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An experimental study on island effects related to "double relative clauses" in Korean* **

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Kim, Ilkyu. 2017. An experimental study on island effects related to "double relative clauses" in Korean. *Linguistic Research* 34(3), 191-214. In this paper, I test the validity of two competing approaches to island effects: syntactic and functional. Based on two acceptability judgment tasks on Korean relative clauses that are closely related to double relative clauses, I argue that the functional approach is superior to the syntactic approach at least in explaining Korean data. To be more specific, the results of the experiments show that Korean relativization is mainly affected by a semantico-pragmatic constraint called the Characterization Constraint, rather than by syntactic islands, the Complex NP Constraint in particular. **(Kangwon National University)**

Keywords island effects, double relative clauses, Characterization Constraint, coherence, Korean

1. Introduction

Korean is a language that allows so called "double relative clauses" (henceforth, DRCs), which are formed by relativizing out of another relative clause. An example of a DRC is shown in (1).

(1) $[_{RC1}\ [_{RC2}\ e_i\ e_j$ cohaha-nun] kangaci-ka$_j$ cwuk-un] ai$_i$
$e_i\ e_j$ like-ADN dog-Nom die-ADN kid$_i$
'the kid $[_{RC1}$ who$_i$ the dog $[_{RC2}$ which$_j$ e_i likes e_j died]]'
'the kid who the dog which [he] liked died' (Han & Kim 2004:316)

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Here, the object of *cohaha-* 'to like' is relativized first, after which the subject of the same verb is relativized out of the relative clause (RC_2), resulting in another relative clause (RC_1).

What is interesting about DRCs is that they are often perfectly acceptable even though they violate an island constraint, the Complex NP Constraint (CNPC) in particular.

(2) The Complex NP Constraint (Ross 1967:127)
No element contained in a sentence dominated by a noun phrase with a lexical head noun may be moved out of that noun phrase by a transformation.

As to why DRCs are not sensitive to CNPC, two competing approaches exist, Han & Kim's (2004) syntactic approach and Kim's (2013) functional approach. First, Han & Kim claim that Korean has no true DRCs. Instead, what appears to be DRCs, according to them, are relative clauses involving only one relativization with no island violation. To support their argument, they provide examples of relativization that are unacceptable due to the violation of CNPC. That is, they try to show that the syntactic structure of DRCs does not involve CNPC violation, by showing that CNPC-violating relative clauses are indeed unacceptable. It is important to note that for their analysis to be valid, the existence of CNPC must be implicitly assumed.

In contrast to Han & Kim, Kim (2013) attributes the non-sensitivity of DRCs to CNPC to its peculiarity from a functional perspective. Kim's main claim is that syntactic "islands" have little, if at all, effect on relativization in Korean, and that acceptability of Korean relative clauses is mostly dependent on a functional constraint, which he calls the Characterization Constraint (CC). According to Kim, DRCs are acceptable not because they do not violate CNPC but because they conform to CC.

The purpose of this paper is to shed light on the nature of island effects related to Korean DRCs by empirically comparing the syntactic and functional approaches. Based on the results of two acceptability judgement experiments, it will be claimed that acceptability of DRCs is heavily affected by CC but not by CNPC, and that the underlying assumption that CNPC plays a crucial role in Korean relativization is ungrounded.

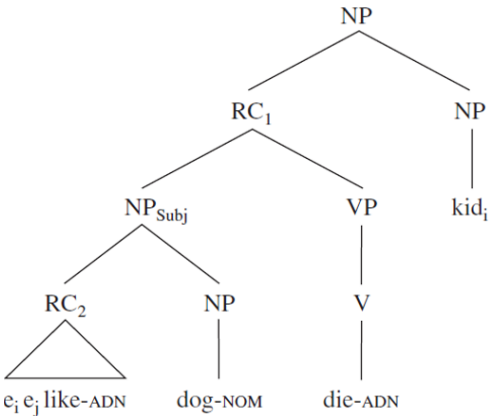
The structure of the paper is as follows. In section 2, the two previous works will be introduced and discussed, based on which two hypotheses will arise. Then, two experiments for testing each hypothesis will be introduced and their results will be reported in section 3 and 4, respectively. In section 5, general discussion will be provided on the results of the two experiments. Finally, section 6 concludes the paper.

2. Previous studies

2.1. Han & Kim (2004)

Before getting into Han & Kim's (2004) main claim, let us first understand the widely accepted syntactic structure of DRCs and how it violates CNPC. As an example, the syntactic structure of (1) is shown in (2).

(2) Syntactic structure of (1) (Han & Kim 2004:317)



Here, we can see that there is relativization out of another relative clause, that is, making RC_1 out of RC_2, hence a DRC. Also, note that NP_{Subj}, the mother of RC_2, qualifies as CNPC since its head is a lexical noun (i.e. *kangaci* 'dog') and *ai* 'kid' is extracted out of a clause it dominates (i.e. RC_2).

The fact that the DRC in (2) is totally acceptable is a serious problem for those

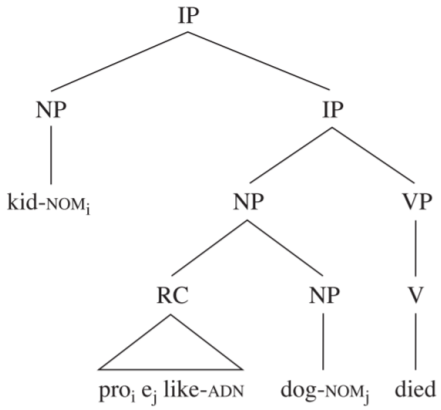
who believe that island constraints (or later versions of them such as Subjacency) apply universally, that is, to every language. In fact, this "universalist" view is shared by most, if not all, linguists working under the transformational, or movement-based framework (Hofemeister & Sag 2010).

Han & Kim are no exception with this and assume that island constraints, including CNPC, affect long-distance dependencies in Korean. Their solution for the problem shown in (2) is to provide a different syntactic structure for DRCs, where no island violation is involved. According to them, there is no DRC in Korean, and what appears to be DRCs are in fact "derived from double nominative constructions, through relativizing the first nominative NP that originates from an IP-adjoined position" (Han & Kim 2004:315). For example, they propose that the seeming DRC in (1) is derived from a double nominative construction (DNC) in (3).

(3) ai-ka$_i$ [$_{RC}$ pro$_i$ e$_j$ cohaha-nun] kangaci-ka$_j$ cwuk-ess-ta
kid-NOM$_i$ pro$_i$ e$_j$ like-ADN dog-NOM$_j$ die-PAST-DECL
'As for the kid, the dog that he liked died.' (Han & Kim 2004:327)

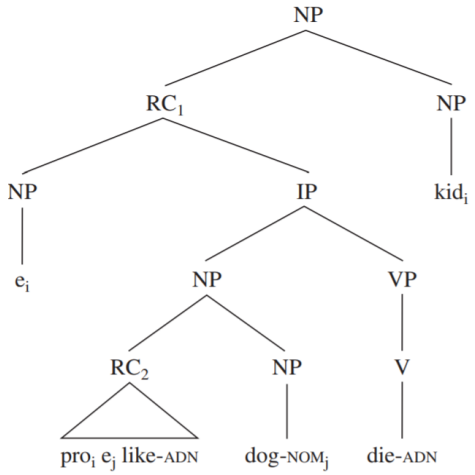
Here, note that the subject of *cohaha-* 'to like' is an empty pro which is coindexed with the first nominative NP of the DNC. The syntactic structure of (3) is provided in (4) below.

(4) Han & Kim's analysis of (3) (Han & Kim 2004:327)



Based on the structure of the DNC in (4), Han & Kim argue for the operator movement analysis for Korean relative clauses as opposed to the selective binding analysis, because DRCs are not instances of island violations any more. That DRCs do not violate CNPC is shown in a new syntactic structure of (1), represented in (5) below.

(5) Han & Kim's new analysis of (1) (Han & Kim 2004:328)



According to the structure in (5), what is known as a DRC is not formed by relativizing out of another relative clause. That is, the operator for the head NP of RC_1 (i.e. *ai* 'kid') is no longer moved from within RC_2 but from the IP-adjoined position, thus not causing any island violation.

In order to support their claim that "the relativization of the first nominative NP involves operator movement" (Han & Kim 2004:327), they provide two types of evidence. First, they argue that the first nominative NP of DNCs is subject to island constraints, as shown in (6).

(6) *[$_{RC}$ Sue-ka papokathi [$_{CNP}$ e_i yangpok-i telep-tanun
Sue-NOM foolishly e_i suit-NOM dirty-ADN
sasil-ul] molu-nun]
fact-ACC not.know-ADN

sinsa$_i$
gentleman$_i$
the gentleman who Sue foolishly does not know the fact that his suit is dirty'
(Han & Kim 2004:327)

Second, they claim that since DRCs must be derived from DNCs, DRC "formation is possible only when the lower relative clause is in a subject position'' (Han & Kim 2004:332), as shown in (7).

(7) *[$_{RC1}$ wuli pan haksayng-i [$_{RC2}$ e_i e_j ip-un] yangpok$_j$-ul
our class student-NOM wear-ADN suit-ACC
po-n] sinsa$_i$
see-ADN gentleman
'a gentleman$_i$ who a student from our class saw the suit which e_i wore' (Han and Kim 2004:332)

That is, the unacceptability of (7) is attributed to the fact that the lower relative clause is in an object position.

At first glance, the two pieces of evidence appear to support the argument that Korean relativization is subject to island constraints. However, there is a crucial problem with the way they present their evidence. The problem is that (6) and (7) are the only unacceptable examples provided by Han & Kim to support each type of evidence, and thus potential factors other than the CNPC-violating condition are not properly controlled. That is, it is hard to figure out whether the unacceptability of each example is really due to the island violation or due to some other factors such as processing difficulty, lexical properties of the materials, semantic and/or pragmatic anomaly, and cognitive biases on the part of the researcher (Gibson & Fedorenko 2010). In fact, this is not a problem that can be found only in Han & Kim's work. It has been observed that "linguists frequently do not construct enough control examples to sort out the factors involved in ambiguity or ungrammaticality" (Culicover & Jackendoff 2010:234).

2.2. Kim (2013)

Contra Han & Kim (2004), Kim (2013) tries to account for the unacceptability

of examples like (6) and (7) based on a semantico-pragmatic constraint on relativization, which he calls the Characterization Constraint (CC).

(8) Characterization Constraint (Kim 2013:64)
- ✓ What is denoted by a relative clause must be appropriate for characterizing a head NP referent.
- ✓ In order for a relative clause to properly characterize a head NP,
  1) the head NP referent and its situation must be directly related to each other, or
  2) the upper situation should be coherent with the lower situation, and/or
  3) the upper situation should be coherent with the head NP referent

CC is defined based on (in)direct relation between a relative clause and its head NP, and the notion of coherence, which is adopted from Hobbs (1990) and Kehler (2002, 2004). First, in order to understand (in)directness of the relation between a relative clause and a head NP, let us look at two possible syntactic structures of a relative clause.

(9) a. $[_S \cdots e_i \cdots ([_S \cdots (e_i) \cdots]) \cdots] NP_i$
b. $[_S \cdots [_S \cdots e_i \cdots] \cdots] NP_i$ (Kim 2013:61)

What distinguishes (9a) from (9b) is the fact that the head NP has its gap in the upper clause in (9a), whereas there is no gap in the upper clause in (9b). Crucially, this syntactic difference leads to a semantic difference. In (9a), the referent of the head NP is *directly* related to the situation denoted by a relative clause in that there is no intervening situation between the referent and the situation which it is part of. On the other hand, in (9b), the head NP referent is *indirectly* related to its situation because the situation denoted by the upper clause intervenes between the referent and its situation.

Why does only direct relation but not indirect relation satisfy CC? Because it is only through direct relation that a relative clause can easily denote some characteristic property of the head NP referent by having the referent as its element. If a referent and its situation are indirectly related to each other, the upper situation is predicted to cause trouble by intervening between the head NP referent and the lower situation where it belongs.

The second notion, coherence, is usually defined as a relation between clauses.

Regarding the island effects in DRCs, Kim, based on Hobbs (1990) and Kehler (2002, 2004), introduces three types of coherence relation, as shown in Table 1.[1]

Table 1. Coherence relations between clauses (Kim 2013:65)

	Sub-relations
Cause-Effect relation	Result, Explanation, Violated Expectation, Denial of Preventor
Resemblance	Parallel, Contrast, Exemplification, Generalization, Elaboration
Contiguity	Occasion

According to Kim (2013), even if a relative clause and a head NP are indirectly related to each other, they can satisfy CC if the intervening upper situation and the lower situation are coherently related to each other. Connected with the lower situation in a coherent relation, the upper situation no longer acts as an intervener but a *semantic/pragmatic bridge* that can help to characterize the head NP referent.

With the introduction of CC, Kim attributes the unacceptability of (7) to the incoherence between the lower and upper situations, which are illustrated in (10).

(10) A gentleman was wearing a suit. A student from our class saw the suit.

That is, the relation between the two situations in (10) cannot be properly captured by any coherence relation in Table 1. On the other hand, Kim argues that if lower and upper situations are coherently related to each other, the relative clause can be acceptable even if the CNPC is violated. An example of such a case is shown in (11a), whose lower and upper situations are illustrated in (11b).

(11) a. [[e_i e_j cikumkkaci cecilu-n] calmos$_j$-ul sensayngnim-i
[[e_i ej until now commit-ADN] fault$_j$-ACC teacher-NOM
motwu yongse ha-n]
all forgiveness do-ADN]
haksayng$_i$
student$_i$
'The student$_i$ who the teacher forgave all the faults that (he_i) had committed' (Kim 2013:73)

1 The definition of each (sub-)relation will be provided only when necessary.

b. A student has committed fault so far. Her teacher forgave all her fault.

Note that the two situations are related by the relation of Occasion, through which one can "infer a change of state for a system of entities from the assertion of S_2, establishing the initial state for this system from the final state of the assertion of S_1" (Kehler 2004:1970).

In addition, observing that characterizability can also be enhanced by making the relation between an upper situation and the referent of a head NP coherent, Kim newly introduces four types of coherence relation between a clause and a NP.

Table. 2. Coherence relations between a clause and a NP

Relation	Definition
Cause-Effect	Some property of e is inferred to cause P.[2]
Importance	P is inferred to be important information about e.
Influence	P is inferred to have direct/indirect influence on e.
Contrast	P is inferred to distinguish e from other.

For instance, in (11a), whether the teacher forgives the student or not can be easily inferred to be important information about the student, and Kim argues that the existence of Importance relation between the upper clause and the head NP is another factor that guarantees the high acceptability of the relative clause.

With the introduction of CC, Kim shows that the unacceptability of CNPC-violating relative clauses like (6) and (7) can also be explained by their violation of CC. Then, showing that one can productively make acceptable relative clauses that violate CNPC but conform to CC, Kim concludes that Korean relativization is governed not by CNPC but by CC.[3]

Although Kim has shed new light on the nature of the island effects in Korean relativization by providing various types of examples in a more controlled way than Han & Kim did, his analysis is not without problems. Most of all, just like Han & Kim, he relies solely on his own intuition in reporting (un)acceptability of the examples, which inevitably weakens its reliability.

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2 *P* is a situation denoted by the clause and *e* is what the NP denotes.

3 He introduces several processing factors as well, but it is not relevant to the current discussion.

This paper can be seen as an attempt to test the validity of Han & Kim's (2004) and Kim's (2013) analyses, by taking a quantitative approach to the matter at hand. Our focus is on the two types of relative clauses: 1) a relative clause in which the first nominative NP of a MNC is relativized (cf. (6)), and 2) a double relative clause in which the lower relative clause is in an object position (cf. (7)). The two types are claimed to be unacceptable due to the violation of the CNPC by Han & Kim (2004) but argued by Kim (2013) to be acceptable as long as they conform to CC. From what follows, I will introduce and discuss the two experiments that are aimed at finding out which approach is superior to the other.

3. Experiment 1

The first experiment deals with whether the first nominative NP of a MNC can be relativized even violating CNPC. We have seen that Han & Kim (2004) and Kim (2013) make different predictions about this issue.

3.1. Hypothesis

Our hypothesis is that if Korean relativization is constrained by CC rather than by CNPC, relativization of the first nominative NP of a MNC would be acceptable as long as they observe CC even if it violates CNPC. On the other hand, if Korean is subject to CNPC, CNPC-violating construction will yield significant decrease in acceptability no matter how semantically and pragmatically well-formed it is.

3.2. Participants

A total number of 42 students at Kangwon National University participated in the experiment, all in their 20s (female: 22, male: 20). They had no background in linguistics except that some of them had taken an introductory course on linguistics.

3.3. Materials

The total number of the test items was thirty five, among which fifteen were

experimental stimuli and twenty were fillers.[4] The experimental stimuli are made by relativizing the first nominative NP of a MNC with CNPC violation. Ten of them conform to CC (e.g. (11)) while the other five violate CC (e.g. (6)). The CC-observing type is divided into two subtypes; the first type is exactly like (11), which has an object of an upper clause (henceforth Good_Obj), and the second type does not have an object of an upper clause (henceforth Good_NoObj), as shown in (12).

(12) [[e_i paksahakwi-ka kacca-lanun] uyhok-i sasil-lo
Ph.D.-Nom forgery-Adn suspicion-Nom fact-as
palkhyeci-n] kyoswu$_i$
to be turned out-Adn professor
'the professor that the suspicion that (his) Ph.D. is a forgery has been turned out to be true'

Adding the second type of relative clauses like (12) was intended to see if reducing the number of arguments between the filler and gap would ease the processing effort and thus improve acceptability.[5] (CC-violating stimuli are called Bad_Obj, henceforth, since all of them have a lower object.)

As for fillers, ten ungrammatical relative clauses (Filler_Bad) and ten grammatical ones are used. The grammatical ones are further divided into two types: 1) relative clauses without a lower clause (henceforth Filler_Good) and 2) relative clauses where the first nominative NP of a MNC is extracted out of a lower clause but with an additional gap in an upper clause (henceforth Filler_PG). An example of the second type is shown in (13).

(13) [[e_i mommwukey-ka acwu manhi nakanta-nun] sasil-ul e_i
weight-Nom very much weigh-Adn fact-Acc
mopsi silheha-nun] haksayng$_i$
very dislike-Adn student
'the student that dislikes the fact that (he/she) weighs a lot'

4 The full list of the test items for the first experiment is provided in Appendix 1.

5 It was impossible to make CC-violating counterparts to examples like (12), because in the construction where there is no object in an upper clause, "semantic content of the upper clause becomes so ''transparent''" (Kim 2016:43) that the construction of this type automatically satisfies CC. For more on this issue, see Kim (2013, 2016).

The relative clauses of this type are parasitic gap (PG) constructions, where a gap in an island is saved by another gap outside it. In (13), for instance, the gap inside the lower clause is a PG and its existence is dependent on the "real" gap that is in the upper clause.

These PG constructions are used as fillers because they are structurally identical to the CNPC-violating experimental stimuli except that there is one more gap in an upper clause. Although our main interest is in the effect of CC, the structural similarity they share with the experimental stimuli gives a chance to get a glimpse, albeit indirectly, of the effect of CNPC-violation.[6]

3.4. Procedure

Each test item was paired with a 5-point acceptability scale (1-very bad, 5-very good). The participants were given a written questionnaire and asked to provide acceptability for Korean relative clauses in it. Before the participants started the real experiment, three grammatical and two ungrammatical fillers were first provided in a random order at the beginning of the questionnaire in order to make the participants be able to get the feeling of what is acceptable and what is not. (The participants did not know the existence of this short practice session, so the actual number of test items for them was 40, not 35.)

The items in the questionnaire were randomized using the list randomizer provided online (http://random.org). In order to prevent the order of the test items presented to the participants from acting as a confounding factor, two versions of each questionnaire were created such that the order of target item presentation could vary across the two versions. The survey was done in a quiet classroom, and it took the participants about 10 minutes to complete the questionnaire, and their participation was voluntary.

3.5. Results

Before looking at the results of inferential statistics, let us first check the

6 Of course, in order to directly see the effect of CNPC, we would need to compare two constructions which are identical to each other except that one involves CNPC-violation while the other does not, which is impossible in this case because one cannot make a relative clause with a head NP in its gap position.

descriptive statistics, the central tendency in particular, which provides the overall picture of the participants' performance. The median values for each group of the independent variable and fillers are shown in Table 3.[7]

Table 3. Central tendency of the acceptability judgments

Type	**Independent variable: CC**			**Filler**		
Group	Good_NoObj	Good_Obj	Bad-Obj	Filler_Bad	Filler_Good	Filler_PG
Median	5	5	2	1	5	5

Importantly, the median for the relative clauses which violate CNPC but observe CC (i.e. Good_NoObj and Good_Obj) is 5, which is the same as that of the grammatical fillers (i.e. Filler_Good and Filler_PG). On the other hand, the type of relative clauses that violate both CNPC and CC had 2 as its median, and the ungrammatical filler relative clauses got 1.

In order to see whether a significant difference exists between groups, the non-parametric Friedman test was conducted, and there was a statistically significant difference in the participants' acceptability judgment depending on which type of relative clauses they read, $\chi^2(5)=838.598$, $p<.001$.

Five post-hoc analyses were conducted using the Wilcoxon signed-rank test. First and most importantly, the results show a significant difference between Good_Obj and Bad_Obj, $T=226$, $p<.001$.[8] Interestingly, there was also a significant difference between the acceptability of CNPC-violating but CC-satisfying relative clauses without an upper object (Good_NoObj) and those with an upper subject (Good_Obj), $T=1237$, $p<.001$. Significant differences were found between Good_Obj and Filler_PG, $T=267$, $p<.001$, and between Bad_Obj and ungrammatical fillers (Filler_Bad), $T=439.5$, $p<.001$. Finally, there was no significant difference between ordinary grammatical fillers (Filler_Good) and Filler_PG, $T=232.5$, $p = 0.091$.

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7 Since the data obtained is ordinal, their central tendency can better be captured by median than by mean (Gravetter & Wallnau 2013).

8 One needs to use a Bonferroni adjustment on the results gotten from the Wilcoxon tests, because multiple comparisons are made, which would likely result in a Type I error. The Bonferroni adjustment can be calculated by simply taking the significance level that was initially used (in this case, 0.05) and dividing it by the number of tests run. In this example, the new significance level is 0.01.

3.6. Discussion

First of all, the fact that the median of acceptability for both Good_Obj and Good_NoObj is 5 shows that Korean relative clauses, as long as they conform to CC, can be totally acceptable even if they violate CNPC, which is further backed up by the main effect of CC on acceptability shown between Good_Obj and Bad_Obj. These results strongly support Kim's (2013) functional approach against Han & Kim's (2004) syntactic approach.

The significant difference between Good_Obj and Good-NoObj indicates that (non-)existence of an upper object indeed plays a role in people's acceptability judgment, which is not surprising from the processing point of view, but surprising enough from the perspective of the syntactic approach since their syntactic structures in terms of islandhood are identical. Although this has little to do with the validity of the pragmatic approach, it surely weakens the syntactic approach.

The fact that there is a statistically meaningful difference between Good_Obj and Filler_PG is interesting because it shows that relative clauses of the Good-Obj type are not as acceptable as those of the Filler_PG type, the acceptability of which is as good as that of the Filler_Good type. One way of explaining the gap between the two variables is to attribute it to the effect of CNPC; that is, the slight but meaningful decrease in the acceptability of Good_Obj can be ascribed to CNPC violation. Or, the difference between the two groups can also be explained by the difference in the degree to which they satisfy CC; note that there is a direct relation between the head NP referent and its situation in the condition of Filler_PG whereas only an indirect relation exists between the head NP referent and its situation in the condition of Good_Obj. It may be the case that a head NP referent can better be characterized when it is directly related to its situation than when it is indirectly related, however the upper situation is coherently related to the lower situation and/or to the head NP referent. This issue will be discussed in more detail in section 5.

Lastly, the significant difference between Bad_Obj and Filler_Bad shows that CNPC- and CC-violating relative clauses are still more acceptable than purely ungrammatical ones. Why should this be the case? No clear answer can be given at this stage, but it appears at least that CNPC-violation might be qualitatively different from typical ungrammaticality. More discussion will follow in section 5 when we

compare the results of other experiments (including our second experiment) that deal with a similar issue.

4. Experiment 2

The second experiment focuses on DRCs in which the lower relative clause is in an object position. As discussed above, Kim (2013) and Han & Kim (2004) make different predictions about their acceptability.

4.1. Hypothesis

Our hypothesis for this case is that if Korean relativization is constrained by CC rather than by CNPC, DRCs with a lower relative clause in an object position would be still acceptable as long as they observe CC.

4.2. Participants

The participants were undergraduate students at Kangwon National University, who were in their 20s. This time, the total number of participants was 148 (male: 119, female: 29) and their participation was voluntary. Most of them had no background in linguistics, except that a few had taken an introductory course in linguistics.

4.3. Materials

In this experiment, we also increased the number of test items to get stronger reliability. The experimental stimuli are comprised of 16 DRCs with their lower clauses in an object position, which are predicted to be unacceptable according to Han & Kim (2004). The 16 DRCs are divided into two groups, one consisting of DRCs which satisfy CC (henceforth DRC_Good) and one consisting of DRCs which do not (henceforth DRC_Bad). An example of the former is shown in (14) below, and one for the latter is shown in (7) above.[9]

(14) [[e_i e_j teypwicak-eyse phelchi-n] yenki$_j$-lul kamtok-i
debut film-in do-Adn acting-Acc director-Nom
kukchanha-n] paywu$_i$
highly praise-Adn actress$_i$
'the actress who the director highly praised her acting in her debut film'

Here, we can see that the upper and lower situations are related by Occasion relation, and the upper situation and the head NP referent by Important relation.

As for filler items, 32 fillers were used, among which 16 were ungrammatical relative clauses (Filler_Bad) and 16 were grammatical ones. The grammatical fillers were further divided into two types as in the first experiment: 8 typical grammatical relative clauses (Filler_Good) and 8 grammatical relative clauses with PGs (Filler_PG).

4.4. Procedure

The procedure of the second experiment is exactly the same as that of the first one, except that instead of just two, five different versions of the questionnaire were used, with different orders of the test items presented to the participants.

4.5. Results

The participants' overall performance on their acceptability judgment seems to be very similar to that of the first experiment. Table 4 shows that the central tendency of each group is the same as that of their corresponding group in the first experiment, except that the acceptability of the CNPC-violating but CC-satisfying relative clauses (DRC_Good) is not 5 but 4.

Table 4. Central tendency of the acceptability judgments

Type	**Independent variable: CC**		**Filler**		
Group	DRC_Good	DRC_Bad	Filler_Bad	Filler_Good	Filler_PG
Median	4	2	1	5	5

9 The full list of the test items for the second experiment is provided in Appendix 2.

After finding out that a significant difference exists between groups by the Friedman test, $\chi^2(4)=3917.391$, $p<.001$, four post-hoc analyses were conducted. First, the difference between DRC_Good and DRC_Bad was significant, $T=1929.5$, $p<.001$; hence, a main effect of CC. Second, as in the first experiment, there was a significant difference between DRC_Good and Filler_PG, T=2703, $p<.001$. Unlike in the first experiment, however, significance was also found in the difference between Filler_Good and Filler_PG, $T=4330$, $p<.001$. Lastly, the difference between DRC_Bad and Filler_Bad was significant, $T=54226$, $p<.001$, as was the case in the first experiment.

4.6. Dicsussion

The results clearly show that CC plays a key role in the acceptability of Korean relativization. To be more specific, DRCs with a lower relative clause in an object position, contra Han & Kim (2004), can be quite acceptable as long as they satisfy CC. However, the fact that they are less acceptable than ordinary grammatical relative clauses or relative clauses with a PG needs explanation. The slight decrease in acceptability, again, can be explained in different ways (e.g. the CNPC effect, different degrees of coherence and/or processing difficulty between groups).

The meaningful difference between DRC_Bad and Filler_Bad calls for a principled account, because the same result was also found in the first experiment. Although relative clauses of the DRC_Bad type tend to be judged unacceptable, they are certainly taken to be less unacceptable than typical ungrammatical relative clauses.

Given no significant difference between Filler_Good and Filler_PG in the first experiment, it is curious that a significant difference exists between them in the second experiment. One possible (and plausible) reason for the difference between the two experiments is that the items for Filler_Good in the second experiment is much shorter than those in the first experiment. That is, each Filler_Good item in the second experiment consists of three *ejeol*s[10] (e.g. (15a)) while in the first experiment, Filler_Good items are comprised of 7~8 *ejeol*s (e.g. (15b)).

10 An *ejeol* is a word-like element that is used as a basic unit of spacing in Korean writing. It is not exactly a word because it can consist of more than one word.

(15) a. Chelmini-ka e_i mek-unsakwa$_i$
Chelmin-Nom e_i eat-Adn apple$_i$
'an apple that Chelmin ate'
b. e_i Jengimi-lul mopsi salanghaci-man kopaykhaci mos
e_i Jengim-Acc really love-but propose cannot
ha-nun namca$_i$
do-Adnman
'a man who really loves Jengim but cannot propose (to her)'

It has long been observed that the longer the distance between a filler and its gap is in filler-gap dependencies the harder it is to process, which in turn leads to lower acceptability (Gibson 1998, 2000). Thus, the significant difference between Filler_Good and Filler_PG in the second experiment might be attributed to difference in processing difficulty of the relative clauses in the two groups, and the insignificance found in the first experiment could be explained by similar processing difficulty of the items in the two groups.

5. General discussion

Here are four main findings of this study based on the two experiments.

(16) a. CC plays an important role in Korean relativization.
b. Korean relative clauses can be (almost) totally acceptable even if they violate CNPC.
c. CNPC-violating and CC-satisfying relative clauses are still less, albeit slightly, acceptable than grammatical ones.
d. CNPC- and CC-violation is not as bad as typical ungrammaticality.

Most importantly, the first two findings ((16a) and (16b)) strongly support Kim's (2013) functional approach to island effects in Korean relativization. That is, contra Han & Kim's (2004) claim that Korean relative clauses are subject to CNPC, they clearly suggest that the role of CNPC is almost ignorable (compared to the role of CC) in Korean speakers' acceptability judgment of relative clauses.

Note that this is also consistent with Kim's (2016) experimental work, which investigated the role of CNPC and CC in Korean relativization based on a different type of relative clauses, where an object in a lower clause is extracted as shown in (17).

(17) a. [$_S$ NP_{Subj} [$_S$ NP_{Subj} ... e_i ...] NP_{obj} ...] NP_i
b. [$_S$ [$_S$ NP_{Subj} ... e_i ...] NP_{obj} NP_{Subj} ...] NP_i
c. [$_S$ [$_S$ NP_{Subj} ... e_i ...] NP_{Subj} ...] NP_i (Kim 2016: 42)

In his work, acceptability judgment was measured on a 7-point scale, and there was a significant difference between CNPC-violating but CC-satisfying items and CNPC- and CC-violating items, with the medians of each group being 6 and 4, respectively. Thus, the results of Kim's experiment and those of the current ones all converge into the same point that Korean speakers have no problem of judging CNPC-violating relative clauses acceptable as long as CC is observed.

Given what we have discussed so far, it is very tempting to conclude that CNPC does not play any role in constraining Korean relativization. However, we should be cautious about deciding the exact role of CNPC in Korean. Although it is certain that the constraint is much weaker than CC in its power of affecting relativization in Korean, the third finding in (16c) prevents us from simply claiming that CNPC just does not exist. As discussed above, it might be CNPC-violation that is responsible for the minor decrease in acceptability.

In fact, Kim's (2016) study might be able to shed some light on this issue. According to the results of his experiment, CNPC-violating but CC-observing relative clauses were just as acceptable as CNPC-satisfying grammatical fillers; that is, he could not find any significant difference between the two groups. This suggests that the little difference between the two groups in our experiments may be due to factors other than CNPC, such as difference in processing difficulty, frequency, and/or semantic/pragmatic well-formedness. More elaborated experimental study is required in order to figure out the exact role of CNPC in Korean.

Lastly, it must be explained why relative clauses that violate both CNPC and CC are not as bad as typical ungrammatical relative clauses. In fact, results of Kim's (2016) experiment show even much higher acceptability of CNPC- and CC-violating relative clauses. As mentioned above, the median of their acceptability was 4, which

can be interpreted at least as “neither good nor bad”. One possible answer to this problem is that CNPC-violation may not have any effect on Korean relativization. Rather, the acceptability which is lower than that of typical grammatical relative clauses but higher than that of ungrammatical ones could be due to the violation of CC and processing constraints. If CNPC were affecting the acceptability of those relative clauses, it would be hard to explain why it does not make them totally unacceptable just like other ungrammatical expressions.

6. Conclusion

In this paper, we have seen that Korean relativization is mainly affected by CC but not CNPC. This is consistent with the functional approach but not compatible with the syntactic approach. Regarding the exact status of CNPC, no definitive answer could be given due to limits of the experiments. In order to get a deeper understanding of the nature of island effects in Korean, further experimental research must be conducted focusing on the difference in acceptability between CNPC-violating but CC-satisfying constructions and CNPC- and CC-satisfying ones. Furthermore, more types of relative clauses and constructions other than relative clauses should be tested in terms of their sensitivity to CNPC and other island constraints.

It is also important to note that although Korean seems to be governed mainly by functional constraints in long-distance dependencies, it is possible (and probable) that other languages might behave in a different way with respect to island phenomena. In order to understand the nature of island effects, cross-linguistic study must also be conducted using various constructions and constraints.

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Appendix 1. Materials for Experiment 1

A. Good_NoObj

1. 아들이 명문대에 입학했다는 소식이 널리 알려진 유명가수
2. 밑반찬이 정갈하고 맛있다는 소문이 손님들 사이에 퍼진 식당
3. 핵심참모가 선거자금을 불법적으로 유용했다는 증거가 드러난 정치인
4. 모든 안주가 단돈 1000원이라는 광고가 인기를 끈 술집
5. 박사학위가 가짜라는 의혹이 사실로 밝혀진 교수

B. Good_Obj

6. 바람기가 많다는 사실을 옛 애인이 폭로한 축구선수
7. 알콜중독이 심각하다는 사실을 소속사에서 오랫동안 숨겨 온 연예인
8. 취업율이 전국 최고라는 사실을 재학생들이 자랑스러워하는 대학
9. 부인이 수십억대 자산가라는 사실을 친구들이 부러워하는 회사원
10. 아버지가 장군이라는 사실을 동료들이 전혀 눈치채지 못한 훈련병

C. Bad_Obj

11. 시력이 안 좋아졌다는 사실을 형이 바보같이 몰랐던 경찰
12. 취미가 독서라는 사실을 누나가 친구에게 말한 화가
13. 친구가 식당에서 일을 한다는 사실을 동생이 슬퍼한 과학자
14. 신발이 찢어졌다는 사실을 기자가 못마땅해 하는 환자
15. 발이 엄청 크다는 사실을 화가가 싫어하는 공무원

D. Filler_Bad

16. 우체부가 학교에 가서 열심히 책을 읽은 음식
17. 좋았던 추억들만 기억하고 싶어하는 철수를 독서
18. 민수가 매우 아름답다고 칭찬하고 그린 여자가 취미
19. 철민이가 그 영화를 너무 싫어하기만 하는 민지
20. 시간 여행이 가능한 민수와 연수를 입고 바지
21. 기자가 다리를 건너는 미워하는 심한 발표
22. 컴퓨터를 구입하려고 열심히 준비한 공무원을 의사
23. 승수가 무척 사랑한 여자를 예쁜 다해
24. 말이 많다고 구박받는 원인이 사탕을 태호
25. 라면을 먹고 자면 피자를 열심히 치킨이 영미

E. Filler_Good

26. 정임이를 몹시 사랑하지만 고백하지는 못 하는 남자
27. 내연녀와 함께 몰래 극장 안으로 들어간 감독
28. 연필을 사고싶었지만 돈이 없어 포기할 수밖에 없었던 아이
29. 종교가 다르다는 이유로 남편과의 이혼을 결심한 여인
30. 술을 마셨기 때문에 대리기사를 불러 집으로 간 회사원

F. Filler_PG

31. 몸무게가 아주 많이 나간다는 사실을 몹시 싫어하는 학생
32. 아버지가 일류 명문대 출신이라는 사실을 자랑스러워하는 아들
33. 인기가 많다는 사실을 여기저기 뽐내며 다니는 방송인
34. 목소리가 누구보다 좋다는 사실을 잘 알고 있는 아나운서
35. 이상형이 돈 많은 여자라는 사실을 숨기지 않는 백수

Appendix 2. Materials for Experiment 2

A. DRC_Good

1. 지금까지 저지른 잘못을 선생님이 모두 용서해준 학생
2. 야심차게 발표한 소설을 대중이 외면한 소설가
3. 데뷔작에서 펼친 연기를 감독이 극찬한 배우
4. 소신껏 지원한 대학을 부모님이 못마땅해하는 수험생
5. 10년전에 했던 공연을 아직도 팬들이 기억하는 가수
6. 결혼할 상대를 부모가 강제로 정한 재벌2세
7. 도박으로 진 빚을 소속사에서 갚아준 유명 연예인
8. 정성껏 만든 요리를 심사위원들이 혹평한 요리대회 참가자

B. DRC_Bad

9. 방에서 사용하던 노트북을 아들이 끈질기게 쳐다본 회사원
10. 교실에서 발로 찬 공을 선생님이 꽉 잡은 학생
11. 밤새도록 읽은 책을 부모님이 무척 싫어하는 학생
12. 출판기념회에 초대한 여인을 사람들이 욕한 정치인
13. 집안에 설치한 CCTV를 아내가 우연히 발견한 남편
14. 새로 구입한 가방을 점원이 열심히 포장한 고객
15. 열심히 만든 옷을 신사가 순식간에 가져간 여인
16. 오랫동안 좋아하던 여학생을 친구가 만난 남학생

C. Filler_Good

17. 철수가 짝사랑하는 여학생
18. 철민이가 먹은 사과
19. 병원에서 해고된 의사
20. 영희가 방에 붙인 부적
21. 지욱이가 영미에게 사준 반지
22. 교통사고를 당한 아이
23. 영수가 존경하는 사람
24. 집으로 간 회사원

D. Filler_PG

25. 이번 학기에 배운 내용을 전부 이해하는 학생
26. 아침에 읽은 신문을 학생들에게 요약해 준 선생님
27. 만나는 사람을 편안하게 하는 능력이 있는 남자
28. 백화점에서 찜 해둔 옷을 돈을 모아 산 여자
29. 주문한 음식을 먹지 않고 나가버린 손님

30. 오랫동안 사귀던 남자를 돈 때문에 배신한 여자
31. 동료들과 진행하던 공동연구를 그만 둔 교수
32. 스스로 설립한 학교를 지금까지 잘 지켜 온 교장

E. Filler_Bad

33. 창규가 자기 전에 사탕을 먹은 사과
34. 교수가 열심히 가르친 학생인 수업
35. 찬구가 사랑하는 애인을 결혼한 여자
36. 유미가 친한 친구와 함께 노트
37. 국회의원이 항상 읽은 책을 아이
38. 병모가 사자가 맛있게 먹은 사슴
39. 선생님이 맛있는 밥을 울린 여자
40. 석일이가 졸린 영수를 주문한 피자
41. 미라가 갔던 순이
42. 병철이가 책을 읽은 교사
43. 영재를 닮은 읽던 책
44. 진성이가 일기를 고른 책
45. 벽이 찐득하게 껌
46. 이름이 기억하는 날마다 정현이
47. 기택이가 살이 찐 수아
48. 노력을 했던 다이어트의 영찬이

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