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ARTICLE

Binding Interpretations of Anaphors by Korean Heritage Speakers

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This study investigates the potential incomplete acquisition of binding interpretations in Korean-English bilinguals by asking whether and how the majority language of these bilinguals (English) influences their family or heritage language (Korean), especially when exposure to and use of English starts very early. The experiment tested the long-distance and local interpretations of different Korean anaphors—*caki*, *casin*, and *caki-casin*—by 51 Korean-English bilinguals raised in Korean-speaking families residing in the United States (22 early bilinguals and 29 late bilinguals) together with a control group of 34 Korean monolinguals residing in Korea. Overall results indicated that the bilinguals maintain the distinction between local and long-distance anaphors, though not to the same degree as monolinguals. There was a tendency among early bilinguals to choose more local binding overall compared to the late bilinguals and Korean monolinguals. At the individual level, many early bilinguals failed to differentiate between *caki-casin* and *casin* in terms of binding distance, treating both as local anaphors, whereas monolinguals and late bilinguals tended to collapse *caki* and *casin*, treating both as long distance anaphors.

1. INTRODUCTION

This study investigates the interpretation of Korean anaphors by Korean-English bilinguals who are *heritage speakers* residing in the United States. We adopt Valdés' definition of a heritage speaker as 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, 1). More specifically, we focus on potential *incomplete acquisition* in a particular bilingual setting. Although incomplete acquisition is characteristic

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of child and adult language learning situations during linguistic development, in this study we focus on incomplete acquisition as a nonnative outcome in adults. That is, our study seeks to understand the linguistic competence of adults who were reared bilingually since early childhood in a language-minority situation, but who, due to different circumstances, failed to reach age-appropriate levels of proficiency in the family language as compared to adults raised in a monolingual environment who possess full command of their family language (Montrul 2002, 2004, 2008; Polinsky 1997, 2008; Silva-Corvalán 1991, 1994).

As an adult linguistic end state, incomplete acquisition may have arisen as a result of different socio-linguistic circumstances leading to reduced input. This type of linguistic outcome is very typical of second-generation immigrants, or children born to first-generation immigrants in the host country. While monolinguals who immigrate as adults (first-generation immigrants) retain their native language as they learn the second language, their children are exposed to the family language and the second (majority) language early in childhood. Some are exposed to the two languages from early childhood (simultaneous bilinguals), while others begin exposure to the second language after the basic foundations of the family language are in place (sequential bilinguals). Nonetheless, these children are typically schooled later in English in the United States, and their exposure to and use of the family language beyond the confines of the home tend to decrease significantly. When children do not receive sufficient exposure to the language in a wide variety of settings, many grammatical aspects of their home language, and especially those that are acquired late or depend on certain pragmatic contexts, are either acquired but soon lost (attrition), acquired but not completely mastered (i.e., incompletely acquired), or not acquired at all (Merino 1983; Silva-Corvalán 2003). Even though many immigrant children of East Asian heritage attend community language schools on weekends, research shows that their linguistic skills in the family language still tend to lag behind those of monolingual children (see the contributions in Kondo-Brown 2006).[1]

The heritage language speaker population raises several questions about language acquisition and ultimate attainment and the roles of age and input in language development. For example, nonnative ultimate attainment, indeterminate intuitions, fossilization, and language transfer are all characteristics typically ascribed to adult L2 learners (who acquire their L2 after puberty) but are equally applicable to heritage speakers who are early bilinguals (Montrul 2008).

Second, while an extensive body of research indicates that simultaneous bilingual children differentiate linguistic systems from the outset of acquisition, follow monolingual developmental schedules in each language, and can have balanced command of the two languages at the age of 3–4 years (Genesee 2000; Meisel 2001), the study of adult heritage language learners suggests that not all these initial achievements may survive into adulthood.[2] Indeed, the study of heritage language speakers suggests that linguistic competence is quite fragile in childhood and highly vulnerable to fluctuations in input until the child reaches a certain linguistic and cognitive maturity at or around middle childhood (Montrul 2008). And this has implications for claims about L1 acquisition as well, since the literature states that a great deal of linguistic

[1]In this article, we only refer to early bilinguals in a language-minority situation. Our claims about incomplete acquisition in this population should not be extended to cases where a child is exposed to a foreign language from early childhood, like Korean children in Korea exposed to English, as an anonymous reviewer pointed out.

[2]Not all simultaneous bilinguals are heritage language learners, but many heritage language learners are simultaneous bilinguals. The term "heritage speaker" takes into account the socio-political status of the languages.

knowledge is in place by age 4. Thus, while much is known about the ultimate L2 attainment of the children of immigrants as adults (typically discussed in the context of child-adult differences related to the critical period hypothesis), and about bilingual development in early childhood, much less is known about the fate of their minority language. It is precisely the linguistic nature of the minority language in early bilinguals that concerns us in this article.

We approach our study from the theoretical perspective of Generative Grammar, a perspective that has made an important contribution to the study of formal properties of natural languages and their L1 and L2 acquisition, and most recently, potential L1 attrition and incomplete acquisition (Gürel 2002, 2004; Montrul 2002, 2005, 2008; Sorace 2000; Tsimpli, Sorace, Heycock, Filiaci & Bouba 2003; Tsimpli, Sorace, Heycock & Filiaci 2004). Since Chomsky (1979) presented the famous "Poverty of the Stimulus" argument, researchers in the Chomskyan tradition posit a specialized mechanism predisposed to the acquisition of language called Universal Grammar (UG), which guides the acquisition of L1.

When it comes to the acquisition of more than one language (simultaneously with the L1 in early childhood bilingualism or after the L1 is in place as in post-puberty L2 acquisition), it is unclear whether a similar explanation is viable. Normally developing children acquiring their L1 are universally successful; in contrast, the outcomes of L2 acquisition and bilingualism can be quite different. Although a handful of individuals attain full competence in a second language, many never reach the linguistic attainment of native speakers due to differences in age of acquisition and/or input.

Despite the fact that the outcomes of L2 acquisition and bilingualism can be incomplete with respect to the target language, many researchers point out that bilingual children and adults are faced with the same poverty of the stimulus problem as child L1 learners: Many errors that L2 learners and bilinguals make can be traced back to the other language (L1), but others are similar to the developmental errors child L1 learners make, suggesting UG involvement in these situations as well (White 1989, 2003). This constitutes the impetus for UG-based studies of L2 acquisition, which we now extend to the study of heritage language speakers, since these speakers present characteristics of both L1 and adult L2 acquisition (Montrul 2008).

In the present study, we address three main research questions. The first question is whether and how Korean-English bilinguals reared in the United States can acquire the properties of long-distance (LD) and local binding of different Korean anaphors, a distinction that is arguably due to UG. Our second research question concerns the role of transfer: it seeks to understand whether and how the stronger language of these bilinguals (i.e., English) affects the binding interpretations of Korean, the weaker language. Our third research question relates to the type of bilingual situation, i.e., age of onset of bilingualism and duration of exposure to English. If Korean binding interpretations are influenced by English, will knowledge of Korean be affected in the same way in bilinguals exposed simultaneously to English and Korean early in their lives as in those who acquired Korean first and were exposed subsequently to English, after the linguistic knowledge of Korean was fully acquired and consolidated?

We begin our investigation by first reviewing previous studies on the acquisition and loss of binding properties in L1 and L2 acquisition (Section 2). Section 3 introduces the theoretical background on anaphor binding, focusing on the differences between Korean and English in the inventory and properties of anaphors. Section 4 constitutes the main body of the article where we present the methods and results of the experiment. Section 5 concludes the article with discussion and directions for future research.

2. PREVIOUS RESEARCH ON BINDING INTERPRETATIONS IN LANGUAGE ACQUISITION AND LOSS

The acquisition of binding has received significant attention within generative approaches to L1 and post-puberty L2 acquisition. In L1 acquisition, research has focused on the acquisition of Principle B, since it has been shown that this principle, as opposed to Principle A, is acquired late in English and other Germanic languages (Grimshaw & Rosen 1990; Chien & Wexler 1990). By contrast, within L2 acquisition, most research has focused on the acquisition of Principle A, since there is parametric variation with respect to how different languages define the binding domain for anaphors. Other differences that have been investigated include antecedent orientation in binding. For example, in languages that possess long-distance anaphors (LDAs), the antecedent of an LDA must be a subject, while it can be a nonsubject in languages with local reflexives.

One of the main issues in L2 acquisition research has been whether L2 learners have access to the principles and parameters of universal grammar. Several studies on binding have addressed the question as to whether L2 grammars are UG-constrained in the same way as L1 grammars are assumed to be (Thomas 1995, 1997; White, Hirakawa & Kawasaki 1996; Song, O'Grady, Cho & Lee 1997), or whether they are random or "wild" by contrast (Christie & Lantolf 1998; Hamilton 1997). A related issue is the extent to which the parameter settings of the native language influence the acquisition of an L2 with a different parameter setting, and whether eventual parameter resetting is possible in L2 acquisition. Some studies on UG access and binding have found that various aspects of binding properties of the L1 grammar can have an impact on L2 grammars (White 1989; Hirakawa 1990; Thomas 1995, 1997; Kim & Montrul 2004; Kim, Montrul & Yoon 2005, forthcoming). That is, when L2 binding properties are different from those of learners' L1 grammars, transfer effects are found in L2 acquisition. For example, L2 learners whose L1 has LDAs have been found to accept ungrammatical sentences in English where the anaphor *himself/herself* is LD bound. By contrast, studies testing the acquisition of East Asian languages have shown that L2 learners whose L1 has only local anaphors have difficulty in accepting LD binding, preferring local interpretations of anaphors instead (Hirakawa 1990; Thomas 1995, 1997; White et al. 1996; Yuan 1998; Kim & Montrul 2004).

Binding interpretations can also be affected under L1 attrition in first-generation immigrants who move to the L2 environment as adults. Gürel (2002, 2004) tested adult L1 Turkish speakers who resided in an English-speaking country for more than 10 years and found that there is cross-linguistic transfer in binding (Principle B) in the Turkish of these speakers due to contact with English. However, in a more recent study on potential loss of binding interpretations in English speakers residing in Turkey for an extended period of time (between 10 to 35 years), Gürel (2007) failed to find similar attrition effects. She therefore proposed that L1 attrition could affect the domain of syntax (binding) to some extent under extensive L2 input and limited L1 input.

Of all available previous studies, perhaps the one most related to our own study because it documents cases of incomplete acquisition is Song et al.'s (1997) investigation of Korean anaphors by early Korean-English bilinguals residing in the United States (i.e., heritage speakers). Korean, like Japanese and Chinese, possesses a rich inventory of anaphors, which differ from one another with regard to their distribution in a sentence. Based on Cole, Hermon

& Sung's (1990) hypothesis on the correlation of form and function of the anaphors (i.e., LDAs are simple, while local anaphors are complex), Song et al. (1997) investigated whether Korean monolinguals (ages 2–8 years) and early Korean-English bilingual children (ages 3–8 years) can learn this putative universal (i.e., UG) property without explicit instruction.[3] They compared the possibility of local vs. long-distance binding of two different Korean anaphors (*caki-casin* and *caki*) in bilingual children and found that the children were able to distinguish the respective long-distance vs. local binding property of the two anaphors. The results also showed that the bilingual children did not perform like the monolinguals in that they accepted LD and locally bound *caki* to a similar degree (around 65%).[4] This study shows that Korean heritage speakers have only partially acquired the properties of this anaphor. Though Song et al. (1997) did not discuss the effect of the dominant language (English) on the Korean binding interpretations of the bilinguals, the results of this study provide us with a baseline for different types of Korean anaphors and acquisition of their properties in heritage speakers. As for incomplete acquisition in adult Korean heritage speakers, small-scale studies conducted by Kim & Montrul (2004) and Kim et al. (2005, forthcoming) investigated the interpretation of anaphors (Principle A), and found that the binding interpretations of Korean in these bilinguals were apparently influenced by English. Just like the L2 acquisition studies, existing studies on attrition and incomplete acquisition document a strong preference for local over long-distance binding in the Korean of bilinguals involved in a language minority situation.

The present study contributes to this line of research by expanding the scope of an earlier study (Kim & Montrul 2004), investigating the degree to which the Korean spoken by Korean heritage speakers residing in the U.S. diverges from that of monolinguals. In particular, we want to understand the grammars of Korean heritage speakers who can be deemed to be incomplete learners of Korean. To assess the degree of incomplete acquisition in this population, we will compare early or simultaneous bilingual speakers with a group of late or sequential bilinguals (with a later onset of acquisition of English after age 10), as well as with a control group of Korean monolinguals residing in Korea. Because early/simultaneous bilinguals have less exposure to Korean than sequential/late bilinguals, they are more likely than the latter to manifest incomplete acquisition of Korean. Our hypothesis is that the earlier the age of onset of bilingualism and reduced exposure to Korean, the more divergent the Korean grammars of the speakers will be from that of monolingual Korean speakers, as also shown by Montrul (2002) in a study of Spanish-English bilinguals with different ages of onset of bilingualism in childhood (see also Montrul 2008). If divergence between the grammars of Korean heritage speakers and the grammars of monolingual Korean speakers is found, we hypothesize that a great deal of such divergence can be predicted from patterns of transfer from English.

[3]All the U.S.-born Korean-English bilingual children were residing in Hawaii and had a very good level of oral proficiency in Korean. It is not clear, however, whether the children were simultaneous or sequential bilinguals, since no details were given about the family and linguistic history of the children. In order to maintain and preserve proficiency in Korean, the bilingual children who attended regular English language school during the week attended a Korean language community school on Saturdays. While the bilingual children had advanced oral proficiency skills and received some schooling in Korean, their Korean still did not reach age-appropriate levels of morphosyntactic development.

[4]This is not native-like in that native speakers display a strong preference for long distance over local binding for this anaphor, as we shall see.

We turn now to a description and theoretical discussion of the differences between Korean and English anaphors.

3. ANAPHORS IN KOREAN AND ENGLISH

A salient difference between Korean and English lies in the inventory of anaphors. English has one type of (reflexive) anaphor, while Korean has four, three of which we investigate in this article. We will first discuss the differences between the two languages in the anaphor inventory and turn to a discussion of theoretical accounts of local and long-distance anaphor binding.

3.1. Anaphor Inventory

English has one type of reflexive that is morphologically complex, composed of *pronoun* + *self*. As is well known, English anaphors are local anaphors, as shown in (1) below[5]:

(1) a. Bill_i said [that Tom_j blamed $\text{himself}_{*i/j}$]
b. Bill_i said that [Tom_j blamed $\text{him}_{i/*j}$]

The anaphor inventory of Korean is quite rich by contrast. The anaphor *caki* is by far the most common form, but in addition to *caki*, there are other anaphors. For instance, *casin*, which seems to be a simple, monomorphemic anaphor like *caki*, is quite commonly used. In addition to these two, there are two types of complex anaphors—*caki-casin* and *pronoun* + *casin*.[6] We shall first discuss their structure and then turn to their function—focusing on the local vs. LD binding preference.

[5]We use "reflexive" and "anaphor" interchangeably in the article since we are not focusing on reciprocals.

Even though English anaphors are local, it is well known that they admit long-distance binding in certain contexts, as "exempt" anaphors (Pollard & Sag 1992).

[6]In fact, the inventory is even richer. In addition to these, the honorific second person pronoun *tangsin* can be used as a third-person reflexive (cf. (i)). *Susulo* ("(on) own's own") is an adverbial/adnominal element that has a reflexive interpretation (cf. (ii), (iii)), but can also occur in an argument position (cf. iv). *Susulo* seems to have the distribution of floated quantifiers.

(i) Sensayngnim-kkeyse **tangsin**-uy ceycatul-ul salangha-si-n-ta.
Teacher.hon-hon.nom self.hon-gen students-acc love-subj.hon-prs-decl
"The teacher loves self's (= his) students very much."

(ii) John-un ku mwuncey-lul **susulo** haykyelhay-ss-ta.
J-top that problem-acc on.his.own solve-pst-decl
"John solved the problem on his own."

(iii) John **susulo**-(ka) ku mwuncey-lul haykyelhay-ss-ta.
John-on.his.own-(nom) that problem-acc solve-pst-decl
"John himself solved the problem."

(iv) Kutul-un **susulo**-lul nathanay-ki cohaha-n-ta.
They-top their.own-acc show.off-comp like-prs-decl
"They like to show off."

3.1.1. Structure

Even though both *caki* and *casin* are morphologically simple, when they occur in complex anaphors they behave differently. *Casin* occupies the final head position of the complex anaphor, while *caki* occupies the nonhead position, on a par with pronouns in *pronoun* + *casin* anaphors. Correlated with this difference is the fact that while *casin* can sometimes be modified, *caki* cannot be modified as easily (Kang 1998). In addition, bare *caki* can specify/modify common nouns, while *casin* cannot.[7] This is shown in (2) and (3).

(2) a. pwulssangha-n casin
Pitiful-rel self
b. *?pwulssangha-n caki
Pitiful-rel self

(3) a. Cheli-nun caki sensayngnim-ul coahanta.
C-top self teacher-acc likes
"Cheli likes his teacher."

b. *Cheli-nun casin sensayngnim-ul coahanta.
C-top self teacher-acc likes
"'Cheli likes his teacher."

A further difference between the two is that *caki* has an inherent phi-feature (as third person), while *casin* does not, as it is compatible with antecedents in all three persons.

(4) a. Cheli/*ney/*nay-ka caki yakcem-ul molunta-(ko?)
C/you/I-nom self weakness-acc unaware-(did.you.say?)
"(Did you say that) Cheli/you/I is/are/am unaware of his/your/my weaknesses(?)."

b. Cheli/ney/nay-ka casin-ul miwwhanta-(ko?)
C/you/I-nom self-acc hate-(did.you.say?)
"(Did you say that) Cheli/you/I hate himself/yourself/myself(?)."

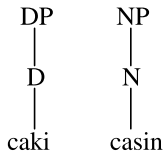
These facts suggest an analysis of *caki* as a D, and *casin* as an N (Katada 1991; Kim 2000).[8]

[7]The following is acceptable. However, in (i) *casin-uy* occurs as a Possessor DP/NP and not as a bare D modifying/specifying NP, as can be seen by the Genitive marking:

(i) Cheli-nun casin-uy sensayngnim-ul coahanta.
C-top self-gen teacher-acc likes
'Cheli likes his teacher.'

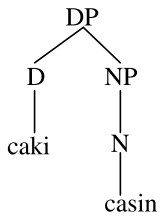
[8]We assume that *caki*, as a D, can occur without its complement NP. This assumption is routinely made for pronouns, which are assumed to be Ds without complements. We are also assuming that *casin*, as NP, can occur without a D. However, we will allow an alternative parse of bare *casin* in Section 5.

It should be noted that in the "Bare Phrase Structure" proposal of Chomsky (1994), the anaphors as analyzed above are simultaneously heads and maximal projections. If correct, this suggests a certain amount of indeterminacy in how speakers might analyze such forms.

(5)


The analysis explains the different positions of the two reflexives in a complex anaphor as well as the differences between the two with regard to modification and the ability to co-occur with common nouns. Finally, if we make the reasonable assumption that the locus of phi-features is D, the difference with respect to phi-features is also explained.

The anaphor *caki-casin* is made up of *caki* and *casin*. Given what we have proposed, the relative order of the two morphemes in this reflexive is predicted. *Caki* must come before *casin* since it is a D. We posit (6) as the structure of *caki-casin*. Complex anaphors are phrasal in our analysis.

(6)


Pronoun + *casin* anaphors, which we did not investigate in this article, have a structure parallel to *caki-casin*. The order of morphemes in this complex anaphor is as expected. This anaphor provides additional support for taking *caki* to be D, since other instances of D, the pronouns, can occupy the nonhead position of complex anaphors.

3.1.2. *Function—Long-Distance vs. Local Binding and Antecedent Choice*

Turning to the functions of different reflexives in Korean, a well-known dimension along which the different reflexives differ is local vs. long-distance binding. All three reflexives investigated in this study can be bound locally, but they differ with respect to LD binding. They also differ with respect to the restrictions on antecedents. We discuss these two properties in this section.

The reflexive *caki* is a typical long-distance anaphor. It has been claimed to prefer long-distance antecedents over local antecedents (cf. (7b)). And antecedents, whether local or long-distance, are third person, as noted earlier (cf. (7a)).

(7) a. John$_i$/*Na$_j$-nun [Cheli$_k$-ka *caki*$_{i,*j,k}$-lul koylophinta-ko] malhayssta.
John/I-top C-nom self-acc harass-comp said
"John/I said that Cheli is harassing self(=John>Cheli, *I)."

b. Bill$_i$-un [Cheli$_j$-ka *caki*$_{i>j}$-lul koylophinta-ko] sayngkakhanta.
Bill-top C-nom self-acc harass-comp thinks
"Bill thinks that Cheli harasses self(=Bill>Cheli)."

The claim that the LDA *caki* prefers LD to local antecedents receives support from both corpus and processing studies. Kang's (1998) corpus study of the three reflexives investigated in our study confirmed the tendency for *caki* to be LD-bound. Specifically, Kang investigated accusative-marked forms of the three reflexives and found that *caki*-acc (i.e., *caki-lul*) occurs with more LD than local antecedents in his corpus (Korea University Corpus of Korean, Collection-I, 10 million words), as indicated in Table 1 (Kang 1998, 183).

However, we need caution in interpreting the above figures, since only Acc-marked forms of reflexives were examined, and also because LD-bound *caki* is only slightly more frequent than locally bound *caki*. This is surprising in view of the intuition reported in many theoretical studies that *caki* has a strong preference for LD over local antecedents (Moon 1995; Kim 2000). The figures from Kang's study do not seem to corroborate these intuitions.

We have reason to believe that Kang's data are not representative of the overall behavior of *caki* and that *caki* does indeed show a strong preference for LD binding. Our evidence comes from Choi & Kim (2007), who used eye-tracking to investigate the antecedent choice of the reflexives *caki* and *casin*, using bi-clausal sentences where the reflexives occur as objects of the embedded clause and the verb of the embedded clause biases the reflexive interpretation in favor of either the local subject (yielding a locally bound reflexive) or the matrix subject (yielding a LD-bound reflexive). They found that sentences where *caki* was bound by the matrix subject had the fastest reading time overall (first-pass and rereading) and the lowest regression rate. However, when the sentence was biased by the embedded verb in favor of the local interpretation of the reflexive, speakers lingered significantly longer when they reached the disambiguating region (the embedded verb, which follows *caki*-acc). Choi & Kim (2007) interpret this as evidence supporting the LD preference for *caki*. The fast reading time with a LD antecedent indicates that speakers expect *caki* to have a LD antecedent. When it doesn't, they revise their parse and that is why they linger in the disambiguating region. As we will show, a robust preference for LD antecedents with *caki* also emerges in our experimental study among the monolinguals, confirming the LD binding preference for *caki*.[9]

The anaphor *casin* is also an LDA, in the sense that it allows both local and long-distance antecedents. The vast majority of studies on Korean reflexives have focused on *caki*, so that

[9]This raises the question of how to understand Kang's (1998) data. A clue to what may be going on is provided by Moon (1999), who investigated differently case-marked forms of reflexives. He found that the most common form in which *caki* is found in his informal search of drama scripts on the PC server Nownuri is the bare form. He found that *caki*-acc occurs only 61 times out of a total of 641 tokens of *caki* (less than 10%). On the other hand, bare *caki* occurs 402 times (around 63%). By contrast, *casin*-acc (including complex forms that have *casin*, which we notate (x)-*casin*) occurs 583 times out of 3572 tokens (around 15%). The most common form of (x)-*casin* was (x)-*casin*-gen (1958 tokens).

Thus, the results based on *caki*-acc in Kang's corpus may not reflect the overall LD binding preference of *caki*, as it is based on a form that is not representative of the overall behavior of *caki*. Moon's results also allow us to understand the relatively small number of tokens of *caki*-acc compared to *casin*-acc in Kang's corpus.

Unlike Moon, Kang did not include complex *casin* forms (x-*casin*) in his calculation of the token frequency of *casin* and yet ended up with more tokens of *casin* than *caki*. This is surprising in view of the intuitions of native speakers that *caki* is the most common form of the reflexive. However, when we consider that *caki*-acc represents a tiny fraction of the overall frequency of *caki*, we can understand why its token frequency was low.

The higher token frequency of *casin* in both Kang's and Moon's corpora may also be due to the fact that *casin* places no restrictions on the phi-features of its antecedent, while *caki* restricts them to third person.

TABLE 1
Distribution of Acc-Marked Forms of Reflexives

	caki-acc	*casin-acc*	*caki-casin-acc*
Local	151	311	66
Long-distance	165	123	5
Total	316	434	71

there are few studies that include *casin* in their scope, Yoon (1989), Kang (1998), Kim (2000), and Choi & Kim (2007) being the notable exceptions.

As noted earlier in (4b), antecedents of *casin* are not restricted to third person (cf. (8a), (8b)), and though *casin* is an LDA, speakers seem to have the intuition that it does not have a strong preference for LD antecedents (cf. (8c)).

(8) a. John$_i$/Na$_j$-nun *casin*$_{i,j}$-uy mwunceycem-ul cal alko issta.
John/I-top self-gen problem-acc well know is
"John is/I am well aware of self's(=John's, my) weaknesses."

b. Ne$_i$-nun *casin*$_i$-uy mwunceycem-ul cal alko iss-ni?
You-top self-gen problem-acc well know is-Q
"Are you well aware of self's(=your) own shortcomings?"

c. Mary$_i$-nun [Susie$_j$-ka *casin*$_{i,j}$–ul miwehanta-ko] malhayssta.
Mary-top Susie-nom self-acc hates-comp said
"Mary said that Susie hates self(=Mary, Susie)."

Kang's (1998) corpus results with Acc-marked *casin* (cf. Table 1) seem to corroborate this intuition. In fact, Kang's findings indicate that *casin* actually prefers local antecedents to LD antecedents. However, there are reasons to believe that this may not be a legitimate conclusion to draw.

One reason for caution is that only the Acc-marked forms of *casin* were examined in his study, so that we are not aware of the overall behavior of *casin* with respect to local vs. LD binding. Another reason for caution is that Choi & Kim (2007) failed to find a preference for the local interpretation of *casin* in their eye-tracking study. *Casin* did not display a preference for either the local or LD construal. This was so even when the embedded verbs were biased in favor of one or the other interpretation. Overall, subjects took longer to process *casin* than *caki*, but there was no bias in favor of a local interpretation. *Casin* thus contrasts with *caki*, which displayed a detectable bias in favor of the nonlocal interpretation. In our study, as we shall see, we found that the monolinguals (and the late bilinguals) displayed a slight preference for the LD construal of *casin*, though the difference was not significant when measured at the group level.[10] Summarizing the various sources of evidence, we take *casin* to be an LDA, like *caki*, but to differ from it in not having a preference for one or the other type of binding.

[10]And individual results reveal something more complicated, as we shall see.

Finally, the anaphor *caki-casin* also requires a third-person antecedent (cf. (9a), (9b)). This is understandable since the phi-features of this reflexive come from *caki*, which is third person. However, unlike *caki* or *casin*, *caki-casin* is predominantly a local anaphor (cf. (9c)). The results of Kang's (1998) study confirm the local preference for the anaphor (cf. Table 1). We will see that the monolinguals (and late bilinguals) in our study also treated *caki-casin* overwhelmingly (90% or more) as a local reflexive.

(9) a. John$_i$/Na$_j$-nun *caki-casin*$_{i/*?j}$-uy mwunceycem-ul cal alko issta.
John/I-top self-gen problem-acc well know is
"John is/I am well aware of self's(=John's, *?my) weaknesses."

b. *?Ne$_i$-nun *caki-casin*$_i$-uy mwunceycem-ul cal alko iss-ni?
You-top self-gen problem-acc well know is-Q
"Are you well aware of self's(=*your) shortcomings?"

c. Mary$_i$-nun [Susie$_j$-ka *caki-casin*$_{j,*?i}$-ul miwehanta-ko] malhayssta.
Mary-top Susie-nom self-acc hate-comp said
"Mary said that Susie hates self(=Susie, *?Mary)."

In sum, the three reflexives we investigated in our study differ as follows:

(i) *Caki* and *casin* are LDAs. However, while *caki* has a strong preference for LD binding, *casin* does not. *Caki-casin* is a local anaphor.
(ii) *Caki* and *caki-casin* have third-person antecedents, while *casin* is compatible with antecedents in all three persons.

These are generalizations that have been established in the theoretical literature. The additional evidence from corpus and processing studies does not contradict the findings.[11]

3.2. Local vs. Long-Distance Binding—Theoretical Accounts

Long-distance anaphors have been accounted for in a variety of ways. For example, Manzini & Wexler (1987), following Yang (1983), propose a parameterization of the size of the governing category (GC); LDAs have a larger GC than local anaphors. Manzini & Wexler go further, however, and propose their Lexical Paramterization Hypothesis. In this approach, the definition of GC for Principle A is parameterized separately for each anaphor in a given language. This readily captures the existence of languages such as Korean, in which different anaphors vary

[11] A reviewer comments that there doesn't seem to be agreement regarding the properties of *caki* and *casin* among corpus, processing, and theoretical studies. We do not share this assessment, naturally. First of all, the processing and theoretical studies are in complete agreement that both anaphors are LDAs and that *caki* has a LD preference while *casin* does not.

The only potential source of disagreement is the corpus study by Kang where the pronounced preference for *caki* to have LD antecedents was not found (and a tendency for local binding for *casin* was found as well), for which we provided an explanation based on the relatively low token frequency of accusative-marked forms of the anaphors. However, even when that is taken into account, there is no ambiguity in the corpus results about the fact that both *caki* and *casin* are LDAs. A third (*casin*) or more (*caki*) of the tokens containing the two anaphors had LD antecedents.

in their local vs. LD binding behavior. A system-wide parameterization of GC would not be able to account for such languages easily.

A subsequent approach does away with parameterization of GC altogether, and takes all LDAs to be locally bound, but at the level of LF, after undergoing covert anaphor movement (Chomsky 1986; Cole et al. 1990).

In part to address this problem, a subsequent approach does away with parameterization of GC and takes all LDAs to be locally bound, but at the level of LF, after undergoing covert anaphor movement (Chomsky 1986; Cole et al. 1990). In this approach, having an LDA does not entail parameterization of GCs. Instead, what differs across languages (or across different anaphors in the same language) is the level at which Principle A is checked. This approach can handle the problem of languages with multiple anaphors, some of which are local while others are LD. However, in that it shifts the locus of parameterization from GC size to the "timing" of anaphor movement, it has to provide an account of why certain anaphors cannot avail themselves of the covert/LF movement option. The answer provided in this line of investigation is that covert anaphor movement is restricted to (successive-cyclic) head movement (Cole et al. 1990). Thus, only those anaphors that are heads (X^0) can be licensed as LDAs. Complex, or phrasal (XP), anaphors cannot, by contrast. That is, the analysis seeks to capture the **form-function correlation** in local vs. LD binding of anaphors, according to which (genuine) LDAs are simple anaphors while local anaphors are complex. In addition to capturing the form-function correlation, the theory tries to tie two other properties of LDAs—their (putative) subject orientation and sensitivity to intervening material (*aka* "blocking effect")—to the way in which covert anaphor movement works.

As such, the theory offers an attractive unification of certain recurring properties of LDAs. However, it suffers from empirical and technical difficulties. For instance, since LF phrasal movement can be long distance, it is not clear what, short of a stipulation, can prevent a complex, phrasal, anaphor from undergoing long phrasal movement at LF to be licensed as an LDA. For another, LDAs can be located within islands and be bound by antecedents outside the island. Since covert anaphor movement must be successive-cyclic (in order to account for the blocking effect), it is predicted that if there are islands in the path between the antecedent and the LDA, binding should fail, contrary to fact.

Yet another approach to local vs. LD anaphors adopts a finer typology of LDAs (Cole, Hermon & Huang 2001). In this approach, not all LDAs are created equal. Some are genuine anaphors bound in a larger GC than local anaphors (and these are typically simple anaphors), but others are logophors (or exempt anaphors) that are not subject to Principle A of the binding theory. Logophors that can be bound LD can be phrasal anaphors, as is the case in English. The syntactic binding theory applies to locally bound core (or grammatical) anaphors only (Cole et al. 2001; Huang & Liu 2001). If an LDA is a logophor, its LD binding does not fall under the purview of syntactic principles, but pragmatic conditions. Huang & Liu (2001) argue that this is the right way to view LD-bound *ziji* in Mandarin Chinese, while Pollard & Xue (2001) disagree, claiming that certain instances of LD-bound *ziji* are not constrained by pragmatic conditions.

For the purposes of this article, we assume that a theory of LD-binding should be able to explain why genuine LDAs (and not logophors) are simple, or monomorphemic, and why complex, or phrasal, anaphors cannot behave as genuine LDAs (though they may behave as LD-bound logophors). In other words, we assume that the correct theory of LDAs should be able

to capture the form-function correlation. The LF head movement theory of LDAs of Cole et al. (1990) is one such theory. The theory of relativized SUBJECT in Progovac (1992) is another.[12]

We assume that knowledge of the form-function correlation is rooted in UG.[13] Therefore, if access to UG is available, knowledge of the correlation will be accessible to learners, even in the absence of systematic input and under conditions of incomplete acquisition. In the next section, we present the research questions and the hypotheses for the experiment we conducted.

4. THE EXPERIMENT

4.1. Research Questions and Hypotheses

The experiment tested local and LD binding of three Korean reflexives, *caki, casin*, and *caki-casin*. Recall that all three reflexives can be locally bound. However, they differ in the degree to which they can be bound long distance. While *caki* is predominantly an LDA, the anaphor *caki-casin* is restricted to local binding. The anaphor *casin* can be LD-bound, but unlike *caki*, it does not display a preference for LD binding.

Korean monolinguals have knowledge about (i) the structural properties of the three anaphors; (ii) whether a given anaphor is a local or LD anaphor; and (iii) the subtle pragmatic conditions that differentiate them. The question we are interested in investigating is to what degree bilinguals acquire and maintain the grammar of anaphor binding in their Korean, under conditions of dominant language transfer and potential incomplete acquisition. We thus formulated the following research questions in our study:

(i) Do Korean-English bilinguals who are English-dominant still maintain the local vs. long-distance contrast among the three different reflexives in their Korean?
(ii) If Korean binding interpretations are influenced by the properties of English binding in a bilingual situation, will Korean-English bilinguals show possible transfer effects from English in their interpretation of the three anaphors?
(iii) Do age of acquisition and length of exposure to English have an effect on the knowledge of Korean binding? That is, will the early bilinguals, who were exposed to English earlier than the late bilinguals, show less determinate preferences (what we will take as a reflex of incomplete acquisition) in the binding of the three anaphors?

[12]It is important to stress what the form-function correlation does not predict. It does not predict that an LDA will prefer LD to local binding, since the relative frequency of two types of binding cannot be predicted from the makeup of the reflexives. Therefore, the fact that of the LDAs in Korean, *caki* prefers LD-binding, whereas *casin* fails to show a preference, is not something that is predicted by the form-function correlation, i.e., UG.

[13]A reviewer asks us to clarify our assumption that the knowledge of the form-function correlation is based on UG. We believe there are good reasons to think that UG is implicated. First, the correlation is a robust one that holds across typologically unrelated languages. That is, a genuine LDA is simple or monomorphemic, while complex or polymorphemic anaphors are local anaphors. Secondly, the correlation holds even within a single language with multiple anaphors. Thirdly, the correlation cannot be easily explained by invoking factors external to language, such as communicative function.

Under an approach that imputes a role to UG in language acquisition, typologically stable generalizations that do not lend themselves to obvious extra-grammatical accounts are likely due to UG. This is the reason why we believe that the correlation is rooted in UG. This is also the reason why previous researchers (Cole et al. 1990; Progovac 1992) have tried to account for the correlation using notions rooted in UG.

To answer the above questions, we postulate the following hypotheses along with their specific predictions. The first hypothesis regards the availability of UG, specifically, knowledge of the form-function correlation in LD binding. The second focuses on the role of transfer from the dominant language, while the third focuses on age and extent of exposure, i.e., matters pertaining to potential incomplete L1 acquisition which might set apart early bilinguals from the other groups.

Hypothesis 1: Form-Function Correlation and UG Access

If UG is available in the acquisition of Korean binding as a heritage language, Korean-English bilinguals will know the form-function correlation regarding local vs. LD binding. That is, they will analyze the simple anaphors *caki* and *casin* as LDAs and *caki-casin*, a complex anaphor, as a local anaphor.

Predictions:

a) Bilinguals will treat *caki* and *casin* as LDAs in their responses.
b) Bilinguals will treat *caki-casin* as a local anaphor in their responses.

Hypothesis 2: Dominant Language Transfer

If there is a transfer effect from the dominant language (English) to Korean in the realm of binding interpretations, bilinguals will differ from Korean monolinguals in their responses with the Korean reflexives *caki* and *casin*.

Predictions[14]*:*

a) Since English anaphors are local anaphors, bilinguals will show less acceptability overall compared to Korean monolinguals with LD binding. Specifically, bilinguals will accept LD bound *caki* and *casin* to a lesser degree than monolinguals.
b) Bilinguals will have no problem with locally bound *caki-casin*, since it is similar in makeup to the complex anaphor *pronoun-self* in the dominant language, which is a local anaphor.

By contrast, we do not believe that transfer of the English reflexive system will result in the increased acceptance of local binding for the LDAs *caki* and *casin*. This is so because there is no counterpart to these anaphors (i.e., morphologically simple anaphors) in the reflexive inventory of English.

Before introducing the third hypothesis, which deals with the effects of age of onset and length of exposure that can result in potential incomplete acquisition, it is necessary to introduce the background on the L1 acquisition of Korean reflexives, since the age of L1 acquisition is tied to the question of potential incomplete acquisition.

[14]Hypotheses 1 and 2 make the same predictions with regard to *caki-casin*. However, they make distinct predictions with regard to the behavior of *caki* and *casin*, as should be clear.

According to studies on the L1 acquisition of reflexive binding, children initially show a preference for local binding of *caki* between the ages of 3 and 6 (Lee & Wexler 1987; Lee 1990; Cho 1989, forthcoming). The preference for local binding begins to diminish around the age of 6 or 7 (Lee 1990; Cho 1989). Cho (1992) conducted a study with Korean LDA *caki* with children aged 6 to 12 and found that local binding was preferred by 6- to 8-year-old children, while this preference was weaker in 10- to 12-year-old children. The results of this study suggest that although knowledge of binding theory in Korean emerges around age 3, it takes several more years for the adult system to be fully established, around the age of 12.[15]

The age of L1 acquisition of local and LD binding is important in understanding the early bilinguals in our study, since they begin to be exposed extensively to the community language (English) and significantly less to the heritage language (Korean) at around the time that L1 children begin to acquire the reflexive system. Since the acquisition of Korean is inhibited by the competing English grammar and the shift in the dominant language from Korean to English, the acquisition of Korean reflexive binding in this population is likely to be incomplete. On the other hand, assuming that the adult Korean binding system is acquired at age 12, for the late bilinguals who came to be immersed in an L2 (English)-speaking community after their L1 (Korean) had been robustly acquired (their mean age of exposure to English was 13;6), the properties of Korean reflexive binding will have been acquired fully before the onset of intense exposure to English.[16] Therefore, our third hypothesis is the following.

Hypothesis 3: Age of Onset of Bilingualism and Incomplete Acquisition

If age of onset of bilingualism and prolonged exposure to English have an effect on the knowledge of Korean, early bilinguals who were exposed to English before they had a chance to acquire the Korean binding system fully will be vulnerable to more transfer effects from English than the late bilinguals who began to be exposed to English after their Korean binding system had a chance to develop fully.

Predictions[17]*:*

a) The late bilinguals will be more similar to Korean monolinguals overall compared to the early bilinguals.
b) The early bilinguals will display effects attributable to incomplete acquisition of the Korean reflexive system and manifest a greater degree of transfer from the dominant language.

[15]The literature on L1 acquisition focuses on *caki*, so it is hard to gauge when and how the other reflexives are acquired. However, it is interesting that *caki*, the most nonlocal of all reflexives in adults, starts out as a local reflexive.

[16]The late bilinguals can still be subject to dominant language transfer (Hypothesis 2) or L1 attrition. However, attrition is not likely since their length of residence in the U.S. was not extensive, compared to the early bilinguals, and there were plenty of Korean speakers in the community with whom they interacted on a regular basis.

[17]How exactly the incomplete acquisition will manifest itself is hard to predict, in advance of the actual investigation. What we discovered in our study, as we shall see, is that the incomplete acquisition manifested itself in how the three reflexives were categorized in terms of local vs. LD binding.

TABLE 2
Biographical Information on Early and Late Bilinguals (Korean Heritage Speakers)

	Early Bilinguals (n = 22)	*Late Bilinguals (n = 29)*
Mean age of onset of acquisition of English (in years)	0 (at birth)	15.7 (around puberty)
Mean length of residence in the U.S. (in years)	22.4	8.9
Language of education	English ($n = 18$) Both[a] ($n = 4$)	Korean and English ($n = 29$)
Language spoken at home with parents	English and Korean ($n = 18$) Only Korean ($n = 4$)	English and Korean ($n = 3$) Only Korean ($n = 26$)
Mean % of present use of Korean	40.8%	64.4%
Language preference	English and Korean ($n = 1$) Korean ($n = 2$) English ($n = 19$)	English and Korean ($n = 1$) Korean ($n = 25$) English ($n = 3$)

[a]This refers to those subjects who attended Korean Saturday schools.

4.2. Method

Participants in this experiment were 51 Korean heritage speakers residing in the United States. Twenty-nine of them were late/sequential bilinguals (mean age at testing 24;4, range 19–32, mean age of arrival in the U.S. 15;7, range 11–19 years; mean length of residence in the U.S. 8.9 years, range 6–15 years) who acquired Korean as the first and only language in Korea and subsequently acquired English as L2 in late childhood or early adolescence, after immigrating to the United States. These bilinguals spoke both English and Korean in their daily lives. The other 22 bilingual speakers (mean age at time of testing 22;2, range 19–27) were all born in the United States to Korean families, and were exposed to Korean and English simultaneously from birth. These are cases of bilingual L1 acquisition, which means that the speakers acquired both Korean and English as L1s (Genesee 2000; Meisel 2001). These speakers were all schooled in English, and after age 5–6, English became their dominant language.[18] At the time of testing, 18 of the early bilinguals were taking Korean as a second/heritage language in college. None of the late bilinguals were enrolled in these classes. In addition, 34 monolingual speakers of Korean in Seoul, Korea were tested as the control group (mean age 38;2, range 35–58). Participants filled out a questionnaire with information about their language background and took a Korean proficiency test (a cloze passage in Korean) designed to assess their overall proficiency in Korean. Table 2 summarizes the background information on early and late bilinguals tested in this study.

The Korean proficiency test (cloze) included 20 items investigating various properties of Korean grammar (case marking, coordination, verb forms, etc.). Mean scores in percentages for the control and the two bilingual groups are shown in Table 3.

[18]Two reviewers requested more information about possible frequency and patterns of code-switching in these speakers. This was not a question that we asked in our language questionnaire, since many bilinguals may not be aware of their code-switching practices and may even deny that they engage in such practice. Furthermore, this type of bilingual behavior is hard to collect *a posteriori*.

TABLE 3
Mean Accuracy on the Korean Proficiency Test (in Percentages) of Early and Late Bilinguals

Groups	*N*	*Mean*	*sd*	*Range*
Korean monolinguals	34	91.5	(4.85)	85–100
Early bilinguals (Korean L1–English L1)	22	63.9	(15.73)	40–95
Late bilinguals (Korean L1–English L2)	29	91.2	(7.89)	65–100

According to ANOVA and Tukey post-hoc tests [$F(2, 82) = 65.014$, $p < .0001$], the performance of the early bilinguals differed significantly from that of late bilinguals and the controls, who in turn did not differ from each other. The early bilinguals performed around 63% correct, while the other groups performed over 90% correct in the proficiency test. With scores in the early bilingual group ranging between 40–95%, these results already suggest that some early bilinguals have incomplete knowledge of Korean. Our question is whether this incomplete knowledge will also be reflected in the area of binding interpretations.

The main task used in this experiment was a truth value judgment task (Crain & Thornton 1998) with pictures (as adapted and used by White et al. (1996) for adult L2 acquisition). There were 50 pictures (30 target items and 20 filler items). To test the difference between local and long-distance binding, we constructed the items so that all of the target items consisted of bi-clausal sentences, 10 for each type of reflexive (*caki*, *casin*, *caki-casin*). The matrix verb used was *malhata* "say" while direct action verbs such as *ttaylita* "hit," *ssota* "shoot," *kulita* "draw," *phalta* "sell," and *thaywuta* "burn" were used as embedded verbs. The embedded verbs were chosen so that their lexical properties did not bias the interpretation of the reflexive in favor of either the local or the LD interpretation. An example of a target sentence is shown in (10).[19] An accompanying picture is also provided (Figure 1).

(10) a. Cheli$_i$-nun [Minswu$_j$-ka *caki*$_{i/j}$-ul kuli-ess-ta-ko] malhay-ss-ta.
Cheli-top Minswu-nom self-acc draw-past-decl.-comp said
"Cheli said that Minswu drew him(self)"

In half of the sentences (five for each anaphor), the picture used represented the locally bound interpretation for the reflexive, while for the other half, the picture represented a long-distance interpretation. There were 20 filler items: 15 were sentences with three different anaphors (five sentences for each) which did not match the pictures. The remaining five fillers were sentences with pictures unrelated to binding. All the sentences were grammatical. The subjects were asked to judge whether each sentence was a true description of the picture.

[19] In the picture, the persons mentioned in a given sentence can be identified by the name tag.

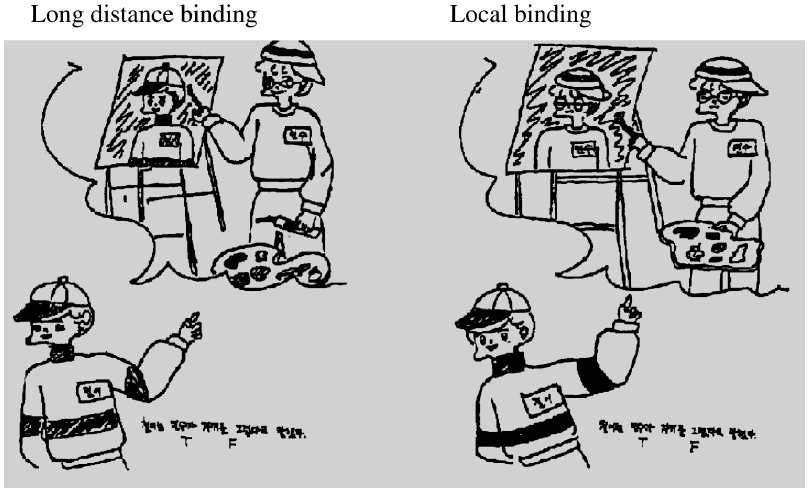


FIGURE 1 Long-distance binding and local binding.

4.3. Results

4.3.1. Group Results

We will first present group results, followed by an individual subject analysis in the next section. Group results were analyzed in the following way. If a participant chose a "true" response, s/he was considered as accepting the binding relation in the sentence exemplified by the story. A "false" response was taken to mean the rejection of the binding relation in the sentence. Subjects whose responses contained more than 20% incorrect responses with filler items were dropped from the analysis. This resulted in the elimination of one subject from the early bilingual group. A score of "1" was assigned to "true" responses, while a score of "0" was assigned to "false" responses for each anaphor in both local and long distance contexts. The subjects' responses were then averaged and a mean percentage score was calculated for each subject. Repeated measures ANOVA and one-way ANOVA were conducted to determine the statistical significance among groups and among anaphor types. The overall results are shown in Table 4.

A repeated measures ANOVA showed no significant main effect by reflexive type (*caki*, *casin*, *caki-casin*), or by binding distance (local, LD), but showed a main effect by group (monolinguals, early bilinguals, late bilinguals) [$F(2, 81) = 2866.145$, $p < .0001$] and a significant reflexive type by distance interaction [$F(2, 162) = 150.987$, $p < .0001$]. Interactions were further analyzed with one-way ANOVAs and paired sample t-tests.

Figure 2 illustrates the mean percentage acceptability judgments for *caki*.

Within subjects, the difference between LD and local binding of *caki* was statistically significant for the three groups (monolinguals: $t(33) = 16.571$, $p < .0001$, late bilinguals: $t(28) = 17.889$, $p < .0001$, early bilinguals: $t(21) = 3.479$, $p < .002$), suggesting that all groups accepted significantly more instances of LD-bound *caki* than locally bound instances. When we compare the mean acceptance of LD interpretations for *caki* between groups, we

TABLE 4
Percentage Acceptance of Long-Distance and Local Binding by Group (where T = 1 and F = 0)

Reflexive type			*Caki*		*Caki-casin*		*Casin*	
Group	*N*		*LD*	*Local*	*LD*	*Local*	*LD*	*Local*
Monolinguals	34	Mean	0.93	0.24	0.15	0.94	0.65	0.49
		sd	(0.11)	(0.23)	(0.26)	(0.18)	(0.35)	(0.32)
Late bilinguals	22	Mean	0.96	0.13	0.20	0.94	0.59	0.56
		sd	(0.10)	(0.19)	(0.26)	(0.19)	(0.37)	(0.37)
Early bilinguals	29	Mean	0.80*	0.45*	0.34*	0.77*	0.44*	0.67
		sd	(0.17)	(0.39)	(0.39)	(0.27)	(0.36)	(0.29)

*Statistically significant.

see an important difference, however. The early bilinguals were less accepting of LD-bound *caki* than the monolinguals and late bilinguals, and this difference was significant (one-way ANOVA: $F(2, 82) = 10.610$, $p < .0001$). The results of the locally bound *caki* also show that the early bilinguals were significantly more accepting of locally bound *caki* than the other two groups (one-way ANOVA: $F(2, 82) = 8.067$, $p < .001$). These results with *caki* support Hypothesis 1, which predicted that all groups, including the early bilinguals, would treat *caki* as an LDA. In fact, not only did the early bilinguals correctly analyze *caki* as an LDA, by accepting LD-bound *caki* to a degree that is significantly above chance, they also displayed a preference for LD-bound over locally bound *caki*, which approximates the responses of monolinguals and the late bilinguals.

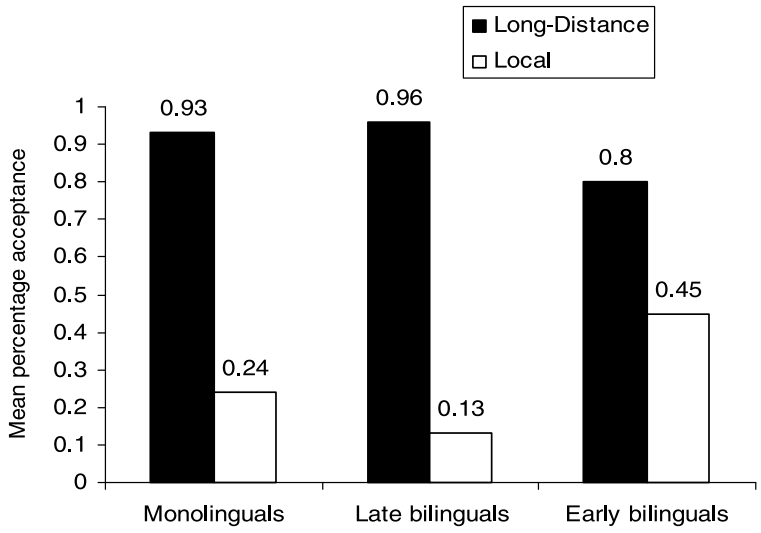


FIGURE 2 Mean acceptance of local and LD binding with *Caki* (T = 1, F = 0).

At the same time, Hypothesis 2 is also supported because the early bilinguals accepted LD binding of *caki* to a lesser degree than monolinguals. We predicted this pattern of results from the fact that English, the preferred language of these speakers, does not possess LDAs and that transfer from English would result in less acceptance of LD interpretations for the LDAs *caki* (and *casin*).

Hypothesis 3 predicted that due to incomplete acquisition of the reflexive system the knowledge of reflexive binding in Korean will be incomplete in early bilinguals. The question is to determine how symptoms of incomplete acquisition will be manifested in the case of *caki*.

One way in which symptoms of incomplete acquisition might surface in early bilinguals is that they may not know that *caki* is an LDA. However, this is not what we found with the early bilinguals, a result that we attributed to the fact that knowledge of the form-function correlation is available in the early bilinguals (that is, Hypothesis 1 is supported).

Another way in which signs of incomplete acquisition might show up is that early bilinguals might display less determinate preferences in the binding behavior of *caki* compared to monolinguals. That is, the early bilinguals might not discriminate local and LD binding of *caki* to the same degree as monolinguals, by accepting LD-bound *caki* to a lesser degree while accepting locally bound *caki* to a greater degree. If we take this to be the reflex of incomplete or unstable acquisition, then we have potential support for incomplete acquisition of *caki* in the responses of the early bilinguals.

As a reviewer reminds us, it is, in general, difficult to tease apart the effects of L2/dominant language transfer from those attributable to L1 incomplete acquisition. However, we think that while the lowered degree of acceptance of LD binding of *caki* is attributable to both transfer and incomplete acquisition, the heightened degree of acceptance of local binding of *caki*, which leads to a less pronounced discrimination of local and LD binding of *caki*, is not attributable to transfer, and possibly results from incomplete acquisition.[20]

Figure 3 shows the binding interpretations of *caki-casin* by the different groups of speakers.

The difference between LD and local binding of *caki-casin* was statistically significant for all three groups (monolinguals: $t(33) = -13.625$, $p < .0001$, late bilinguals: $t(28) = -9.359$, $p < .0001$, and early bilinguals: $t(20) = -3.579$, $p < .002$), suggesting that all groups chose the local interpretation of this anaphor significantly more than the LD interpretation. The percentage acceptance of LD-bound *caki-casin* did not differ significantly across groups, even though the early bilinguals accepted this anaphor with an LD interpretation more often than the other two groups. By contrast, the mean percentage of local binding was different across the groups [$F(2, 82) = 4.677$, $p < .012$]. Interestingly, the early bilinguals accepted the local binding interpretation significantly less than the other two groups, who in turn were not different from each other.

The pattern of the results with *caki-casin* supports Hypotheses 1 and 2, both of which predicted that bilinguals will treat *caki-casin* as a local anaphor, though for different reasons.[21]

The results also indicate that the grammars of the early bilinguals are somewhat indeterminate, as predicted by Hypothesis 3. The response of the early bilinguals was different from that of monolinguals in that local binding of *caki-casin* was accepted to a lower degree

[20] See discussion in Section 4.1 on what the transfer hypothesis (Hypothesis 2) predicts and does not predict.

[21] Hypothesis 1 makes this prediction by the form-function correlation property of UG, while Hypothesis 2 makes this prediction by dominant language transfer.

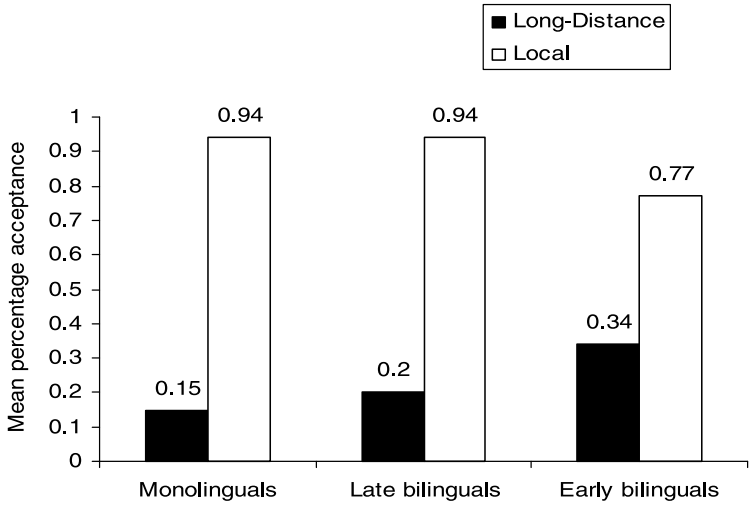


FIGURE 3 Mean acceptance of local and LD binding with *caki-casin* (T = 1, F = 0).

while LD-binding was accepted to a higher degree than in the other two groups. This result is consistent with incomplete acquisition, if the early bilinguals have not acquired the full reflexive system and are demonstrating uncertainty in their judgments of *caki-casin*. That is, though they are aware that this is a local anaphor, they may be misled by the fact that *caki* is an LDA into accepting more instances of LD binding of *caki-casin*, with a concomitant decrease in the acceptance of local binding when compared to the monolinguals and the late bilinguals. Because dominant language transfer cannot explain this pattern of behavior, we suspect that incomplete acquisition is at play here.

Figure 4 shows the results with *casin*. Though this anaphor is an LDA, recall that Kang (1998) found that this anaphor does not display a marked preference for either LD or local binding, unlike *caki*. Choi & Kim (2007) similarly failed to find a preference for local or LD-binding in the processing of sentences containing *casin*.

As expected, there were some differences among the three groups. The difference between LD and local binding of *casin* was not statistically significant for the monolinguals ($t(33) = 1.387$, $p < .175$, ns.), though they preferred the LD interpretation to the local interpretation. For the two bilingual groups, there was no significant difference between local and LD-bound *casin* (late bilinguals: $t(28) = .216$, $p < .831$, early bilinguals: $t(21) = -2.028$, $p < .055$, marginally significant). Only the early bilinguals accepted the local interpretation more frequently than the LD interpretation, though the difference between the two types of binding in early bilinguals was only marginally significant. As for the sentences containing LD-bound *casin*, the monolinguals showed higher acceptance than the early bilinguals though the significance was marginal [$F(2, 82) = 2.560$, $p < .083$, marginally significant].

It is difficult to determine from the group results whether the responses of early bilinguals on *casin* support or falsify the hypotheses given earlier. For example, Hypothesis 1 predicted that *casin* would be analyzed as an LDA even by the early bilinguals. The group results do not allow us to determine whether the hypothesis is supported. This is so because even though

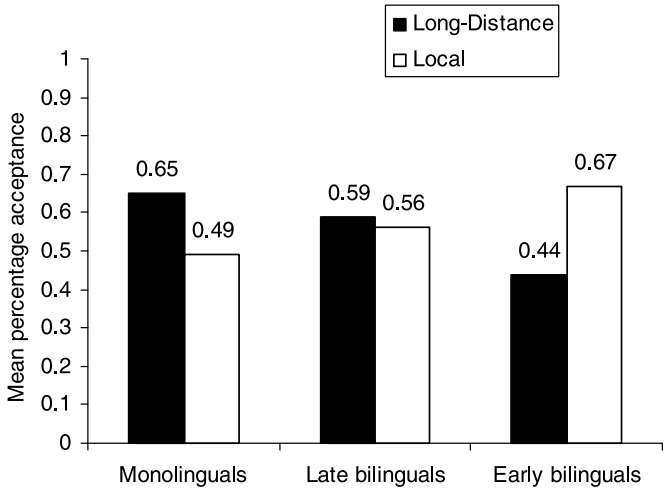


FIGURE 4 Mean acceptance of local and LD binding with *Casin* (T = 1, F = 0).

local binding was accepted more frequently than LD binding for *casin*, the difference was only marginally significant.

Therefore, in order to determine more precisely whether each group shows a preference for LD or local binding of a given anaphor, we devised the long distance preference ratio (LDPR) for each anaphor for each subject in the following manner. Acceptance of long-distance interpretations (regardless of context) was coded as 1 and acceptance of local interpretations was coded as 0 (likewise, the rejection of LD interpretation was coded as 0 and rejection of local interpretations as 1). We then calculated the LDPR for each anaphor for the 10 sentences per anaphor. A subject who has a strictly local interpretation for a given anaphor gets a score of 0 for the anaphor, and a subject who has a strictly long-distance interpretation for the anaphor receives a score of 10. Subjects with no preference receive a middle score, i.e., 5. Thus, all subjects obtained overall scores ranging from 0 to 10 for each anaphor.[22] Figure 5 shows the LDPR for different anaphors by group.

Overall results indicate that all three groups robustly displayed a strong LD binding preference for *caki* and a strong local binding preference for *caki-casin*, though differing in degree. Nonetheless, the early bilinguals' LDPR for *caki* was lower than that of the other two groups ($F(2, 82) = 10.902$, $p < .0001$), while their LDPR for *caki-casin* was higher than that of the other two groups ($F(2, 82) = 4.082$, $p < .020$). On the other hand, none of the groups displayed a strong LD binding preference for the anaphor *casin*. And though the

[22]The LD preference ratio is not the same as the total number of actual T (or F) responses for a given anaphor (which is the analysis presented in Table 4 and Figures 2–4), since it shows the relative preference that a speaker has for LD of a given anaphor. For example, a subject who accepts all five instances of LD binding while at the same time rejecting three instances of local binding (and accepts two instances of local binding) will have a LD preference ratio of 8, which means that the subject has a strong preference for LD binding. On the other hand, a subject who accepts five instances each of LD and local binding (i.e., accept 2 LD/reject 3 LD + reject 3 local/accept 2 local) for an anaphor will have a LD preference ratio of 5, meaning that the subject has no preference for LD over local binding.

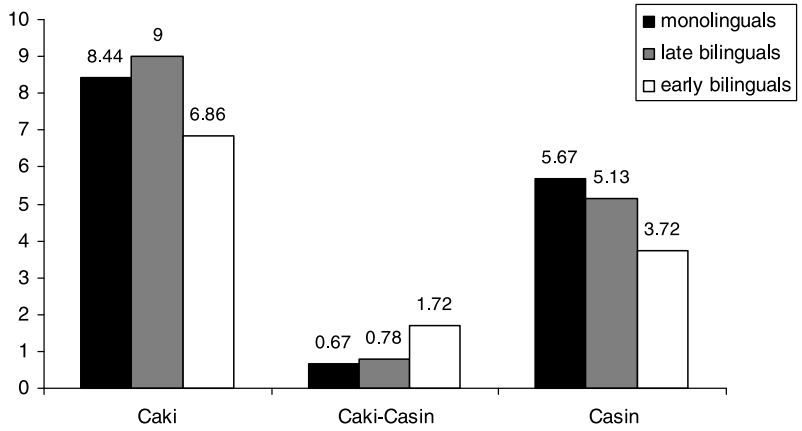


FIGURE 5 Mean LD preference ratio for each anaphor by group (10 = LD/0 = local).

early bilinguals showed a preference towards local binding of *casin*, the difference between the three groups reached only marginal significance due to the large standard deviations in the three groups ($F(2, 82) = 2.558$, $p < .082$).

The results of LDPR for *casin* might be taken to imply that Hypothesis 1 is disconfirmed by the responses of the early bilinguals, in that they displayed a preference for the local interpretation of *casin*. However, the group results with *casin* mask some interesting patterns among speakers. Compared to the other two anaphors, there was a greater amount of individual variation with *casin* in all three groups of subjects (standard deviations were large for the three groups). That is, neither the monolingual Korean group nor the bilinguals showed consistent acceptance of both local and LD-bound *casin*. In all three groups, speakers were divided into those who treated *casin* as an LD anaphor and those who treated *casin* as a strictly local anaphor. We thus need to examine the pattern of individual results in depth before we can come to a firm decision on what we can conclude about *casin*.

4.3.2. Individual Results

To calculate how individual subjects behaved with respect to LDPR, we split the scale into three possible values as follows: scores 7–10 = long-distance preference; scores 4–6 = no preference; scores 0–3 = local preference. The preference ratio was calculated in two ways—first for each anaphor by groups and then for each group by anaphors.

4.3.2.1. Anaphor-by-Groups. Overall individual results with *caki* showed that the majority of speakers in all three groups preferred LD binding of *caki* to local binding (monolinguals: 92%; late bilinguals: 93%; early bilinguals: 60%). However, there were several individuals ($n = 6$ out of 22) who showed a local preference for the LDA *caki* in the early bilingual group, a pattern that is not found in the monolingual and late bilingual groups. The pattern of LD preference for *caki* is shown in Table 5.

The individual results with *caki* reinforce the conclusions drawn earlier on the basis of group results. All three groups of speakers treated *caki* as an LDA, with a preference for LD

TABLE 5
Percentage of Individual Subjects per Group According to Binding Preference for *Caki*

		Long Distance		*Local*		*No preference*	
	N	*Count*	*%*	*Count*	*%*	*Count*	*%*
Monolinguals	34	31	92	—	—	3	8
Late bilinguals	29	27	93	—	—	2	7
Early bilinguals	22	13	60	3	14	6	20

over local binding (supporting Hypothesis 1). However, among early bilinguals, there were a few speakers who had a preference for local binding with *caki*. This result could be attributed to transfer (Hypothesis 2) as well as to incomplete acquisition (Hypothesis 3). Though these early bilinguals are aware that *caki* is an LDA, they are not quite native-like in the LD binding preference ratio concerning this anaphor.

Regarding *caki-casin*, individuals in all three groups showed a robust preference for local binding (monolinguals: 97%; late bilinguals: 93%; early bilinguals: 86%). There were three subjects (14%) who showed no preference for LD or local binding for *caki-casin* in the early bilingual group, a much higher proportion when compared to the other two groups (3% for monolinguals and 7% for late bilinguals). The pattern of LD preference for *caki-casin* by groups is shown in Table 6.

Individual results with *caki-casin* also support the interpretation given earlier for this anaphor on the basis of group results. Hypothesis 1 is confirmed. Hypothesis 2 (L2/dominant language transfer) is largely irrelevant for this anaphor. And while no early bilinguals treated *caki-casin* as an anaphor with a LD preference, a large number of them (compared to monolinguals and late bilinguals) treated it as an anaphor permitting a greater degree of LD binding. We suspect that this pattern is also attributable to incomplete acquisition, constituting potential support for Hypothesis 3. The early bilinguals have not quite acquired the strong local binding preference for *caki-casin*.

Finally, the results of LDPR for *casin* are as follows. While a sizable number of monolinguals and late bilinguals showed a LD preference for *casin* (monolinguals: 44%; late bilinguals: 41%), the majority of early bilinguals displayed a local binding preference for *casin* (60%) instead. However, what is noteworthy is that even among monolinguals and late bilinguals, there were

TABLE 6
Percentage of Individual Subjects per Group According to Binding Preference for *Caki-Casin*

		Long Distance		*Local*		*No Preference*	
	N	*Count*	*%*	*Count*	*%*	*Count*	*%*
Monolinguals	34	—	—	33	97	1	3
Late bilinguals	29	—	—	27	93	2	7
Early bilinguals	22	—	—	19	86	3	14

TABLE 7
Percentage of Individual Subjects per Group According to Binding Preference for *Casin*

		Long Distance		*Local*		*No Preference*	
	N	*Count*	*%*	*Count*	*%*	*Count*	*%*
Monolinguals	34	16	44	7	20	11	36
Late bilinguals	29	12	41	10	34	7	25
Early bilinguals	22	5	23	13	60	4	18

speakers who displayed a local binding preference (20% and 34%, respectively) for *casin*. The pattern of the individual preference for *casin* by different groups is shown in Table 7.

The pattern of results that emerges with *casin* is intriguing, since even among monolinguals there were speakers who preferred local binding for this anaphor. We need to understand the reasons. However, before we get to the relevant discussion, we will briefly examine individual results by groups, to see if there are any additional findings.

4.3.2.2. Group-by-Anaphors. The individual results for each group by anaphors are similar to the anaphor-by-group results given in Tables 5, 6, and 7, but also revealed some new patterns. For example, there are two groups of Korean monolinguals. One group (14 out of 34, 41%) keeps the three anaphors distinct in terms of binding distance preference. These speakers treat *caki* as an LDA with a strong LD preference, *casin* as an LDA with no LD preference, and *caki-casin* as an anaphor with a strong local preference. The monolinguals in the other group appear to collapse *casin* and either *caki* (13 out of 34, 38%) or *caki-casin* (7 out of 34, 20%) in terms of the binding distance preference.[23] The pattern of individual results within the monolingual group for the three anaphors is shown in Figure 6.

The late bilingual group exhibited a similar pattern of binding distance preference for the three anaphors to that of monolinguals. Ten out of 29 (34%) differentiated three anaphors in terms of binding distance preference, while the rest of the speakers showed a two-way distinction. Specifically, 12 out of 29 (41%) collapsed *casin* with *caki* in terms of binding distance, while 7 out of 29 (24%) collapsed *casin* and *caki-casin*. The overall pattern of individual results by late bilinguals for the three anaphors is shown in Figure 7.

The results with individual responses in the early bilingual group revealed the following distribution. The majority of the speakers (10 out of 22, 42%) collapsed *casin* and *caki-casin*, interpreting *casin* as an anaphor with a local binding preference. A few speakers collapsed *casin* and *caki* (5 out of 22, 23%), treating *casin* as an anaphor with a LD preference. Interestingly, 3 out of 22 (14%) speakers seem to have collapsed *caki* and *caki-casin*, which seems to

[23]We did a binary comparison of anaphors by considering "less than one point in LD preference between two anaphors" to be "collapsing two anaphors."

When we say they are "collapsing" the anaphors, we are simply saying that they do not distinguish the two anaphors in question by the binding distance preference. Since binding distance is not the only way in which the anaphors can be differentiated, it is still possible that the anaphors are kept distinct, for example, by restrictions on the grammatical or semantic-pragmatic features of antecedents. In this respect, the finding by Kang (1998) that the semantic role of antecedents of *caki* and *casin* tends to differ (agent for the former and experiencer for the latter) is suggestive.

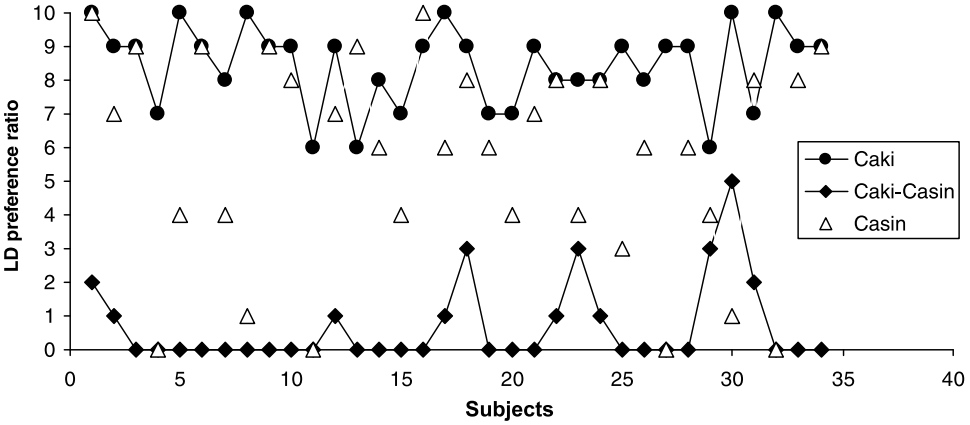


FIGURE 6 Korean monolinguals' ($n = 34$) LD preference ratio by anaphor (0 = local/10 = LD).

imply that they regard *caki* as a local anaphor. The remainder (4 out of 22, 18%) showed no preference for local or LD binding. However, unlike their counterparts among monolinguals and late bilinguals, these speakers did not display a consistent pattern of differentiating the three anaphors by binding distance. These patterns are similar to the results obtained earlier for anaphor-by-groups, except for the last finding. The pattern of individual responses within the early bilingual group for the three different anaphors is shown in Figure 8.

To summarize, the analysis of individual subjects largely confirms the group results. *Caki* is an LDA with a strong preference for LD over local binding. *Caki-casin* is a local anaphor and speakers in all three groups do not have a uniform analysis of *casin*. While many monolinguals and late bilinguals retained a distinction among the three anaphors in terms of binding distance, or collapsed *casin* with *caki* in terms of binding distance preference, most of the early bilinguals treated *casin* as an anaphor with a local binding preference, collapsing it with *caki-casin*.

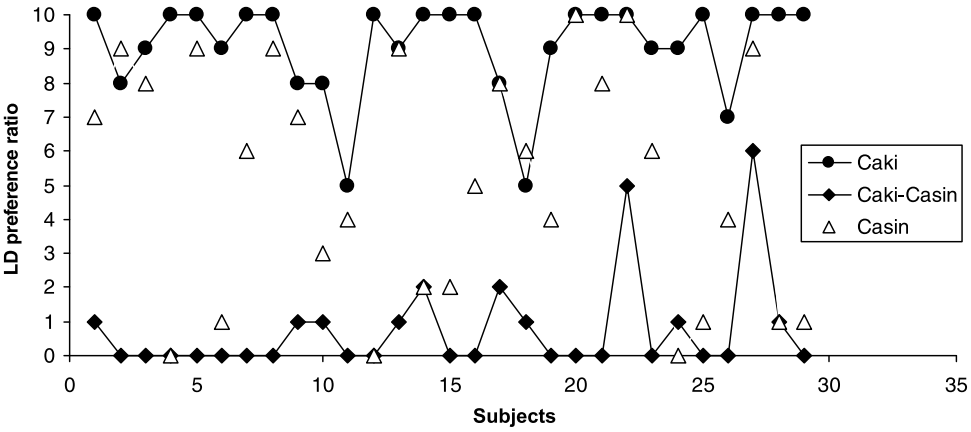


FIGURE 7 Late bilinguals' ($n = 29$) LD preference ratio by anaphor (0 = local/10 = LD).

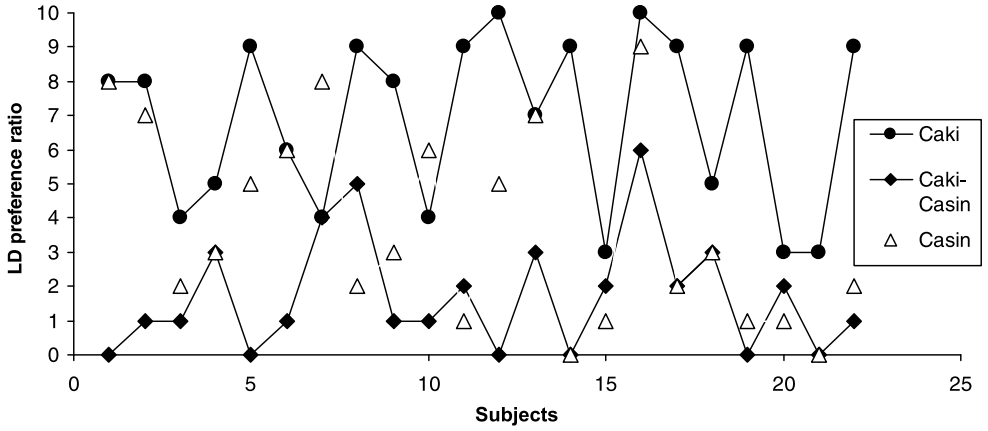


FIGURE 8 Early bilinguals' ($n = 22$) LD preference ratio by anaphor (0 = local/10 = LD).

Among early bilinguals, a few individuals even treated *caki* as an anaphor with a local binding preference.

After revisiting how the overall findings address our research questions and hypotheses in the following discussion section, we provide an extensive explanation for the intriguing behavior of the anaphor *casin* in the three groups.

5. DISCUSSION

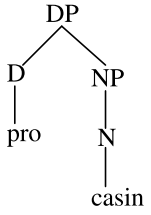
The aim of this study was to assess the knowledge of aspects of the Korean binding system in early bilinguals who are heritage speakers of Korean. Although these speakers grew up speaking Korean and English, they were schooled in English and as adults they consider English to be their dominant language. It is very common for such bilinguals not to develop full linguistic ability in their family language, and as adults they display incomplete knowledge of the minority language. To estimate the degree of incomplete acquisition in this early bilingual population, we compared this group with another bilingual group consisting of Koreans who immigrated to the United States at a later age, after they had a chance to master Korean completely in childhood and also to be schooled in the language. We also compared early bilinguals with monolingual Koreans residing in Korea. The research questions we investigated concerned the following: (i) whether Korean-English bilinguals who are English-dominant still maintain the local vs. long-distance contrast among the three different reflexives in their Korean; (ii) whether bilinguals show possible transfer effects from English in their interpretation of the three different anaphors; and (iii) whether age of acquisition and length of exposure to English have an effect on the degree of incomplete acquisition of Korean binding.

From the group results as well as the individual results for the three anaphors, we can draw conclusions for each hypothesis we formulated. Hypothesis 1 stated that if bilinguals had access to UG, they would show evidence of form-function correlations with local and LD anaphors. Our results show that this hypothesis is partially supported: both monolinguals and bilinguals

treated *caki* as an LDA and *caki-casin* as a local anaphor. However, with respect to *casin*, this hypothesis does not seem to be supported, since about half the early bilinguals did not treat *casin* as an LDA. Why is this so? Before assessing how the results of our analysis support the other two hypotheses, we want to address first the peculiar behavior of the anaphor *casin*.

Assuming that the form-function correlation between morphological complexity and binding distance is a property of UG, we are left with the question of why there are speakers in all three groups who treat *casin* as a predominantly local anaphor. We hypothesize that this pattern of response is related to the ambiguous structural properties of *casin*. That is, given the pro-drop property of Korean and the position of *casin* in a complex anaphor, there are two possible analyses of this anaphor, as shown in (11a) and (11b) (cf. Kim 2000):

(11) a.


b.


Under the first analysis (11a), *casin* is a simple anaphor, and speakers who have this parse will treat it as an LDA, by the form-function correlation. However, those who adopt the second analysis will treat it as a local anaphor, again by the form-function correlation. This explains the puzzling distribution of *casin*. Speakers have the option of analyzing *casin* as either a phrasal (local) or a simple (LD) anaphor, and both options are consistent with UG, in particular, the form-function correlation. This also implies that Hypothesis 1 (form-function correlation) cannot be tested for *casin* by simply examining LD vs. local binding preference of the anaphor. In particular, locally bound *casin* is not a refutation of Hypothesis 1, either for the early bilinguals or for the other groups of speakers.

This finding leaves us with the following revised assessment of the differences between the monolinguals and late bilinguals on the one hand and the early bilinguals on the other: the former are increasingly adopting the LDA analysis, while the latter favor the phrasal analysis of *casin*, as revealed by the pattern of individual results. The question is why.

There may be two ways to explain why more early bilinguals under conditions leading to incomplete acquisition might favor the phrasal, local-only, analysis for *casin*, compared to the monolinguals and the late bilinguals. The first path to explore is dominant language transfer (Hypothesis 2), as suggested already. The idea would be that since the dominant language (English) has phrasal (*pronoun-self*) anaphors, by transfer the early bilinguals will adopt a phrasal parse. This can be done easily with *casin*, if the early bilinguals are aware that Korean is a pro-drop language. Thus, while the form-function correlation (UG property) might push in one direction and lead learners to treat *casin* as a simple, and hence a long-distance, anaphor, transfer from the dominant language pushes in the opposite direction and favors a phrasal parse of *casin*. By contrast, transfer will not lead to a phrasal parse of *caki*, since its position within a complex anaphor does not allow it to be analyzed as being composed of a *pro* followed by *caki*. Thus, the form-function correlation (UG property) holds sway and allows the early bilinguals to treat it as an LDA.

The second way in which we can account for why more early bilinguals treated *casin* as a local-only anaphor compared to monolinguals and late bilinguals relies on diachrony and input frequency, i.e., factors attributable to Hypothesis 3 (incomplete acquisition). We have reason to believe that the increased use of *casin* as a long-distance anaphor is a relatively recent innovation and that *casin* in older stages of Korean was primarily a local anaphor. The grammars of early bilinguals are closer to the grammar of the earlier stages of Korean in this regard. This is hardly surprising in view of the fact that the language of an immigrant group tends to be more conservative than that of the native speakers in the home country (Aitchinson 1991). Needless to say, the early bilinguals' primarily source of Korean input before their dominant language shift is at home.

The overall use of *casin* is rapidly expanding in contemporary Korean. With it, the rise of other *casin*-related forms, including *caki-casin*, is also underway. We make this claim on the basis of the following. *Caki* as a reflexive pronoun is much older than *casin*. It is reported that *caki* began to be attested in written records in the late 16th century (Kim 2001). The diachronic development of *casin* has not been investigated systematically, to the best of our knowledge, but there is a source that allows us to determine the late development of *casin* (and its derivatives) and the expanding use of *casin* in contemporary Korean. Kim & Yoon (2008) document a steady increase in the frequency of *casin* in the later Bible translations, and with it, an increase in its usage as a long-distance anaphor.

When we examine the profiles of monolinguals in our group we find that those who either treat *casin* as a local anaphor or as an LDA, but without a strong LD binding preference, are mostly in their 40s and 50s. On the other hand, younger speakers were common among those who treat *casin* as an LDA with a strong LD binding preference, though we also had older speakers in this group. The relative distribution of speakers in terms of age seems consistent with the fact that the LD binding of *casin* is an innovation, and is also consistent with the evidence from the Bible translations.

Overall, then, we can conclude that *casin* is increasing in frequency in contemporary Korean, and with it, its use as an LDA. This change must be a relatively recent one, if the results from the Bible translations are indicative. Given the recency of this change and the overall conservative nature of immigrant/heritage grammars, it is easier to understand why the early bilinguals treat *casin* more as a local anaphor than as an LD anaphor. They have not had sufficient exposure to the ongoing change.

Let us now return to the other two hypotheses. Were Hypothesis 2 confirmed, we would observe what can be considered transfer effects from English into Korean, not only with *casin*, but with the other LDA *caki*. This hypothesis seems to be supported because the early bilinguals accepted LD binding of *caki* to a lesser degree than monolinguals. There were even individuals who showed a local binding preference for *caki*, a pattern that is never found with monolinguals or late bilinguals. With regard to *casin*, the majority of early bilinguals showed a preference for local interpretation, unlike the majority of monolinguals and late bilinguals who treated it as an anaphor with an LD preference. These results suggest transfer from English, which has only local anaphors.

Finally, Hypothesis 3 stated that early bilinguals, who had the longest period of exposure to English and less exposure to Korean in childhood, would show more signs of incomplete acquisition than late bilinguals, who immigrated to the United States after age 10. Indeed, Hypothesis 3 is fully supported, since the grammars of the early bilinguals tested in this study

diverge in several respects from the grammars of the monolinguals and the late bilinguals. For example, while the early bilinguals distinguished *caki* and *caki-casin* as LD and local anaphors, respectively, they differed from the monolinguals and late bilinguals in the degree of binding distance preference for the two anaphors. In particular, they accepted more instances of LD-bound *caki-casin*, compared to the monolinguals and late bilinguals. This cannot be due to transfer, but is more suggestive of unstable acquisition. With regard to *casin*, we noted that many early bilinguals treat it as a local anaphor rather than an LDA. While this may be due to incomplete acquisition, it could also result from transfer, as noted. However, there is a finding that suggests incomplete acquisition may be responsible for this behavior. Individual results with early bilinguals revealed that although there are early bilinguals who do not show a preference for either local or LD binding with *casin*, these individuals nevertheless differed from the corresponding individuals in the monolingual or late bilingual group (i.e., those individuals who did not display a binding distance preference for *casin*). While the latter speakers maintained a three-way contrast between the three anaphors in terms of binding distance, the early bilinguals did not.[24]

The result is reminiscent of a similar simplification pattern with gender agreement in nouns in low-proficiency heritage speakers of Russian reported by Polinsky (2008). Russian has a three-way gender system (masculine, feminine, neuter). Two experiments conducted by Polinsky show that low proficiency heritage speakers have a two-way system that maintains masculine and feminine but excludes neuter.

If the Korean binding system is not fully acquired until age 12 (Cho 1989, forthcoming), as we reviewed in the hypotheses section, then it is possible that the early bilinguals, having received less input in Korean than late bilinguals, missed the opportunity to completely acquire the complex Korean anaphor system. Although early bilinguals know the long-distance properties of *caki* and the local properties of *caki-casin*, it is also clear that they show a preference for local binding in general, and this may be partially reinforced by the entrenchment of English. We acknowledge that in adult early bilinguals, both L1 attrition and incomplete acquisition may occur, but teasing apart these two forms of language loss is difficult if not impossible without a longitudinal study documenting their linguistic knowledge since early childhood.

In common with Gürel's (2002) study of L1 attrition, our conclusion is that invariant syntactic notions underlying binding, such as the distinction between overt and null pronouns, anaphors and pronouns, long-distance versus local anaphors, seem to be integral parts of the knowledge of adults' native grammar as provided by universal grammar and thus are apparently not vulnerable to significant degrees of L1 attrition. In fact, the late bilinguals, who were assumed to have completed their acquisition of Korean before intense exposure to English began, showed the same patterns of interpretations as the monolinguals tested in Korea. If this knowledge is innate and manifests itself in early childhood, we can understand why early bilinguals, whose interpretations were quite indeterminate overall, still displayed basic knowledge of local versus long-distance anaphors.

[24]That is, monolinguals and bilinguals in this category (those with 4–6 LDPR for *casin*) employ *caki* as a predominantly LDA and *caki-casin* as a predominantly local anaphor (cf. Figures 6 and 7), while early bilinguals in this category (those with 4–6 LDPR for *casin*) do not discriminate among the three anaphors in a similar manner (cf. Figure 8).

In conclusion, we have shown that in comparison to monolingual and bilingual speakers who had a chance to acquire their L1 fully and continue to be exposed to the language, adult early bilinguals who are Korean heritage speakers display incompletely acquired knowledge of the full Korean anaphor system. Even when they distinguish local and LD anaphors, there are nonnative effects in their adult grammars. Specifically, they retain the basic difference between the clearly LDA *caki* and the local counterpart *caki-casin*, but their treatment of the ambiguous anaphor *casin* is different, since many speakers treat *casin* as a predominantly local anaphor. Although it is very difficult to tease apart all the external factors that may have contributed to the early bilinguals' current state of linguistic knowledge, we discussed two interrelated forces: (i) transfer from English, the dominant language, and (ii) the quality of the input. Not only had these speakers been exposed to less Korean input than the monolinguals and the late bilinguals, but our diachronic discussion suggests that with respect to the particular anaphor that early bilinguals have the biggest difficulty with (*casin*), the actual input these early bilinguals have been exposed to may also be different.

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