Binding Interpretations by Korean Heritage Speakers and Adult L2 Learners of Korean

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1. INTRODUCTION

L2 acquisition research has amply documented that various aspects of L1 grammar have an impact on interlanguage grammars (White 1989, Schwartz & Sprouse 1994, 1996). Likewise, other recent studies have shown that aspects of the L2 grammar of bilinguals can also influence the maintenance of structural properties of the L1. This is very often the case with the weaker (family) language of *heritage speakers* [1](Bouba et al., 2002; Köpke, 2002; Gürel, 2001, 2004; Schmid, 2002; Sorace, 2001; Tsimpli et al., 2004). Studies of heritage speakers who were *simultaneous bilinguals*[2] in childhood have found that, as adults, these speakers display incomplete knowledge of the family language and are somewhat like L2 learners in certain grammatical aspects (Montrul, 2002, 2004; Silva-Corvalán, 1994; Polinsky, 1997; Lipski, 1993, 1996; Kim & Montrul, 2003a, Kim & Montrul, 2003b, Kim, Montrul & Yoon, 2004). Thus, language transfer in bilingual grammars can be from the L1 to the L2 or from the L2 to the L1.

The present experimental study investigates language transfer in learners (late bilinguals) of Korean as L2 and Korean heritage speakers (or early bilinguals). Specifically, we focus on whether English, the L1 of the L2 learners and the dominant language (but usually L2) of the Korean heritage speakers, affects the interpretations which these L2 learners and heritage speakers assign to sentences illustrating particular binding properties of Korean. Another objective of this study is to tease apart the influence of UG-related binding properties from language-specific properties in the acquisition and maintenance or loss of the Korean binding properties. Therefore, the study focuses on the properties of Korean reflexive *caki*. Before presenting the details of the experiment, let us first introduce the theoretical background, followed by a section that describes some binding properties in Korean and English.

2. THEORETICAL BACKGROUND

2.1. Binding Theory

According to the Standard Binding Theory (Chomsky, 1981, 1986) anaphors and pronouns are in complementary distribution within their *binding domain* (successively defined as the conjunction of the Opacity Conditions -- the Specified Subject Condition (SSC) and the Tensed S Condition (TSC), Governing Category, and BT-compatible CFC). Principle A of the Binding Theory states that anaphors must be bound within their binding domain, while Principle B prevents pronouns from being bound inside the binding domain. Therefore, the Standard Binding Theory predicts that anaphors occur only within the local binding domain, which is usually the finite clause. However, this prediction is not borne out, since there are many languages where anaphors are bound outside the local domain, as shown in (1) with Korean and Chinese.

(1) a. *__Bill__$_i$ said that Mary hates __himself__$_i$. (English)
b. __Bill__$_i$-un Mary$_j$ –ka ***caki***$_i$-lul silheha–n-ta -ko malhay-ss-ta.
Bill-top Mary-nom self-acc hate-pres-decl-comp say-past-decl.
'Bill said that Mary hates him.' (Korean)
c. __Zhangsan__$_i$ yiwei __Lisi__$_j$ hui ba __Xiao Ming__$_k$ dai hui ***ziji***$_{i/j/k}$-de jia.
thought will BA take back self-gen home
'Zhangsan thought that Lisi would take Xiao Ming back to self's home.' (Chinese)

There are two main approaches to account for cross-linguistic differences in anaphor binding. One attempt was to parameterize the size of Governing Category (GC) across languages, proposing that languages with Long-

[1] A *heritage speaker* is a bilingual "raised in a home where a non-English language is spoken, who speaks or merely understands the heritage language, and who is to some degree bilingual in English and the heritage language" (Valdés 2000, p.1).
[2] Simultaneous bilinguals are bilinguals who are exposed to two languages simultaneously since birth.

Distance Anaphors (LDAs) such as Chinese and Korean have larger GCs in which anaphors are bound, compared to languages without LDAs (Yang, 1983; Manzini & Wexler, 1987). However, this analysis cannot explain the fact that languages like English, which do not have genuine LDAs, allow some exceptional long-distance binding, such as (2a), where the anaphor is bound outside the GC, or (2c), where the anaphor is discourse bound (unbound), as Reinhart & Reuland (1993) pointed out.

(2) a. **Bill** remembered that the Times had printed [a picture of **himself**] Sunday.
b. ***Bill** remembered [that the Times had rejected **himself**.]
c. [Physicist like **yourself**] are a godsend.

To deal with the problem raised above, an alternative approach has focused rather on the type of binding than the size of GCs (Reinhart & Reuland, 1993; Pollard & Sag, 1992, 1994; Huang & Liu, 2001). Two types of bindings are assumed in this approach -- *core (or grammatical) binding* in which the anaphors are bound within the GC, and *exempt (or logophoric) binding* where the anaphors are discourse-bound or bound by antecedents outside the GC. According to this approach, anaphors which have no superior co-argument as in (2a) and (2c) need not be bound within the GC. In this line of research, the GC size in English and Korean (and Chinese) is not as radically different as assumed in the first approach, since core anaphors in Chinese (and Korean) cannot violate SSC. All anaphors that are bound across an intervening subject are assumed to be exempt anaphors (Huang and Liu 2001). Huang and Liu (2001) actually argue that making the distinction between two types of anaphors allows the GC for core binding is invariant across languages. This assumption, however, is problematic, since anaphors violating TSC behave as core anaphors in languages like Chinese and Korean.[3]

In the present study, we assume therefore that the GC for core anaphors admits limited variation. While SSC and TSC jointly define the core GC in English, only the SSC defines the core GC in Korean. In addition, we also incorporate the distinction between core and exempt anaphors. Thus in Korean, anaphors that violate SSC will be exempt anaphors, while in English those that violate TSC and/or SSC count as exempt. In our study, we mainly focus on the property of *caki* as a core anaphor in Korean. A larger project dealing with both core and exempt binding of the anaphor *caki* is under way.

2.2. Cross-linguistic differences in Binding Theory: English vs. Korean

There are two major differences between English and Korean in core binding: GC size for core anaphors and strictly c-commanding vs. sub-commanding antecedents. In English, the GC is defined as the conjunction of two Opacity Conditions (Chomsky 1980)—TSC and SSC. However, in Korean core binding TSC violation is allowed while SSC violation is not possible.

The contrast between (3a) and (3b) shows that TSC violation in English is not possible in core binding, unless special logophoric contexts are provided to license the anaphor as exempt anaphor, as in (3b) (Reinhart & Reuland 1993). However, anaphors in languages like Korean (and Chinese) that violate TSC behave as core anaphors, as shown by the fact that sloppy readings are possible and even preferred in contexts of VP-ellipsis, as shown in (3c).[4]

(3) a. * **John**$_i$ believes [that **himself**$_i$ is clever].
b. **John** believes that [no one but **himself**] is clever.
c. **John**$_i$-un **caki**$_i$ –ka ttokttokhata-ko sayngkak-han-ta. (Korean)
John-top self-nom be-smart-comp think-past-decl.
Bill-to kulehkey sayngkaka-han-ta.
Bill-too so think-pres-decl.

[3] Another line of research, based on the LF-movement of LDAs (Cole, Hermon, Sung 1990, etc.) tries to maintain a uniform GC for all languages, by relocating BT to LF after anaphor movement has applied. According to this account, what differs among languages is not the size of GC, but whether or not an anaphor can undergo LF/covert movement out of the minimal clause where it is contained. The inadequacy of LF-movement theories has been widely documented (Huang and Liu, 2001). Therefore, the attempt to eliminate all parameterization of GCs is not tenable. Languages do differ in their GCs, though not as radically as originally assumed.

[4] Cole, Hermon, and Huang (2001) argue that sloppy readings under contexts of VP-ellipsis diagnose core vs. exempt anaphors.

In Chomsky (1981), a specially crafted theory of GC (based on the 'i-within-i' condition) is posited to account for how (2b) but not (2a) can escape violation of TSC. Reinhart & Reuland (1993), by contrast, argue that what is at issue is that the anaphor that seemingly violates TSC is in a logophoric context, exempt from principles of core binding.

(= Bill thinks that John<**Bill** is smart)

On the other hand, the contrast between (4a) and (4b) in English, compared with (4c) in Korean show that SSC violation in both languages can be remedied by logophoric factors that license the anaphor as exempt anaphor.

(4) a. *$\mathbf{John_i}$ believes that Mary hates $\mathbf{himself_i}$.
b. $\mathbf{John_i}$ believes that Mary despises [everyone but $\mathbf{himself_i}$]. (Korean)
c. $\mathbf{John_i}$-un [Mary-ka $\mathbf{caki_i}$ –lul silheha-n-ta]-ko sayngkakha-n-ta.
John-top Mary-nom self-acc hate-pres-decl.-comp think-pres-decl.
Bill-to kulehkey sayngkaka-han-ta.
Bill-too so think-pres-decl.
(= Bill thinks that Mary hates **John**>Bill.)

Compared to the TSC violation in (3c), when SSC is violated as in (4c), the possibility of sloppy reading under VP-ellipsis is considerably reduced in Korean, which implies that *caki* in (4c) may be an exempt anaphor licensed by logophoricity rather than by core binding.

In sum, anaphors violating TSC in English and SSC in both languages are licensed as exempt anaphors, while Korean anaphors violating TSC do not require special logophoric contexts, indicating that they are licensed as core anaphors. Therefore, Korean and English core binding differ with respect to the size of the domain that constitutes the GC— core anaphors in English are constrained by both TSC and SSC, while in Korean they are constrained only by SSC. We take the difference in the size of GCs to be *parametric* – that is, determined by UG.

Another difference between English and Korean binding has to do with structural conditions on the antecedent-anaphor relation. Antecedents must strictly c-command anaphors in English, as shown in (5a), while in Korean (and Chinese), a *sub-commanding* antecedent (Tang 1989) is allowed as in (5b). A constituent A sub-commands B when a larger constituent that contains A c-commands B and features of the containing constituent are not identical to A.

(5) a. *$\mathbf{Silvia_i}$'s pride tortures $\mathbf{herself_i}$
b. $\mathbf{Silvia_i}$-uy casonsim-i $\mathbf{caki_i}$-lul koylophi-n-ta (Korean)
Silvia-gen pride-nom self-acc torture-pres-decl
c. *$\mathbf{Silvia_i}$-uy tongsayng-i $\mathbf{caki_i}$-lul koylophi-n-ta
Silvia-gen brother-nom self-acc torture-pres-decl

As stated earlier, the difference in the size of GC is plausibly a UG-determined difference, if the line of research initiated by Manzini & Wexler (1987) is correct. However, the property of strict c-command vs. sub-command appears to be a language-specific difference, rather than a parametric difference in UG principles. This is suggested strongly by the fact that in English, while bound variable readings can arise under conditions of sub-command, anaphoric binding cannot.[5] Such a state of affairs suggests that the impossibility of sub-command for anaphoric binding has to be learned specifically for English. In Korean (and Chinese), by contrast, what allows anaphors to be bound under sub-command is the fact that anaphors require animate antecedents, which is a lexical property that has to be learned. When the containing phrase is headed by an animate noun (as in 5c), sub-command fails.

Based on the binding differences between Korean and English, the questions that motivated the present study are as follows:

1) How do UG-based vs. language-specific properties of binding affect the acquisition of Korean as L2?
2) How do UG-based vs. language-specific properties of binding affect the maintenance of Korean as heritage language in an English-dominant situation?
3) How are L2-ers of Korean different from Korean heritage speakers in interpreting UG-based vs. language-specific properties of binding?

Given the properties of the Korean anaphor *caki*, some of its core-binding properties are shown in the sentence types in (6). Sentence types (6a-c) are not different from English in terms of GC. However, sentence types (6d, e) differ from English since the reflexive *caki* is bound outside the English GC (tensed clause), but within the core GC

[5] This is seen in the following contrast:
(i) Every boy's mother loves him (him=bound variable reading o.k.)
(ii) *Every boy's mother loves himself

for Korean. Although sentence (6f) is not relevant to the difference in GC between Korean and English, this type tests the sub-command condition, which is not allowed in English.

(6) a. NP … [*caki*] … V : Sentence type 1
Betty*-nun oloci* ***caki****-man sayngkakha-n-ta.*
Betty-top only self-only think-pres-decl.
'Betty thinks of only herself.'

b. NP … [*caki* …]$_{\text{argument}}$ … V: Sentence type 2
Sandy*-nun [****caki*** *yetongsayng]-ul ttayli-ess-ta.*
Sandy-top self sister -acc hit-past-decl.
'Sandy hit self's (her own) sister.'

c. NP … [*caki* …]$_{\text{adjunct}}$ … V: Sentence type 3
Laura*-nun Charles-eykey [****caki*** *chinkwu]-taysin senmwul-lul cwu-ess-ta.*
Laura-top Charles-to(dat) self friend -instead present-acc give-past-decl.
'Laura gave Charles a present instead of self's (her own) friend.'

d. NP … [$_{S}$ *caki* V] … V: Sentence type 4
Wendy*-nun Ted-eykey [****caki****-ka Charles-pota ttokttokha-ta]-ko malhay-ss-ta.*
Wendy-top Ted-to(dat) self-nom C-comparative smart-decl-comp say-past-decl.
'Wendy told Ted that self (she) is smarter than Charles.'

e. NP … [[*caki* …]$_{\text{NP(argument)}}$ … V] …V: Sentence type 5
Christine-un Tom-elopwuthe [[**caki** tongsayng]-I cheypo-tang-ha-n iywu]-lul *tul-ess-ta.*
C-top Tom-from self brother-nom got-arrested-rel reason-acc hear-past-decl.
'Christine heard from Tom of the reason self's (her) brother got arrested.'

f. [N [NP]$_{\text{[-animate]}}$] … *caki* … V: Sentence type 6
*[****Silvia****-uy [caconsim]-i* ***caki****-lul koylophi-n-ta.*
Silvia-gen pride -nom self-acc torture-pres-decl.
'Silvia's pride torures herself.'

3. EXPERIEMENT

3.1. Hypothesis and Predictions

Based on the properties of Korean *caki* and the differences between English and Korean core binding phenomena, the hypotheses are as follows.

If UG-based vs. language-specific properties of binding are acquired and maintained differently in L2 learners and heritage speakers;
- There will be no differences in interpreting invariant UG principles (e.g. c-commanding condition between the anaphor and the antecedent) among different groups (Korean native speakers, Korean heritage speakers, L2 learners of Korean with English L1). In other words, all three groups will not differ from one another with Sentence types (6a), (6b) and (6c).
- There will be different judgments among the three groups in accepting TSC-violations of Korean core-anaphors (UG parameter). In other words, the heritage speakers and L2 group will show less acceptability with Sentence type (6d) and (6e).
- There will be different judgments among three groups in accepting Korean sentences with sub-commanding antecedents (language-specific), i.e., sentence type (6f), with which at least L2 learners with English L1 will show less acceptability.

3.2. Method

3.2.1. Participants.

14 English- speaking L2 learners of Korean (late learners) (mean age: 29) and 17 adult simultaneous Korean-English bilinguals (the heritage speakers) (mean age: 25) participated in this study. Participants filled out a language background questionnaire to determine their prior experience in Korean. All participants took a Korean proficiency test testing grammar and vocabulary. 30 native speakers of Korean (mean age: 28) participated in this study as a control group. These were recent arrivals to the United States, born in Korea and monolingually educated in Korean until they entered the university in the United States. The length of residence ranged from 4 months to 6 years.

As for the performance in Korean Proficiency test, the mean scores of the subjects in the three groups are given below in Table 1.

Table 1. Percent Accuracy in the Korean Proficiency Test

Group	Mean Scores
Control Group (n = 30)	95 (sd 0.04)
Bilingual Group (n=17)	64 (sd 0.23)
Late L2 Group (n=14)	50 (sd 0.37)

3.2.2. Main Task.

A Truth Value Judgment Task (Crain & Thornton, 1983) with stories was used to test binding interpretations. The task consists of 72 sentences: 36 target items and 36 fillers. The target items had 6 sentences for each sentence type shown in (6) in the previous section and now illustrated in (7). Three of them contained subject-oriented *caki*, while the other three sentences had *caki* that can be interpreted as non-subject-oriented reflexive by the context of the story. Though there could be some variability among native speakers in judging whether *caki* could be bound by a non-subject antecedent given the context, it was our assumption that all the target items, including the non-subject oriented *caki,* could be judged as true. Subjects were required to judge if the sentence is a true description of the previous story. For instance, if a subject judges a target sentence as true, when a reflexive is co-referential with its antecedent in the sentence, the subject is deemed to accept the binding in that sentence. In contrast, if a subject judges the sentence as false, s/he is deemed to be rejecting the possibility of the binding shown in the sentence. The fillers were composed of 36 sentences also containing *caki*, but actually not testing binding itself.

(7) a. Mary thinks she is very ugly. To make her feel better, her boyfriend Paul took her in front of a mirror and said, "Look, how pretty you are."

Q: Paul-i Mary-eykey *caki*-lul poye-cwu-ess-ta.
Paul-nom Mary-to(dat) self-acc show-give-past-decl.
'Paul showed Mary herself'; Target item: expected➔ **True**)

b. Betty showed Mary a photograph. She pointed to a girl in the photo and told that it was her sister.

Q: Betty-ka Mary-eykey *caki*-lul poye-cwu-ess-ta.
Betty-nom Mary-to(dat) self-acc show-give-past-decl.
'Betty showed Mary herself'; Filler item: expected➔ **False**)

The task was administered in two parts to reduce the chance of fatigue. Subjects completed the cloze test and the language questionnaire in between the two parts of the TVJT.

4. Results

Subjects who did not perform above 70% correct with the filler items were excluded for the analysis, as they were deemed not to have understood the main task. For each target sentence type, the average of each subject's degree of acceptability was calculated. A 1 was assigned to 'True' responses, which was taken to mean that subjects accepted *caki*-binding' in a given sentence. False responses to the target items received a score of 0, indicating rejec-

tion of *caki*-binding. To compare group a Repeated Measures ANOVA was run (alpha = .05; df = 58), followed by the *Scheffe* post hoc test. There was a significant main effect for sentence types ($p < 0.016$), a significant effect by group (Korean controls, Heritage speakers, L2ers with English L1): $p < 0.001$) and a sentence by group interaction ($p > .05$). The Korean control group was significantly different from the two experimental groups, while the two experimental groups (L2 learners and early bilinguals) were not different from each other.

Let us now focus on the results of the sentence types, which are displayed in Table 2 and Figure 1. Overall results showed no difference among three groups with Sentence types 1, 2, and 3 (6a,b,c), where the binding condition is legitimate in the two languages.

Table 2. Accetability of core anaphor 'caki'

Binding Conditions		TSC-non-violation			TSC-violation		Sub-commanding
Sentence types		S1	S2	S3	S4	S5	S6
Controls	*mean*	0.90	0.81	0.96	0.96	1.00	0.95
	sd	0.18	0.23	0.12	0.16	0.00	0.22
Bilinguals	*mean*	0.86	0.73	0.88	**0.78***	**0.82***	0.88
	sd	0.17	0.27	0.16	0.36	0.28	0.34
L2 learners	*mean*	0.86	0.83	0.86	**0.76***	**0.80***	**0.67***
	sd	0.21	0.23	0.17	0.38	0.40	0.45

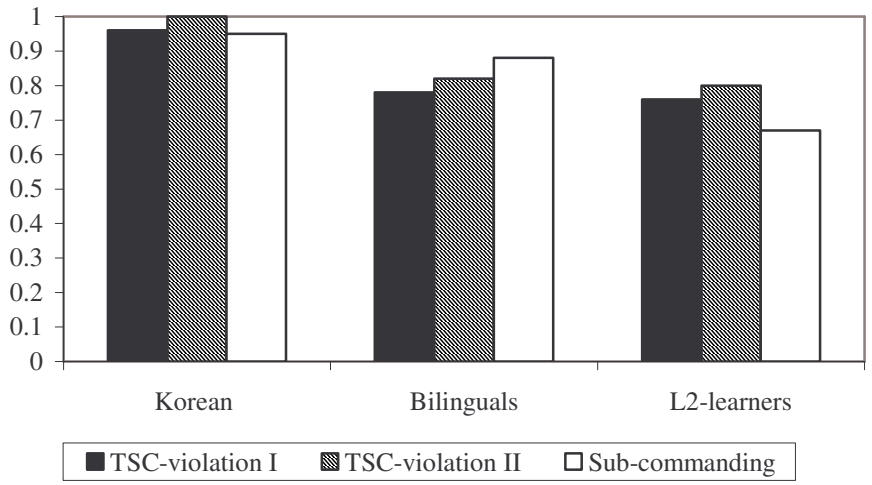

Figure 1: Mean Acceptability of the Korean anaphor *caki* by binding condition

In Sentence types 4 and 5 (6d,e) *caki* was bound and violated the TSC. This is not acceptable in English core binding, yet possible in Korean core binding. With these sentences, both L2 learners and bilinguals showed less acceptability than the Korean controls (L2 learners' acceptability on Sentence type 4: mean = 0.76, Sentence type 5: mean = 0.80; Bilinguals' acceptability on Sentence type 4: mean = 0.78, Sentence type 5: mean = 0.82; Korean Control's acceptability: Sentence type 4: mean = 0.96, Sentence type 5: mean =1.00).

Finally, with Sentence type 6 (6f), where *caki* was bound by sub-commanding antecedent, L2 learners differed from Korean controls, showing less acceptability (mean = 0.67 correct) even in comparison with their own performance on Sentence type 4 and 5 (mean = 0.76 and 0.80, respectively). On the other hand, bilinguals did not differ significantly from Korean controls with Sentence type 6 (Bilinguals: mean = 0.88; Controls: mean = 0.95).

5. DISCUSSION AND CONCLUSION

The present study investigated how binding properties of Korean as L2 or as the heritage (family) language in bilinguals are influenced by those of L1 and the dominant language in bilinguals. In addition, this study tries to tease apart UG properties from non-UG language specific properties in the acquisition of Korean binding.

The predictions and the results of the hypothesis tested throughout this study can be summarized as follows. First, the three groups did not differ from one another when Korean sentences show binding properties legitimate in Korean and English (UG principles). Therefore, the first prediction is borne out by the results of the present study.

Second, both the bilingual group and the L2 group showed less acceptance than the Korean controls, when *caki* was bound outside English GC, though it was bound within the Korean GC. The second prediction, thus, can be supported by the results. These results with GC difference seem to imply that parametric differences in UG could be influenced by cross-linguistic transfer, be it the L1 or the L2, depending on the population.

Finally, the results of sentences testing language specific properties (sub-commanding antecedents) showed that only the L2 learners, but not the bilinguals, differed from Korean controls and showed worse performance compared with sentences displaying a GC difference. Though there was large individual variation in the performance with sub-commanding antecedents, a look at individual results revealed that learners who showed no problem with GC-parameter still demonstrated problems with sub-commanding antecedents, but not vice versa. It seems that L2 learners treat UG-related and language-particular properties differently (UG principle > UG parameter > language-specific rule).

For simultaneous Korean-English bilinguals, it seems that once the lexical property of *caki* are acquired (such as having inanimate c-commanding noun and specified as 3rd person) it is maintained, probably due to the saliency of the property. However, those bilinguals who have not acquired the lexical properties of *caki* seem to assimilate the constraints on the structural condition to their dominant and more fluent language (English). However, these issues remain open for further research.

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