

Dominant language influence in acquisition and attrition of binding: Interpretation of the Korean reflexive *caki*

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(Received: December 7, 2005; Revised: January 14, 2008; Accepted: January 28, 2008; First published online 13 November 2009)

This study investigates how the dominant language of Korean heritage speakers (English) influences Korean (minority language) in the domain of binding interpretations by comparing the performance of Korean immigrants in English dominant context with that of incomplete learners of Korean and L2 learners of Korean. Four groups (10 Korean immigrants, 17 simultaneous bilinguals, 14 late L2 learners, and 30 Korean native speakers) were tested. Differences between English and Korean in Governing Category and structural constraints were tested through a Truth Value Judgment Task with stories. Overall results showed that Korean immigrants (attriters) did not differ from Korean controls, while simultaneous bilinguals (incomplete learners) and late L2 learners of Korean showed behavior different from Korean control when two languages were different in their binding properties.

Recent studies on L1 attrition have shown that in a bilingual situation, properties of the dominant L2 that differ from the L1 can affect various aspects of the L1 in theoretically interesting ways (Major, 1992; Bouba Filiaci, Heycock, Sorace and Tsimplici, 2002; Gürel, 2002, 2004; Köpke, 2002; Schmid, 2002; Tsimplici, Sorace, Heycock and Filiaci, 2004). For the purposes of this paper, we follow Silva-Corvalán's (1994) characterization of L1 attrition as loss of features of L1 after L1 has been acquired completely and remained stable for a while. Given this characterization, L1 attrition should best be investigated among adult speakers who have acquired and received schooling in L1 and subsequently go on to acquire a second language upon immigrating to an L2-speaking country. While such LATE BILINGUAL speakers rarely become near-native speakers of L2, their L1 may nevertheless be affected in significant ways after a prolonged period of exposure to and extensive use of L2, showing signs of L2-induced attrition.

This is not to gainsay the value of investigations of early bilinguals in research on language attrition. Early bilinguals can also contribute to such research, though in a different way than late bilinguals. The linguistic profile of early bilinguals is similar to that of typical L1 attriters in that they are usually exposed to the family language as their L1 (perhaps simultaneously with the L2/community language). However, unlike adult L1 attriters, early bilingual children begin to acquire the community language before their family language is fully established. As a result, and depending on variations in the L1 input they receive as children, their knowledge of L1 may turn

out to be incomplete when they become adults. Therefore, early bilinguals are usually treated as exhibiting incomplete L1 acquisition (Montrul, 2002) and are referred to as “incomplete L1 learners” (Polinsky, 1997). Nevertheless, just like studies of L1 attrition, studies of incomplete L1 learners have revealed that the grammar of the weaker language is influenced by properties of the dominant language (Silva-Corvalán, 1994; Polinsky, 1997; Montrul, 2002, 2004; Kim and Montrul, 2004a).

The present article has two related goals. First, the magnitude of dominant language transfer and first language loss will be estimated in early and late bilinguals, who differ in terms of the onset of bilingualism and the extent of exposure to the majority language (attrition in late bilinguals vs. attrition or incomplete acquisition in early bilinguals). Second, we will investigate whether dominant language effects in incomplete L1 acquisition are similar to those typically observed in adult L2 acquisition. By its very nature, the developing L2 in bilinguals is also an incomplete grammatical system, which in many cases fossilizes. The question therefore is whether incomplete L1 and L2 acquisition look alike when the dominant language is the same.

In particular, we will investigate how knowledge of English influences interpretations of anaphor binding in Korean. To address this question, two groups of Korean–English bilinguals residing in an English-speaking environment who differ in their age of exposure to English will be compared. The main goal is to tease apart the effects of L1 attrition and incomplete acquisition of L1 by testing both early and late bilinguals. To

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investigate differences between incomplete L1 acquisition and incomplete L2 acquisition, a group of English-speaking learners of Korean as a second language is also included. All three groups are compared with a control group of monolingual Koreans residing in Korea. The linguistic focus of our study is the interpretation of the Korean anaphor *caki*, which is licensed in structural configurations that differ from English core binding.

1. Binding Theory

1.1 Binding Theory and Long-Distance Anaphors

Standard Binding Theory (Chomsky, 1981, 1986) hypothesizes that anaphors (reflexives like *himself*) and pronominals (pronouns like *he/him*) are in complementary distribution. That is, while anaphors must be bound within a local domain known as the Governing Category (GC) by Principle A of the Binding Theory (BT), as shown in (1a, b), pronominals are required to be free within the GC by Principle B, as shown in (1c, d).

- (1) a. [_{GC} John_i is in love with himself_i].
 b. *John_i said that [_{GC} himself_i was in love with Mary].
 c. John_i said that [_{GC} he_{ij} was in love with Mary].
 d. *[_{GC} John_i is in love with him_i].

At least in the earliest incarnations, the GC for BT was assumed to be invariant across languages. However, this assumption is immediately counter-exemplified by languages like Korean (see (2b)) and Chinese (see (2c)), which have anaphors that take antecedents outside the constituent that functions as the GC in English.¹

- (2) a. *Bill_i said that [_{GC} Mary_j hates himself_i].
 b. Bill_i-un [_{GC} Mary_j-ka caki_{ij}-lul
 Bill-TOP Mary-NOM self-ACC
 silheha-n-ta-ko] malhay-ss-ta.
 hate-PRES-DECL-COMP say-PAST-DECL
 “Bill said that Mary hates him/herself.”
 c. Zhangsan_i yiwei [_{GC} Lisi_j hui ba
 Zhangsan thought Lisi will BA
 Xiao Ming_k dai hui zij_{ijk}-de jia].
 Xiao Ming take back self-GEN home
 “Zhangsan thought that Lisi would take
 Xiao Ming back to his home.”

An initial attempt to address this problem proposed to parameterize the size of GCs across languages (Yang, 1983; Manzini and Wexler, 1987). In this line of research,

¹ The abbreviations used in the glosses of Korean and Chinese examples are as follows: ACC = accusative, COMP = complementizer, DAT = dative, DECL = declarative, GEN = genitive, NOM = nominative, PRES = present tense, REL = relative clause marker, TOP = topic marker.

languages with Long-Distance Anaphors (LDAs) differ from those without LDAs in the size of the GC. For example, the GC in English is defined by the conjunction of the two Opacity Conditions proposed in Chomsky (1980) – the Tensed S Condition (TSC) and the Specified Subject Condition (SSC). By contrast, the GC in languages like Korean (and Chinese) with LDAs is the root clause (Yang, 1983). A subsequent attempt tried to locate the differences between languages with and without LDAs not in the parameterized size of the GC, but in whether an anaphor satisfies the BT at S-structure or after LF Head Movement (Cole, Hermon and Sung, 1990).

1.2 Core versus Exempt Binding and Long-Distance Anaphors

A problem both of these approaches face is that while they predict the complete absence of long-distance bound anaphors in languages like English, there are in fact apparent cases of LD-bound anaphors (as well as unbound anaphors) in languages like English. The relevant data are shown in (3a, b).

- (3) a. Bill remembered that the Times had printed
 [a picture of himself] in its Sunday edition.
 b. Physicists like yourself are a godsend.
 (Reuland and Everaert, 2001, pp. 642–643)

Responding to facts such as these, Pollard and Sag (1992), Reinhart and Reuland (1993) (see also Cole, Hermon and Huang, 2001a; Huang and Liu, 2001) tried to account for apparent LD-binding of anaphors in languages deemed to possess only local anaphors by positing a distinction between CORE (or GRAMMATICAL) ANAPHORS and EXEMPT ANAPHORS (equivalently, LOGOPHORS). According to this line of analysis, syntactic binding theory constrains only core anaphors, while exempt anaphors are licensed by extra-grammatical mechanisms. This is the theoretical approach to anaphor binding we adopt in this paper.

This approach raises an important question: how do we know that a given anaphor is exempt? This question is particularly pertinent since we know of no languages that have dedicated forms of exempt anaphors. The same item serves double duty as core and exempt anaphor in language after language. Pollard and Sag (1992) answer this question by proposing that core and exempt anaphors are in complementary distribution. Specifically, in their analysis, an anaphor is exempt when it occurs in a context without a minimal Subject (or superior co-argument). Otherwise, it is a core anaphor. For instance, the anaphor *himself* in (3a) above is an exempt anaphor by this reasoning, since there is no potential antecedent within the minimal DP that contains the anaphor. By contrast,

the anaphor in (4) below is a core anaphor, and behaves as such as seen by the impossibility of LD-binding.²

- (4) Bill remembered that *The Times* had printed Mary's picture of herself/*?himself in its Sunday edition.

More generally, exempt anaphors and core anaphors can be distinguished by the following properties:

- (5) a. Exempt anaphors may be long-distance bound.
 b. Exempt anaphors may be unbound (or discourse-bound).
 c. Exempt anaphors do not need c-commanding antecedents.
 d. Exempt anaphors do not show a preference for sloppy readings in VP ellipsis/VP proform contexts.

These properties can be illustrated with English exempt anaphors. First, as we saw in the contrast between (3a) and (4) above, English allows exempt anaphors to be bound long-distance. Exempt anaphors are also fine as unbound or discourse-bound anaphors, as shown in (3b) above. In addition, c-command, which is required in core binding, is not necessary between exempt anaphors and their antecedents. By contrast, anaphors that cannot be construed as exempt (in virtue of the presence of a locally commanding subject/specifier in the minimal CFC) cannot be licensed in similar contexts. This is seen in the contrast between (6a) and (6b) below.

- (6) a. [Incriminating pictures of **himself_i** published in *The Times*] have all but eliminated **John_i's** chances of being promoted.
 b. *[Mary's pictures of **himself_i** published in *The Times*] have all but eliminated **John_i's** chances of being promoted.

Finally, the preference for strict versus sloppy reading in contexts of VP ellipsis/VP proforms can also help to differentiate core from exempt anaphors (Cole et al., 2001a; Runner, Sussman and Tanenhaus, 2002; Ying 2005). Unless an explicit context favoring the strict

² The reason why the presence or absence of a superior co-argument should draw the line between core and exempt anaphors is that a superior co-argument is a potential local antecedent of the reflexive. Thus, when there is a potential antecedent, the reflexive must be bound under the option provided by grammar – perhaps because it is the “cheaper” option (Reuland and Everaert, 2001). The absence of a superior co-argument rules out the option of finding an antecedent through grammar. The system then switches to extra-grammatical mechanisms to license the anaphor.

The proposal in Chomsky (1986) that defines the GC as the minimal domain in which the Binding Theory could be potentially satisfied – a BT-compatible Complete Functional Complex (CFC) – is similar in orientation, except that in Chomsky (1986) the potential satisfaction of BT is used not to distinguish core and exempt anaphors, but to posit a principled differentiation of the GC for anaphors and pronouns in certain contexts.

reading³ is given (say, if the sentence is followed by *Bill and John are best friends*), the elliptical VP in (7) is interpreted sloppily, that is, as meaning that Bill too defended himself (= Bill) against the committee's accusations.

- (7) John defended **himself** against the committee's accusations. Bill did so too.

However, even in the absence of a favoring context, speakers assign a strict interpretation to the missing VP in (8a). Similarly, in (8b), a strict reading is more likely than the sloppy reading. It is the sloppy reading that requires a specific context.

- (8) a. John_i thinks that Susan and **himself_i** are to blame for the accident. Bill_j does so too.
 (= Bill thinks that Susan and himself_i(strict)/_j(sloppy) are to blame . . .)
 b. John_i thinks that an article written by **himself_i** caused the uproar. Bill_j does so too.
 (= Bill thinks that an article written by himself_i(strict)/_j(sloppy) caused the uproar.)

Assuming this to reflect a general pattern, we can use the lack of preference for strict readings in VP ellipsis/VP proform contexts as another diagnostic for exempt anaphors.

While exempt anaphors escape the strictures of syntactic conditions that constrain core anaphors, their licensing is nevertheless subject to discourse-pragmatic conditions. Conditions that fall under the rubric of LOGOPHORICITY (Sells, 1987; Huang and Liu, 2001) are relevant in the licensing of exempt anaphors. Thus, antecedents of exempt anaphors are optimal if they are logophoric centers.⁴

The contrast shown below can be understood in this light. The structural distance between antecedent and anaphor as well as their relative configurations (lack of c-command) are identical in the sentences and yet there are subtle degrees of contrast.

- (9) a. [Incriminating pictures of **himself** published in the Times] have been worrying **John** for some time.
 b. [Incriminating pictures of **himself** published in the Times] have all but eliminated **John's** chances of being promoted.
 c. *?[Incriminating pictures of **himself** published in the Times] accidentally fell on **John's** head.

³ The strict reading here is the reading where Bill defended John against the committee's accusations.

⁴ Sells (1987) did not make the core-exempt distinction. We are reinterpreting his conclusions in light of this distinction, following Huang and Liu (2001), who demonstrate convincingly that core anaphors do not require discourse-pragmatic conditions to be licensed.

The judgments reflect the ease with which *John* can be identified as a logophoric antecedent of the anaphor. In (9a), *John* is a SELF, in the terminology of Sells (1987).⁵ As SELF, it is also a PIVOT.⁶ In (9b) and (9c) it can only be a PIVOT. And (9b) is better than (9c) because it is easier to construe this sentence as being reported from the point of view of *John*.

1.3 Core versus Exempt Binding and the Parameterization of Governing Category across Languages

Since the ability to take long-distance antecedents is one of the properties of exempt anaphors, it is conceivable that LDAs are always exempt anaphors. If that were the case, there would be no need to parameterize the size of GC across different languages – if we understand GC as the domain where core, not exempt, anaphors are bound. In a careful empirical investigation of the Mandarin LDA *ziji*, Huang and Liu (2001) come to this conclusion. *Ziji* as a core anaphor is bound in the same GC as English core anaphors, while LD-bound *ziji* displays the hallmarks of exempt anaphors.

There are, however, reasons to revisit this conclusion. The first reason is that it is far from clear whether LDAs in all other languages display the signature properties of exempt anaphors/logophors. If some LDAs cannot be classified as exempt anaphors, then we must countenance the possibility that they are core anaphors with a larger GC than their counterparts in languages like English (or Chinese, according to the analysis of Huang and Liu, 2001). Indeed, whether or not all instances of LD-bound *ziji* behave as exempt anaphors/logophors is a matter of debate. Pollard and Xue (2001) claim that there are instances of LD-bound *ziji* that do not require logophoric conditions to be licensed. In other words, *ziji* as a core anaphor can occur in a GC that is larger than the English GC.

Secondly, even if we grant that LD-bound *ziji* and other LDAs are exempt anaphors, Huang and Liu's (2001) contention that the GC for core binding in all languages is invariant cannot be maintained. This is so for the following reason. As long noted in the literature, the GC for core anaphors in English is defined by the conjunction of two Opacity Conditions (Chomsky, 1973) – the Specified Subject Condition (SSC) and the Tensed S Condition (TSC). However, in languages like Chinese, the TSC

⁵ In Sells (1987), the following three logophoric centers are introduced: SOURCE = the agent of the communication, SELF = one whose mental state or attitude the content of the proposition describes, and PIVOT = one with respect to whose (space–time) location the content of the proposition is evaluated.

⁶ Certain logophoric roles have been claimed to be more canonical than others (SOURCE > SELF > PIVOT). See Sells (1987) on the implicational hierarchy of logophoric roles, from which this reasoning follows.

is ineffective in defining the GC for core anaphors, as we shall see below. Therefore, we cannot claim that there is no parameterization of GC for core anaphors across languages. GC size for core anaphors must still be parameterized, though to a lesser extent than suggested by approaches such as Yang's (1983).

To summarize, we adopt a theoretical distinction between core and exempt anaphors. Since one of the properties of exempt binding is LD-binding, this perspective opens up the possibility that most cases of LD-binding may involve exempt anaphors, which in turn leads to the possibility that the domain of core binding for anaphors (= GC) may not vary across languages. While being somewhat agnostic as to whether all LDAs can be viewed as exempt anaphors, we noted that even under such a scenario, a limited parameterization of the GC for core binding must be countenanced. With this background, we now turn to a detailed investigation of the differences in anaphor binding between English and Korean.

2. Differences in Binding Theory: English vs. Korean

2.1 Differences in Governing Category for Core Anaphors

As stated earlier, English and Korean differ in the size of GC for core anaphors. We will assume that all anaphors bound across an intervening subject (SSC violations) are exempt anaphors in Korean (and Chinese). SSC also defines the GC for core anaphors in English. However, we take anaphors bound outside the minimal finite clause (TSC violations) but not across an intervening subject to be core anaphors in Korean, unlike English, where TSC-violating anaphors behave as exempt anaphors. In other words, we propose the following differences in the size of GC for core binding in English and Korean:

- (10) *GC for Core Binding*
- a. English: defined by SSC and TSC
 - b. Korean: defined by SSC

We now proceed to show that the proposal in (10) is supported. We noted earlier, following Cole et al. (2001a) (see also Runner et al., 2002; Ying, 2005), that core anaphors display a strong preference for sloppy readings in VP ellipsis/VP proform contexts, while exempt anaphors do not.

As noted earlier (cf. (8) above) and as we see below, when an anaphor is bound within the GC in English, the sloppy reading is predominant (cf. (11a)). By contrast, when the anaphor is bound outside the GC as an exempt anaphor, the strict reading seems to be preferred (cf. (11b)).⁷

⁷ It is possible for context and/or inherent lexical properties of predicates to introduce a bias in favor of one or the other reading.

- (11) a. John_i is in love with himself_i. (Core binding)
 And so is Bill_j.
 (= Bill_j is in love with **Bill** (> John))
 b. John_i was not unduly worried about
 Mary's opinion of himself_i. (Exempt binding)
 Neither was Bill_j.
 (= Bill is not unduly worried about Mary's
 opinion of **John** (> Bill))

We made the claim in (10) that English core anaphors cannot violate TSC. However, TSC-violating anaphors in English can be licensed as exempt anaphors under appropriate discourse conditions, as shown in (12b). Anaphors cannot violate the TSC when they are Subjects, but when they are contained within a Subject, TSC-violating anaphors can become acceptable (Chomsky, 1981). When we place such sentences in the context of VP ellipsis, the strict reading becomes more salient.

- (12) a. *John_i thinks that himself_i is clever. (*TSC: core binding violation)
 b. John_i thinks that no one but himself_i is to blame. (TSC violation licensed as exempt anaphor)
 So does Bill_j.
 (=Bill thinks that no one but **John** (>Bill) is to blame: strict reading)

However, as predicted, an anaphor bound in violation of SSC (and/or TSC) displays a preference for the strict reading, as shown in (13) below.

- (13) John remembered that the Times had printed [a picture of himself] in its Sunday edition. (SSC violation)
 So does Bill_j.
 (=Bill remembered that the Times had printed a picture of **John** (>Bill): strict reading)

We take these results to support our hypothesis (cf. (10)) that in English anaphors that violate TSC and/or SSC are exempt anaphors.

When we turn to Korean, the results are different. An anaphor that violates only TSC does not display a preference for the strict reading in contexts of VP ellipsis,⁸ as shown in (14).

The claim of a preference for one or the other reading is therefore made for neutral contexts and predicates that introduce no inherent bias. As readers can verify, there is no preference for one or the other reading in the contexts reported in (11).

⁸ An anonymous reviewer raises the question of whether Korean has VP ellipsis, as some have questioned the existence of VP ellipsis in languages like Korean and Japanese (Saito, 1985). Otani and Whitman (1989) claim that there are structures instantiating VP ellipsis, but without a proform. For the purposes of this paper, we are taking VPs containing the proform *kuleh-key* "so" as the equivalents of English sentences containing VPs with the proform (*do*) *so*. The particular VP in Korean may not result from VP ellipsis, but some other process. Nonetheless, this does not affect our main point, since such VPs allow both strict and sloppy readings.

- (14) John_i-un **caki**_i-ka ttokttokhata-ko
 John-TOP self-NOM be-smart-COMP
 sayngkakha-n-ta. (TSC violation)
 think-PAST-DECL
 "John thinks that self (= he) is clever."
 Bill_j-to kulehkey sayngkakha-n-ta.
 Bill-too so think-PRES-DECL
 "Bill thinks so too."
 (= Bill thinks that John < **Bill** is smart: sloppy reading)

By contrast, when an anaphor is bound in violation of SSC and TSC, the strict reading becomes much more salient, as shown below in (15).

- (15) John_i-un Mary_j-ka **caki**_i-lul
 John-TOP Mary-NOM self-ACC
 silheha-n-ta]-ko sayngkakha-n-ta.
 hate-PRES-DECL-COMP think-PRES-DECL
 (SSC violation)
 "John thinks that Mary hates self (= John)."
 Bill_j-to kulehkey sayngkakha-n-ta.
 Bill-too so think-PRES-DECL
 "Bill thinks so too."
 (= Bill thinks that Mary hates **John** > Bill: strict reading)

We take these results to mean that TSC is ineffective in defining the GC for core anaphors in Korean. What defines the GC for core anaphors in Korean is only SSC.

In sum, the first difference between Korean and English with respect to core binding is related to the factors that determine the size of GC: TSC is ineffective in defining the GC for core binding in Korean while it is relevant in English. SSC is relevant in both languages.

2.2 Different structural conditions on antecedents

In addition to the difference in the size of GC for core binding, there is another difference between Korean and Chinese on the one hand and English on the other. In English, antecedents of core anaphors must strictly c-command the anaphors, as shown in (16a). However, in Korean and Chinese, in configurations called "sub-command" (Tang, 1989), the antecedent, which is the possessor of an inanimate noun which c-commands the anaphor, can bind the anaphor that it does not c-command, as shown in (16b). The definition of sub-command is given in (17).⁹

⁹ Given that exempt anaphors do not need c-commanding antecedents, a question arises why the anaphor in (16a) cannot be licensed as an exempt anaphor. While we do not have a definitive answer, the following facts are suggestive.

To express the binding relations indicated in (16a) in English, we reverse the position of the anaphor (or pronoun, in case of

- (16) a. *Silvia_i's pride tortures herself_i.
(English: no sub-command)
b. Silvia_i-uy casonsim -i **caki**_i-lul
Silvia-GEN pride-NOM self-ACC
koylophi-n-ta.
torture-PRES-DECL
"Silvia's pride tortures self (= Silvia)."

- (17) 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.

When the c-commanding Noun is animate, binding fails, because sub-command does not obtain. This is shown in (18).

- (18) *Silvia_i-uy tongsayng_j-i **caki**_i-lul
Silvia-GEN brother-NOM self-ACC
koylophi-n-ta.
torture-PRES-DECL
"Silvia's brother tortures self (= Silvia)."

An anaphor with a locally accessible sub-commanding antecedent in Korean and Chinese behaves as a core anaphor under the VP Ellipsis test, as we see below (cf. Huang and Liu, 2001):

- (19) Silvia_i-uy casonsim_j-i **caki**_i-lul nul
Silvia-GEN pride-NOM self-ACC always
koylophi-n-ta.
torture-PRES-DECL
"Silvia's pride tortures self (= Silvia)."

Possessors, given that English does not have Possessive anaphors) and the antecedent, yielding Backward Binding:

- (i) [Her pride] tortures Silvia.
(ii) [Doubts about herself] continue to torment Silvia.

Doubtless this has to do with the fact that when the antecedent is the Object, it can be construed easily as SELF (hence, also PIVOT), while when it is part of the Subject, it cannot easily be construed as a logophoric antecedent.

This explanation extends to (18) in Korean. The binding in (18) cannot be licensed under core binding. Neither is it felicitous as exempt binding, given the difficulty of identifying the Possessor as a logophoric antecedent. When the positions of the anaphor and the antecedent are switched, yielding Backward Binding, the binding relation becomes licit again, as we see below:

- (iii) Caki tongsayng-i Silvia-lul koylophi-n-ta.
self brother-NOM Silvia-ACC torture-PRS-DECL
"Her brother tortures Silvia."

This line of explanation predicts that sub-command must be core binding, as in fact it is (cf. (19)), since if it were part of exempt binding, we do not predict that sub-commanding antecedents should be acceptable, given that the Backward Binding pattern is more optimal as an instance of exempt binding.

Susan_i-uy yeltungkam yeksi kuleh-ta.
Susan-GEN complex.NOM too so-DECL
"So does Susan's complex (= Susan's complex tortures self (= Susan > Silvia))."

In this section, we argued that there are two differences between English and Korean in anaphor binding. The first difference has to do with the determination of GC for core anaphors. While SSC defines the core GC for both, TSC is inoperative in defining the core GC in Korean. The second difference has to do with configurations of binding. Sub-commanding antecedents (of core anaphors) are possible in Korean while they are ruled out in English. In the next section, we turn to a review of the previous studies conducted on attrition and incomplete acquisition of binding.

3. Attrition and incomplete acquisition of binding

The acquisition of binding has received significant attention within generative approaches to L2 acquisition, but to date there are very few studies that have looked at L1 attrition and incomplete acquisition of anaphor binding from a generative perspective.

One of the main issues in L2 binding acquisition research addressed in several studies has been whether binding properties in L2 grammars are UG-constrained in the same way as L1 grammars are, or whether they are random or "wild" by contrast (Thomas, 1995, 1997; White, Hirakawa and Kawasaki, 1996; Hamilton, 1997; Christie and Lantolf, 1998; Yuan, 1998). A related issue is whether parametric variations in L1 grammar can have an impact on L2 grammars (White, 1989; Hirakawa, 1990; Thomas 1995, 1997; Kim and Montrul, 2004b; Kim, Montrul and Yoon, 2004, 2005). That is, when L2 binding properties are different from those of L1 grammars, transfer effects are usually shown in L2 acquisition. For example, L2 learners whose L1 has LDAs have been shown to accept ungrammatical sentences in English where the anaphor *himself/herself* is LD-bound (Hirakawa, 1990, and others). Similarly, studies testing the acquisition of L2s with LDAs have shown that learners whose L1 has only local anaphors have difficulty accepting LDAs in L2, preferring a local interpretation instead (Hirakawa, 1990; Thomas, 1995, 1997; White et al. 1996; Yuan, 1998; Kim and Montrul, 2004b).

Binding interpretations that fall under Principle B are also affected in an L1 loss situation. Gürel (2002, 2004) tested adult Turkish L1 speakers residing in an English-speaking country for an extended period of time, and found that there is cross-linguistic transfer in Principle B from English onto Turkish. She proposed that L1 attrition could affect the domain of syntax to some extent, under extensive L2 input and limited L1 input. Interestingly, a recent study testing the opposite – the potential attrition of binding in English speakers who have been living in

Turkey for a long time – failed to show similar results (Gürel, 2007).

Along with cases of L1 attrition, the cross-linguistic transfer effect in the interpretations of Binding Principles has also been discovered in child attrition and incomplete L1 acquisition. Song, O’Grady, Cho and Lee (1997) tested knowledge of the Korean reflexive pronouns *caki* and *caki-casin* in sixteen 6–14-year-old Korean bilingual children attending Korean community school in the United States.

Only three of the 16 children knew the meaning of the Korean reflexives. Studies by Kim and Montrul (2004a) and Kim et al. (2004, 2005) on adult early Korean–English bilinguals born in the U.S. and exposed to both languages since birth found that the binding interpretations of long-distance Korean anaphors were affected by the syntactic constraints on English binding, since their dominant language (English) is a language with only local anaphors. Similar transfer effects from English to Korean were observed in the Korean interlanguage grammars of English-speaking L2 learners of Korean (Kim et al., 2004).

The purpose of this study is to further pursue our preliminary findings from Korean L1 and L2 incomplete acquisition, and to see whether similar transfer effects from English binding interpretations to Korean anaphors also occur in potential cases of L1 attrition of Korean, as Gürel (2002, 2004) found for Turkish. Therefore, our study investigates the influence of English, the dominant language, on Korean, the weaker language, in different types of Korean–English bilinguals: Korean–English late bilinguals (L1 attrition group), Korean–English early bilinguals (incomplete L1 acquisition group) and English-speaking L2 learners of Korean (incomplete L2 acquisition group). In particular, we investigated the interpretation of the Korean anaphor *caki* in cases where English and Korean differ with respect to the size of the Governing Category and structural conditions on antecedent–anaphor relations.

The research questions which motivated the present study are the following:

1. How does English influence Korean in the domain of binding interpretations of anaphors? Specifically, how do (i) differences in the size of GC for core binding, and (ii) language-specific differences in the structural conditions on the antecedent–anaphor relation affect the acquisition, maintenance and attrition of Korean binding?
2. If transfer effects are found in these domains, how do they compare across the different bilingual populations tested (L1 attrition vs. L1 and L2 incomplete acquisition)?

We hypothesize that if the weaker language in bilinguals is affected by the knowledge of the dominant language, and if the properties of the L1 affect the acquisition of the L2, Korean–English bilinguals (L1 attriters and early Korean–

Table 1. Mean percentage accuracy on the Korean Proficiency Test.

Group	N	Mean	SD
Korean monolinguals	30	92	8
Korean L1 attriters	10	89	13
Korean–English bilinguals	22	64	23
Korean L2 learners	18	58	40

English bilinguals) in an English-dominant context and late L2 learners of Korean (with English L1) would show a lower degree of acceptability than monolingual Korean native speakers with sentences where the Korean anaphor *caki* is (i) bound outside the core GC of English, and/or (ii) bound by sub-commanding antecedents.

4. Experiment

4.1 Participants

Four groups of subjects were tested – three experimental groups and one control group. The experimental groups were the Korean attrition group (late bilinguals), the incomplete L1 acquisition group (early bilinguals), and the incomplete L2 acquisition group (late bilinguals). The Korean attrition group consisted of 10 adult first generation Korean immigrants to the U.S. (mean age = 35, range: 20–38, mean age of English onset = 23.5, length of residence in the U.S.: 10+ years). The early bilingual group was composed of 22 second generation Korean–English bilinguals (mean age = 22.4, range: 20–25, mean age of Korean and English onset = since birth). The L2 group consisted of 18 adult English-speaking L2 learners of Korean residing in South Korea (mean age = 27.3, range: 20–43, mean age of Korean onset = 24.8, length of residence in Korea: 3+ years). There was a control group of 30 Korean monolinguals residing in Korea (mean age = 36, range: 25–42). All groups completed a Korean proficiency test, consisting of cloze test testing different grammatical areas such as case marking, coordination, verb forms, vocabulary, etc. The mean accuracy scores on the proficiency test¹⁰ are displayed in Table 1.

4.2 Tasks

In (20), we present the sentence types we used to test Korean core binding. The sentences in (20a–c) involve no

¹⁰ According to a series of statistical analyses (i.e. ANOVA and post-hoc tests), the Korean L1 attriters did not differ significantly from the controls in their scores on the proficiency test, while the other two groups (early Korean–English bilinguals and late L2 learners of Korean) were significantly different from the control group (Korean monolinguals). No significant difference was found between Korean–English bilinguals and late L2 learners of Korean.

violation of TSC and thus are acceptable as core binding in both English and Korean, while those in (20d–e) are TSC violations where English and Korean are different.¹¹ A sentence with a sub-commanding antecedent is given in (20f).¹²

- (20) a. *Type 1: NP ... [caki] ... V*
 Betty-nun oloci **caki**-man sayngkakha-n-ta.
 Betty-TOP only self-only think-PRES-DECL
 “Betty only thinks of herself.”
- b. *Type 2: NP ... [caki ...]_{ARGUMENT} ... V*
 Sandy-nun [caki yetongsayng]-ul
 Sandy-TOP self sister ACC
 ttayli-ess-ta.
 hit-PAST-DECL
 “Sandy hit self’s (her own) sister.”
- c. *Type 3: NP ... [caki ...]_{ADJUNCT} ... V*
 Laura-nun Charles-eykey [**caki**
 Laura-TOP Charles-to.DAT self
 chinkwu]-taysin senmwul-lul
 friend-instead present-ACC
 cwu-ess-ta.
 give-PAST-DECL
 “Laura gave Charles a present on behalf of
 self’s (her own) friend.”
- d. *Type 4: NP ... [_s caki ... V] ... V*
 Wendy-nun Ted-eykey [**caki**-ka Charles-pota
 Wendy-TOP Ted-to.DAT self-NOM Charles-than
 ttoktokha-ta]-ko malhay-ss-ta.
 smart-DECL-COMP say-PAST-DECL
 “Wendy told Ted that self (she) is smarter than
 Charles.”
- e. *Type 5: NP ... [_s [NP caki ...]_{argument} ... V]*
 ... V
 Christine-un Tom-elopwuthe [[**caki**
 Christine-TOP Tom-from self
 tongsayng]-i cheypotangha-n
 brother-NOM got.arrested-REL
 iywu]-lul tul-ess-ta.
 reason-ACC hear-PAST
 “Christine learned from Tom the reason for
 self’s (her) brother’s arrest.”

¹¹ These two sentence types are actually longer than the other types, which could contribute to the pattern of the results with GC size as a reviewer correctly pointed out. We were unaware of this possibility at the time the experiment was conducted. However, in a more recent version of the test materials (Kim, 2007) the length of all sentence types was controlled for. Even after controlling for sentence length more carefully, we got the same pattern of results in sentences testing GC size. Thus, we take this to mean that the results obtained in the present study are due to the size of the GC and not to the length of the sentences.

¹² Sentence types are labeled by the type of structure. For example, (20a) represents the sentence type where *caki* occurs between a subject NP and main verb.

- f. *Type 6: NP ... [N [NP_[-animate]]] ... caki ... V*
 [Silvia-uy [caconsim]-i **caki**-lul
 Silvia-GEN pride-NOM self-ACC
 koylophi-n-ta.
 torture-PRES-DECL
 “Silvia’s pride tortures herself.”

Given the properties of the Korean anaphor *caki* and the binding differences between Korean and English, the predictions with the different groups of subjects regarding the six sentence types in (20) are as follows:

1. The three experimental groups (L1 attriters, L1 incomplete learners (Korean–English bilinguals), L2 incomplete learners) should show a lower degree of acceptability with sentence types 4 and 5, compared to the control group of Korean native speakers.
2. The three experimental groups should accept sentence type 6 to a lesser extent than the control group of Korean native speakers.

The main task used was a Truth Value Judgment Task¹³ with stories (Crain and Thornton, 1998), composed of 36 target items and 36 filler items¹⁴ (six sentences for each type¹⁵), each of which contained a short English story followed by a Korean sentence.¹⁶ Examples of the test items are shown in (21).

- (21) a. *Sentence type 2 (target item)*
 Story: Maya is Jim’s grader. One day, Jim got very angry because Maya showed his score to her sister without his consent.

¹³ The Truth Value Judgment Task typically investigates “interpretation” rather than “grammaticality”. In a Truth Value Judgment Task, we expect four types of responses: 1. Grammatical and Acceptable interpretation, 2. Grammatical but Not Acceptable interpretation, 3. Ungrammatical but Acceptable interpretation, and 4. Ungrammatical and Not Acceptable interpretation. Response 1 will fall into the category “True”, while response 4 falls into the category “False”. We usually do not expect to have responses like 2 in this task. The most problematic case is response 3, where a subject considers the sentence marginal, but can still obtain an interpretation given some contextual information. We included instructions explaining the four types of examples and tried to exclude possible confusions represented as response 3. However, a better way to cope with this problem is called for when using Truth Value Judgment Task as a probe of grammaticality.

¹⁴ Filler items were composed of sentences of the same types as the stimuli, but where the preceding story did not match the sentence describing the story. Since we assume that all target items are “True”, we made the filler items to come out as false to balance the overall number of “True” and “False” responses.

¹⁵ The number of tokens for the sentence types determined by three main factors (i.e. TSC no violation, TSC violation and sub-commanding antecedent) was not balanced throughout for the six sentence types and we admit that this was not ideal. However, we did not add more test items because the test was already quite long (and tedious to complete).

¹⁶ All Korean monolinguals received a version of the task where all the stories and sentences were in Korean.

- Question:
 Maya 는 Jim 의 점수 를 자기
 Maya-nun Jim-uy cemswu-lul **caki**
 Maya-TOP Jim-GEN score-ACC self
 동생에게 보여주었다. True False
 tongsayng-eykey poye-cwu-ess-ta.
 sister-DAT show-give-PAST-DECL
 “Maya showed Jim’s score to her sister
 (Expected → True).”
- b. *Sentence type 1 (filler item)*
 Story: Betty showed Mary a photograph. She pointed to a girl in the photo and told that it was her sister.
 Question:
 Betty 가 Mary 에게 자기 를
 Betty-ka Mary-eykey **caki-lul**
 Betty-NOM Mary-to.DAT self-ACC
 보여주었다. True False
 poye-cwu-ess-ta.
 show-give-PAST-DECL
 “Betty showed Mary herself
 (Expected → False).”

Scoring

If a participant chose a “True” response we considered the participant to have accepted the binding relation in the sentence exemplified by the story. We considered a “False” response as rejection of the binding relation in the sentence.

Subjects who did not score higher than 70% correct with the filler items were excluded from the analysis. We assumed that they did not understand the logic of the main task. (Filler items were included in the task to save time in the testing sessions and to divert attention from the main items in the task.) Using this criterion, five subjects from the incomplete Korean–English (incomplete L1

acquisition) group and four subjects from Korean L2 (incomplete L2 acquisition) group were removed from the analysis. To obtain numerical scores, “True” responses received a 1 and “False” responses were coded as 0.

Results

Mean scores on each sentence type (maximum six) were submitted to statistical analysis (one way ANOVA). To compare groups, a Repeated Measures ANOVA was run (alpha = .05), followed by the *Scheffe* post-hoc test to examine differences between groups. There was a significant main effect for sentence type ($F(5, 31) = 4.024, p < .001$), a significant effect by group: ($F(3, 68) = 7.134, p < .000$), and a sentence by group interaction ($F(15, 87) = 2.235, p < .005$). The between-subjects analysis indicated that there were no overall differences between the average performance of the Korean attrition group and Korean monolinguals. Table 2 shows results by each sentence type, while Figure 1 shows the sentence types averaged within the *No violation of TSC* and *TSC-violations* conditions.

One way ANOVAs were performed to see how groups differed from each other with each sentence type. Performance on sentence types 1, 2, and 3 (where *caki* is bound without violating TSC (English = Korean)) was no different between the experimental groups and the monolingual Korean group, as expected. There was a statistically significant difference between the performance of the experimental groups and the control group on S4 (sentence type 4) ($F(3, 67) = 5.123, p < 0.003$), S5 ($F(3, 67) = 6.569, p < 0.001$) and S6 ($F(3, 67) = 3.027, p < 0.035$). Specifically, with sentence types 4 and 5 (where *caki* is bound violating TSC), the early bilinguals and the L2 learners showed significantly less acceptability than the control group. Performance with S6 (where *caki* is bound by a sub-commanding antecedent) indicated that the late L2 group showed significantly less

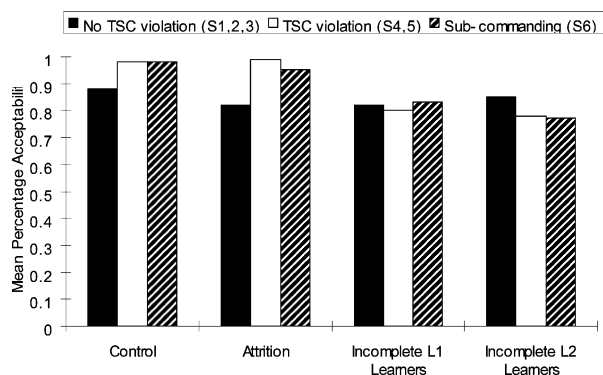
Table 2. Mean acceptability of the six sentence types with *caki*.

Groups	N		No violation of TSC			TSC-violation		Sub-commanding antecedents
			Type 1	Type 2	Type 3	Type 4	Type 5	Type 6
Korean monolinguals	30	Mean	0.90	0.81	0.96	0.95	1.00	0.95
		SD	0.18	0.23	0.12	0.16	0.00	0.22
Korean L1 attriters	10	Mean	0.85	0.85	0.85	0.96	1.00	0.94
		SD	0.24	0.24	0.18	0.11	0.00	0.16
Korean–English bilinguals	17	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
Korean L2 learners	14	Mean	0.86	0.83	0.86	0.77*	0.80*	0.77*
		SD	0.21	0.23	0.17	0.38	0.40	0.48

Note. An asterisk indicates that the numeric difference of the score of the given group compared to Korean monolinguals is statistically significant.

Table 3. Individual performance on sentence type 6 (S6; sub-commanding antecedents).

Groups	N	Group results	Individuals partially rejecting S6	Individuals completely rejecting S6
Korean monolinguals	30	Mean .95	3 (10%)	0
Korean L1 attriters	10	Mean .94	1 (10%)	0
Korean–English bilinguals	17	Mean .88	2 (12%)	1 (6%)
Korean L2 learners	14	Mean .77	7 (50%)	0

Figure 1. Mean acceptability of sentences with *caki* by condition.

acceptability, compared with the monolingual controls. However, the performance of the simultaneous bilinguals (on S6) did not differ significantly from that of the control group.

In particular, the results of a language-specific binding difference (c- vs. sub-commanding antecedents) revealed that the Korean attrition group had no problem overall with sentences with sub-commanding antecedents, accepting them just like Korean monolinguals, while differing significantly from the other two experimental groups. The L2 learners displayed a lower degree of acceptability with sentences containing sub-commanding antecedents compared to the Korean controls. Seven out of 14 subjects (50%) in this group showed indeterminate judgment with S6, by rejecting at least half of the sentences in this type, which implies the effect of L1 transfer. However, the early Korean–English bilinguals (incomplete L1 learners) did not show overall difficulty with sub-commanding antecedents, though there was some individual variation. While 14 out of 17 individuals in this group did not have problems with the sub-commanding condition for the Korean anaphor *caki*, the remaining three performed similarly to the incomplete L2 learners. This pattern of individual results is shown in Table 3.

5. Discussion and conclusion

The results of our study investigating the size of the Governing Category (GC) in binding interpretations of the Korean anaphor *caki* showed that the Korean L1

attrition group did not have any problem with Korean core binding since these speakers were sensitive to SSC but not TSC, at least at the group level. On the other hand, early bilinguals (incomplete L1 learners) showed a lower degree of acceptability than Korean controls with Korean sentences where *caki* is bound outside the English GC but inside the Korean GC. This implies that the parametric property of the binding system (size of GC) of the weaker language (Korean) may be influenced by the dominant language (English) through transfer. However, along with Tsimpli et al. (2004), we surmise that the parametric value of the weaker language is not “unset” completely, but simply affected in the aspects for which the dominant language assumes different values. Late L2 learners of Korean with English L1 also showed problems with GC size, which is also consistent with L1 transfer effects from English in the acquisition of an L2 parametric property. The results of the Korean proficiency test showed that the scores of the early Korean–English bilinguals (incomplete L1 learners) were similar to late L2 learners of Korean (incomplete L2 learners), whereas potential L1 attriters were similar to Korean monolinguals. The results of binding interpretations using a Truth Value Judgment Task showed the same pattern as the proficiency test.

An interesting question has to do with why the Korean L1 attrition group did not show the expected effect of L1 attrition.¹⁷ We suspect that there are some sociolinguistic reasons, related to use of Korean and availability of Korean, for why this group does not exhibit a pronounced degree of L1 attrition. Korean first generation immigrants tend to live in closely knit communities (especially around churches) even in an L2-speaking environment and are willing to use their L1 if there is a choice between speaking L1 and L2. Most participants in this study lived in a Korean community where daily communication is in their L1.¹⁸ Contact with Korean speakers was therefore not interrupted. It is possible that even after extended exposure to English, Korean is still the dominant language for this group. Therefore, the effect of L1 attrition may not be

¹⁷ Even though the sample size for the attrition groups was small (N = 10), there was not much variability within the group. A larger sample size may be significant if there is variability within the group.

¹⁸ The early bilinguals in this experiment were living in the similar environment; however, their dominant language was English.

apparent in the selected population. A similar conclusion was reached by Gürel (2007), who found no attrition in binding in English speakers living in Turkey. However, Schmid (2007) found no correlation between L1 use and degree of attrition in German immigrants in Canada, so it is difficult to assess at this point where the role of L1 use stands in L1 attrition research. Testing more potential cases of L1 attrition, especially where there are few other Korean speakers and no Korean community, or with speakers whose command of English is close to native, might yield results that are different from the present study. This suggests that the likelihood of L1 attrition in first generation immigrants may vary with their sociolinguistic circumstances and their command of the L2. As far as second generation immigrants are concerned, on the other hand, the sociolinguistic circumstances in which they use the community language (English) much more than the family language (Korean), despite the existence of robust Korean-speaking community, are more likely lead to incomplete acquisition of their family language.

However, the pattern of results on sentences with sub-commanding antecedents showed that some of the incomplete L1 learners were like monolingual Korean speakers with that particular sentence type, whereas others were more like incomplete L2 learners. The question that arises is the source of linguistic variation in incomplete L1 learners, especially with sentences containing sub-commanding antecedents. We conjecture that sub-commanding antecedents require bilinguals' access to the lexical property of *caki* (e.g. that is, *caki* must be bound by animate 3rd person antecedents). It is possible that once the lexical property of *caki* has been acquired, it is not vulnerable to loss. On the other hand, if the lexical property of *caki* has not been acquired by certain simultaneous bilinguals, they would face problems in sub-command cases, similar to late L2 learners. Recall that Song et al. (1997) found that many Korean–English bilingual children did not know the lexical meaning of *caki* and *caki-casin*. This issue should be investigated further.

In conclusion, with respect to the first goal of this study, we were unable to show attrition effects in late bilinguals in the specific linguistic domain tested in this experiment. In addition to the particular sociolinguistic profiles of the speakers, there are two additional reasons that may explain this finding. One is that the particular type of grammatical knowledge tested (Korean core binding) is something that may not be vulnerable to attrition. The other reason is methodological, and has to do, perhaps, with the small sample size ($N = 10$) of our attrition group. However, despite the small number of subjects, there was little individual variation within this group. In future work we would like to include a larger sample of potential L1 attriters who are isolated from L1 input and community.

Our study showed that the magnitude of language loss as estimated from transfer from English is more severe

in early bilinguals (incomplete L1 learners) than in late bilinguals (L1 attriters). This discrepancy in extent (and possibly in nature as well) between child and adult L1 loss may be indicative of different mechanisms responsible for attrition according to age of onset of bilingualism.

With respect to the second goal of our study, we were able to establish that incomplete L1 acquisition and incomplete L2 acquisition share similarities. We showed that incomplete L1 and L2 Korean grammars are affected by English, the dominant language in the bilinguals tested, in structural domains that differ between the two languages. This suggests that transfer effects can be bidirectional in bilingualism (Cook, 2003).

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