

An Experimental Study on Scrambling out of Islands: To the Left and to the Right*

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Ko, Heejeong; Chung, Han-byul; Kim, Kitaek; Sprouse, Jon (2019), “An Experimental Study on Scrambling out of Islands: To the Left and to the Right,” *Language & Information Society* 37. This paper presents an experimental study to examine whether scrambling out of an island is (im-)possible in Korean. It is shown that scrambling out of an island may trigger occasional additive degradation in acceptability, but no super-additive degradation is obtained in leftward or rightward scrambling (or right-dislocation), contrary to *wh*-movement in English. Our results also show that strong islands may cause additive degradation whereas weak islands do not. The current study poses a new challenge to a processing approach to islands which solely relies on linear

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dependencies, and demonstrates that the role and type of island structures must be considered. Our research also suggests that a factorial-design experiment needs to be employed to examine potential interactions among scrambling, the direction of movement, and island effects in language.

keywords: scrambling, islands, leftward scrambling, rightward scrambling, right-dislocation, super-additivity, additivity

1. Introduction

The term *scrambling* was coined by Ross(1967) to refer to free word order variations observed in languages. Ross(1967) originally defined scrambling as a stylistic rule that applies freely in the grammar. Since then, its theoretical import has been adopted in many different ways (see Ko(2018) for a comprehensive overview).

In this paper, we focus on a research question concerning restrictions on scrambling - in particular, scrambling out of islands. We present an experimental study to investigate the question of whether scrambling out of island is (im-)possible in Korean and whether scrambling out of island yield unacceptability comparable to *wh*-movement out of island in other languages.

This paper is organized as follows. In section 2, as a theoretical background, we discuss major approaches to scrambling. In section 3, we posit research questions that motivate the current experimental study on islands, and lay out the underlying hypothesis and predictions of our experiment. In section 4, we present the details of our experimental study, including the methods, results, and statistical analyses. In section 5, we discuss implications and limitations of the current study.

2. Theoretical Approaches to Scrambling

Though the details differ, theoretical approaches to scrambling can be divided into two major schools: some researchers argue that scrambling is a result of base-generation in syntax, whereas others take scrambling as a movement operation with differing assumptions on its nature. The base-generation approach is further divided into a configurational vs. non-configurational approach, and the movement approach is divided into stylistic (PF) vs. syntactic movement approaches (See Ko(2018) for an overall discussion).¹⁾

2.1. Base-generation approaches to scrambling

Hale(1982) adopted a non-configurational flat structure to explain free word order in languages like Warlpiri and Japanese. Hale(1982) proposes that languages with rigid word order take the configurational structure, whereas languages with free order take the non-configurational flat structure. In flat structures, each element has the same structural relationship with the head, so that free word order is allowed.

As an alternative way to implement Hale's insight, other researchers argue that scrambling languages are fully configurational, but scrambled orders can be freely base-generated in syntax. In particular, Bošković and Takahashi(1998) argue that scrambled phrases must be base-generated in their surface position, and that they undergo lowering at LF in order to

1) This section is a summary of the critical review on the literature on scrambling provided by Ko(2018).

check their theta features, if necessary.

2.2. Movement approaches to scrambling

It has also been proposed that scrambling is an instance of movement, *contra* the base-generation approaches. Some researchers argue that scrambling operates in the PF component (see Ross 1967; Chomsky & Lasnik 1977; cf. Zubizarreta 1998; Kwon 2010; Sauerland & Elbourne 2002). Others argue that scrambling is a movement operation that applies in core syntax.

The syntactic movement approach is further divided into two sub-types. In one camp, scrambling is assumed to be a type of cost-free optional movement. This has been the most dominant view in the field, especially in the pre-minimalist era (e.g. Kuroda 1988; Saito 1985; Hoji 1985). In the other camp, scrambling is argued to be a feature-driven movement in syntax (e.g. Y. Lee 1993; Miyagawa 1997, 2001, 2010; Lee & Cho 2003a, b; Jung 2002; Yang & Kim 2005; H. Lee 2006; Ko 2007, 2011, 2014a).

Note that the two syntactic movement approaches share the assumption that scrambled orders must be understood as a result of movement. Thus, both of the approaches receive support from the empirical evidence that the distribution of scrambled phrases is constrained by predictable grammatical factors concerning movement (see Saito 1985; Hoji 1985; Y. Lee 1993; Cho 1994, *i.a.*).

In particular, it naturally follows that scrambling obeys movement constraints such as island constraints, the left branch condition, and the proper binding condition. It is also expected that scrambling does affect structural configurability in binding, scope, and semantic interpretation.

The remaining issue under current debate is whether scrambling is cost-free or must be triggered by a formal feature (see, for instance, Ko(2014a) for evidence for the latter based on cyclicity and (anti-)locality of scrambling; cf. Saito(2016) for optional scrambling based on the labeling theory of Chomsky(2013, 2015)).

3. Research questions on scrambling out of islands

There is a general consensus that scrambling out of strong islands in Korean may cause degraded judgments. For instance, the judgment that examples like (1) are unacceptable is widely shared in the field.

(1) a. *John-ul₁ Mary-ka [t₂ t₁ cohaha-nun] chinkwutul₂]-ul
 J.-Acc M.-Nom like-Rel friends-Acc
 mannassta.
 met

‘Mary met the friends who likes John.’ (Cho 1994:106)

b. ^{??}mwues-ul₁ John-i [Mary-ka t₁ saki-ceney] hwa-ka nass-ni?
 what-Acc J.-Nom M.-Nom buy-before anger-Nom got-Q
 ‘What is such that John got angry before Mary bought it?’

(R. Kim 2003:6; based on Saito & Fukui 1998:463)

Crucially, however, relatively little experimental research on scrambling and islands has been conducted previously, potentially limiting our understanding of the nature of scrambling (cf. J.-M. Yoon 2013, 2015, 2016; Y.-J. Jung 2015; I. Kim 2016).

First, it is in fact rather controversial how island effects should be understood in the grammar. The syntactic movement approach argues that the very existence of low acceptability in scrambling out of islands constitutes strong evidence for scrambling as syntactic movement (Saito 1985; Lee 1993; Cho 1994 for scrambling, *i.a.*). This claim is crucially based on the premise that island effects arise due to a violation of syntactic constraints on movement (Ross 1967; Chomsky 1973, 1986).

A growing number of researchers, however, argue against this underlying premise. One example is the family of analyses that we will call *the processing approach to islands*. The processing approach argues that low acceptability observed with movement out of islands is fully attributable to one or more types of processing difficulty (see J.-M. Yoon 2013, 2015, 2016; Jung 2015; I. Kim 2016, *i.a.*; Kluender & Kutas 1993; Kluender 1998, 2004; cf. Sprouse 2012 for an overall discussion). To examine the nature of scrambling, it is therefore necessary to test to what extent the low acceptability observed with scrambling out of islands might be explained by the processing approach.

Second, despite the consensus on the judgements of scrambling out of islands, it has not been studied yet whether the effect size of unacceptability caused by scrambling is comparable to that of other types of long distance movement such as *wh*-movement in English. In fact, it has long been debated whether scrambling can be assimilated to A-movement or A'-movement or by certain modifications of it (see Saito 1985, 1992; Webelhuth 1989; Tada 1993; Mahajan 1990; Miyagawa 1997, 2001; Karimi 2005, *i.a.*). Even if examples like (1) are rejected by native speakers of Korean, it remains to be seen whether the thus-far documented unacceptability should be analyzed in the same way as island violations

observed in standard long distance A'-movement. An experimental study is needed to examine a potential discrepancy between scrambling and A'-movement out of islands.

Third, in-depth research on the nature of scrambling and islands becomes even more important and intriguing in the context of rightward scrambling (or rightward dislocation) in Korean.²⁾ It has been debated whether rightward scrambling is degraded when it occurs across islands. Some argue that rightward scrambling is restricted by syntactic island constraints, just as leftward scrambling - especially under the mono-clausal movement approach, (e.g. Choe 1987; Kural 1997; Manetta 2012; Ko 2017, among others). Others argue that rightward scrambling/dislocation does not have to obey island conditions - especially under base-generation (e.g. J.-S. Lee 2008; C.-H. Lee 2009) or bi-clausal approaches (e.g. Chung 2009, 2012; M.-K. Park & S.-W. Kim 2009; Ahn & Cho 2015, 2016; Park & Oh 2017, among others; cf. W. Lee 2010; Yoon 2016). On the latter, degradation due to rightward scrambling out of islands, if any, must be attributed to processing difficulty traced to the long distance dependency between the host and the appendix (W. Lee 2010; Ahn & Cho 2015, 2016; Park & Kim 2016).

Given the controversy addressed above, we are led to ask how the low acceptability associated with scrambling out of islands should be explained. To elucidate the exact nature of islands and scrambling, it is necessary to

2) The construction with a postverbal constituent in head-final languages has been referred to in various names, reflecting different theoretical perspectives: *postverbal constituent*, *afterthought*, *rightward scrambling*, and *right-dislocation construction*, among others. In this paper, we call it rightward scrambling to make a comparison with leftward scrambling on a descriptive level, without committing ourselves to a particular theory. See Ko(2014b, *to appear*) for overviews.

set up an experiment that can isolate the distinct sources of sentence processing difficulty that arise in scrambling constructions. It remains to be seen whether a low acceptability in leftward and rightward scrambling can be traceable to the same source - be it syntactic ungrammaticality or processing difficulty. Crucially, there exists no experimental study which compares effects associated with leftward scrambling out of islands with those that arise from rightward scrambling out of islands.

Our study investigates these research questions, employing the factorial definition of island effects developed by Sprouse and colleagues in a series of papers (e.g., Sprouse 2007; Sprouse et al. 2011; Sprouse et al. 2012; Sprouse et al. 2016).

4. The Experiment

4.1. Factorial experimental design on wh-movement

Sprouse and colleagues (Sprouse et al. 2012; Sprouse et al. 2016) stress the importance of experimental studies in exploring theoretical issues in syntax which often interact with extra-linguistic factors (Keller 2000; Featherston 2005; Sprouse et al. 2011).

Sprouse and colleagues note that the unacceptability of sentences with island violations could have two possible sources that are potentially relevant for debates about the nature of island effects.

The first possibility is that the low acceptability is the result of the linearly additive sum of the processing difficulties that arise from the long distance dependency and complex structure. The second possibility is that

This design lends itself to two relatively straightforward analyses, one visual, and one statistical. Visually, a purely linearly additive effect will appear as two parallel lines, while a super-additive effect will appear as two non-parallel lines (see section 4.3 for example plots). Statistically, a purely linearly additive effect will yield no statistically significant interaction term, while a super-additive effect will yield a statistically significant interaction term.

4.2 Factorial experimental design on scrambling

On the surface, scrambling out of an island in (3) looks very similar to *wh*-movement in (2d). Given the discussion by Sprouse and colleagues, however, we are led to ask whether island effects accompanied by scrambling yield the super-additive pattern, as in English A'-movement. As Sprouse and colleagues note, it is in principle possible to obtain degraded acceptability without super-additive effects. Note, crucially, that this question cannot be answered by a traditional pairwise-way contrast between scrambling out of a non-island vs. island, which is comparable to the contrast between (2b) and (2d).

- (3) *John-ul₁ Mary-ka [emma-ka ___ pwuluki-cency] hakkyo-lo ttenassta
 J.-Acc M.-Nom mom-Nom call-before school-to left
 'John, Mary left for school [before the mother called ___].'
 [Korean; adjunct island]

The factorial definition for scrambling that we adopt here is composed of four target conditions crossing main two factors, length (matrix vs.

embedded) and structure (non-island vs. island), as schematized in (4) (see the appendix A for a sample set of the stimuli used in our experiment).

(4) Schematic factorial design stimuli for scrambling out of islands

a. [DP-Acc [DP-Top [_{CP} DP-Nom DP-Acc verb C] _ DP-Dat verb]:

Non-Island | Matrix

b. [DP-Acc [DP-Top [_{CP} DP-Nom _ verb C] DP-Acc DP-Dat verb]:

Non-Island | Embedded

c. [DP-Acc [DP-Top [_{Island} DP-Nom DP-Acc verb C_{island}] _ DP-Dat verb]:

Island | Matrix

d. [DP-Acc [DP-Top [_{Island} DP-Nom _ verb C_{island}] DP-Acc DP-Dat verb]:

Island | Embedded

We conducted three experiments using the factorial definition of island effects, crossed with the direction of scrambling (2 levels: left vs. right). Each experiment tested a distinct island type, which includes two types of strong islands (adjuncts, relative clauses), and one type of weak island (*wh*-island).

4.3 Method

Participants and procedure.

In total, 127 native speakers of Korean participated in our experiment: 45 in the adjunct island experiment, 40 in the relative clause island experiment, and 42 in the *wh*-island experiment.³⁾ The experiment was

3) The experimental protocol has been approved by the IRB at SNU (IRB No. 1708/001

conducted from August 30, 2017 to June 2018, 2018 in the Department of Linguistics at SNU. The participants were recruited through on-line advertisements.

The experimental procedure was as follows. First, participants answered questions concerning their background, which includes their native and second languages, age, dialectal background, and academic background in linguistics. After completing the background survey, the participants read 70 Korean sentences on the computer screen. Participants were asked to rate how natural the Korean sentences are on a 7-point scale, with 7 as the most natural, and 1 as the least natural, following Sprouse et al.(2016). The first 6 sentences out of 70 were practice items to help familiarize participants with the task. They were explicitly marked as practice. The next 64 sentences were the stimuli including 16 target items and 48 fillers, in pseudorandomized order. The experiment took about 40 minutes to complete.⁴⁾ Debriefing information was provided at the conclusion of the experiment. The participants received monetary compensation (10,000 KRW).

Stimuli.

The stimuli were constructed according to our 2*2*2 design: 2 levels of length (matrix vs. embedded), 2 levels of structure (island vs. non-island), and 2 levels of direction (leftward vs. rightward). We created 16 lexically matched sets, and distributed 2 tokens per condition (16 items) with 48

-015). Prior to the main experiment, we have also conducted a pilot study with 66 native speakers of Korean.

4) A reviewer pointed out that the 40-minute experiment could result in a fatigue effect. However, we found consistent results across the three experiments in the fillers (see the result section), which suggests that despite any potential fatigue, the data are reliable.

fillers into 8 lists, using the Latin Square design. 48 fillers include 16 utterly ungrammatical, 16 grammatical, and 16 sentences with mild degradation due to processing difficulty or semantic incongruity. The test items were pseudo-randomized prior to presentation. This procedure was repeated for each of the three islands tested.⁵⁾ We employed the same 48 fillers for the three experiments.

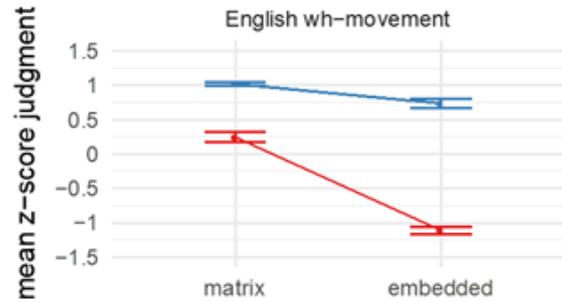
4.3 Diverging Predictions

There is widespread agreement that scrambling out of islands leads to relatively low acceptability in Korean. The factorial definition of island effects leads to four potential sources for this low acceptability: (i) super-additivity, (ii) main effect of length only, (iii) main effect of complex structure only, (iv) additive sum of length and complex structure effects

Consider first the possibility of super-additivity. If long distance scrambling is syntactically the same operation as other A'-movement, we predict that scrambling out of islands would yield super-additive effects just

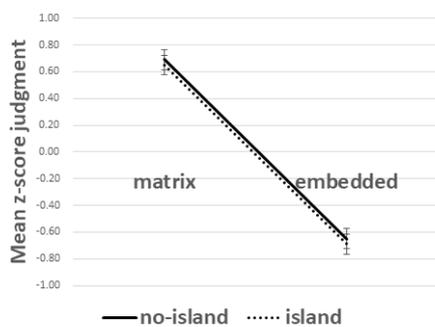
5) All the target sentences including fillers are matched in the filler-gap dependency, word frequencies, and the number of words. The base items were tested with 4 native speakers of Korean prior to the main experiment on whether they are semantically plausible: all the base items were scored higher than 5 on the 7-point Likert scale. Sentences were built using words taken from the *Spoken Korean Frequency Dictionary* (Seo 2015), which appeared at least two times in the spoken Korean corpus. Since the length of the sentences affects processing difficulty, we carefully controlled them; thus, no significant difference was found in the length between all 8 conditions in all three experiments. For the same reason of controlling a processing difficulty, we tried to control the number of syllables between the filler and the gap (Gibson 1998, 2000; Hawkins 2004); however, it was not successful to control the distance between the filler and the gap across all 8 conditions. Instead, we were partly successful to control the distance within the 'matrix' conditions and within the 'embedded' conditions.

as English *wh*-movement out of islands does. An example of this pattern from English adjunct islands is given in <Figure 1>.

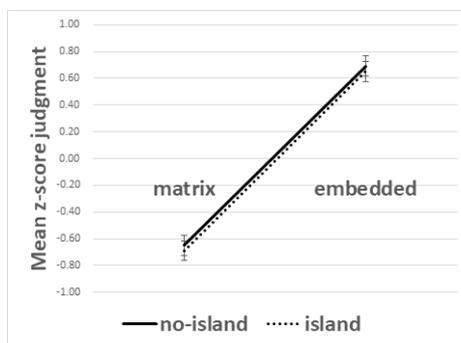


<Figure 1> Super-additivity in adjunct islands in English
(Sprouse & Messick 2015)

The second possibility is that the low acceptability in scrambling out of islands is solely attributable to the processing cost of long distance dependencies (see W. Lee 2010; Ahn & Cho 2015, 2016; Park & Kim 2016 for rightward scrambling/dislocation). This would arise as a main effect of length, but no main effect of island structure, and no interaction of the two. Hypothetical plots can be depicted either as in <Figure 2A> or <Figure 2B>.

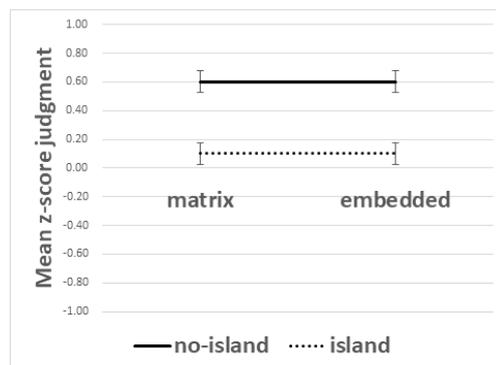


<Figure 2A> Main effect of length only



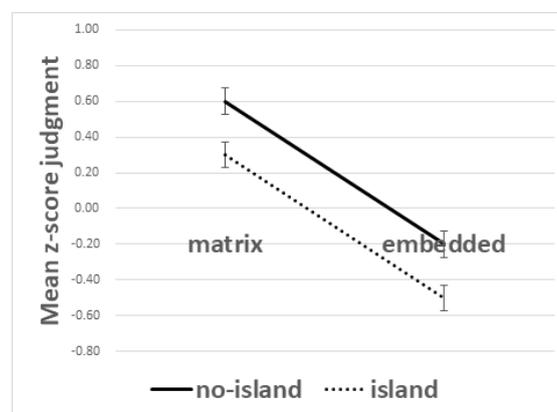
<Figure 2B> Main effect of length only

The third possibility is that the low acceptability in scrambling out of islands is solely attributable to the presence of an island structure. Under this scenario, there will be a main effect of island structure, but no main effect of length, and no interaction of the two. A hypothetical plot of this scenario is given in <Figure 3>.



<Figure 3> Main effect of island structure only

Lastly, if islands effects can attributable to both the presence of the island structure and the long distance dependency, we expect linearly additive main effects. Main effects of length and island structure are predicted, but no interactions. A hypothetical plot for this scenario is depicted in <Figure 4>.



<Figure 4> Linearly additive effects in scrambling out of islands

4.4 Results

We z-score transformed the results prior to analysis to minimize differences in the use of the 7-point scale. We first ran a 2x2x2 ANOVA to see the main effects of three factors, structure, length, and direction, and then conducted two-way, repeated-measures ANOVAs on the z-score transformed data for each island and direction of scrambling separately by using SPSS 18.0.⁶⁾

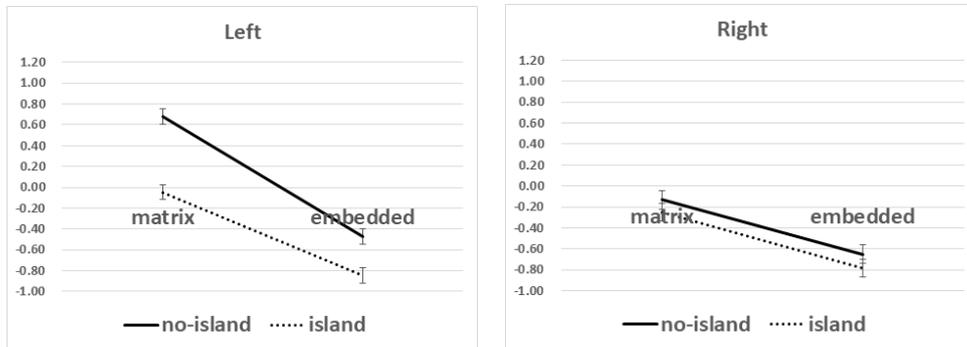
In the adjunct island experiment, we have obtained statistically significant main effects of structure, length, and direction. To investigate further specific patterns for the leftward scrambling and rightward scrambling each, separate repeated-measures 2(structure) x 2(length) ANOVAs were conducted for each direction. The detailed results are summarized in [Table 1], and also plotted in <Figure 5> (error bars reported in this paper represent standard errors).

In leftward scrambling, we found main effects of structure and length, but no super-additive interaction. Instead, we have obtained a sub-additive interaction between structure and length. In rightward scrambling, we found main effects of structure and length, but no interaction between structure and length.

6) The z-score transformation is a linear transformation, so the risk of introducing artifacts is low in a design like ours where every participant sees tokens from the same conditions. We also conducted the same statistical analyses on the raw data, which yields the same results. We take this as further evidence that the z-score transformation has a benefit of eliminating scale biases with little downside.

[Table 1] Results from the adjunct island experiment

Scrambling and adjunct islands		
Factors	Leftward Scrambling	Rightward Scrambling
Length	$F1(1,44)=239.235, p<.0001^{***}$ $F2(1,15)=73.246, p<.0001^{***}$	$F1(1,44)=49.863, p<.0001^{***}$ $F2(1,15)=55.777, p<.0001^{***}$
Structure	$F1(1,44)=66.915, p<.0001^{***}$ $F2(1,15)=55.845, p<.0001^{***}$	$F1(1,44)=7.713, p=.008^{**}$ $F2(1,15)=8.523, p<.0001^{***}$
Length* Structure	$F1(1,44)=9.906, p=.003^{**}$ $F2(1,15)=5.027, p=.041^*$	$F1(1,44)=0.002, p=.883$ $F2(1,15)=0.039, p=.846$

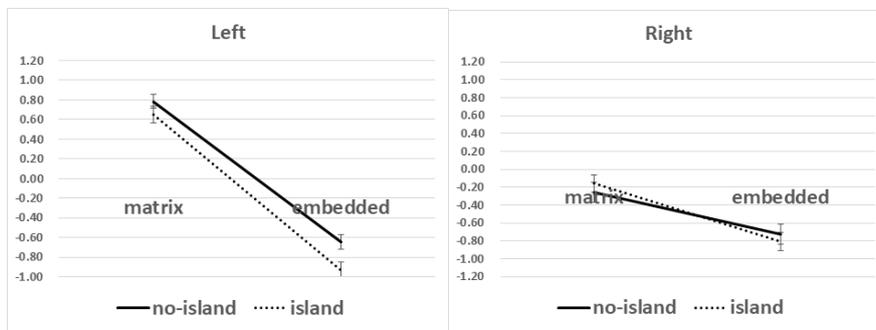


<Figure 5> Interaction plot for the adjunct island experiment

In the relative clause island experiment, we also found significant main effects of structure, length, and direction. To investigate further specific patterns, separate repeated-measures 2(structure) x 2(length) ANOVAs were conducted for each direction of scrambling. The detailed results are summarized in [Table 2], and plotted in <Figure 6>. For leftward scrambling, we found main effects of structure and length, but no super-additive interaction. For rightward scrambling, we found a main effect of length, but no main effect of structure and no interaction between length and structure.

[Table 2] Results from relative clause island experiment

Scrambling and relative clause islands		
Factors	Leftward Scrambling	Rightward Scrambling
Length	$F1(1,39)=298.313, p<.0001^{***}$ $F2(1,15)=197.367, p<.0001^{***}$	$F1(1,39)=31.862, p<.0001^{***}$ $F2(1,15)=24.576, p<.0001^{***}$
Structure	$F1(1,39)=8.803, p=.005^{**}$ $F2(1,15)=6.024, p=.027^*$	$F1(1,39)=.017, p=.897$ $F2(1,15)=.012, p=.915$
Length* Structure	$F1(1,39)= 2.124, p=.153$ $F2(1,15)=1.706, p=.211$	$F1(1,39)=2.454, p=.125$ $F2(1,15)=.813, p=.382$

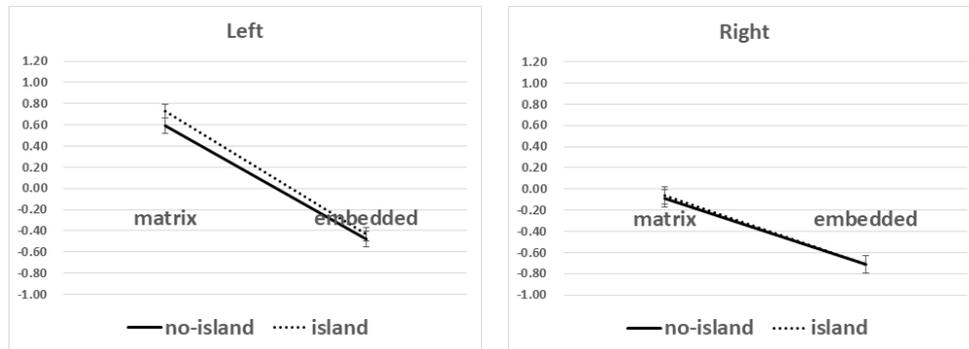


<Figure 6> Interaction plot for the relative clause island experiment

In the island experiment, again, we conducted a 2(structure) x 2(length) x 2(direction) repeated-measures ANOVA. As in the other two experiments, separate repeated-measures 2(structure) x 2(length) ANOVAs were conducted for each direction. We found main effects of length, but no main effect of structure, and no interaction for either direction of scrambling. The detailed results are summarized in [Table 3], and plotted in <Figure 7>.

[Table 3] Results from the wh-island experiment

Scrambling and <i>wh</i> -islands		
Factors	Leftward Scrambling	Rightward Scrambling
Length	$F1(1,41)=153.294, p<.0001^{***}$ $F2(1,15)=96.874, p<.0001^{***}$	$F1(1,41)=51.679, p<.0001^{***}$ $F2(1,15)=94.100, p<.0001^{***}$
Structure	$F1(1,41)=1.468, p=.233$ $F2(1,15)=.903, p=.357$	$F1(1,41)=.131, p=.720$ $F2(1,15)=.057, p=.814$
Length* Structure	$F1(1,41)=.562, p=.458$ $F2(1,15)=.331, p=.573$	$F1(1,41)=.075, p=.786$ $F2(1,15)=.078, p=.784$



(Figure 7) Interaction plot for the wh-island experiment

5. Discussion

5.1 Lack of super-additive interactions

In our experiment, we found no super-additive interactions in any of our experimental conditions. The only interaction that we observed was a sub-additive interaction in the adjunct island experiment (see footnote 8). In all other experimental conditions, there was no interaction between structure and length. In fact, this result is quite unexpected and surprising

under the view that long distance scrambling must be treated in the same as other long-distance A'-movement. Since the seminal work by Saito (1985), it has been widely accepted in the field that scrambling out of islands leads to a low acceptability. Our experiment shows that this is indeed the case, but that the low acceptability is the linearly additive sum of the cost of long-distance dependencies and occasionally the cost of island structures. There is no extra effect that requires us to postulate island constraints for super-additivity.

There might be several possible interpretations of the current result. Only after we conduct a further experiment, can we make a proper evaluation. In this paper, we suggest two possibilities for future evaluation.

One possibility is to assume that the lack of super-additivity reflects a syntactic difference between scrambling in Korean and movement in English. In particular, it is noteworthy that scrambling languages such as Korean and Japanese allow multiple specifiers (Ura 1996; Richards 2001; Saito 2016). If scrambled phrases may merge as a multiple specifier of C (e.g. non-operation adjunction as argued by Saito 1985 and Cho 1994), long distance scrambling would never cross over the island domain in one fell swoop. Theoretically, standard island effects (with super-additivity) arise only when a phrase crosses over an island (Ross 1967; Chomsky 1977).

In the case of Korean, however, if scrambling may stop on a specifier of C and does not cross over it, no super-additive degradation is expected. Under the view that Korean allows multiple specifiers, only the additive effects are expected in scrambling. English, on the other hand, lacks the multiple specifier system, so an element that is extracted from an island domain must cross over the island (without escape hatch), and thus super-additive effects are duly predicted in long distance extraction out of

an island. To verify whether this claim is on the right track, it is necessary to test whether other multiple specifier languages such as Japanese and Bulgarian lack super-additivity in overt movement.

We also need to consider a possibility that the lack of super-additivity is due to some defects in our experiment. It could be possible that super-additive interactions could have been masked by particular experimental items or by a ceiling/floor effect. We note that the acceptability for our baseline condition(no island) has been already very low. We conjecture that the low acceptability for the baseline condition would lead to a floor effect on the target condition(embedded, island), which could turn a super-additive result into a linearly additive one.

Notably, the z-scores of the embedded, no island condition (which is one of the baseline conditions) ranged between -0.47 and -0.64. This is strikingly different from the English adjunct islands experiment (Sprouse & Messick 2015), as introduced in Figure 1, in which the corresponding condition showed a z-score of about 0.8. With such low acceptability score in the baseline condition, it could be hard to find a super-additive interaction. It needs to be tested whether our baseline stimuli contained an additional factor to make them less acceptable, which leads to a lack of super-additive interaction in our factorial design experiment.

5.2 Main effects of length and structure

In leftward scrambling, we found significant main effects of length in every condition in all three types of island experiments, and we also found main effects of island structure in scrambling out of adjunct and relative clause islands. Crucially, however, we found no main effects of structure for

islands in Korean.

As discussed with (1), it has been reported that scrambling in Korean cannot occur across islands such as relative clauses and adjunct clauses (Y. Lee 1993:140-163; Cho 1994:106/131; Y. Choi 2004; R. Kim 2003). At the same time, it has also been argued that scrambling out of islands and NP-complements may be acceptable in Korean (Y. Lee 1993:153; R. Kim 2003:7). To capture the contrast between the two types of islands, Y. Lee(1993:163) proposes that sub-categorized clauses do not constitute an island in Korean, whereas non-subcategorized clauses constitute a strong island against scrambling. Though it remains to be seen how the distinction among different types of islands can be analyzed, our study could support the existence of the dichotomy between strong vs. weak islands in scrambling.⁷⁾

The results for rightward scrambling are somewhat complicated. As in the case of leftward scrambling, we found main effects of length in every condition in all three types of island experiments. Interestingly, however, main effects of structure were significant for adjunct islands, but not for relative clause and islands in rightward scrambling. This result does not fit perfectly with any of the theories that are currently proposed in the literature.

Under the mono-clausal movement approach, we would predict that rightward scrambling out of strong islands (but not weak islands) would yield significantly degraded judgments, just as in leftward scrambling. This

7) However, we also acknowledge that it is possible that the main effect of structures come from other sources. For example, one could argue that *wh*-islands are not islands in Korean even though they function as islands in English. One could also argue that strong islands such as adjuncts cause more processing difficulty than weak islands. A further study to test this possibility is called for.

prediction is confirmed by the results from adjunct and island experiments. We, however, did not obtain a main effect of structure in relative clause islands. The lack of island structure effects in relative clause islands challenges the mono-clausal movement approach to rightward scrambling.⁸⁾

Notice that our experimental results also pose a serious challenge to the bi-clausal approach to rightward scrambling/dislocation. Under the bi-clausal approach, no degradation due to movement across an island is expected since the host and the appendix to its right are not related to each other via movement. The data from adjunct islands, however, clearly shows that we obtained main effects of island structure and length, in contrast to islands. It is not clear how the bi-clausal approach could accommodate the contrast between adjunct islands and islands, let alone the one between adjunct and relative clause islands. Admittedly, the current results pose non-trivial challenges towards both the mono-clausal and bi-clausal approaches, and further experimentation is needed to draw a conclusion on the status of rightward scrambling with islands.

8) The baseline condition in our relative clause experiment (*i.e.* matrix extraction without an island structure) was judged too low, even lower than the one with an island structure. According to Sprouse et al.(2016), we expect that the baseline condition without an island and long distance dependency would be judged most acceptable, but this was not the case in our relative clause experiment. This unexpectedly low z-score on the matrix, island condition can be a potential reason for the sub-additive interaction effect, which calls for a further experiment. One possible approach is to run a rating study with different types of fillers that may go much lower on the scale. The other approach is to conduct an on-line study that does not trigger the floor/ceiling effect. We leave this issue open for now.

6. Conclusion

Using the factorial definition of island effects, we have tested the presence or absence of super-additivity in scrambling out of islands in Korean. We found that scrambling out of an island may trigger occasional additive degradation in acceptability, but no super-additive degradation is obtained, contrary to movement in English. It was also shown that strong islands may cause additive degradation in scrambling whereas weak islands do not. The current study naturally leads to novel research questions concerning scrambling and islands. In particular, a finer typology of movement (e.g. scrambling vs. movement) and its interactions with island conditions must be examined in future research. Moreover, the direction of displacement and floor/ceiling effects need to be considered in future evaluation of island effects in scrambling. We hope that our study constitutes an attempt to provide a useful backdrop to deepen our understanding of scrambling and islands.

References

- Ahn, H.-D. and Cho, S.(2015), "Right dislocation vs. fragment: A reply to Ko (2014)," *Studies in Generative Grammar* 25, 427-446.
- Ahn, H.-D. and Cho, S.(2016), "A uniform analysis of right dislocation: A reply to Ko (2016)," *Language Research* 52(2), 213-245.
- Bošković, Ž. and Takahashi, D.(1998), "Scrambling and last resort," *Linguistic Inquiry* 29, 347-366.
- Cho, J.-H.(1994), *Scrambling in Korean: Crossover, reconstruction and binding theory*, Ph.D. Dissertation, University of Connecticut.
- Choe, H. S.(1987), Successive-cyclic rightward movement in Korean. In Kuno, S. et al. (Eds.), *Harvard studies in Korean linguistics 2*, Seoul: Hanshin Publishing Company, 40-56.
- Choi, Y.-S.(2004), "Reconstruction, weak crossover, and binding in Korean scrambling: Some theoretical implications," *The Linguistic Association of Korea Journal* 12(2), 185-206.
- Chomsky, N.(1973), "Conditions on transformations," In Anderson, S. and Kiparsky, P. (Eds.), *A festschrift for Morris Halle*, New York: Holt, Rinehart, and Winston, 232-286.
- Chomsky, N.(1986), *Barriers*, Cambridge, MA: MIT press.
- Chomsky, N.(2013), "Problems of projection," *Lingua* 130, 33-49.
- Chomsky, N.(2015), "Problems of projection: Extensions," In Domenico, E. D., Hamann, C., and Matteini, S. (Eds.), *Structures, Strategies and Beyond: Studies in Honour of Adriana Belletti*, Amsterdam/ Philadelphia: John Benjamins Publishing Company, 3-16.
- Chomsky, N. and Lasnik, H.(1977), "Filters and control," *Linguistic Inquiry* 8, 425-504.
- Chung, D.(2009), "An elliptical coordination analysis of the right dislocated construction in Korean," *The Linguistic Association of Korea Journal* 17(4), 1-23.
- Chung, D.(2012), "Pre- vs. post-verbal asymmetries and the syntax of Korean right

- dislocated construction,” *Studies in Generative Grammar* 22(4), 703-721.
- Featherston, S.(2005), “Magnitude estimation and what it can do for your syntax: Some wh-constraints in German,” *Lingua* 115, 1525-1550.
- Gibson, E.(1998), “Linguistic complexity: Locality of syntactic dependencies,” *Cognition* 68, 1-76.
- Gibson, E.(2000), The dependency locality theory: A distance-based theory of linguistic complexity. In Marantz, A. et al. (Eds.), *Image, language, brain*, Cambridge, MA: MIT Press, 95-126.
- Hale, K.(1982), “Preliminary remarks on configurationality,” In *Proceedings of NELS* Vol. 12, GLSA, Department of Linguistics, UMass, Amherst, 86-96.
- Hawkins, J. A.(2004), *Efficiency and Complexity in Grammars*, Oxford: Oxford University Press.
- Hoji, H.(1985), *Logical Form Constraints and Configurational Structures in Japanese*, Ph.D. Dissertation, University of Washington, Seattle.
- Jung, Y.-J.(2002), “Scrambling, edge effects and A/A'-distinction,” *The Linguistic Association of Korea Journal* 10, 41-64.
- Jung, Y.-J.(2015), “Subjacency revisited: Is it real or a reflex of performance biases?,” *Korean Journal of Linguistics* 40, 511-542.
- Karimi, S.(2005), *A Minimalist Approach to Scrambling: Evidence from Persian*, Berlin-New York: Mouton de Gruyter.
- Keller, F.(2000), *Gradience in Grammar: Experimental and Computational Aspects of Degrees of Grammaticality*, Ph.D. Dissertation, University of Edinburgh.
- Kim, R.(2003), “Scrambling and minimalist program,” *Studies in Generative Grammar* 13, 3-19.
- Kim, I.(2016), “An experimental study on island effects in Korean relativization,” *Language Research* 52(1), 33-55.
- Kluender, R.(1998), “On the distinction between strong and weak islands: A processing perspective,” In by Culicover, P. and McNally, L. (Eds.), *The Limits of Syntax*, 241-279. *Syntax and Semantics* 29. San Diego, CA: Academic Press.
- Kluender, R.(2004), “Are subject islands subject to a processing account?,” In Rodriguez, A. et al. (Eds.), *WCCFL* 23, Somerville, MA: Cascadilla Press,

475-499.

- Kluender, R. and Kutas, M.(1993), "Subjacency as a processing phenomenon," *Language and Cognitive Processes* 8, 573-633.
- Ko, H.(2007), "Asymmetries in scrambling and cyclic linearization," *Linguistic Inquiry* 38, 49-83.
- Ko, H.(2011), "Predication and edge effects," *Natural Language and Linguistic Theory* 29, 725-778.
- Ko, H.(2014a), *Edges in Syntax: Scrambling and Cyclic Linearization*, Oxford: Oxford University Press.
- Ko, H.(2014b), "Remarks on right dislocation construction in Korean: Challenges to biclausal analyses," *Language Research* 50, 275-310.
- Ko, H.(2017), "Right dislocation: Copies vs. fragments," In Halpert, C. et al. (Eds.), *A Pesky set: A festschrift for David Pesetsky*, Cambridge, MA: MIT, Department of Linguistics and Philosophy, 253-262.
- Ko, H.(2018), "Scrambling in Korean syntax," In Aronoff, M. (Ed.), *Oxford Research Encyclopedia of Linguistics*, New York: Oxford University Press.
- Ko, H. *to appear*. "Right-dislocation in Korean: An overview," In *Cambridge Handbook of Korean Language and Linguistics*. Cambridge University Press.
- Kural, M.(1997), "Postverbal constituents in Turkish and the linear correspondence axiom," *Linguistic Inquiry* 28(3), 498-519.
- Kuroda, S.-Y.(1988), "Whether we agree or not: A comparative syntax of English and Japanese," *Lingvisticae Investigationes* 12, 1-47.
- Kwon, J.(2010), "Scrambling of Korean embedded clauses," *Studies in Generative Grammar* 20, 229-249.
- Lee, C.-H.(2009), "The structure of Korean afterthought constructions [written in Korean]," *Emwunyenkwu* 142, 31-54.
- Lee, H.(2006), "A study on scrambling in Korean: the minimalist approach," *Studies in Generative Grammar* 16, 425-460.
- Lee, J.-S.(2008), "Notes on right dislocated constructions in Korean," *The Linguistic Association of Korea Journal* 16, 47-68.
- Lee, W. and Cho, S.(2003a), "Argument scrambling and object shift," *Studies in Generative Grammar* 13, 39-59.

- Lee, W. and Cho, S.(2003b), "Is scrambling EPP-driven?" *Studies in Generative Grammar* 13, 331-341.
- Lee, W.(2010), "The architecture of right dislocation constructions," *Studies in Generative Grammar* 20, 521-543.
- Lee, Y.-S.(1993), *Scrambling as Case-Driven Obligatory Movement*, Ph.D. Dissertation, University of Pennsylvania.
- Park, B.-S. and Kim, H.(2016), "Case-drop, left-branch extraction and multiplicity in the right-dislocation construction," *Linguistic Research* 33(2), 259-297.
- Park, B.-S. and Oh, S.-R.(2017), "On the island-(in)sensitivity in the right-dislocation construction in Korean," *The Journal of Linguistic Science* 83, 135-153.
- Park, M.-K. and Kim, S.-W.(2009), "The syntax of afterthoughts in Korean: Move and delete," *The Linguistic Association of Korea Journal* 17, 25-53.
- Mahajan, A. K.(1990), *The A/A'-distinction and Movement Theory*, Ph.D. Dissertation, MIT.
- Manetta, E.(2012), "Reconsidering rightward scrambling: postverbalconstituents in Hindi-Urdu," *Linguistic Inquiry* 43, 43-74.
- Miyagawa, S.(1997), "Against optional scrambling," *Linguistic Inquiry* 28, 1-25.
- Miyagawa, S.(2001), The EPP, scrambling, and *wh*-in-situ. In Kenstowicz, M. (Ed.), *Ken Hale: A Life in Language*, Cambridge, MA: MIT Press, 293-338.
- Miyagawa, S.(2010), *Why Agree? Why Move? Unifying Agreement-Based and Discourse-Configurational Languages*. Cambridge, MA: MIT Press.
- Richards, N.(2001), *Movement in Language: Interactions and Architecture*, Oxford-New York: Oxford University Press.
- Ross, J. R.(1967), *Constraints on Variables in Syntax*, Ph.D. Dissertation, MIT.
- Saito, M.(1985), *Some Asymmetries in Japanese and their Theoretical Implications*, Ph.D. Dissertation, MIT.
- Saito, M.(1992), "Long-distance scrambling in Japanese," *Journal of East Asian Linguistics* 1, 69-118.
- Saito, M.(2016), "(A) Case for labeling: Labeling in languages without ϕ -feature agreement," *The Linguistic Review* 33, 129-175.
- Saito, M. and Fukui, N.(1998), "Order in phrase structure and movement,"

- Linguistic Inquiry* 29, 439-474.
- Sauerland, U. and Elbourne, P.(2002), "Total reconstruction, PF movement, and derivational order," *Linguistic Inquiry* 33, 283-319.
- Seo, S. K.(2015), *Spoken Korean Frequency Dictionary 1 – In Order of Frequency*, Hankook Munhwasa.
- Sprouse, J.(2007), *A Program for Experimental Syntax*, Ph.D. Dissertation, University of Maryland.
- Sprouse, J.(2012), "The differential sensitivity of acceptability judgments to processing effects," *Linguistic Inquiry* 39, 686-694.
- Sprouse, J., Caponigro, I., and Creco, C.(2016), "Experimental syntax and the variation of island effects in English and Italian," *Natural Language and Linguistic Theory* 34, 307-344.
- Sprouse, J., Fukuda, S., Ono, H., and Kluender, R.(2011), "Reverse island effects and the backward search for a licensor in multiple wh-questions," *Syntax* 14, 179-203.
- Sprouse, J. and Messick, T.(2015), *How Gradient are Island Effects?* Poster presented at the 46th Northeast Linguistic Society, Concordia University.
- Tada, H.(1993), *A/A-bar Partition in Derivation*, Ph.D. Dissertation, MIT.
- Ura, H.(1996), *Multiple Feature-Checking: A Theory of Grammatical Function Splitting*, Ph.D. Dissertation, MIT, Cambridge, Mass.
- Webelhuth, G.(1989), *Syntactic Saturation Phenomena and the Modern Germanic Languages*, Ph.D. Dissertation, University of Massachusetts, Amherst.
- Yang, D.-W. and Kim, S.-H.(2005), "Scrambling and interpretive complex," *The Linguistic Association of Korea Journal* 13(2), 169-193.
- Yoon, J.(2016), "Implications of constraints on null constituents for analyses of the right dislocation construction," In Kenstowicz, M. et al. (Eds.), *Japanese-Korean Linguistics* 23, Stanford, CA: CSLI Publications.
- Yoon, J.-M.(2013), "Undoing and *wh*-Island effects of scrambling in Korean," *Studies in Generative Grammar* 23, 41-63.
- Yoon, J.-M.(2015), "Constructions sharing similar restrictions with MSCs in Korean and the processing approach to islands," *Studies in Generative Grammar* 25, 377-411.

Yoon, J.-M.(2016), “Double relativization of different grammatical functions in Korean,” *Language Research* 52, 247-282.

Zubizarreta, M. L.(1998), *Prosody, Focus and Word Order*, Cambridge, MA: MIT Press.

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Appendix A.

(1) Sample target stimuli for the adjunct island experiment

Test for leftward scrambling in a 2x2 factorial design

- a. kemchal-ey₁ Tahuy-nun [kwukhoyuywen hwupo-ka kieptul-lopwuthe
 prosecutor-to T.-Top congressman candidate-Nom corporations-from
 senkecakum-ul patass-tako] t₁ chapwunhakey palkhyessta.
 campaignfund-Acc received-C calmly revealed
 ‘Tahuy calmly revealed to the prosecution that a Congress candidate received campaign funds from
 corporations.’ [Matrix, NoIsland]
- b. senkecakum-ul₁ Tahuy-nun [kwukhoyuywen hwupo-ka t₁
 campaignfund-Acc T.-Top congressman candidate-Nom
 kieptul-lopwuthe patass-tako] kemchal-ey chapwunhakey palkhyessta.
 corporations-from received-C prosecutor-to calmly revealed
 ‘Tahuy calmly revealed to the prosecution that a Congress candidate received campaign funds from
 corporations.’ [Embedded, NoIsland]
- c. kemchal-ey₁ Tahuy-nun [kwukhoyuywen hwupo-ka kieptul-lopwuthe
 prosecutor-to T.-Top congressman candidate-Nom corporations-from
 senkecakum-ul patki-ceney] t₁ ku sasil-ul palkhyessta.
 campaignfund-Acc receive-before that truth-Acc revealed
 ‘Tahuy revealed the truth to the prosecution before a Congress candidate received campaign funds from
 corporations.’ [Matrix, Island]
- d. senkecakum-ul₁ Tahuy-nun [kwukhoyuywen hwupo-ka kieptul-lopwuthe
 campaignfund-Acc T.-Top congressman candidate-Nom corporations-from
 t₁ patki-ceney] ku sasil-ul kemchal-ey palkhyessta.
 receive-before that truth-Acc prosecutor-to revealed
 ‘Tahuy revealed the truth to the prosecution before a Congress candidate received campaign funds from
 corporations.’ [Embedded, Island]

Test for rightward scrambling in a 2x2 factorial design

- e. Tahuy-nun [kwukhoyuywen hwupo-ka kieptul-lopwuthe senkecakum-ul
T.-Top congressman candidate-Nom corporations-from campaign fund-Acc
patass-tako] t₁ chapwunhakey palkhyesta kemchal-ey₁.
received-C calmly revealed prosecutor-to
'Tahuy calmly revealed to the prosecution that a Congress candidate received campaign funds from
corporations.' [Matrix, NoIsland]
- f. Tahuy-nun [kwukhoyuywen hwupo-ka t₁ kieptul-lopwuthe patass-tako]
T.-Top congressman candidate-Nom corporations-from received-C
kemchal-ey chapwunhakey palkhyesta senkecakum-ul₁.
prosecutor-to calmly revealed campaign fund-Acc
'Tahuy calmly revealed to the prosecution that a Congress candidate received campaign funds from
corporations.' [Embedded, NoIsland]
- g. Tahuy-nun [kwukhoyuywen hwupo-ka kieptul-lopwuthe senkecakum-ul
T.-Top congressman candidate-Nom corporations-from campaign fund-Acc
patki-ceney] t₁ ku sasil-ul palkhyesta kemchal-ey₁.
receive-before that truth-Acc revealed prosecutor-to
'Tahuy revealed the truth to the prosecution before a Congress candidate received campaign funds from
corporations.' [Matrix, Island]
- h. Tahuy-nun [kwukhoyuywen hwupo-ka kieptul-lopwuthe t₁ patki-ceney]
T.-Top congressman candidate-Nom corporations-from receive-before
ku sasil-ul kemchal-ey palkhyesta senkecakum-ul₁.
that truth-Acc prosecutor-to revealed campaign fund-Acc
'Tahuy revealed the truth to the prosecution before a Congress candidate received campaign funds from
corporations.' [Embedded, Island]

(2) Sample target stimuli for the relative clause island experiment

Test for leftward scrambling in a 2x2 factorial design

- a. kemchal-ey₁ Tahuy-nun [kwukhoyuywen-i kieptul-lopwuthe
prosecutor-to T.-Top congressman-Nom corporations-from

senkecakum-ul patass-tako] t₁ coyonghi palkhyessta.
 campaignfund-Acc received-C quietly revealed
 ‘Tahuy quietly revealed to the prosecution that a Congressman received campaign funds from corporations.’ [Matrix, NoIsland]

b. senkecakum-ul₁ Tahuy-nun [kwukhoyuywen-i kieptul-lopwuthe t₁
 campaignfund-Acc T.-Top congressman-Nom corporations-from
 patass-tako] kemchal-ey coyonghi palkhyessta.
 received-C prosecutor-to quietly revealed
 ‘Tahuy quietly revealed to the prosecution that a Congressman received campaign funds from corporations.’ [Embedded, NoIsland]

c. kemchal-ey₁ Tahuy-nun [swunyen tongan yumyeng cwungsokieptul-lopwuthe
 prosecutor-to T.-Top many.years during well-known small businesses-from
 senkecakum-ul pat-un] siuywen ilum-ul t₁ palkhyessta.
 campaign.fund-Acc receive-Rel councilman name-Acc revealed
 ‘Tahuy revealed to the prosecution the name of the Common Councilman who has received campaign funds from well-known small businesses for many years.’ [Matrix, Island]

d. senkecakum-ul₁ Tahuy-nun [swunyen tongan yumyeng
 campaignfund-Acc T.-Top many.years during well-known
 cwungsokieptul-lopwuthe t₁ pat-un] siuywen ilum-ul
 small businesses-from receive-Rel councilman name-Acc
 kemchal-ey palkhyessta.
 prosecutor-to revealed
 ‘Tahuy revealed to the prosecution the name of the Common Councilman who has received campaign funds from well-known small businesses for many years.’ [Embedded, Island]

Test for rightward scrambling in a 2x2 factorial design

e. Tahuy-nun [kwukhoyuywen-i kieptul-lopwuthe senkecakum-ul
 T.-Top congressman-Nom corporations-from campaign fund-Acc
 patass-tako] t₁ coyonghi palkhyessta kemchal-ey₁.
 received-C quietly revealed prosecutor-to
 ‘Tahuy quietly revealed to the prosecution that a Congressman received campaign funds from

corporations.’ [Matrix, NoIsland]

- f. Tahuy-nun [kwukhoyuywen-i kieptul-lopwuthe t₁ patass-tako]
T.-Top congressman-Nom corporations-from received-C
kemchal-ey coyonghi palkhyesta senkecakum-ul₁.
prosecutor-to quietly revealed campaign fund-Acc
‘Tahuy quietly revealed to the prosecution that a Congressman received campaign funds from corporations.’ [Embedded, NoIsland]

- g. Tahuy-nun [swunyen tongan yumyeng cwungsokieptul-lopwuthe
T.-Top many.years during well-known small businesses-from
senkecakum-ul pat-un] siuywen ilum-ul t₁ palkhyesta
campaign.fund-Acc receive-Rel councilman name-Acc revealed
kemchal-ey₁ .
prosecutor-to
‘Tahuy revealed to the prosecution the name of the Common Councilman who has received campaign funds from well-known small businesses for many years.’ [Matrix, Island]

- h. Tahuy-nun [swunyen tongan yumyeng cwungsokieptul-lopwuthe t₁
T.-Top many.years during well-known small businesses-from
pat-un] siuywen ilum-ul kemchal-ey palkhyesta
receive-Rel councilman name-Acc prosecutor-to revealed
senkecakum-ul₁.
campaign.fund-Acc
‘Tahuy revealed to the prosecution the name of the Common Councilman who has received campaign funds from well-known small businesses for many years. [Embedded, Island]

(3) Sample target stimuli for the *wh*-island experiment

Test for leftward scrambling in a 2x2 factorial design

- a. kemchal-ey₁ Tahuy-nun [cangkwanhwupo-ka kieptul-lopwuthe
prosecutor-to T.-Top minister candidate-Nom corporations-from
senkecakum-ul patass-tako] t₁ cosimsuley palkhyesta.
campaignfund-Acc received-C cautiously revealed

‘Tahuy cautiously revealed that a candidate for a minister position received campaign funds from corporations.’ [Matrix, NoIsland]

- b. senkecakum-ul₁ Tahuy-nun [cangkwanhwupo-ka kieptul-lopwuthe t₁
 campaign.fund-Acc T.-Top minister candidate-Nom corporations-from
 patass-tako] kemchal-ey cosimsuley palkhyesta.
 received-C prosecutor-to cautiously revealed

‘Tahuy cautiously revealed that a candidate for a minister position received campaign funds from corporations.’ [Embedded, NoIsland]]

- c. kemchal-ey₁ Tahuy-nun [nwuka yumyeng taykieptul-lopwuthe
 prosecutor-to T.-Top who well-known major companies-from
 senkecakum-ul patassnun-ci] t₁ cosimsuley palkhyesta.
 campaign.fund-Acc receive-Q cautiously revealed

‘Tahuy cautiously revealed to the prosecution who received campaign funds from well-known major companies.’ [Matrix, Island]

- d. senkecakum-ul₁ Tahuy-nun [nwuka yumyeng taykieptul-lopwuthe t₁
 campaignfund-Acc T.-Top who well-known major companies-from
 patassnun-ci] kemchal-ey cosimsuley palkhyesta.
 receive-Q prosecutor-to cautiously revealed

‘Tahuy cautiously revealed to the prosecution who received campaign funds from well-known major companies.’ [Embedded, Island]

Test for rightward scrambling in a 2x2 factorial design

- e. Tahuy-nun [cangkwanhwupo-ka kieptul-lopwuthe senkecakum-ul
 T.-Top minister candidate-Nom corporations-from campaign.fund-Acc
 patass-tako] t₁ cosimsuley palkhyesta kemchal-ey₁.
 received-C cautiously revealed prosecutor-to

‘Tahuy cautiously revealed that a candidate for a minister position received campaign funds from corporations.’ [Matrix, NoIsland]

- f. Tahuy-nun [cangkwanhwupo-ka kieptul-lopwuthe t₁ patass-tako]
 T.-Top minister candidate-Nom corporations-from received-C
 kemchal-ey cosimsuley palkhyesta senkecakum-ul₁.

prosecutor-to cautiously revealed campaign.fund-Acc
 ‘Tahuy cautiously revealed that a candidate for a minister position received campaign funds from corporations.’ [Embedded, NoIsland]

g. Tahuy-nun [nwuka yumyeng taykieptul-lopwuthe senkecakum-ul
 T.-Top who well-known major companies-from campaign.fund-Acc
 patassnun-ci] t₁ cosimsuley palkhyesta kemchal-ey₁.
 receive-Q cautiously revealed prosecutor-to
 ‘Tahuy cautiously revealed to the prosecution who received campaign funds from well-known major companies.’ [Matrix, Island]

h. Tahuy-nun [nwuka yumyeng taykieptul-lopwuthe t₁ patassnun-ci]
 T.-Top who well-known major companies-from receive-Q
 kemchal-ey cosimsuley palkhyesta senkecakum-ul₁.
 prosecutor-to cautiously revealed campaign fund-Acc
 ‘Tahuy cautiously revealed to the prosecution who received campaign funds from well-known major companies.’ [Embedded, Island]

