Sentence

gyul-i	*sangkhumha-ko*	*masiss-ø-ta.*
tangerine-NOM	refresing-and	delicious-PRS-DECL

'The tangerine is refreshing and delicious.'

(2) Whether EHRCs are recalled as IHRCs being primed by IHRCs

a. EHRC

Chelswu-nun	*nemeci-lyeko ha-nu-n*	
Chelswu-TOP	fall-be.about.to-IPFV-REL	
Yenghuy-lul	*pwuthcap-a*	*cwu-ess-ta.*
Yenghuy-ACC	catch-LNK	give-PST-DECL

'Chelswu caught Yenghuy, who was about to fall.'

b. IHRC (1)

Chelswu-nun	*[Yenghuy-ka*	*nemeci-lyeko ha-nu-n*
Chelswu-TOP	Yenghuy-NOM	fall-be.about.to-IPFV-REL
kes]-ul	*pwuthcap-a*	*cwu-ess-ta.*
KES-ACC	catch-LNK	given-PST-DECL

'Chelswu caught Yenghuy, who was about to fall.'

c. IHRC (2)

Chelswu-nun	*[Yenghuy-ka*	*nemeci-lyeko ha-nu-n*
Chelswu-TOP	Yenghuy-NOM	fall-be.about.to-IPFV-REL
kes]-ul	*pwuchwukha-e*	*cwu-ess-ta.*
KES-ACC	support-LNK	give-PST-DECL

'Chelswu supported Yenghuy, who was about to fall.'

d. Contrast Sentence

policha	*han*	*can-ul*	*ttattushakey*
barley tea	one	cup-ACC	warmly
masi-ko siph-ø-ta.			
drink-want-PRES-DECL			

'I want to drink a cup of barley tea warm.'

(3) Whether EHRCs are recalled as IHRCs being primed by CCs and PVCs.

a. EHRC

Chelswu-nun	*ca-ko iss-nu-n*	*Yenghuy-lul*
Chelswu-TOP	sleep-CONT-IPFV-REL	Yenghuy-ACC
kkaywu-ess-ta.		
wake up-PST-DECL		

'Chelswu woke up Yenghuy, who was sleeping.'

b. CC

Chelswu-nun	*Yenghuy-ka*	*ca-ko iss-nu-n*
Chelswu-TOP	Yenghuy-NOM	sleep-CONT-IPFV-REL
kes-ul	*al-ass-ta.*	
KES-ACC	know-PST-DECL	

'Chelswu knew that Yenghuy was sleeping.'

c. PVC

Chelswu-nun	*Yenghuy-ka*	*ca-ko iss-nu-n*
Chelswu-TOP	Yenghuy-NOM	sleep-CONT-IPFV-REL

kes-ul *po-ass-ta.*
KES-ACC see-PST-DECL
'Chelswu saw Yenghuy sleeping.'

d. Contrast Sentence
onul-un *halwu* *congil* *pi-ka* *nayli-n-ta.*
today-TOP a.day all.day rain-NOM fall-PRS-DECL
'Today it is raining all day.'

Appendix B. Examples for Structural Priming Effect Task

(1) a. 철수는 영희가 자고 있는 것을 깨웠다.
b. 철수는 자고 있는 영희를 깨웠다.
c. 철수는 자고 있는 영희를 밀었다.
d. 밤하늘에 별이 많다.

(2) a. 철수는 영희가 양말을 벗어 놓은 것을 세탁기에 넣었다.
b. 철수는 영희가 벗어 놓은 양말을 세탁기에 넣었다.
c. 철수는 영희가 벗어 놓은 양말을 집어 들었다.
d. 이 펜은 잘 써진다.

(3) a. 철수는 넘어지려고 하는 영희를 붙잡아 주었다.
b. 철수는 영희가 넘어지려고 하는 것을 알았다.
c. 철수는 영희가 넘어지려고 하는 것을 보았다.
d. 운동장에서 아이들이 야구를 한다.

(4) a. 철수는 영희가 데쳐 놓은 나물을 볶았다.
b. 철수는 영희가 나물을 데쳐 놓은 것을 알았다.
c. 철수는 영희가 나물을 데쳐 놓은 것을 보았다.
d. 나뭇가지가 바람에 흔들린다.

(5) a. 철수는 일어나서 나가려고 하는 영희를 붙잡았다.
b. 철수는 영희가 일어나서 나가려고 하는 것을 붙잡았다.
c. 철수는 영희가 일어나서 나가려고 하는 것을 불렀다.
d. 귤이 상큼하고 맛있다.

(6) a. 철수는 영희가 끓여 놓은 미역국을 먹었다.
b. 철수는 영희가 미역국을 끓여 놓은 것을 먹었다.
c. 철수는 영희가 미역국을 끓여 놓은 것을 버렸다.
d. 고양이 한 마리가 길에서 자고 있다.

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