

An Experimental Study on Island Effects in Korean Relativization*

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One of the most important issues in syntax is whether so-called “islands” are universal or not. This issue is important because the nature of Universal Grammar (UG), including the issue of whether it exists or not, partly depends on the (non-)existence of islands in every language. The goal of this paper is to shed light on this issue by using a quantitative method. Particularly, the paper focuses on the effect of Complex NP Constraint (CNPC) on the acceptability of Korean relative clause constructions (RCCs). The quantitative method used for this purpose is experimentation based on questionnaires. The results of the experiment strongly support the view that sees islands as non-universal constraints and classifies Korean as a pragmatic (or discourse-oriented) language.

Keywords: island effects, Complex NP Constraint, Characterization Constraint, relative clause constructions, Korean

1. Introduction

One of the most important issues in syntax is whether so-called “islands” are universal or not. This issue is important because the nature of Universal Grammar (UG), including the issue of whether it exists or not, partly depends on the (non-)existence of islands in every language. A number of syntacticians, particularly those who work under the framework of Chomskyan transformational grammar, believe that islands are universal (e.g. Cinque 2010). However, the universality of islands has been questioned and challenged for a long time, especially by functionalists (e.g.

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Van Valin 1995; Goldberg 2006; I. Kim 2013). Those who argue against the universality of islands often contribute the island effects to pragmatic and/or processing factors, thus questioning the very existence of part or all of islands in any language.

One of main limits of previous studies on islands is that researchers have mainly relied on their own intuition when deciding the acceptability of the data they use to support their argument. As Gibson & Fedorenko (2013) point out, this does not allow proper testing of scientific hypotheses due to cognitive biases on the part of the researcher. One way to solve this problem is to adopt quantitative methods such as using corpora and experimentation with a fair amount of participants and experimental stimuli.¹⁾

Given this background, the goal of this paper is to shed light on the issue of whether islands are universal or not by using a quantitative method. Particularly, the paper focuses on the effect of Complex NP Constraint (CNPC) on the acceptability of Korean relative clause constructions (RCCs). The quantitative method used for this purpose is experimentation based on questionnaires.

1.1. Why Korean?

The motivation for looking at Korean comes from the typological difference between “pragmatic” and “syntactic” languages (Huang 2000). Korean is known as a pragmatic (or discourse-oriented) language in the sense that discourse/pragmatic factors play a more important role than syntactic ones (e.g. islands) in how people speak and understand their language.²⁾

What is important here is that a serious consideration of the typological characteristic of Korean leads to a prediction that the islands, which are purely syntactic in nature, would have a less strong (or no) effect on

1) Philip Hofmeister and Jon Sprouse are two representative researchers who have recently started to use experimental techniques on studying island effects (cf. Sprouse & Hornstein 2013).

2) For various diagnostics for the distinction between pragmatic and syntactic languages, see Huang (2000).

Korean than languages like English. Interestingly, this prediction is contradictory to the “universalist” view, which predicts that both Korean and English show the same degree of island effects due to the universality of the islands.

This paper tries to achieve the goal introduced above by comparing and testing the two competing hypotheses. That is, if the typological perspective is on the right track, Korean would be less (or not) sensitive to islands than English. On the other hand, if the universalist view is correct, Korean must behave the same as English does with respect to whether it is affected by islands or not.³⁾

Na & Huck (1993) and Kim (2013) are among those who challenge the very existence of islands in Korean relativization. In contrast, a number of researchers, particularly formalists, have assumed or tried to prove the universalist view (e.g. Yang 1973; J.-B. Kim 1998; Han & Kim 2004).

1.2. Why relative clause constructions (RCCs)?

Among various kinds of constructions showing long-distance dependency, I chose RCCs for practical reasons. First, unlike English, Korean does not allow *wh*-movement, which makes it hard to use Korean counterparts to English constructions involving *wh*-movement (e.g. interrogative constructions). For our purposes, RCCs are ideal since it is evident by their surface structure that the head NP of a RCC is “extracted” out of its base position in both Korean and English.

Second, in Korean syntax, RCCs have been at the center of debates on the nature of island effects (e.g. Na & Huck 1993; Kim 1998; Han

3) One might argue that even if the universalist view is correct, it is still possible that Korean is less sensitive to islands than English due to its discourse-oriented nature. That is, pragmatic or discourse plausibility can be argued to override the violation of the syntactic constraints, thus making island-violating sentences quite acceptable. However, this claim is problematic in at least two respects. First, it needs to be explained how syntactic abnormality can be “cured” by pragmatic normality. As far as I know, there have been no explanation on this problem. Secondly, if certain unacceptability disappears by manipulating pragmatic factors, it is most reasonable to assume that the source (or nature) of the unacceptability is pragmatic. In other words, there is not a single reasonable reason to say that syntactic constraints are responsible for unacceptability which can be alleviated by some pragmatic factor(s).

& Kim 2004; Yoon 2011; I. Kim 2013). Thus, it is worthwhile to investigate Korean RCCs for the purpose of finding out whether islands are universal or not.

1.3. Why Complex NP Constraint (CNPC)?

It is Ross (1967) who first introduced the notion of island and its various types. According to him, CNPC can be defined as in (1) below.

(1) 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.

Here, a complex NP is defined as a NP consisting of a lexical head and a sentence. The relation between the lexical head and the sentence is domination; that is, the NP that has the lexical head dominates the sentence. And any element inside that sentence cannot get out of the complex NP because it is an “island”.

There are two reasons for choosing CNPC for our research: one practical, one theoretical. The theoretical reason is that CNPC is known as a “strong” island, which means that unlike “weak” islands, it is difficult to extract any element out of the constraint, thus showing the typical “islandhood”. Also, the strong nature of CNPC makes it a better candidate for its universality than weak islands.

The practical reason is that CNPC is the constraint that has been one of the most discussed islands in dealing with island effects in RCCs in various languages (Na & Huck 1993; Izutani 1995; Tsai 1997; Han & Kim 2004; Ishizuka 2009; Kim 2013). Thus, it makes good sense to look at CNPC when investigating island effects in RCCs.

The structure of the rest of the paper is as follows. In Section 2, I will introduce the characterization constraint (CC) in detail, which, together with CNPC, will be used as the independent variable in our experiment.

In Section 3, I will introduce the experiment which examines the CNPC and CC effects in Korean RCCs. In Section 4, I discuss the results of the experiment. Finally, Section 5 concludes the paper.

2. Characterization Constraint (CC)

Providing various types of counterexamples to the argument that the acceptability of Korean RCCs are determined by CNPC, Kim (2013) tries to show that the acceptability of Korean relativization is mainly affected by what he calls the characterization constraint (CC), which is pragmatic in nature.

(2) 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,

- (a) the head NP referent and its situation must be directly related to each other, or
- (b) the upper situation should be coherent with the lower situation, and/or
- (c) the upper situation should be coherent with the head NP referent

First, it is important to understand what it means for a head NP and a relative clause to be directly/indirectly related to each other. There are two possible syntactic relations between a head NP and a relative clause. The first possibility is that a head NP is extracted out of an upper clause of a relative clause. The second possibility is that a head NP is extracted out of a lower (or embedded) clause. The two relations can be schematized as in (3a) and (3b). (4a) and (4b) are example sentences representing each type of the relations.

- (3) a. [s ... ([s ... (e_i) ...]) ... e_i ...] NP_i
- b. [s ... [s ... e_i ...] ...] NP_i

- (4) a. [John-i [Kim-i paykophu-ta-ko
 [John-Nom [Kim-Nom hungry-Dec-Comp
 hay-se] e_i sacwu-n] ppang_i
 say-because] e_i buy-Adn] bread
 ‘The bread_i that John bought e_i because Kim said he was
 hungry’
- b. [John-i [Kim-i e_i sass-ta-ko]
 [John-Nom [Kim-Nom e_i bought-Dec-Comp]
 mit-nun] ppang_i
 believe-Adn] bread
 ‘The bread_i that John believes that Kim bought e_i’

What is important here is the fact that in (3a), the head NP is extracted out of the outermost clause. Whether there is an embedded clause or whether a gap also exists in the embedded clause is not relevant. What distinguishes (3a) from (3b) is that the head NP has its gap in the upper clause in (3a), whereas there is no gap in the upper clause in (3b).

The syntactic distinction based on where the head NP is extracted from leads to an important semantic difference. In (3a), the referent of the head NP is directly related to “its” situation, i.e., the situation in which it participates as a semantic argument/adjunct, in that there is no intervening situation between the referent and its situation. On the other hand, in (3b), the head NP referent is only indirectly related to its situation because the situation denoted by the upper clause intervenes between the two. For instance, in (4b) the situation of John’s believing intervenes between the the bread and its situation, that is, Kim’s buying the bread.

It is also important to understand the notion of coherence. Kim (2013) bases his notion of coherence on Kehler’s (2002, 2004) discourse coherence, under which there are three main types of relations, namely Resemblance, Cause-Effect, and Contiguity. Each type has its own subtypes of relations as shown in Table 1.

Table 1. Kehler’s (2002, 2004) Discourse Coherence⁴⁾

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

In order to better understand what it means for two situations are coherently related to each other, let us compare (5a) and (5b).

- (5) a. The suspect smuggled transparent drugs. John heard the news.
- b. The suspect smuggled transparent drugs. The police after all failed to find evidence for it.

In (5a), the two situations denoted by the two sentences can hardly be taken to be coherently related to each other, because it is hard to infer any coherent link between the event of the suspect’s smuggling transparent drugs and that of John’s hearing the news. In other words, unless one understands how the suspect is related to John and why and how John’s hearing the news is relevant to the suspect’s smuggling transparent drugs, the two events are just independent from each other and no meaningful relationship between the two can be captured by the hearer.

In contrast, (5b) can be safely considered to be coherent, because the two situations are coherently related to each other by Result relation⁵⁾, which is a subtype of Cause-Effect relation. That is, it can be inferred that the transparent nature of the drugs resulted in the failure of the police to find evidence for the smuggling.

According to Kim (2013), Korean RCCs are acceptable as long as they satisfy CC; that is, even if they violate CNPC, they can be acceptable if the head NP is appropriately characterized by the relative clause by

4) Formal definitions and detailed discussions on each sub-relation is provided in Kehler (2002, 2004). Because not all the relations will be relevant to the topic of this paper, I will not introduce all the definitions of the relations. Rather, only some of them will be introduced when it is necessary.

5) Result: Infer P from the assertion of S1 and Q from the assertion of S2, where normally $P \rightarrow Q$ (Kehler 2004: 247).

observing CC. For instance, RCCs in (6a) and (6b), which are from Kim (2013), have the same syntactic structure which violate CNPC. However, their acceptability differs from each other depending on whether they satisfy CC or not.

- (6) a. ???[John-i [[kangto-ka e_i hwumchy-ess-tanun]
 [John-Nom [[thief-Nom e_i steal-Past-Adn
 sosik-ul tul-un] posek_i
 news-Acc hear-Adn jewel_i
 ‘a jewel which John heard the news that a thief stole e_i’
- b. [kyengchal-i [yonguyca-ka e_i mollay
 [Police-Nom [suspect-Nom e_i secretly
 panip hayssta-nun]
 carrying-in did-Adn]
 cungke-lul kkutnay chacci motha-n]
 evidence-Acc after all find not-Adn]
 thwumyeng mayak_i
 transparent drug_i
 ‘The transparent drug_i that the police failed after all to find
 evidence that the suspect secretly carried in e_i’

That is, the acceptability of (6a) is low because the head NP is not properly characterized by the relative clause; unless we know how John is related to the thief and/or the event of the thief's stealing the jewel, it is not easy to infer a coherent relation between the upper situation and the lower one or the head NP referent. In contrast, (6b) is acceptable since it is easy to infer a coherent relation between the lower and upper situations, which is Cause-Effect relation.

As already pointed out in the introduction, acceptability judgment can be cognitively biased, which decreases the reliability of the acceptability judgments provided by previous studies on this issue. In fact, the author's personal experience tells that the acceptability of the examples introduced above is not stable and vary from person to person. In next section, I will introduce and report the results of an experiment based on accept-

ability judgments which was conducted to understand what really constrains Korean relativization.

3. Experiment

3.1. Hypothesis

The experiment was designed to test the two competing hypotheses discussed above: one from the typological perspective and one from the universalist point of view. The former is that Korean RCCs violating CNPC but satisfying CC would be as (nearly) acceptable as ordinary grammatical RCCs, since pragmatic factors are assumed to be more influential than syntactic ones in Korean. The latter is that Korean RCCs which violate CNPC are unacceptable regardless of whether they satisfy CC or not since the existence of CNPC is universal, which means that the violation of CNPC makes the sentence ungrammatical (and thus unacceptable) no matter what.

3.2. Participants

The total number of participants is sixty six. All of them are in their twenties and university students at Kangwon National University at Samcheok. They have had no education on linguistics except for taking an introductory course on English linguistics.

In the actual analysis, data from two participants had to be excluded due to unreliable responses. For instance, they gave the acceptability of 5 or above to totally ungrammatical RCCs, or gave 3 or below to totally grammatical RCCs. As a result, data from the remaining sixty four participants were analyzed, among whom thirty seven are female and twenty seven are male.

3.3. Materials

The experimental stimuli are thirty Korean RCCs, all of them violating CNPC. Among the thirty RCCs, fifteen of them violate CC and fifteen

do not. Each set of fifteen RCCs is divided into three different types as in (7). Sentences in (8) are the examples of each type of RCCs in (7).

- (7) 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

- (8) a. [John-i [Kim-i e_i meke-ss-ta-nun]
 [John-Nom [Kim-Nom e_i eat-Past-Dec-Adn]
 sasil-ul molu-nun] ppang;
 fact-Acc not know-Adn] bread;
 ‘The bread_i that John does not know the fact that Kim ate e_i’
- b. [[John-i e_i mek-ess-ta-nun] sasil-ul
 [[John-Nom e_i eat-Past-Dec-Adn] fact-Acc
 Kim-i molu-nun] ppang;
 Kim-Nom not know-Adn] bread;
 ‘The bread_i that John does not know the fact that Kim ate e_i’
- c. [[John-i e_i mek-ess-ta-nun] sasil-i
 [[John-Nom e_i eat-Past-Dec-Adn] fact-Nom
 nelli allyeci-n] ppang;
 widely known-Adn] bread;
 ‘The bread_i that the fact that John ate e_i is widely known’

The first type in (7a) has the subject of the upper clause at the canonical sentence initial position. An example of this is shown in (8a), where *John* is the subject of the upper clause. In the second type in (7b), the subject of the upper clause follows the object argument thus being closer to its predicate, an example of which is illustrated in (8b). Lastly, the third type in (7c) has no object argument in the upper clause; that is, unlike the other two types, the head NP of the complex NP acts as the subject but not the object of the upper clause. An example of this type is shown in (8c), where the noun *sasil* ‘fact’ is not accusative- but nominative-marked.

In the actual analysis, however, I excluded the acceptability of the third

type of RCCs because it turned out that the RCCs of the third type which were supposed to violate CC did not really violate it. In other words, all the ten RCCs in that group satisfied CC.⁶⁾ Thus, the total number of the experimental stimuli actually analyzed for our purposes is twenty.

For fillers, twenty five RCCs are used, among which four were ungrammatical and twenty one were grammatical. Among the grammatical ones, eleven were ordinary grammatical RCCs, six were grammatical RCCs with a complex NP within them, and four were RCCs involving a “cyclic movement”.⁷⁾

The reason for using not only simple RCCs but also the RCCs with a complex NP and those with a cyclic movement is to compare their acceptability with the acceptability of the experimental stimuli so that it can be shown, for instance, whether the CNPC-violating but CC-satisfying RCCs are less acceptable than the RCCs with a similar syntactic structure (i.e. the RCCs with a complex NP), which would be expected if the CNPC would really have an effect in Korean relativization, and whether a possible non-perfect acceptability of the CNPC-violating and CC-satisfying RCCs are significantly lower than the non-perfect acceptability caused by processing difficulty of a cyclic movement.

6) An example RCC of the third type is shown in (i) below.

(i) [[e_i ku kaswu-wa sakwinta-nun] somwun-i iss-nun] yeca_i
 [[e_i the singer-with date-ADN] rumor-NOM exist-ADN] woman_i
 ‘The woman_i that a rumor that e_i goes out with the singer exists.’

The crucial reason for this type of construction to necessarily satisfy CC is that although the head NP is extracted out of the lower clause, which establishes indirect relation between the head NP referent and its situation, the semantic content of the upper clause becomes so “transparent” that the “intervention effect” caused by the indirect relation is not significant enough to decrease acceptability. Moreover, one cannot divide the whole situation of a relative clause of the third type into two separate situations, which makes it impossible to posit any coherence relation between the upper and lower clauses. Constructions like (i) thus “vacuously satisfy *coherence* [emphasis added] between the upper and lower clauses” (Kim 2013: 70). Indeed, even the median of the acceptability of the five RCCs that were of the third type and supposed to violate CC was 6, which is high enough to be considered (fully) acceptable.

7) For the actual test items for each type of fillers and experimental stimuli, see Appendix.

3.4. Procedure

Each RCC in the questionnaire was paired with a 7-point acceptability scale (1-bad, 7-good). Two 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 which is 1 and which is 7. The rest of the RCCs in the questionnaire were randomized using the list randomizer provided online (<http://random.org>).

The survey was done with written questionnaire in a quiet classroom. It took the participants about 25 minutes to complete the questionnaire, and their participation was voluntary.

3.5. Results

For the statistical analysis of the data, ordinal regression was used instead of analysis of variance (ANOVA), which is widely used for analyzing acceptability data (cf. Sprouse 2007; Kush et al. 2013). Before going into any detail of the results, let me first explain why ordinal regression must be preferred over ANOVA.

The most important reason why ANOVA is not a proper method for analyzing the current data is that ANOVA requires data that can be used to compute means and variances. That is, ANOVA is done by calculating the means and variances of numerical data. And it is very basic knowledge of statistics that the mean is defined in terms of distances.

However, Likert scale, or ordinal scale in general, which is used for acceptability judgment in this experiment and many others do not measure distance but direction. In other words, “ordinal values tell you only the direction from one score to another, but provide no information about the distance between scores” (Gravetter & Wallnau 2013: 743). Thus, it is not appropriate to compute a mean for scores from an ordinal scale, and for this reason, “it generally is considered unwise to use traditional statistics such as t tests and analysis of variance with scores consisting of ranks or ordered categories” (Gravetter & Wallnau 2013: 743).

Unlike ANOVA, ordinal regression models, also known as cumulative link models (Agresti 2002), are a powerful model class for ordered catego-

rical data, or simply ordinal data, because “observations are treated rightfully as categorical, the ordered nature is exploited and the flexible regression framework allows in-depth analyses” (Christensen 2015: 3).

Before looking at the results of inferential statistics based on ordinal regression, let us first check the descriptive statistics, which provides the overall picture of the participants’ performance. First, the frequency of the acceptability classified by the independent variable is shown in Table 2.

Table 2. Frequency

Types of RCCs	Acceptability							Total
	1	2	3	4	5	6	7	
CC-violating	99	106	87	89	135	82	42	640
CC-satisfying	16	27	38	85	94	174	206	640

As shown in Table 2, the most frequent judgment for the CC-satisfying RCCs is 7, whereas that for CC-violating RCCs is 5. Also, it is important to note that there is a clear tendency for the frequency of the CC-satisfying RCCs to gradually increase as the acceptability improves, whereas it is hard to find such a tendency in the frequency of the CC-violating RCCs.

The second descriptive statistics to look at is the central tendency of the frequency of the acceptability judgments. Due to the nature of ordinal scale that does not measure distance but only direction, the mean is undesirable for getting the central tendency of ordinal data (Song et al. 2015; Gravetter & Wallnau 2013). Instead, “when scores are measured on an ordinal scale, the median is always appropriate and is usually the preferred measure of central tendency” (Gravetter & Wallnau 2013: 92). The median is the number separating the higher half of data from the lower half.

The median for the CC-satisfying RCCs is 6 and that for the CC-violating RCCs is 4. That is, among the 640 judgment scores of each type of RCCs, the score in the middle for the CC-satisfying RCCs is 6 and that for the CC-violating RCCs is 4, hence an apparent difference between the two groups. In order to figure out whether this difference is statistically significant, and exactly to what extent the independent variable has effect on the acceptability of Korean RCCs, inferential statistics is necessary.

For inferential statistics, I conducted the ordinal regression analysis using SPSS. The specific model used in this study is the cumulative logit⁸⁾ model, which is a kind of cumulative link model that uses the logit function as its link function. The results of the analysis is shown in Table 3.

Table 3. Parameter Estimate

		Estimate	Wald	df	Sig.
Threshold	[Acceptability = 1 (6-7)]	-1.418	252.019	1	.000
	[Acceptability = 2 (4-5)]	.162	4.463	1	.035
	[Acceptability = 3 (2-3)]	1.724	276.280	1	.000
Location	[CC=1]	-1.795	248.964	1	.000
	[CC=2]	0	.	1	.

Link function: Logit

First, note that in order to get the model that best explains the data, I changed the number of scales from 7 to 4, by combining 6 and 7, 4 and 5, and 2 and 3. And for technical reasons, the order of acceptability was reversed, thus resulting in 1, 2, 3, and 4, each of which corresponds to the initial 6-7, 4-5, 2-3, and 1.

In ordinal (logistic) regression, the event of interest is observing a particular score or less. For the rating of the acceptability in our experiment, the following odds should be modeled:

$$\theta_1 = \text{prob}(\text{acceptability of 1}) / \text{prob}(\text{acceptability greater than 1})$$

$$\theta_2 = \text{prob}(\text{acceptability of 1 or 2}) / \text{prob}(\text{acceptability greater than 2})$$

$$\theta_3 = \text{prob}(\text{acceptability of 1, 2, or 3}) / \text{prob}(\text{acceptability greater than 3})$$

The last category does not have an odds associated with it because the probability of scoring up to and including the last score is 1. This is also why Table 3 does not have the category 4 (1).

Our experimental design has just one independent variable, and the ordinal logistic model for a single independent variable is shown in (9).

8) Logit is the log of odds that an event occurs.

$$(9) \ln(\theta_j) = \alpha_j - \beta X$$

Here, the quantity to the left of the equal sign is the logit, and j goes from 1 to the number of categories minus 1. Each logit has its own α_j term but the same coefficient β , which means that the independent variable, which is β , has the same effect on different logit functions. In fact, this is an assumption that has to be checked by the test of parallel lines. The proposed model passed this assumption ($p = .663$).⁹⁾

The estimates labeled Threshold are the α_j 's, the intercept equivalent terms. The estimates labeled Location are of our interest, because they are the coefficients for the predictor variables. The coefficient for CC (coded 1 = satisfying, 2 = violating), the independent variable in the model, is -1.795. Here, the negative coefficient for [CC=1] means that lower scores are more likely for the CC-satisfying RCCs than for the CC-violating RCCs. We can also see that the independent variable has a statistically significant effect on the dependent variable ($p = .000$).

The regression model also makes a prediction about the most probable acceptability for each condition.

Table 4. Predicted Acceptability for the Two Types of Korean RCCs

	Predicted acceptability			
	1 (6-7)	2 (4-5)	3 (2-3)	4 (1)
CC-violating RCC	0	640	0	0
CC-satisfying RCC	640	0	0	0

As shown in Table 4, the acceptability of CC-satisfying and CNPC-violating RCCs predicted by this model is 1, or 6-7 in our original scale, which means that even if a RCC violates CNPC, its acceptability can be as good as typical grammatical RCCs.

It is also important to note that even RCCs violating both CNPC and CC are *not unacceptable*. The predicted acceptability for these RCCs is

9) The current model also passed all the other important assumptions or tests such as goodness of fit statistics and pseudo R-square statistics, which is necessary to prove that the model fits.

2, or 4-5 in our original scale. Although the acceptability is not as high as that of CC-satisfying RCCs, it is far from unacceptable.

Next, I further compared the acceptability of CNPC-violating and CC-satisfying RCCs with that of fillers with a similar syntactic structure (i.e. RCCs with complex NP in it). Mann-Whitney test was used for the analysis and the result shows that the two groups of RCCs are not different from each other in terms of their acceptability ($p = .500$). In fact, the medians of the two groups of RCCs are the same; both are 6.

In addition, I also investigated whether the acceptability of CNPC-violating and CC-satisfying RCCs is different from that of grammatical RCCs with high processing cost due to a cyclic movement. The Mann-Whitney test shows that there is a significant difference between the two groups ($p = .000$), the latter being significantly less acceptable than the former. The median score of the RCCs with a cyclic movement is 3.

4. Discussion

The results reported in the previous section can be summarized as in (10).

- (10) a. CNPC-violating RCCs are quite acceptable if CC is satisfied.
- b. CC has a significant effect on the acceptability of Korean RCCs.
- c. RCCs violating both CNPC and CC are not unacceptable.
- d. CNPC-violating but CC-satisfying RCCs are as acceptable as grammatical RCCs with a similar structure.
- e. CNPC-violating but CC-satisfying RCCs are more acceptable than grammatical RCCs involving a cyclic movement.

From (7a), we can safely conclude that CNPC does not have any significant effect on the acceptability of Korean RCCs. If it did, RCCs that violate CNPC should be unacceptable whether they satisfy CC or not.

This conclusion is further supported by the prediction made by the proposed ordinal regression model. The prediction is that the acceptability

of CNPC-violating but CC-satisfying RCCs is 6-7, which means that the acceptability increases to the extent that Korean speakers would not be able to distinguish it from the acceptability of other ordinary grammatical constructions with similar structures. In fact, this is exactly what (10d) shows. Again, (10d) is not expected if CNPC had any significant effect on the acceptability of Korean relativization.

The most reasonable conclusion we can get from (10b) is that the difference in acceptability between the CC-satisfying RCCs and CC-violating ones is caused by CC but not by CNPC. As discussed in footnote 3, there is no independent reason to contribute the relatively low acceptability to CNPC if that lowness disappears by manipulating CC. The fact that the type of RCCs discussed in footnote 6 are almost fully acceptable also supports the proposed explanation but is inconsistent with the universalist view.

Considering what previous studies have argued based solely on the researchers' intuition, the most striking result may be (10c), which states that even if RCCs violate both CNPC and CC, they are not totally unacceptable. Rather, the predicted acceptability of them is 5-6. (Note that the median for the ungrammatical fillers is 1.) This result is contradictory to what most previous studies have agreed on, according to which they are totally unacceptable. However, the median of those RCCs is 4, which means that it is neither acceptable nor unacceptable. The most plausible explanation of this result seems to be that Korean is a really strong pragmatic language and people try hard to infer coherence relation between situations even if what they hear or read hardly gives them hints for coherence.

As for (10e), what it implicates is that Korean is not really a syntactic language, in the sense that syntactic well-formedness is not an important factor on how people evaluate the acceptability of complex expressions. Rather, they need to be able to infer coherent relations between situations in order to make sense of them and feel that they are natural Korean expressions. (Note that the RCCs with cyclic movements express situations that are not coherently related to one another, such as 'the book that John knows that Susan believes that Kim brought'.)

Lastly, it is important to note that the results reported in Table 2 clearly shows that the acceptability judgments are gradient. The gradient nature can best be explained by a process-based approach to coherence. According to Kousta (2002: 101-102), “coherence is essentially a mental entity, and the degree to which a text is judged to make sense is a function of the amount of inferences required in the processing of sequences of utterances given the context in which these utterances are embedded. *The fewer inferences a hearer is required to make, and, consequently, the less processing effort is required on his/her part, the more coherent the discourse is judged to be* [emphasis added]”.

With the understanding of coherence provided above, the pragmatic constraint CC could ultimately be assumed to be one of the processing factors that affect acceptability of Korean RCCs. The fact that the acceptability judgments are gradient then naturally follows from the gradient nature of coherence, the degree of which is in inverse proportion to the number of inferences required in order to make two sentences (or a sentence and a NP) coherent.

It is also important to note that there two types of variation for coherence judgment: inter- and intra-individual. First, it is not unreasonable to assume that inter-individual variation exists, since knowledge gained from human experience and general inference pattern/ability (including granularity with which one conceptualizes events and change resulting from them) differ from person to person. Second, there must be intra-individual variation as the two factors, that is., world knowledge and inference pattern/ability, changes both quantitatively and qualitatively as time goes by.

5. Conclusion

In this paper, we investigated the issue of whether islands are universal or not by looking at CNPC effects on Korean RCCs. The results strongly counterargue the universalist hypothesis, mainly because they show 1) that CNPC-violating RCCs can be as acceptable as other ordinary grammatical RCCs by manipulating CC and 2) that even RCCs that violate

both CNPC and CC are not unacceptable.

Rather, all the results of the experiment is consistent with the view that takes Korean RCCs to be affected by pragmatic factors, thus strongly supporting the idea of classifying English and Korean into different typological groups in terms of syntax- vs. discourse-orientedness.

It has to be noted that the experiment has its limits in terms of its degree of precision. First, although the test items were randomized in the questionnaire, the questionnaires given to each participant are exactly the same, which means that the experiment failed to provide each participant with differently randomized items. We can get a better precision by having each participant get differently randomized items, which can be much more easily done by computer than hand. Second, the length of experimental stimuli are not the same, which could also be a confounding factor.¹⁰⁾

In order to get a more persuasive and solid conclusion, we need to conduct an experiment in the future that is more elaborately designed so as not to have the limits discussed above. Also, an experimental study on the CNPC effects on English RCCs should also be carried out in order to better understand the (non-)universality of islands and the validity of the typology between pragmatic and syntactic languages.

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10) However, it has to be noted that if the difference in length between test items had affected the results, it must have been done in a way that would undermine the conclusion made in this paper. That is, the CC-satisfying RCCs are longer than the CC-violating RCCs, and it is usually the case that the longer expressions are, the harder it is to process them. Thus, it is predicted that the results would have been more supportive of the argument of the paper if it had not been for the confounding factor.

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Appendix 1. Experimental stimuli

A. CC-Violating RCCs

1. 철수가 강도가 훔쳤다는 소식을 들은 보석
2. 민지가 사서가 버렸다는 사실을 알고있는 봉지
3. 약사가 민수가 안다는 사실을 몰랐던 책
4. 기자가 민정이가 구입했다는 소문을 낸 자동차
5. 조교가 소영이가 훔치리란 예상을 하지 못한 배낭
6. 윤주가 읽었다는 소식을 신사가 들은 책
7. 조교가 흘렸다는 사실을 미나가 알게 된 종이
8. 판사가 먹었다는 증거를 약사가 찾아낸 피자
9. 그 학생이 수강하리란 예상을 윤희가 했던 강좌
10. 프로그래머가 먹으리란 기대를 변호사가 한 피자
11. 스님이 먹었다는 증거가 있는 사탕
12. 철수가 버렸다는 사실이 널리 알려진 지우개
13. 유명배우가 읽었다는 소문이 널리 퍼진 책
14. 그 공무원이 사용했다는 사실이 밝혀진 연필
15. 민지가 사용하리라는 기대가 컸던 휴지

B. CC-satisfying RCCs

1. 경찰이 용의자가 몰래 반입했다는 증거를 끝내 찾지 못한 투명마약
2. 보안요원이 범인이 바지 안에 숨기고 있다는 사실을 알아채지 못한 초소형 권총
3. 관객들이 그 아이돌 가수가 콘서트에서 부를 것이라 예상을 전혀 하지 못한 옛 노래
4. 국문학자가 그 시인이 20년 전에 썼다는 사실을 오랜 연구 끝에 어렵게 알아낸 시
5. 김교수가 수강생들이 재밌게 읽으리란 기대를 전혀 하지 않은 두꺼운 수업교재
6. 모든 학생이 아주 쉽게 풀었다는 사실을 출제자가 도저히 믿기 힘든 최고난이도의 문제
7. 그 회사가 아주 비위생적으로 만들었다는 사실을 소비자들이 전혀 알지 못한 냉동식품
8. 파파라치가 몰래 찍었다는 사실을 피해 당사자가 전혀 눈치 채지 못한 사진
9. 자살한 여배우가 직접 구입했다는 사실을 경찰이 CCTV를 통해 알아낸 수면제
10. 철수가 가차없이 휴지통에 버렸다는 사실을 그의 약혼녀가 도저히 받아들일 수 없는 약혼반지
11. 범인이 사용했다는 증거가 있는 신용카드
12. 감독이 쉽게 섭외할 수 있으리란 예상이 벗어난 여배우
13. 육상선수가 우승을 하기 위해 복용한 의혹이 있는 약물
14. 유명작가가 몰래 배꼈다는 소문이 널리 퍼진 소설

Appendix 2. Fillers

A. Ordinary grammatical RCCs

1. 판사가 내린 결정에 불복하여 항소를 결심한 피의자
2. 철민이는 먹었지만 민정이는 안 먹은 사과
3. 철수가 어쩔 수 없이 거절한 부탁
4. 기철이가 먹은 사과
5. 지연이가 가지 말라고 말렸지만 말을 듣지 않은 민수
6. 영수가 본 줄 알았지만 실제로는 그렇지 않았고 민수가 본 달력
7. 그 잡지를 정기구독하려 했으나 돈이 부족해 포기해야 했던 회사원
8. 철수가 나중에 먹으려고 냉장고에 보관해 둔 사과
9. 영화감독과 배우가 모두 만족하며 촬영한 영화
10. 철수가 오늘 사려고 했는데 영화가 내일 사는 것이 더 좋을 거라고 충고한 티켓
11. 부인이 남편이 훔쳤다고 믿은 자동차

B. Grammatical RCCs with complex NPs

1. 철수가 학교에 갔다는 사실을 민수가 몰랐던 이유
2. 민수가 지영이와 약혼을 하리라는 예상을 철민이가 하지 못한 증거
3. 범인이 음주측정을 거부했다는 증거를 기철이가 찾은 날
4. 선생님이 갑자기 사표를 쓸 것이란 예상을 신사가 못 했던 이유
5. 사장이 그 직원을 해고한 사실을 영화가 몰랐던 이유
6. 아들이 일류대에 합격하리라는 기대를 부모가 저버리지 않았다는 사실

C. Grammatical RCCs with a cyclic movement

1. 민정이가 사용했다고 회애가 믿으리라 중수가 예상한 학용품
2. 학생이 읽기로 부모가 결정했다고 교사가 생각한 책
3. 민수가 철수가 신청할 것이라고 예상했다고 민정이가 믿은 강좌
4. 철수가 살 것이라고 영화가 생각한다고 민수가 믿은 바지

D. Ungrammatical RCCs

1. 병모가 사자가 먹은 사슴
2. 선생님이 밥을 먹었다는 소식을 학생이 퍼뜨린 반찬
3. 철수가 영수를 때린 음식
4. 교수가 학생을 수업

