The syntax of Korean anaphora: An experimental investigation

by

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Abstract

This dissertation investigates the syntactic and interpretative properties of three Korean anaphora, third-person pronouns, VP anaphors (VPAs), and null objects (NOs), using experimental methodologies. There is no general consensus among previous studies regarding whether Korean third-person pronoun *ku* 'he' can be construed as a bound variable. Three interconnected experiments were conducted to explore this issue, and the findings demonstrated that some Korean speakers consistently accepted the quantificational binding of *ku*, while others consistently did not. This result is highly suggestive of inter-speaker variation in the bound variable construal for *ku*. Taking into consideration the historical background of *ku* and its present status, I conclude that child learners of Korean may not receive sufficient evidence regarding *ku* from the primary language input data. Given this, adopting Han et al.'s (2007) two-grammar hypothesis and Déchaine and Wiltschko's (2002) pronominal typology, I propose that some speakers randomly acquire ϕP *ku*, which complies with the "pronominal grammar", while others randomly acquire DP *ku*, which complies with the "demonstrative grammar". On the basis of the finding that there is inter-speaker variation in the bound variable construal for *ku*, the present study investigates the syntax of Korean VPAs and NOs. The existing proposals on their syntactic identities can be grouped into ellipsis and pro-form approaches. In two independent experiments designed to diagnose the presence of "hidden" structure within VPAs and NOs, I examined the (un)availability of sloppy readings for VPAs and NOs with antecedents containing *ku*. Given the standard view that the sloppy reading in ellipsis is due to a pronoun in the ellipsis site being bound, if VPAs or NOs have elided structure that hosts *ku*, the distribution of sloppy readings for them should correlate with that of quantificational binding of *ku*. Such a correlation, however, is not expected if they are pro-forms that do not host elided material (and thus not *ku*). The correlation was found in the experiment for NOs, but not in the experiment for VPAs. Based on these findings, I claim that VPAs are uniform, un-analyzable pro-forms, while NOs are derived from ellipsis, anaphora that have a fully-fledged structure.

Keywords: third-person pronouns; bound variable construal; quantificational binding; inter-speaker variation; VP anaphors; null objects; ellipsis; pro-form; sloppy reading; Korean

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List of Abbreviations

2	second person
3	third person
ACC	accusative
ADN	adnominal
AUX	auxiliary
COMP	complementizer
CONJ	conjunction
DAT	dative
DECL	declarative
DEF	definite
DEM	demonstrative
DET	determiner
EMPH	emphasis
GEN	genitive
HON	honorific
LINK	linking
MASC	masculine
NEG	negative
NOM	nominative
OBJ	object
PART	particle
PAST	past tense
PL	plural
POSS	possessive
PRENOM	prenominal
PRES	present tense
PROG	progressive
Q	question
SG	singular
SUB	subject
TOP	topic
TR	transitive

Chapter 1

Introduction

1.1 Motivation and objectives

This dissertation explores the phenomenon of anaphora in Korean. In particular, efforts are made to unravel the syntactic and interpretative properties of three Korean anaphoric devices, (i) third-person pronouns, (ii) verb phrase (VP) anaphora, and (iii) null objects, which are exemplified by the sentences in (1)-(3) below ([e] in (3) indicates a phonologically missing object).[1]

(1) Third-person pronouns

Motwu-ka **ku**-uy umlyoswu-lul masi-ess-ta.
everyone-NOM **he**-GEN beverage-ACC drink-PAST-DECL

'Everyone drank his beverage.'

(2) VP anaphora

Minswu-ka ku-uy umlyoswu-lul masi-ess-ko, Kiswu-to
Minswu-NOM he-GEN beverage-ACC drink-PAST-CONJ Kiswu-also
kuleha-yess-ta.
so.do-PAST-DECL

'Minswu drank his beverage, and Kiswu did so, too.'

(3) Null objects

Minswu-ka ku-uy umlyoswu-lul masi-ess-ko, Kiswu-to [**e**]
Minswu-NOM he-GEN beverage-ACC drink-PAST-CONJ Kiswu-also
masi-ess-ta.
drink-PAST-DECL

'(lit.) Minswu drank his beverage, and Kiswu drank, too.'

---

[1] The Yale Romanization is used in transcribing the Korean data throughout this dissertation.

This chapter aims to provide the motivation and the main objectives of the present study on the three anaphoric devices listed above. Before doing so, let us first consider the extract from Wasow (1986: 107-108) to look at how the anaphora phenomenon is defined in his work.

> "An appropriate place to begin my survey is with an attempt to characterize what anaphora is. I will not be so bold as to offer a definition: a particularly successful empirical investigation may end with a definition, but research in progress typically involves imprecise 'seat of the pants' characterizations of the phenomena in question. Loosely, then the study of anaphora deals with **pronouns, other pro-forms (e.g.,** *do so***), and ellipsis**. These constructions share a number of properties, the most obvious being that they derive their interpretations in a context from their association with other elements in the context."

Although anaphora has been extensively studied in various fields of linguistics for the past decades, its definitions have not been entirely consistent among researchers and, as pointed out by Garnham and Oakhill (1996: 320), any attempt to formulate a complete and fully satisfactory definition of anaphora seems to have not been successful, because of the wide scope and variety of the phenomenon. However, adopting the idea suggested by Wasow (1986: 107-108) above, the present study defines anaphora as the linguistic phenomenon (or process) wherein the interpretation of one (overt or covert) element is in some way dependent on the interpretation of the other element previously given either in the linguistic or extralinguistic context (see also Huang 1994 for a similar definition of anaphora).[2]

1.1.1 Third-person pronouns in Korean

As is well known, there is a broad range of anaphoric expressions that are legitimately employed by natural language. Among these devices, pronominal anaphora is the one that is probably the most commonly used and has drawn the greatest attention in generative grammar. It is a generally accepted view that pronouns are involved in, at least, two distinct types of anaphoric relations: coreference anaphora and bound variable anaphora. First, a pronoun can enter into coreference when it happens to denote the same referent as some referential nominal expression in the same sentence (or adjacent sentences). In (4), for example, the intended interpretation of the English third-person pronoun *him* results from being coreferential with the preceding referential DP, *future President Andrew Jackson.*

(4) On this day in 1806, future President Andrew Jackson kills a man who accused **him** of cheating on a horse race bet.

---

[2] Following the convention in the literature, the term *anaphora* will also be used to refer to anaphoric expressions in general.

(https://www.history.com/this-day-in-history)

On the other hand, bound variable anaphora can be established when a pronoun is construed as a variable that is bound by an operator such as a quantifier. This is illustrated in (5), where the third-person pronoun *he* is understood as a variable whose value is not fixed, but co-varies with the value that would be assigned to the preceding quantificational DP, *every man*.

(5) Every man must decide whether **he** will walk in the light of creative altruism or in the darkness of destructive selfishness.

(Martin Luther King 1963)

Notably, not all languages include third-person pronouns in their pronominal systems (e.g., for Yidiny, see Dixon 1977; for Basque, see Laka 1996). Moreover, some languages do possess third-person pronouns, but ones that are different from English third-person pronouns in terms of the range of possible anaphoric relations. For example, in languages such as Polish and Catalan, third-person pronouns can enter into coreference, but not into bound variable anaphora, as illustrated in the following sets of sentences.[3]

(6) POLISH

a.

*	Nikt$_1$	nie	wierzy	ze	**on**$_1$	jest	inteligentny.
	nobody	NEG	believe.PRES	COMP	he	be.PRES	intelligent

‘Nobody$_1$ believes that he$_1$ is intelligent.’

b.

Aleksander$_1$	wierzy	ze	**on**$_1$	jest	inteligentny.
Aleksander	believe.PRES	COMP	he	be.PRES	intelligent

‘Aleksander$_1$ believes that he$_1$ is intelligent.’

(adapted from Barski 2013: 59, ex.(18))

(7) CATALAN

a.

*	Ningú$_1$	creu	que	**éll**$_1$	és	antipátic.
	nobody	believe.PRES	COMP	he	be.PRES	nasty

‘Nobody$_1$ believes that he$_1$ is nasty.’

b.

En	Joan$_1$	creu	que	**éll**$_1$	és	simpatic.
DET	John	believe.PRES	COMP	he	be.PRES	nice

‘John$_1$ believes that he$_1$ is nice.’

(Picallo 1994: 270, fn. 16, (ia) and (iia))

In (6a) and (7a), the third-person pronouns *ón* and *éll* cannot be construed as variables bound by the quantificational DPs, *nikt* and *ningú* ‘nobody’, while in (6b) and (7b), they can be coreferential with the referential DPs, *Aleksander* and *en Joan*. Obviously, this is in contrast to English third-person pronouns, which can readily receive bound variable interpretations as well as coreferential interpretations.

---

[3] Catalan is a language spoken in Spain (the Spanish autonomous communities of Catalonia, the Balearic Islands and Valencia), Andorra, and some parts of France and Italy.

Interestingly enough, Korean third-person pronoun *ku* ‘he’ displays seemingly a rather unusual anaphoric status, which is distinctive from the Polish and Catalan counterparts as well as the English counterpart.[4] To illustrate this point, consider the following two sentences, both of which were extracted from some online postings written by native Korean speakers.

(8) a. Motun salam$_1$-un **ku**$_1$-ka nwukwu-inci, hananim-kkeyse **ku**$_1$-ka
every person-TOP he-NOM who-Q God-NOM.HON he-NOM
mwues-ul hayngha-tolok kitayha-si-nunci alko-iss-ta.
what-ACC do-COMP expect-HON-Q know-PROG-DECL
‘Everyone$_1$ knows who he$_1$ is and what God expects him$_1$ to do.’[5]
(https://www.lds.org/general-conference/2000)

b. Motun salam$_1$-un **ku**$_1$-uy sasaynghwual, kaceng saynghwual, cwuke mit
every person-TOP he-GEN privacy family life home and
thongsin-ul concwung pat-ul kwuenli-ka iss-ta.
correspondence-ACC respect receive-PRENOM right-NOM exist-DECL
‘Everyone$_1$ has the right to respect for his$_1$ private and family life, (his$_1$) home, and (his$_1$) correspondence.’
(http://hrlibrary.umn.edu/instree/K-z17euroco.html)

What is noticeable in the above examples is that the pronoun *ku* is intended to be anaphorically linked to the quantificational DP, *motun salam(-un)* ‘everyone’, thus receiving a bound variable reading. However, such a grammatical intuition does not seem to be shared by all native speakers of Korean. For example, of the nine Korean speakers I informally consulted with, six judged that the sentences in (8a) and (8b) are not felicitous under the intended bound variable reading of *ku*, while the remaining three judged that the same sentences are felicitous under such a reading. Moreover, as will be sketched in Section 2.1 of Chapter 2, there is a clear split in the Korean literature between those who argue that *ku* can be used to encode a bound variable interpretation (e.g., Im 1987; B. M. Kang 1988; M. Y. Kang 1988; Suh 1990; Koak 2008) and those who argue that it cannot (e.g., Hong 1985; Choe 1988; S. H. Kang 1990; Shim 1993; Kwon et al. 2009).[6] If so, this observation might be an indication that there is inter-speaker variation in the bound variable use of Korean third-person pronouns. However, such a non-trivial possibility has never been reported or addressed in previous studies on Korean anaphora, and thus never been empirically verified or theoretically justified (cf. Marsden 2012; Kweon 2017). One of the main objectives of this dissertation is to contribute to filling this important void in the extant literature.[7] In particular, in Chapter 2, on the basis of careful and extensive experimental investigations (Experiments 1A, 1B, and 2), I argue that there is indeed variation across Korean speakers in the availability of bound variable construal for Korean third-person pronouns, and

---

[4] Korean third-person pronouns also show unique characteristics in terms of the frequency of occurrence in spoken and written contexts. That is, they are frequently used in the written language, but rarely employed in colloquial speech (e.g., O’Grady 1984). See Chapter 2 for the discussion on the historical reason for this context asymmetry and its potential influences and consequences on children’s acquisition of third-person pronouns in Korean.

[5] The sentence was originally translated from *Fiddler on the Roof* (1963), an English play written by Joseph Stein and later turned into a film.

[6] It is commonly assumed in the literature that in contrast to its bound variable use, the third-person pronoun *ku* can be freely used as a coreferential pronoun. Indeed, all of my informants agreed that the

---

sentences in (i) and (ii) below are felicitous under the intended (intrasentential) coreferential interpretation of *ku*.

(i) a. Changswu$_1$-nun **ku**$_1$-uy emeni-lul salangha-n-ta.
Changswu-TOP he-GEN mother-ACC love-PRES-DECL
'Changswu$_1$ loves his$_1$ mother.'
(C. W. Lee 2005: 200, ex.(1a))

b. Minswu$_1$-uy chinkwu-ka **ku**$_1$-lul ttayli-ess-ta.
Minswu-GEN friend-NOM he-ACC hit-PAST-DECL
'Minswu$_1$'s friend hit him$_1$.' (Cho & Hong 1988: 32, ex.(4))

(ii) Cwucinwu-ka ku namca$_1$-lul sileha-nun mankhum-ina appa-to **ku**$_1$-lul
Cwucinwu-NOM the man-ACC dislike-PRENOM extent-as dad-also he-ACC
sileha-n-ta.
dislike-PRES-DECL
(lit.) 'As much as Cwucinwu (a famous Korean journalist) dislikes the man$_1$, Dad dislikes him$_1$, too.'
(http://blog.aladin.co.kr/735181196/popup)

[7] As a matter of fact, in previous studies on the phenomenon of bound variable anaphora in Korean, much less attention has been devoted to the third-person pronoun *ku* than the long-distance anaphor *caki* 'self'. This is probably due to the fact that in Korean, the use of *caki* as a (local or non-local) bound variable (e.g., Cho 1996; Storoshenko 2008; Han & Storoshenko 2012) is incomparably more preferable and, thus, more common and widespread than the bound variable use of *ku* (e.g., O. H. Kim & Kitagawa 2010; Kwon et al. 2009). All of the nine Korean speakers mentioned earlier unequivocally judged that the sentences in (i) and (ii) below, where *ku* in (8a) and (8b) have been replaced with *caki*, can readily induce a bound variable interpretation. Most of all, according to those three informants who agreed that *ku* can be construed as a bound variable, the *caki* sentences in (i) and (ii) sound far more natural than the corresponding *ku* sentences in (8a) and (8b).

(i) Motun salam$_1$-un **caki**$_1$-ka nwukwu-inci, hananim-kkeyse **caki**$_1$-ka mwues-ul hayngha-tolok
every person-TOP self-NOM who-Q God-NOM.HON he-NOM what-ACC do-COMP
kitayha-si-nunci alko-iss-ta.
expect-HON-Q know-PROG-DECL
'(lit.) Everyone$_1$ knows who self$_1$ is and what God expects self$_1$ to do.'

(ii) Motun salam$_1$-un **caki**$_1$-uy sasaynghwual, kaceng saynghwual, cwuke mit thongsin-ul
every person-TOP self-GEN privacy family life home and correspondence-ACC
concwung pat-ul kwuenli-ka iss-ta.
respect receive-PRENOM right-NOM exist-DECL
'(lit.) Everyone$_1$ has the right to respect for self$_1$'s private and family life, (self$_1$'s) home, and (self$_1$'s) correspondence.'

In light of this reality, the current research can provide a significant contribution to illuminating a more precise and complete picture of Korean (third-person) pronouns.

provide an account for why and how the phenomenon of inter-speaker variation arises and exists in Korean.

1.1.2 VP anaphora in Korean

Let us now direct our attention to VP anaphora. In particular, what the present study is concerned with is the so-called *do so* VP anaphora, a type of predicate anaphora (e.g., Cornish 1986/2005), which can be found, at least, in English and East Asian languages such as Korean, Japanese, and (Mandarin) Chinese.[8,9] Consider the examples of English *do so* and its Japanese and Chinese equivalents, *soo-su* and *zheme-zuo*, given in (9) below.[10]

(9) a. ENGLISH
The data showed that the tropical areas of Southeast Asia, South America and Africa [VP added the same amount of CO2 into the atmosphere], but they **did so** for different reasons.
(https://www.livescience.com/60670-nasa-satellite-reveals-source.html)

b. JAPANESE

A: Taroo-wa [VP sinroo-ni hanatabaa-o watasi]-ta.
Taroo-TOP bridegroom-DAT bouquet-ACC hand-PAST
'Taro handed a bouquet to the bridegroom.'

B: Hanako-mo **soo-si**-ta.
Hanako-also so-do-PAST
'Hanako did so, too.'

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[8] Some researchers, e.g., Hankamer and Sag (1976), Partee and Bach (1984), Huang (2000), use the term *VP anaphora* (or *VP anaphor*) to refer to verbal anaphoric items in general, which include null anaphoric VPs, i.e., VP ellipsis. Throughout this dissertation, however, the term *VP anaphora* is only used to refer to overt anaphoric VPs (e.g., English *do so* anaphora and *do it* anaphora), following the convention used in Matsuo and Duffield (2001), Cecchetto and Percus (2006), Y. H. Lee (2012), and Roberts et al. (2013).

[9] Danish *gør det* and French *le faire* have often been assumed to be *do so* VP anaphors in the literature, based on examples like (i)-(ii) below.

(i) DANISH

Peter spiser spaghetti om aftenen, men Henrik **gør det** om eftermiddagen.
Peter eats spaghetti in evening, while Henry does it in afternoon
'Peter eats spaghetti in the evening, while Henry **does so** in the afternoon.'
(Schøsler 1994: 123, ex. (14d))

(ii) FRENCH

Jacqueline ne devrait pas nager dans cette mer agitee, mais Georges peut **le faire**.
Jacqueline ne should not swim in this sea rough but Georges can it do
'Jacqueline shouldn't swim in that rough sea, but Georges can **do so**.'
(Cornish 1986/2005: 108, ex. (40b))

However, as can be known from the word-by-word glosses given above, it seems more reasonable to take the Danish and French VP anaphors as equivalents of English *do it* anaphora.

[10] In the rest of the dissertation, the term *Chinese* is used to mean Mandarin Chinese, unless otherwise specified.

(Koizumi 1994: 36, ex.(29))

c. Chinese

Zhangsan zai tushuguan [$_{VP}$ nian shengjing]. Mali zai jiali ye **zheme**
Zhangsan at library read bible Mary at home also so
zuo.
do

'Zhangsan read the bible at the library. Mary did so at home, too.'

(Wei & Li 2016: 190, ex.(6a))

In (9a), English *do so* in the second clause is readily understood as taking on the meaning of the bracketed VP in the preceding clause, and thus the second clause is interpreted as 'they added about the same amount of CO2 into the atmosphere for different reasons'. The Japanese and Chinese VP anaphors in (9b) and (9c) are interpreted in the same way as their English equivalent in (9a), and therefore the second clauses in (9b) and (9c) mean 'Hanako handed a bouquet to the bridegroom, too' and 'Mary read the book at home, too', respectively.

Since the classic and landmark work done by Hankamer and Sag (1976) (and also Sag and Hankamer 1984), the syntactic status of *do so* VP anaphora has been a topic of some debate in the generative literature, albeit to a much lesser extent than VP ellipsis, which is also a class of predicate anaphora. In order to understand this point in more detail, we need to consider the crux of Hankamer and Sag's (1976) view on the phenomenon of anaphora. According to their claim, a formal distinction should be drawn between two categories of anaphoric devices, which has become a standard assumption in the subsequent literature on anaphora (cf. Williams 1977; Grimshaw 1979; Tanenhaus & Carlson 1990; Depiante 2000; Johnson 2001; Merchant 2001; Cecchetto & Percus 2006; Houser 2010; cf. Baltin 2012; Kasai 2014; Wei & Li 2016, among many others). The first category of anaphoric devices are elliptical constructions, which are derived from fully articulated syntactic forms by deletion under identity with their antecedent forms at "surface" level (i.e., at the PF component), and which look to the linguistic representations (or, more precisely, the logical forms) associated with the antecedents for their interpretation; these anaphoric devices are referred to as *surface anaphora* (also as *deletion anaphora*). On the other hand, the second category of anaphoric devices are pro-forms, which are atomic units generated in the deep (or underlying) structure, and which make reference to the discourse or semantic model for

Ellipsis (surface anaphors)	Pro-forms (deep anaphors)
VP ellipsis, Sluicing Stripping, Gapping, **Do so anaphora**	*Do it* anaphora Null complement anaphora, Sentential *it* anaphora

Table 1.1: Hankamer and Sag's (1976) two-way classification of anaphora

their interpretation; these anaphoric devices are referred to as *deep anaphora*.[11,12] Table 1.1 provides a list of various English anaphoric devices classified into each of these two categories.

As can be inferred from the above discussion, the major factor that distinguishes the two classes of anaphoric devices is the presence/absence of internal syntactic structure. Consider the following examples of English VP ellipsis and *do it* anaphora, which are representative cases of elliptical anaphora and pro-form anaphora, respectively.[13]

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[11] It is nowadays a widespread practice to assume Hankamer and Sag's deep/surface dichotomy for the study of anaphora, but it was a controversial hypothesis when initially proposed. As mentioned in Hankamer and Sag (1976: 394), at the time of the publication of their work, there existed two major, diametrically opposed approaches to anaphora: (i) strict transformational position and (ii) strict interpretive position. According to the first approach, "all anaphoric processes are transformations that involve deletion (or conversion to a pro-form) of an underlyingly present, fully lexical segment under conditions of identity with an antecedent segment" (e.g., Ross 1967; Postal 1972). The second view, on the other hand, assumes that "all anaphors (overt or null) are present in underlying representations" and that "the anaphoric relation between an anaphor and its antecedent is assumed to be established by an interpretive rule" (e.g., Wasow 1972; Fiengo 1974).

[12] In Sag and Hankamer (1984), surface anaphora and deep anaphora are renamed *ellipsis* and *model-interpretive anaphora*, respectively.

[13] Examples of other English anaphoric devices are given below.

(i) SLUICING:
Hankamer: Someone's just been shot.
Sag: Yeah, I wonder who. (Hankamer & Sag 1976: 408, ex. (42))

(ii) STRIPPING:
Hankamer: Listen, Ivan, he's playing the *William Tell Overture* on the recorder.
Sag: Yeah, but not very well. (Hankamer & Sag 1976: 409, ex. (46))

(iii) GAPPING:
Hankamer: Ivan is now going to peel an apple.
Sag: And Jorge, an orange. (Hankamer & Sag 1976: 410, ex. (49))

(iv) DO SO ANAPHORA:
If you have not yet changed your socks, please do so immediately.
(Hankamer & Sag 1976: 415, ex. (70))

(v) NULL COMPLEMENT ANAPHORA (NCA):
We needed somebody to carry the oats down to the bin, but nobody volunteered.
(Hankamer & Sag 1976: 411, ex. (51c))

(vi) SENTENTIAL *it* ANAPHORA:
That Betty is claimed to be pregnant doesn't make it true.
(Hankamer & Sag 1976: 421, ex. (101))

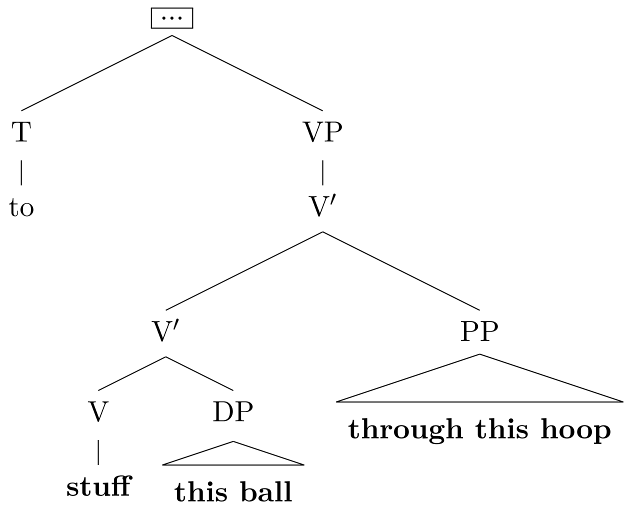
As Houser et al. (2007: 183) point out, Hankamer and Sag's two-way distinction of anaphora is independent of whether an anaphoric item is phonologically null or not. For example, NCA and *do it* anaphora are a

(10) a. VP ELLIPSIS
Hankamer: I'm going to [$_{\text{VP}}$ stuff this ball through this hoop].
Sag: It's not clear that you'll be able to **[$_{\textbf{VP}}$]**.
(Hankamer & Sag 1976: 382, ex. (5))

b. *Do it* ANAPHORA
Hankamer: I'm going to [$_{\text{VP}}$ stuff this ball through this hoop].
Sag: It's not clear that you'll be able to **[$_{\textbf{VP}}$ do it]**.
(adapted from Hankamer & Sag 1976: 382, ex. (4))

In (10a), the VP ellipsis site in the second conjunct (denoted by [$_{\text{VP}}$]) is assumed to have a full-fledged structure that corresponds to its antecedent in the first conjunct, [$_{\text{VP}}$ *stuff this ball through this hoop*], throughout the entire syntactic derivation (i.e., in both overt and covert syntax (LF)), although its surface representation is rendered opaque by a phonological deletion process (see Chapter 3 for further discussion). In (10b), on the other hand, the pro-form *do it* in the second conjunct is assumed to be base-generated as it is, and thus to have no internal structure at any stage of syntactic derivation. Accordingly, it posits no more structure than what must be present for the surface lexical form, i.e., the verb *do* and the pronoun *it*. In light of this contrast, the underlying structures of the second conjuncts of (10a) and (10b) can be roughly represented as in (11a) and (11b), respectively.

(11) a.



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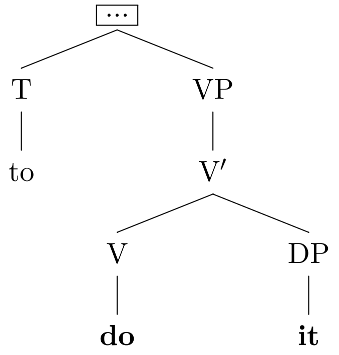
null deep anaphor and an overt deep anaphor, respectively, while VP ellipsis and *do so* anaphora are a null surface anaphor and an overt surface anaphor, respectively (for Spanish and Italian NCAs, see Depiante 2000; for Japanese NCA, see Kasai 2014; for Catalan *do it*, see Busquets 2018).

b.



As well summarized in LaCara (2010) and Baltin (2012), an elliptical anaphor has syntactic material inside of it, which can thus interact with (or can be manipulated by) other syntactic processes; by contrast, a pro-form anaphor does not have any internal syntactic structure, which is thus not available to interact with any syntactic processes. In light of this contrast in syntactic accessibility, a number of syntactic phenomena, which require internal structure for inaudible material, have been put forward as diagnostic tests to distinguish elliptical anaphora from pro-form anaphora. The missing antecedent phenomenon (e.g., Grinder & Postal 1971; Hankamer & Sag 1976) and extraction phenomenon (e.g., Depiante 2000; Johnson 2001; Aelbrecht 2010) are two such examples, as illustrated in (12) and (13), respectively.

(12) a. I've never ridden a camel, but Ivan has [$_{\text{VP}}$], and he says *it* stank horribly. (*it* = the camel that Ivan has ridden)
(Hankamer & Sag 1976: 403, ex. (23))

b. * I've never ridden a camel, but Ivan has **done it**, and he says *it* stank horribly.
(Houser 2010: 10, ex. (24))

(13) a. Although I don't know who John will visit, I do know who Fred will [$_{\text{VP}}$].

b. * Although I don't know who John will visit, I do know who Fred will **do it**.
(Baltin 2012: 382, ex. (2) and (3))

The above grammaticality contrast between the examples of VP ellipsis and *do it* anaphora can be well accounted for in terms of the presence/absence of internal structure. In (12a), the VP ellipsis site involves "hidden" syntactic structure that can accommodate an element that can serve as the antecedent for the pronoun *it*, while in (12b), the pro-form *do it* has no such structure that can house a possible antecedent for the pronoun.[14] In (13a), the VP ellipsis site has internal structure, thus being available to provide a base position for a trace of wh-movement, while in (13b), the *do it* pro-form does not have any internal syntactic structure in which a trace of wh-movement can sit.

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[14] In (12a), the indefinite DP in the first conjunct, *a camel*, cannot serve as the antecedent for the pronoun *it*, since it is in the scope of negation and thus cannot introduce a (new) referent into the discourse (Heim 1982), as illustrated in (i).

(i) * I've never ridden a camel, and *it* stank horribly. (Hankamer & Sag 1976: 404, ex. (25))

Now let us return to the discussion of *do so* VP anaphora. Since the introduction of the "Deep-Surface" hypothesis of Hankamer and Sag (1976), there have been debates on whether *do so* VP anaphora in English should be classified as elliptical anaphora or pro-form anaphora. First, Hankamer and Sag (1976) (see Table 1.1) and other subsequent researchers (e.g., Ward et al. 1991; Fu et al. 2001; Stroik 2001) argue that English *do so* anaphora is a case of ellipsis, and thus has unpronounced syntactic structure. According to their view, the site of *do so* involves a more complex and full-fledged structure, whose surface representation is "replaced" (and thus "deleted") by the overt lexical string *do so*. This ellipsis analysis has often been supported by the observation that English *do so* anaphora can license the missing antecedent phenomenon, as illustrated in the sentences in (14).

(14) a. I didn't ride a camel, but Ivan must have **done so**, and now our office is infested with *its* fleas. (*it* = the camel that Ivan has ridden)
(Hankamer & Sag 1976: 418, ex. (83))

b. Jerry wouldn't read a book by Babel, but Meryl has **done so**, and *it* was pretty good. (*it* = the book by Babel that Meryl has read)
(Johnson 2001: 27, ex. (96))

However, many other researchers argue against the view that English *do so* is an elliptical anaphor, challenging the diagnostic abilities of the processes that have been proposed to support the presence of its elided structure (e.g., Hardts 1993; Kehler & Ward 1999, 2004; Depiante 2000; cf. Culicover & Jackendoff 2005; Sobin 2008; Houser 2010; cf. Hallman 2013; Bruening 2018).[15] They instead claim that English *do so* anaphora is a VP pro-form, which is a syntactically primitive element that never has internal syntactic structure.[16] The observation that wh-movement out of the site of *do so* is not available, as shown in (15a) and (15b), has been widely taken as evidence supporting the pro-form analysis of English *do so* anaphora.

On the other hand, the indefinite DP contained within the elided VP structure is not under the scope of negation, as in *Ivan has* [VP *ridden a camel*], and thus can introduce a discourse referent.

[15] Williams (1977) claims that English *do it*, which is definitely a pro-form, can invoke the missing antecedent effect on the basis of sentences like (i).

(i) John wouldn't order a new sink, so I **did it**, and of course *it* was broken when *it* arrived.
(*it* = the new sink that I ordered) (Williams 1977: 693, ex. (2))

He also adds that the missing antecedent for the pronoun *it* can be licensed through pragmatic or semantic inferences (and thus without recourse to any syntactic material). If this is indeed the case, then the missing antecedent phenomenon "cross-cuts" the ellipsis vs. pro-form distinction and, thus, should not be taken as a diagnostic for distinguishing the two classes of anaphora (see also Johnson 2001, Toosarvandani 2009, and Houser 2010 for discussions on the controversy). In light of this consideration, it might be difficult to maintain that the sentences in (14) can support the ellipsis analysis of English *do so* anaphora.

[16] See Hallman (2013: 77) for the LF-copying analysis of English *do so* anaphora, where its interpretation is assumed to be "reconstructed from that of its antecedent by LF copying of its antecedent into the position occupied by *do so*".

(15) a. * This is the book of which Bill approves, and this is the one of which he can't **do so**.
(cf. This is the book of which Bill approves, and this is the one of which he can't [$_{\text{VP}}$].)

b. * I know which book Max read, and which book Oscar hasn't **done so**.
(cf. I know which book Max read, and which book Oscar hasn't [$_{\text{VP}}$].)

(Johnson 2001: 27, ex. (97a) and (97b))

As can be seen from the discussion thus far, English *do so* VP anaphora has been prominent in the generative literature, along with other members in the predicate anaphora family (e.g., VP ellipsis and *do it* anaphora). In contrast, relatively little attention has been devoted to *do so* VP anaphora in Korean, even though it is broadly used in the language.[17,18] The following sentences are naturally occurring examples of the Korean *do so* anaphora constructions, where *kuliha* and *kulay* in (16b) and (16c) are phonological variants of *kuleha* 'do so' in (16a).[19]

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[17] *Do so* anaphora in other East Asian languages (e.g., Chinese and Japanese) has also received relatively little treatment in the literature. See, however, Wei and Li (2016) for a recent extensive study on the syntactic structure and derivation of Chinese *do so* anaphora.

[18] Very much like its English counterpart, the Korean *do so* VP anaphora construction has been frequently used as a diagnostics to establish the internal structure within the verb phrase (e.g., to distinguish complements from adjuncts), as illustrated in the sentences in (i)-(iii).

(i) Jim-i chenchenhi pap-ul mek-ess-ko, Susana-nun ppalli **kuleha**-yess-ta.
Jim-NOM slowly rice-ACC eat-PAST-CONJ Susana-TOP quickly so.do-PAST-DECL
'Jim ate the rice slowly, and Susana did so (= ate the rice) quickly.'

(ii) Jim-i chenchenhi pap-ul mek-ess-ko, Susana-to **kuleha**-yess-ta.
Jim-NOM slowly rice-ACC eat-PAST-CONJ Susana-also so.do-PAST-DECL
'Jim ate the rice slowly, and Susana did so (=ate the rice slowly), too.'

(iii) * Jim-i chenchenhi pap-ul mek-ess-ko, Susana-nun chenchenhi kimchi-lul **kuleha**-yess-ta.
Jim-NOM slowly rice-ACC eat-PAST-CONJ Susana-TOP slowly kimchi-ACC so.do-PAST-DECL
'Jim ate the rice slowly, and Susana did so (= ate) the kimchi slowly.'

(adapted from Shim & Den Dikken 2007: 8, ex.(11))

Note that the VP anaphor *kuleha* can correspond to either the minimal V' (the verb *mek* 'eat' and its object complement *pap-ul* 'rice-ACC'), as in (i), or the larger V' (the minimal V' and its adjunct *chenchenhi* 'slowly'), as in (ii), while it cannot correspond to the verb alone, as in (iii).

The Korean *do so* anaphora construction has also been used to confirm the bound variable status of the long-distance anaphor *caki* 'self' in the sloppy identity context (e.g., Kim & Yoon 2009; Han & Stroshenko 2012). See Section 3.4 of Chapter 3 for further discussion.

[19] *Do so* anaphora is the only VP anaphora that can be found in Korean. Therefore, in the rest of this dissertation, the term *Korean VP anaphora* is used to mean *do so* anaphora in Korean.

(16) a. Senkyosa-tul-un Ceycwungwon-i senkyopyengwon-i
missionary-PL-NOM Ceycwungwon-NOM missionary.hospital-NOM
twue-ess-tako sayngkakha-yess-ko, ilpanin-tul-to
become-PAST-COMP think-PAST-CONJ ordinary.person.PL-also
kuleha-yess-ta.
SO.DO-PAST-DECL
'The missionaries thought that Ceycwungwon became a missionary hospital, and ordinary people did so (= thought that Ceycwungwon became a missionary hospital), too.'
(http://storage.iseverance.com/mu$_o$bj/add-file/basic$_c$lass/3704)

b. Uysang-i mom-ul ilukhye anca-ss-ko, Wonhyo-to
Uysang-NOM body-ACC move.up sit-PAST-CONJ Wonhyo-also
kuliha-yess-ta.
SO.DO-PAST-DECL
'Uysang sat up, and Wonhyo did so (= sat up), too.'
(http://www.leeinseong.pe.kr/211)

c. Chik-un tanhohi kokay-lul ce-ess-ko, na-to **kulay**-ss-ta.
Chik-TOP flatly head-ACC shake-PAST-CONJ I-also SO.DO-PAST-DECL
'Chik flatly shook his head, and I did so (= flatly shook my head), too.'
(https://books.google.ca/books?id=UtOpAwAAQBAJpg)

There have been two competing approaches to the syntactic identity of Korean VP anaphora: (i) pro-form approaches (e.g., Bae & Kim 2012; M. K. Park 2013), in which VP anaphors are analyzed as base-generated verbal pro-forms, and (ii) ellipsis approaches (e.g., Cho 1996; Son 2006; Ha 2010; Madigan 2015; M. K. Park 2015), in which VP anaphors are analyzed as the results of phonological deletion (or replacement) of a full-fledged VP. One of the main objectives of this dissertation is to contribute to this debate. So far as I am aware, no attempt has yet been made to experimentally investigate the syntax of Korean VP anaphora. In light of this, I conducted two experimental studies designed to diagnose the presence/absence of internal syntactic structure within Korean VP anaphora (Experiment 3 and Experiment 4). More specifically, I examined whether the Korean VP anaphors can license sloppy identity readings and whether they can permit overt extraction. In Chapter 3, based on the results obtained from these two experiments, I argue that they are instances of pro-form anaphora.

Regarding the availability of a sloppy identity reading for an anaphoric item, a number of researchers have taken it as a problematic diagnostics (e.g., Depiante 2000; Houser 2010; Merchant 2013a, 2013b), due to the fact that just like the missing antecedent phenomenon, it cross-cuts the ellipsis vs. pro-form distinction (see Section 3.2 of Chapter 3 for further discussion). However, I demonstrate in Chapter 3 that, with the "great help" of the third-person pronoun *ku* 'he', the availability of a sloppy reading can be used as a reliable diagnostic to identify the syntactic status of Korean VP anaphora.

1.1.3 Null objects in Korean

In East Asian languages such as Korean, Chinese, and Japanese, object arguments (as well as subject arguments) are freely allowed to be left unexpressed.[20] This is illustrated in (17)-(19) below, where the phonologically null objects are indicated by [e] and their meanings are readily recovered.

(17) KOREAN

A: Chelswu-ka sakwa-lul mek-ess-e.
Chelswu-NOM apple-ACC eat-PAST-DECL
'Chelswu ate an apple.'

B: Yenghuy-to **[e]** mek-ess-e.
Yenghuy-also eat-PAST-DECL
'Yenghuy ate an apple, too.'

(J. S. Kim 2012: 3, ex.(7))

(18) CHINESE

A: Zhangsan bu xihuan shucai.
Zhangsan not like vegetables
'Zhangsan doesn't like vegetables.'

B: Mali ye bu xihuan **[e]**.
Mary also not like
'Mary doesn't like vegetables, either.'

(adapted from S.W. Kim 1999: 25, ex.(1))

(19) JAPANESE

A: Bill-wa tegami-o suteta.
Bill-TOP letter-ACC discarded
'Bill discarded a letter.'

B: John-mo **[e]** suteta.
John-also discarded
'John discarded a letter, too.'

(adapted from Oku 1998: 3, ex.(7))

The syntactic status of these null objects has long been one of the extensively debated issues in the literature of East Asian languages. The existing proposals can be largely grouped into two camps: (i) null pro-form approaches (e.g., Park 1997; Hoji 1998; Bae & Kim 2012), in which null objects are analyzed as base-generated empty pronominals (*pro*s), and (ii) ellipsis approaches (e.g., Otani & Whitman 1991; Oku 1998; S. W. Kim 1999; Saito 2007;

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[20] Null objects are also found in Romance languages, although they seem somewhat different from the counterparts of East Asian languages in terms of the range of possible interpretations. See, for instance, Rizzi (1986) and Farrell (1990) for null objects in Italian and Brazilian Portuguese, respectively.

Funakoshi 2016), in which null objects are analyzed as the results of phonological deletion of a full-fledged (DP or VP) structure.[21] This dissertation aims to contribute to this long-standing debate. An experimental study (Experiment 5) was conducted to examine the availability of sloppy identity readings for Korean null objects in order to diagnose the presence/absence of internal syntactic structure within them, in a similar way as in the investigation of the syntax of Korean VP anaphora in Experiment 3.[22] In Chapter 4, based on the results obtained from this experiment, I argue that Korean null objects are instances of ellipsis.

1.2 Outline

In this chapter, the motivation and the main objectives of the present study have been addressed. This section provides an overview of the chapters that follow.

Chapter 2 explores the bound variable status of Korean third-person pronoun *ku* 'he'. I present three experimental studies designed to inspect the possibility of inter-speaker variation in the availability of bound variable construal for *ku*. Experiment 1A examines whether *ku* can be construed as a bound variable. Experiment 1B examines whether there is a difference between the bound variable construal of *ku* in a single clause and across clauses. Experiment 2 examines whether Korean speakers exhibit the same judgment over time on the bound variable construal of *ku*. On the basis of the findings obtained from Experiment 1A, Experiment 1B, and Experiment 2, I aim to determine whether there exists inter-speaker variation regarding the availability of bound variable construal for *ku* and, if so, to provide a principled explanation for why and how the variation phenomenon arises and exists in Korean.

Chapter 3 explores the syntactic identity of VP anaphora in Korean. I present two experimental studies designed to identify the presence/absence of "hidden" syntactic structure within Korean VP anaphora. Building upon the findings regarding the interpretative status of the pronoun *ku*, Experiment 3 examines whether the distribution of sloppy reading for VP anaphora follows from the distribution of bound variable reading of *ku*. Experiment 4 examines whether overt extraction out of VP anaphora is available in both the short distance and long distance scrambling contexts. On the basis of the findings obtained from Experiment 3 and Experiment 4, I aim to determine whether Korean VP anaphora is an instance of VP ellipsis or VP pro-form.

Chapter 4 explores the syntactic identity of null objects in Korean. I present an experimental study designed to identify the presence/absence of "hidden" syntactic structure within null objects in Korean. In a similar way as in Experiment 3, Experiment 5 examines whether the distribution of sloppy reading for null objects follows from the distribution of bound variable reading of *ku*. On the basis of the findings obtained from Experiment 5, I aim to determine whether null objects in Korean are instances of ellipsis or null pronouns.

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[21] The ellipsis approaches, in turn, can be divided into two camps: (i) argument ellipsis analysis, in which null objects are viewed as the results of an ellipsis operation called argument ellipsis (or NP/DP ellipsis), and (ii) V-stranding VP ellipsis analysis, in which null objects are viewed as the results of VP ellipsis after verb raising. See Section 4.1 of Chapter 4 for further discussion.

[22] I also aim to demonstrate that the pronoun *ku* 'he' plays a crucial role in using the availability of a sloppy reading as a reliable diagnostics to identify the syntactic nature of Korean null objects.

Chapter 5 provides a summary of the findings of this study and concludes with some remarks and future work.

Chapter 2

Inter-speaker variation in Korean pronouns

2.1 Introduction

Pronouns are generally known to be interpreted as a bound variable when they are anaphorically linked to a Wh-phrase or a quantified expression, as in (1) and (2).[1]

(1) a. Who dislikes **his** boss?
    b. Which man did you say dislikes **his** boss?

(2) a. No man should mistreat **his** friends.
    b. Every man thinks **he** is lucky.

(Lasnik & Stowell 1991: 687, ex.(1))

The above English sentences can readily receive a bound variable interpretation where the pronoun *his* or *he* is understood as a variable bound by the Wh- or quantified matrix subject, as well as a deictic (or referential) interpretation where the pronoun refers to some male individual in the discourse (e.g., Paul). The distinction between the two interpretations in (2b) may be roughly represented as follows.

(3) a. BOUND VARIABLE READING:
    $\forall x[\text{man}(x) \longrightarrow \text{think}(x, \text{lucky}(x))]$
    [(every $x:$ x is a man) x thinks x is lucky]
    b. DEICTIC READING:
    $\forall x[\text{man}(x) \longrightarrow \text{think}(x, \text{lucky}(\text{y}))]$
    [(every $x:$ x is a man) x thinks y is lucky]

---

[1] Portions of this chapter were published in Patrick Grosz and Pritty Patel-Grosz, eds., *The Impact of Pronominal Form on Interpretation* (Berlin: De Gruyter Mouton, 2016), 349-373.

Interestingly enough, and in contrast to their English counterparts, there is no general consensus among previous studies as to whether Korean third-person pronouns *ku* 'he' and *kunye* 'she' can be construed as a bound variable.[2] That is, for some researchers, including the author, the Wh-questions and the quantificational sentences in (4) and (5) are acceptable under a bound variable reading of *ku* (e.g., Im 1987; B. M. Kang 1988; M. Y. Kang 1988; Hoji 1990; Suh 1990; Noguchi 1997; Chung 1999; Koak 2008), while for others, the same sentences are not acceptable under such a reading (e.g., Hong 1985; Choe 1988; S. H. Kang 1990; J. R. Kim 1992; Shim 1993; O. H. Kim & Kitagawa 2010; Kanno 1997; Lim 1998; N. K. Kang 2001; Kwon et al. 2009; Choi 2013; Song 2013; Y. H. Kim 2016).[3]

(4) a. Enu haksayng-i **ku**-uy kapang-ul ilepeli-ess-ni?
which student-NOM he-GEN bag-ACC lose-PAST-Q
'Which student lost his bag?'
(Y. H. Kim 2016: 48, ex.(4))

b. Nwu-ka **ku**-ka Mary-lul bo-ass-ta-ko malha-yess-ni?
who-NOM he-NOM Mary-ACC see-PAST-DECL-COMP say-PAST-Q
'Who said that he saw Mary?'
(Choi 2013: 540, ex.(51))

(5) a. Nwukwunka-ka **ku**-uy chinkwu-lul paypanha-yess-ta.
someone-NOM he-GEN friend-ACC betray-PAST-DECL
'Someone betrayed his friend.'
(Chung 1999: 134, ex.(17a))

b. Motwu-ka chayksang wuy-ey **ku**-uy chayk-ul kacyeka-ss-ta.
everyone-NOM desk on-LOC he-GEN book-ACC take-PAST-DECL
'Everyone took his book on the desk.'
(S. H. Kang 1990: 127, ex.(32))

c. Amwuto Chelswu-ka **ku**-lul coaha-n-ta-ko an
anyone Chelswu-NOM he-ACC like-PRES-DECL-COM NEG
mit-nun-ta.
believe-PRES-DECL
'No one believes that Chelswu likes him.'
(Shim 1993: 230, ex.(13a))

d. Kak salam-i **ku**-ka chencay-i-ta-ko sayngkakha-n-ta.
each person-NOM he-NOM genius-be-DECL-COMP think-PRES-DECL
'Each person thinks that he is a genius.'
(B. M. Kang 1988: 421, ex.(14))

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[2] It is to be assumed that all the arguments and conclusions made for *ku* 'he' can be equally well applied to *kunye* 'she', unless otherwise specified. Thus, *kunye* will not be mentioned hereinafter.

[3] In contrast to the bound variable reading, it is commonly agreed that the pronoun *ku* can readily induce a deictic reading in sentences such as (4) and (5).

As pointed out by Oosterhof (2008: 84), "conflicting judgments about the well-formedness of the same sentence type" in the literature may be indication that the relevant linguistic phenomenon is "subject to inter-speaker variation". If there is indeed variation among native speakers of Korean regarding the availability of a bound variable construal for *ku*, at least two issues immediately surface. First, the arguments and conclusions of the relevant studies listed above would be all invalid because they are only based on the researchers' own particular intuitions, and thus could not be taken to be representative of Korean in general. Furthermore, given the existing binding theories in the generative tradition (e.g., Chomsky 1981; Reinhart 1983, 1986; Grodzinsky & Reinhart 1993), that one pronominal element exhibits two contradictory binding possibilities must be considerably challenging to account for.[4]

The overarching goal of this chapter is to establish a solid and extensive empirical base for obtaining a complete and precise picture of the interpretative status of Korean (third-person) pronouns. To meet this objective, three experimental studies (Experiments 1A, 1B, and 2) were carried out. It was found that some speakers of Korean consistently accepted the quantificational binding of the pronoun *ku* while other speakers of Korean consistently rejected it, thus substantiating an existence of inter-speaker variation in the bound variable construal for *ku*.

Another primary goal of this chapter is to provide a principled account for why and how the phenomenon of inter-speaker variation arises and exists in Korean and how it can be captured in binding-theoretic terms. Taking into consideration the historical background of *ku* and its present status, I have come to the conclusion that child learners of Korean may not receive sufficient and clear evidence regarding the grammar of *ku* from the primary language input data. Following Han, Lidz, and Musolino (2007), I propose that due to such a deficiency in input, the child learners must randomly "choose" between two competing grammars of *ku*, only one of which allows a bound variable construal, and this thus results in two different groups of speakers in the Korean speech community. I then attempt to provide theoretical support for this line of analysis by adopting the pronominal typology in Déchaine and Wiltschko (2002), wherein each type of pronoun has a distinct binding-theoretic status.

2.2 Theoretical Background

In this section, I review the existing treatments of the availability of pronominal binding in a variety of languages, which may be divided into three groups: competition-based approaches, constraint-based approaches, and structural approaches. I then attempt to evaluate whether and how they can be adapted to elucidate the status of Korean pronouns.

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[4] Following Tanya Reinhart's theory of anaphora, I assume that there are two types of pronominal anaphora, variable binding and coreference, and that the Binding Conditions (i.e., the grammar) only governs variable binding.

2.2.1 Competition-based Approach

It has been widely reported in the literature that the so-called pro-drop languages generally do not allow overt pronouns to have a bound variable interpretation. Consider the following sets of sentences in various pro-drop languages.

(6) FARSI

a. Che kasi$_1$ goft ke *pro*$_1$ yek ketab kharid?
what one say.PAST COMP a book buy.PAST
'Who$_1$ said that he$_1$ bought a book?'

b. * Che kasi$_1$ goft ke **oo**$_1$ yek ketab kharid?
what one say.PAST COMP he a book buy.PAST
'Who$_1$ said that he$_1$ bought a book?'

(Tayyebi et al. 2011: 222, ex.(1a) and (1c))

(7) SPANISH

a. Nadie$_1$ cree que *pro*$_1$ es inteligente.
nobody believe.PRES COMP be.PRES intelligent
'Nobody$_1$ believes that he$_1$ is intelligent.'

b. * Nadie$_1$ cree que **él**$_1$ es inteligente.
nobody believe.PRES COMP he be.PRES intelligent
'Nobody$_1$ believes that he$_1$ is intelligent.'

(Montalbetti 1984: 93, ex.(33a) and (33b))

(8) ITALIAN

a. Ogni studente$_1$ crede che *pro*$_1$ è intelligente.
every student think.PRES COMP be.PRES intelligent
'Every student$_1$ thinks that he$_1$ is intelligent.'

b. * Ogni studente$_1$ crede che **lui**$_1$ è intelligente.
every student think.PRES COMP he be.PRES intelligent.
'Every student$_1$ thinks that he$_1$ is intelligent.'

(Carminati 2013: 3, ex.(1a) and (1b))

(9) CHINESE

a. Meige ren$_1$ xiwang *pro*$_1$ neng xingfu.
every man wish can happy
'Everybody$_1$ wishes that he$_1$ can be happy.'

b. * Meige ren$_1$ xiwang **ta**$_1$ neng xingfu.
every man wish he can happy
'Everybody$_1$ wishes that he$_1$ can be happy.'

(Xu 1986: 87, ex.(44) and (46))

(10) JAPANESE

a. Dono gakusei$_1$-mo *pro*$_1$ katu to omotte-iru.
every student-PART win COMP think-PRES
‘Every student$_1$ thinks that he$_1$ will win.’

b. * Dono gakusei$_1$-mo **kare**$_1$-ga katu to omotte-iru.
every student-PART he-NOM win COMP think-PRES
‘Every student$_1$ thinks that he$_1$ will win.’

(Yashima 2015: 1422, ex.(1) and (4))

In the (a) examples, the null pronouns (*pro*) in the embedded subject position can take Wh-phrase or quantifier antecedents while the corresponding overt pronouns in the (b) examples cannot.[5] According to the competition-based approach, this null/overt asymmetry can be accounted for by postulating that overt pronouns cannot be construed as a bound variable if their “competitors”, null pronouns, can be so construed in the same syntactic position (e.g., Montalbetti 1984; Kanno 1997; Pérez-Leroux & Glass 1999; White 2003).[6] Consider now the following sets of sentences in non-pro-drop languages.

(11) ENGLISH

a. * Every student thinks that *pro* is intelligent.

b. Every student$_1$ thinks that **he**$_1$ is intelligent.

(12) GERMAN

a. * Jeder Schuler denkt dass *pro* intelligent ist.
every student think.PRES COMP intelligent be.PRES

b. Jeder Schuler$_1$ denkt dass **er**$_1$ intelligent ist.
every student think.PRES COMP he intelligent be.PRES
‘Every student$_1$ thinks that he$_1$ is intelligent.’

(13) FRENCH

a. * Personne pense que *pro* est intelligent.
nobody think.PRES COMP be.PRES intelligent

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[5] Note that the overt pronouns in (6)-(10) can all induce a deictic interpretation.

[6] The competition-based approach was originally put forth by Montalbetti (1984: 94) with the name ‘Overt Pronoun Constraint’.

(i) OVERT PRONOUN CONSTRAINT:
Overt pronouns cannot link to formal variables if and only if the alternation empty/overt obtains.

Note that Montalbetti (1984: 48) defines a ‘formal variable’ as follows.

(ii) Formal variable x is a formal variable iff (i) x is an empty category in an argument position; and (ii) x is linked to a lexical operator in a non-argument position [(e.g., Wh-traces or traces of quantifier raising)].

b.

Personne	pense	qu'**il**	est	intelligent.
nobody	think.PRES	COMP.he	be.PRES	intelligent

'Nobody$_1$ thinks that he$_1$ is intelligent.'

(Fonseca-Greber 2002: 774, ex.(8a) and (8b))

In contrast to their equivalents in pro-drop languages, the overt pronouns in English, German, and French can all involve quantificational binding, as shown in the (b) examples above. This can also be easily captured by the competition-based approach because the grammar of these languages does not license null pronominal subjects in embedded clauses, as illustrated in the (a) examples above, and thus the corresponding overt pronouns would "never" compete with any alternative to obtain a bound variable interpretation.

A fundamental problem with the competition-based approach, however, is that it does not always yield correct predictions about the binding behaviours of overt pronouns in pro-drop languages.[7] In Shuswap, for example, not only a null pronoun but also an overt pronoun can be used to obtain a bound variable interpretation, as illustrated below.[8]

(14) SHUSWAP

a.

Xwexweyt$_1$	re	swet	xwis-t-∅-es	*pro*$_1$	re	qe7tse-s.
all	DET	who	like-TR-3SG.OBJ-3SUB		DET	father-3SG.POSS

'Everyone$_1$ likes his$_1$ own father.'

b.

Xwexweyt$_1$	re	swet	xwis-t-∅-es	**newi7-s**$_1$	re	qe7tse-s.
all	DET	who	like-TR-3SG.OBJ-3SUB	EMPH-3SG	DET	father-3SG.POSS

'Everyone$_1$ likes HIS$_1$ own father.'

(adapted from Lai 1998: 31, ex.(21a) and (21b))

Under the competition-based approach, it would be predicted that the overt pronoun *newi7-s* should not take a quantified antecedent, contrary to (14b), because the overt pronoun would "lose" to the null pronoun in the competition for a bound variable interpretation. In fact, given that Korean is also a pro-drop language, the two conflicting intuitions on the binding behaviour of *ku* would also be a counterexample to the notion of competition, since

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[7] Note that the Japanese long-distance anaphor *zibun* 'self' can also be interpreted as a bound variable in the context of (10), as shown in (i).

(i)

Daremo$_1$-ga	**zibun**$_1$-ga	atama-ga	ii	to	omotte-iru.
everyone-NOM	self-NOM	head-NOM	good	COMP	think-PRES

'Everyone$_1$ thinks that he$_1$ is intelligent.'

As pointed out by Gürel (2006: 263), the fact that "[*zibun*] can pattern with the null pronoun in bound variable contexts" would pose a problem to the competition-based approach because it would not be easy to account for why only *kare*, but not *zibun*, should compete with and lose out to the null pronoun for a bound variable interpretation.

[8] Shuswap (also known as Secwepemctsin) is a Northern Interior Salish language spoken in the interior of British Columbia, Canada.

ku would be uniformly predicted not to be construed as a bound variable. Consider now the following Japanese sentences.

(15) a. * Daremo$_1$-ga Mary-ga *pro*$_1$ sitteiru-to it-ta.
everyone-NOM Mary-NOM know-COMP say-PAST
'Everyone$_1$ said that Mary knew him$_1$.'

b. * Daremo$_1$-ga Mary-ga **kare**$_1$-o sitteiru-to it-ta.
everyone-NOM Mary-NOM he-ACC know-COMP say-PAST
'Everyone$_1$ said that Mary knew him$_1$.'

(Noguchi 1997: 774, ex.(15))

Recall from the examples of non-pro-drop languages, (11)−(13), that the competition-based approach would predict an overt pronoun to be bindable in a syntactic context where a competition with a null pronoun would never hold.[9] Such a prediction is *not* always borne out, however. In Japanese, for instance, a null pronoun cannot be construed as a bound variable in the embedded object position, as illustrated in (15a), but still the overt pronoun *kare* 'he' cannot be used as a bound variable in the same position (Noguchi 1997), as illustrated in (15b).[10] Given the discussions so far, it can be concluded that the notion of competition cannot capture the precise distribution and interpretation of overt pronouns in pro-drop languages.

2.2.2 Constraint-based Approach

Several constraint-based explanations have been given in the literature to account for the data of pro-drop languages discussed above. For instance, syntactic constraints such as those in (16) have been put forward for the widely-documented observation that Japanese third-person pronouns cannot be bound (but can only refer), as in (17) (repeated from (10b)).[11]

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[9] In Spanish (and probably many other pro-drop languages), a null pronoun is not licensed in the prepositional object position (e.g., Montalbetti 1984; Pérez-Leroux & Glass 1999), as the ungrammaticality of (i) indicates. Under the competition-based approach, this constitutes a context where no null vs. overt competition would exist, and it would be thus predicted that the bound variable use of an overt pronoun is legitimate in this context. This prediction seems to be borne out, as illustrated in (ii).

(i) * Todo el mundo dice que el presidente habla de *pro*.
everyone says COMP the president speaks of him

(ii) Todo el mundo$_1$ dice que el presidente habla de **él**$_1$.
everyone says COMP the president speaks of him
'Everyone$_1$ says that the president speaks of him$_1$.'

(Pérez-Leroux & Glass 1999: 227, ex.(13), originally from Campos 2002)

[10] One might attempt to argue that in (15), both the null pronoun and *kare* 'he' cannot be interpreted as bound by the quantified matrix subject, since *zibun* 'self' can be so interpreted, as shown in (i).

(i) Daremo$_1$-ga Mary-ga **zibun**$_1$-o sitteiru-to it-ta.
everyone-NOM Mary-NOM he-ACC know-COMP say-PAST
'Everyone$_1$ said that Mary knew him$_1$.'

This line of argument, however, fails to explain examples like (10), where the null pronoun as well as *zibun* can receive a bound variable interpretation. See M. Y. Kang (1988: 195) for a similar argument.

(16) a. *Kare* must be Ā-free. (Aoun & Hornstein 1992: 5)
b. *Kare* must be operator-free. (Katada 1991: 307)

(17) * Dono gakusei$_1$-mo **kare**$_1$-ga katu to omotte-iru.
every student-PART he-NOM win COMP think-PRES
'Every student$_1$ thinks that he$_1$ will win.'

Following May (1977, 1985) in assuming that quantifiers undergo Quantifier Raising (QR) to a TP-adjoined position, Aoun and Hornstein (1992) and Katada (1991) attribute the ill-formedness of (17) to the fact that *kare* is either Ā-bound or operator-bound, thus violating the constraint in either (16a) or (16b).[12]

Hong (1985) also proposes a constraint, as stated in (18), which is intended to account for the contrast between the binding properties of overt pronouns in pro-drop and non-pro-drop languages.

(18) Constraint on Pronominal Binding:

a. Overt pronouns must be Ā-free at LF in pro-drop languages.
b. Overt pronouns must be *locally* Ā-free at LF in non-pro-drop languages.

(adapted from Hong 1985: 95)

(19) local binding:
X locally binds Y if X binds Y and there is no Z such that X binds Z and Z binds Y.

(Chomsky 1984/1986: 164-165)

Adopting Chomsky's (1984/1986) definition of local binding given in (19), Hong maintains that overt pronouns in pro-drop languages cannot be Ā-bound at all; on the other hand, overt pronouns in non-pro-drop languages can be Ā-bound as long as they are non-locally Ā-bound. This cross-linguistic difference is illustrated in (20a) and (20b), where the LF representation for the Japanese sentence in (17) cannot be assigned a bound variable interpretation, but the LF representation for the corresponding English sentence can.[13]

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[11] Contrary to the "standard" observation, however, it has been reported by some researchers (e.g., Hoji et al. 1999; Hara 2002; Yashima 2015) that *kare* 'he' and *kanozyo* 'she' can be construed as bound variables under certain conditions. In footnote 54, I present Yashima's (2015) analysis of the interpretative status of Japanese third-person pronouns, including the above seemingly contradictory observations, and discuss how it can theoretically support the proposal of this chapter regarding the inconsistent binding properties of Korean third-person pronouns.

[12] Katada claims that "A-positions occupied at LF imply operators in the necessary and sufficient sense" (p.307), and thus (16b) is another way of saying (16a).

[13] Hong adopts Chomsky's (1981: 330) definition of 'variable', as stated in (i).

(20) a. * Dono gakuse$_1$-mo [t_1 [**kare**$_1$-ga katu to] omotte-iru.]
b. Every student$_1$ [t_1 thinks [that **he**$_1$ will win.]]

Under Hong's approach, the LF in (20a) is not legitimate in that the embedded subject *kare* is Ā-bound (i.e., is not Ā-free), thus violating the constraint in (18a).[14] The LF in (20b), on the other hand, is taken to be legitimate in that the embedded subject *he* is not locally Ā-bound due to another binder, the trace of the QR'd matrix subject (i.e., is locally Ā-free), thus abiding by the constraint in (18b).

As pointed out by Noguchi (1997: 772), however, an essential problem with the above constraint-based treatments is that a proposed constraint is merely a circular description of the given phenomenon that invites a circular question, and is thus "a restatement of the problem rather than a solution thereof".[15] Under Aoun and Hornstein's (1992) proposal, for instance, the unavailability of a bound variable construal for *kare* is attributed to the constraint that *kare* must be Ā-free, but it then raises another question: why must *kare* be Ā-free? Similarly, with regard to the issue of accounting for the inconsistent binding property of the Korean pronoun *ku*, it would not be satisfactory to simply suggest a "novel" constraint such as "*ku* may or may not be Ā-free", which would again bring up the question as to why it should be so.

2.2.3 Structural Approach

In this subsection, I briefly review three structural approaches to the different binding properties of pronouns in various languages, which have been proposed by Noguchi (1997), Panagiotidis (2002), and Déchaine and Wiltschko (2002), respectively.

(i) α is a variable if and only if it is locally Ā-bound and is in an A-position.

Notice that the traces left by QR and the pronouns in (20) are variables by definition.

[14] Similarly, Hong argues that the Korean pronoun *ku* cannot be construed as a bound variable, as illustrated in (i).

(i) * Nwukwuna$_1$ [t_1 [**ku**$_1$-ka toktokha-ta-ko] sanggakha]-n-ta.
everyone he-NOM intelligent-DECL-COMP think-PRES-DECL
'Everyone$_1$ thinks that he$_1$ is intelligent.' (Hong 1985: 96, ex.(50b))

Note also that Hong uses the constraints in (18) to explain the standard weak crossover (WCO) cases, as shown in the English and Korean examples in (ii) and (iii).

(ii) * **His**$_1$ mother loves everyone$_1$.
LF: Everyone$_1$ ... **his**$_1$ ...... t_1

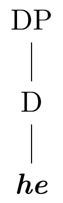
(iii) * **Ku**$_1$-uy umma-ka nwukwuna$_1$-lul sarangha-n-ta.
he-GEN mother-NOM everyone-ACC love-PRES-DECL
LF: Nwukwuna$_1$ ... **ku**$_1$ ...... t_1

In (ii), *his* is locally Ā-bound at LF, and thus violates the constraint in (18a), while in (iii), *ku* is Ā-bound at LF, and thus violates the constraint in (18b).

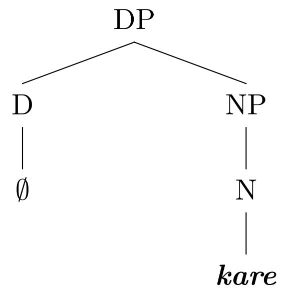
[15] See also Elbourne (2005) for a similar argument.

Following Reinhart (1983, 1986) and Grodzinsky and Reinhart (1993), the three structural approaches share the assumption that there are, at least, two types of anaphoric relations in natural language, (variable) binding and coreference, and that only the former is constrained by the Binding Conditions. They also agree that the cross-linguistic differences in the availability of bound variable construal of pronouns do not derive from some parametric variation within the Binding Theory (e.g., different binding domains), but from different structural characteristics of the pronouns themselves (cf. Déchaine and Wiltschko 2003). However, the fundamental difference between Noguchi (1997) and Panagiotidis (2002) on the one hand and Déchaine and Wiltschko (2002) on the other is whether the grammar (i.e., the Binding Conditions) is sensitive to differences in internal structural organization of pronouns or to differences in their syntactic projections or categories. Consider first (21) from Noguchi (1997: 783) (with irrelevant details suppressed).

(21) a. D-pronoun



b. N-pronoun



Noguchi proposes that languages can have two types of pronouns: D-pronouns that behave like a determiner and N-pronouns that behave like a lexical noun, which English *he* and Japanese *kare* respectively fall into.[16] We see in (21a) and (21b) that within the DP structure, *he* is located at the D node, but *kare* is located at the N node. Crucially, assuming the hypothesis that binding can only apply to functional, not lexical, items such as determiners while coreference can apply to both functional and lexical items, Noguchi claims that D-PRONOUNs can be bound as well as be coreferential, but N-PRONOUNs can only be coreferential.[17]

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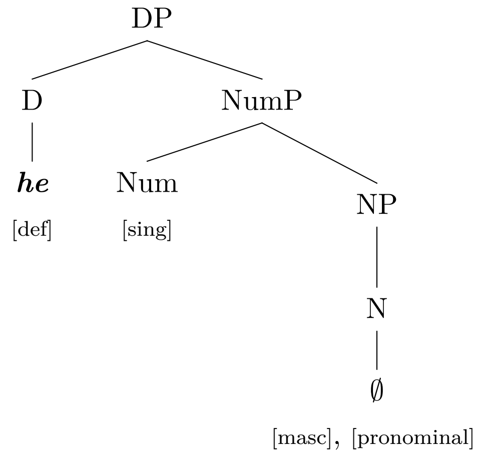
[16] Assuming that lexical items are generally modifiable while functional items are not, Noguchi claims that Japanese pronouns *kare* 'he' and *kanozyo* 'she' are noun-like elements rather than determiner-like elements, citing the fact that just like common nouns, they can be modified by attributive adjectives, as in (i), or by demonstrative determiners, as in (ii) (see also Fukui 1988 for a similar argument). In contrast, English pronouns generally do not take such modifiers, as evident from the unacceptable literal translations in English given below.

(i) a. futota **kare**
fat he
(lit.) 'fat he'

Panagiotidis (2002: 36) adopts Noguchi's (1997) pronominal typology, sharing the core assumptions and claims therein, as illustrated in (22).

(22) a. D-PRONOUN



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b. ryokitekina **kanozyo**
bizarre she
(lit.) 'bizarre she'

(ii) a. kono **kare**
this he
(lit.) 'that he'

b. ano **kanozyo**
that she
(lit.) 'that she' (Noguchi 1997: 777, originally from Kuroda 1965)

Note also that *kare* and *kanozyo* can mean 'boyfriend' and 'girlfriend', as in the following naturally occurring examples, while their English counterparts *he* and *she* cannot.

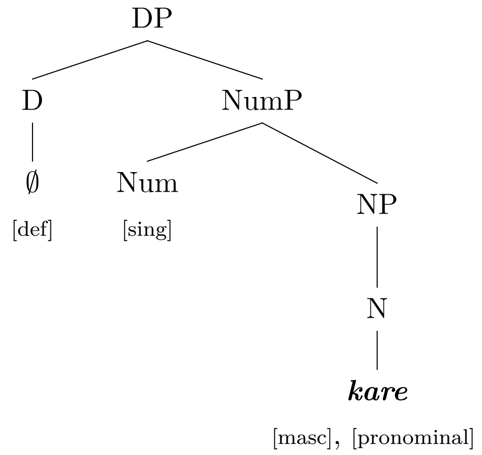
(iii) a. Watashi-mo kankokujin-no **kare**-ga imasu.
I-also Korean-GEN boyfriend-NOM exist
'I also have a Korean boyfriend.'

b. Airi-ga anata-no **kanozyo**-ni!?
Airi-NOM you-GEN girlfriend-Q
'Airi is your girlfriend!?' (Google)

According to Noguchi, the above cross-linguistic contrast can be attributed to the lexical/functional distinction since, he argues, only lexical categories can undergo semantic shift. In footnote 55, I present that the Korean counterparts *ku* and *kunye* can be modified by adjectives, but not by demonstrative determiners, and that they show no such semantic changes. I then discuss the implications of these observations for the main proposal of this chapter.

[17] Noguchi classifies Korean pronouns *ku* 'he' and *kunye* 'she' as D-PRONOUNs, not as N-PRONOUNs, citing M. Y. Kang's (1988) examples which demonstrate that the pronouns can be construed as bound variables.

b. N-pronoun

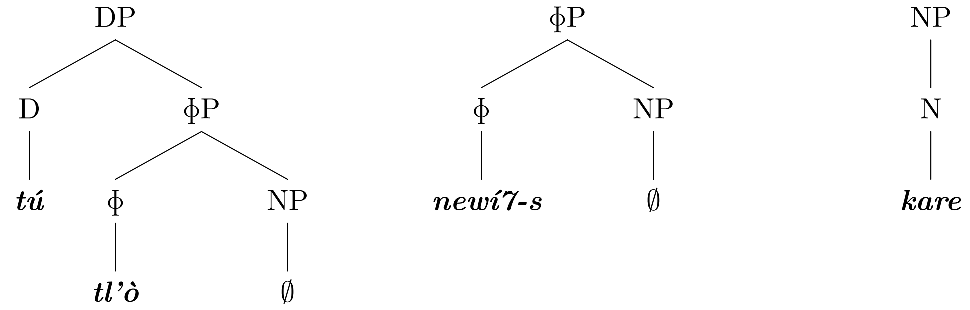


(Panagiotidis 2002: 36)

Panagiotidis' structural approach, however, is distinct from Noguchi's since it assumes that every pronominal DP has a complex structure (i.e., has a NumP projection), and *always* contains either a null or overt noun (phrase) that bears a [pronominal] feature, which, he argues, distinguishes pronouns from "ordinary" nouns that carry concept-denoting (or descriptive) features (cf. Postal 1969; Abney 1987). Note that the D-pronoun *he* in (22a) accommodates a phonologically null NP, and thus is not an intransitive determiner (i.e., is not a determiner with no NP complement), in contrast to Noguchi's D-pronoun *he* in (21a). From a purely syntactic perspective, the structural approaches of Noguchi and Panagiotidis can be said to imply that the availability of a bound variable construal for a pronoun is determined by its internal syntactic make-up, i.e., whether it is placed at D or N within a DP projection.

Déchaine and Wiltschko (2002), on the other hand, propose that there are (at least) three types of pronouns across languages: Pro-DP, Pro-ϕP, and Pro-NP.

(23) a. Pro-DP b. Pro-ϕP c. Pro-NP



(Dechaine & Wiltschko 2002: 401)

Assuming that the grammar of binding can only "see" the external category of a pronoun, Déchaine and Wiltschko (2002: 410-411) argue that the three types of pronouns are not uniformly DPs (cf. Postal 1969; Abney 1987), but project to different syntactic categories, DP, ϕP, and NP, each exhibiting a distinct binding-theoretic property. First, Pro-DPs accommodate a "true DP shell", and are demonstrably definite. They thus function like R-expressions, subject to Binding Condition C. Pro-ϕPs, on the other hand, correspond to "any intermediate functional projection that intervenes between D and N" (e.g., NumP), and encode ϕ-features (e.g., number, gender, and person). They play the role of variables, and thus be equivalent to the standard "Condition B pronouns". Pro-NPs are like lexical nouns, and are inherently semantically constants, undefined regarding its binding-theoretic status.[18] Accordingly, in Déchaine and Wiltschko's theory, only Pro-ϕPs (e.g., Shuswap *newí7-s* 'he or she' and English *he*) can be interpreted as a bound variable while Pro-DPs (e.g., (Upriver) Halkomelem *tú-tl'ò* (DET-3SG) 'he' and *thú-tl'ò* (DET.FEM-3SG) 'she') and Pro-NPs (e.g., Japanese *kare* 'he') cannot.[19] It is noteworthy that the so-called independent (emphatic) pronouns in Halkomelem and Shuswap, both of which belong to the Salish language family, exhibit contrasting binding properties, as shown in (24) and (25).[20]

(24) HALKOMELEM

*Mək'^{w}	t$^{\theta}$ə	swaw'ləs$_1$	ni^{ʔ}	ɬəq'^{w}ənət	θə	sqe^{ʔ}əts	**t$^{\theta}$ə-w'-niɬ$_1$**
all	DET	boy	AUX	strike-TR	DET	younger.sibling-3GEN	DET-LINK-3SG

'Every boy$_1$ hit HIS$_1$ younger sister.'

(25) SHUSWAP

Xwexweyt$_1$	re	swet	xwis-t-∅-es	**newi7-s$_1$**	re	qe7tse-s.
all	DET	who	like-TR-3SG.OBJ-3SUB	EMPH-3SG	DET	father-3SG.POSS

'Everyone$_1$ likes HIS$_1$ father.' (repeated from (14))

Crucially, in contrast to Noguchi (1997), but similar to Panagiotidis (2002), Déchaine and Wiltschko (2002) claim that pronouns *always* maintain their non-maximal projections; that is, Pro-DPs always contain a ϕP and an NP, and Pro-ϕPs an NP. Moreover, the NPs can be phonologically null, as shown in (23a) and (23b) (marked with '∅'), "resulting in the 'pronominal' use of the pronoun[s]"(p.412).

---

[18] Déchaine and Wiltschko (p.411) propose that "[t]he categorical status of these pronominal categories determines their external syntax and their inherent semantics, which in turn determines their binding-theoretic status". This is illustrated in the following table.

(i) *Nominal proform typology*

Category	Pro-DP	Pro-ϕP	Pro-NP
Internal syntax	D syntax	neither D or N syntax	N syntax
Distribution	argument	argument or predicate	predicate
Semantics	definite	—	constant
Binding-theoretic status	R-expression	variable	—

[19] Halkomelem is a Central Coast Salish language spoken in an area of southwestern British Columbia, Canada, and has three principal dialects: Upriver, Downriver, and Island Halkomelem.

[20] (24) is an Island Halkomelem example from my course project paper for LING 811 (First Nations Language), Simon Fraser University, in 2012.

Before ending this section, the point that must be underscored is that in all the three structural approaches discussed so far, the availability of bound variable construal for pronouns is accounted for by the intrinsic essential nature of the pronouns themselves, rather than by the "external" factors such as competition with their alternatives (competition-based approaches) or the nature of their antecedents (constraint-based approaches). Considering the earlier discussion on the problems with the two non-structural approaches, the structural approaches seem to provide a more principled explanation on the issue in question. However, the reported contrasting binding possibilities of the Korean pronoun *ku* is still difficult for the structural approaches to deal with, since these approaches, in principle, assume that the binding property of a given pronoun correlates (in a one-to-one fashion) with the type it belongs to. If there indeed exists inter-speaker variation regarding the bound variable use of *ku*, a possible approach compatible with structural approaches would be to postulate that a single pronoun may fall under two distinctive structural types. In Section 2.5, I will adopt this line of approach and attempt to capture the aforementioned variation of *ku* by postulating two different types of *ku*, each with a distinct binding property.

2.3 Experiment 1

As noted in the outset of this chapter, much disagreement exists in the literature as to the availability of a bound variable construal for *ku*, but there appears to be a lack of empirical research that have attempted to illuminate the exact nature of *ku*. Therefore, two truth-value judgment (TVJ) task experiments (Experiment 1A and Experiment 1B) were conducted, and it was found that while some speakers of Korean consistently allowed *ku* to take a quantified antecedent, other speakers of Korean consistently did not.[21] This empirical finding strongly suggests that there is robust inter-speaker variation regarding the bindability of *ku*.

Before moving on to discuss the methods and findings of Experiments 1A and 1B, it should be emphasized that in contrast to the pronoun *ku*, the long-distance anaphor *caki* 'self' and the null pronoun can readily yield a bound variable interpretation, as illustrated in (26a) and (26b), indicating that native speakers of Korean *do* have knowledge of variable binding.

(26)	a.	Motwu$_1$-ka	{**caki**$_1$-uy/*pro*$_1$}	emeni-lul	salangha-n-ta.
		everyone-NOM	self-GEN	mother-ACC	love-PRES-DECL

---

[21] The TVJ task is an experimental methodology for investigating whether a certain interpretation assigned to a sentence can be licensed by a participant's grammatical competence (Crain & McKee 1985; Crain & Thornton 1998; Gordon 1998). In a typical TVJ task, a discourse context is provided in a story acted out in front of a participant usually using toys, and the participant is asked to judge whether the target sentence is true in the provided context. The TVJ task was originally designed to assess children's linguistic competence. However, since this method has several advantages, such as reducing performance variables (Gordon 1998), it has also been popularly adopted in the literature to investigate adults' grammars.

‘Everyone$_1$ loves his$_1$ mother.’

b. Motwu$_1$-ka {**caki**$_1$-ka/*pro*$_1$} chwukkwu-lul cal ha-n-ta-ko
everyone-NOM self-NOM soccer-ACC well do-PRES-COMP-DECL
sayngkakha-n-ta.
think-PRES-DECL
‘Everyone$_1$ thinks that he$_1$ plays soccer well.’

Note also that it is commonly accepted that *ku* and the null pronoun can receive an (intrasentential) coreferential reading, as illustrated in (27a) and (27b).[22,23]

(27) a. Minswu$_1$-ka {**ku**$_1$-uy/*pro*$_1$} emeni-lul salangha-n-ta.
Minswu-NOM he-GEN mother-ACC love-PRES-DECL
‘Minswu$_1$ loves his$_1$ mother.’

b. Minswu$_1$-ka {**ku**$_1$-ka/*pro*$_1$} chwukkwu-lul cal ha-n-ta-ko
Minswu-NOM he-NOM soccer-ACC well do-PRES-DECL-COMP
sayngkakha-n-ta.
think-PRES-DECL
‘Minswu$_1$ thinks that he$_1$ plays soccer well.’

2.3.1 Experiment 1A

Experiment 1A was conducted to address the following research question.[24]

(28) RESEARCH QUESTION:
Can the Korean pronoun *ku* be construed as a bound variable?
(Is there inter-speaker variation regarding the bound variable use of *ku*?)

---

[22] *Caki* ‘self’ is also available at the position of *ku* and the null pronoun in (27a) and (27b), and is construed as a bound variable (e.g., Cho 1996; Kim & Yoon 2009; Han & Storoshenko 2012).

(i) Minswu$_1$-ka **caki**$_1$-uy emeni-lul salangha-n-ta.
Minswu-NOM self-GEN mother-ACC love-PRES-DECL
‘Minswu$_1$ loves his$_1$ mother.’

(ii) Minswu$_1$-ka **caki**$_1$-ka chwukkwu-lul cal ha-n-ta-ko sayngkakha-n-ta.
Minswu-NOM self-NOM soccer-ACC well do-PRES-DECL-COMP think-PRES-DECL
‘Minswu$_1$ thinks that he$_1$ plays soccer well.’

[23] It is a generally accepted claim that a pronoun can be anaphorically related to a referential antecedent via binding as well as coreference. Therefore, one might reasonably say that the attested readings with *ku* in (27) could have been obtained through the binding mechanism. This issue will be touched upon in Chapters 3 and 4, instead of in the current chapter.

[24] The work based on Experiment 1A was presented as a poster at the 22nd Japanese/Korean Linguistics Conference at NINJAL, Japan, in October 2012.

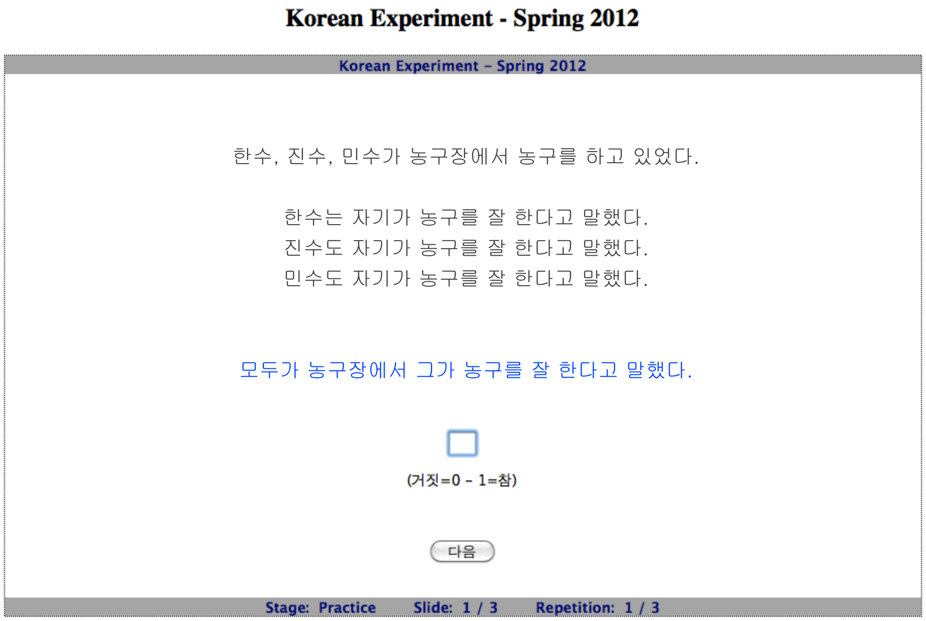
2.3.1.1 Methodology

2.3.1.1.1 Participants

Eighteen adult native Korean speakers living in Vancouver, Canada, participated in Experiment 1A.[25] Socio-linguistic factors such as gender, age, and social status were assumed to not be associated with bound variable anaphora, and thus were not controlled in this experiment. In order to minimize the probable L2 influence on L1 judgment, however, participants were required to have spent no more than 5 months living in countries other than Korea and to have never attended any non-Korean schools before the age of 16. The participants were aged between 19 and 29 (the mean age was 23). Most of them were ESL students, and the rest were visitors with working holiday visas.

2.3.1.1.2 Task

A TVJ task was employed in Experiment 1A. First, sentences describing a context followed by a target sentence were presented to participants on a computer screen. The participants were then asked to judge if the target sentence truthfully described the given context by entering 1 for 'True' and 0 for 'False' (see Figure 2.1 below).



Korean Experiment - Spring 2012

Korean Experiment – Spring 2012

한수, 진수, 민수가 농구장에서 농구를 하고 있었다.

한수는 자기가 농구를 잘 한다고 말했다.
진수도 자기가 농구를 잘 한다고 말했다.
민수도 자기가 농구를 잘 한다고 말했다.

모두가 농구장에서 그가 농구를 잘 한다고 말했다.

□
(거짓=0 – 1=참)

Stage: Practice Slide: 1 / 3 Repetition: 1 / 3

Figure 2.1: Screenshot of a test trial in Experiment 1A

---

[25] All experimental sessions were conducted in a classroom on the Burnaby campus of Simon Fraser University.

ANTECEDENT TYPE	PRONOUN TYPE
Quantificational	Overt
	Null
Referential	Overt
	Null

Table 2.1: Test conditions in Experiment 1A

2.3.1.1.3 Design and Materials

Each target sentence was a complex sentence containing an embedded clause, where the matrix subject was either *motwu* 'everyone' or a proper name, and the embedded subject was *ku* or a null pronoun. Each context was biased towards an interpretation of the embedded subject anaphorically linked to the matrix subject. Hence, two within-subjects factors were crossed to create four conditions: ANTECEDENT TYPE (Quantificational vs. Referential) × PRONOUN TYPE (Overt vs. Null). Table 2.1 above summarizes the experimental design.

Consider now a sample set of test items, given in (29)-(32), where the target sentences are in boldface.[26]

(29) QUANTIFICATIONAL-OVERT condition:

Hanswu, Cinswu, Minswu-ka nongkwucang-eyse nongkwu-lul ha-ko
Hanswu, Cinswu, Minswu-NOM basketball.court-at basketball-ACC do-PROG
iss-ess-ta. Hanswu-ka caki-ka nongkwu-lul cal ha-n-tako
PAST-DECL Hanswu-NOM self-NOM basketball-ACC well do-PRES-COMP
malha-yess-ta. Cinswu-to caki-ka nongkwu-lul cal ha-n-tako
say-PAST-DECL Cinswu-also self-NOM basketball-ACC well do-PRES-COMP
malha-yess-ta. Minswu-to caki-ka nongkwu-lul cal ha-n-tako
say-PAST-DECL Minswu-also self-NOM basketball-ACC well do-PRES-COMP
malha-yess-ta.
say-PAST-DECL

'Hanswu, Cinswu, and Minswu were playing basketball at a basketball court. Hanswu said that he plays basketball well. Cinswu also said that he plays basketball well. Minswu also said that he plays basketball well.'

Motwu-ka nongkwucang-eyse ku-ka nongkwu-lul cal
everyone-NOM basketball.court-at he-NOM basketball-ACC well
ha-n-tako malha-yess-ta.
do-PRES-COMP say-PAST-DECL

---

[26] A complete set of all test items can be found in Appendix A. In Experiment 1A and the other two experiments (1B and 2), each condition appeared four times. In each instance, the background scenes, characters, places, and topics were different. For the names of characters, typical Korean male names were used.

‘Everyone said at a basketball court that he plays basketball well.’

(30) QUANTIFICATIONAL-NULL condition:
(context sentences are the same as those in (29))

Motwu-ka **nongkwucang-eyse** *pro* **nongkwu-lul** **cal**
everyone-NOM basketball.court-at basketball-ACC well
ha-n-tako **malha-yess-ta**.
do-PRES-COMP say-PAST-DECL

‘Everyone said at a basketball court that he plays basketball well.’

(31) REFERENTIAL-OVERT condition:

Hanswu, Cinswu, Minswu-ka nongkwucang-eyse nongkwu-lul ha-ko
Hanswu, Cinswu, Minswu-NOM basketball.court-at basketball-ACC do-PROG
iss-ess-ta. Hanswu-ka caki-ka nongkwu-lul cal ha-n-tako
PAST-DECL Hanswu-NOM self-NOM basketball-ACC well do-PRES-COMP
malha-yess-ta.
say-PAST-DECL

‘Hanswu, Cinswu, and Minswu were playing basketball at a basketball court. Hanswu said that he plays basketball well.’

Hanswu-ka **nongkwucang-eyse** **ku-ka** **nongkwu-lul** **cal** **ha-n-tako**
Hanswu-NOM basketball.court-at he-NOM basketball-ACC well do-PRES-COMP
malha-yess-ta.
say-PAST-DECL

‘Hanswu said at a basketball court that he plays basketball well.’

(32) REFERENTIAL-NULL condition:
(context sentences are the same as those in (31))

Hanswu-ka **nongkwucang-eyse** *pro* **nongkwu-lul** **cal** **ha-n-tako**
Hanswu-NOM basketball.court-at basketball-ACC well do-PRES-COMP
malha-yess-ta.
say-PAST-DECL

‘Hanswu said at a basketball court that he plays basketball well.’

In (29) and (30), each context is compatible with the quantificational binding interpretation for either *ku* or the null pronoun in the target sentence. In (31) and (32), on the other hand, each context is compatible with the coreferential interpretation for either *ku* or the null pronoun in the target sentence. The condition that was key to the experiment was the Quantificational-Overt condition, since the primary concern of the present study is whether *ku* can be interpreted as a bound variable. The Referential-Overt, Referential-Null, and Quantificational-Null conditions were treated as control (or comparison) conditions, where the intended readings of the target sentences were expected to be highly accepted, given that *ku* can be coreferential and a null pronoun can be coreferential or bound, as discussed previously. It should also be noted that the experimental design made it possible to additionally examine the tenability of the competition-based approach discussed in Section 2, through a comparison of the participants' responses in the Quantificational-Overt and Quantificational-Null conditions.

Filler items were also constructed, which were similar in structure to the test items. (33) and (34) are examples of the fillers, in which the matrix subject of each target sentence is either *motwu* 'everyone' or a proper name, and each context is compatible with the 'discourse binding' interpretation for *ku* in the target sentence. These items were also taken to be controls, where high acceptance rates were expected to be obtained since *ku* can readily take an extra-sentential antecedent, as discussed in footnote 3.

(33) Quantificational-discourse condition:

Hanswu, Cinswu, Minswu-ka nongkwucang-eyse, Kiswu-ka oki-lul
Hanswu, Cinswu, Minswu-NOM basketball.court-at Kiswu-NOM coming-ACC
kitalimye, nongkwu-lul ha-ko iss-ess-ta. Hanswu-ka Kiswu-ka
waiting basketball-ACC do-PROG PAST-DECL Hanswu-NOM Kiswu-NOM
nongkwu-lul cal ha-n-tako malha-yess-ta. Cinswu-to Kiswu-ka
basketball-ACC well do-PRES-COMP say-PAST-DECL Cinswu-also Kiswu-NOM
nongkwu-lul cal ha-n-tako malha-yess-ta. Minswu-to Kiswu-ka
basketball-ACC well do-PRES-COMP say-PAST-DECL Minswu-also Kiswu-NOM
nongkwu-lul cal ha-n-tako malha-yess-ta.
basketball-ACC well do-PRES-COMP say-PAST-DECL

'Hanswu, Cinswu, and Minswu were playing basketball at a basketball court, waiting for Kiswu to come. Hanswu said that Kiswu plays basketball well. Cinswu also said that Kiswu plays basketball well. Minswu also said that Kiswu plays basketball well.'

Motwu-ka nongkwucang-eyse ku-ka nongkwu-lul cal
everyone-NOM basketball.court-at he-NOM basketball-ACC well
ha-n-tako malha-yess-ta.
do-PRES-COMP say-PAST-DECL

'Everyone said at a basketball court that he plays basketball well.'

(34) Referential-discourse condition:

Hanswu, Cinswu, Minswu-ka nongkwucang-eyse, Kiswu-ka oki-lul
Hanswu, Cinswu, Minswu-NOM basketball.court-at Kiswu-NOM coming-ACC
kitalimye, nongkwu-lul ha-ko iss-ess-ta. Hanswu-ka Kiswu-ka
waiting basketball-ACC do-PROG PAST-DECL Hanswu-NOM Kiswu-NOM
nongkwu-lul cal ha-n-tako malha-yess-ta.
basketball-ACC well do-PRES-COMP say-PAST-DECL

‘Hanswu, Cinswu, and Minswu were playing basketball at a basketball court, waiting for Kiswu to come. Hanswu said that Kiswu plays basketball well.’

Hanswu-ka nongkwucang-eyse ku-ka nongkwu-lul cal ha-n-tako
Hanswu-NOM basketball.court-at he-NOM basketball-ACC well do-PRES-COMP
malha-yess-ta.
say-PAST-DECL

‘Hanswu said at a basketball court that he plays basketball well.’

2.3.1.1.4 Procedure

The experiment was implemented using the WebExp software package (Keller et al. 2009), and was run on a personal computer. The experimental session began with three practice trials to train the participants to fully understand their task. After the practice trials, 16 test trials (i.e., four trials per condition) and 40 filler trials followed in a uniquely generated random order. On average, the participants took 10-15 minutes to complete the entire experiment. They were paid $5 each as compensation for participation.

2.3.1.2 Findings and Discussion

Figure 2.2 below summarizes mean rates of acceptance (i.e., assignment of 1 ‘True’) by condition: 54% in the Quantificational-Overt condition, 96% in the Quantificational-Null condition, 83% in the Referential-Overt condition, and 92% in the Referential-Null condition. Data were fitted to generalized linear mixed-effects models using the ‘lmer’ function of the ‘lme4’ package (Bates et al. 2012) in the R statistical software (R Development Core Team 2012) to analyze the participants’ responses as a function of ANTECEDENT TYPE and PRONOUN TYPE, with participants and items as random effects. First, the analysis revealed a main effect of PRONOUN TYPE (coefficient estimate = -4.18, $se = .77$, $z = -5.43$, $p < .001$): regardless of ANTECEDENT TYPE, speakers were significantly more likely to accept sentences with null pronouns than overt pronouns (i.e., *ku*). Second, a significant interaction between PRONOUN TYPE and ANTECEDENT TYPE was found (coefficient estimate = 2.87, $se = .95$, $z = 3.02$, $p < .01$): for overt pronouns, speakers were more likely to accept referential subjects (i.e., proper names) as antecedents than quantificational subjects (i.e., *motwu* ‘everyone’), while equally likely to accept both quantificational and referential subjects as antecedents for null pronouns.

Pairwise comparisons of the mean acceptance rates using Tukey’s tests revealed that in the quantificational subject conditions, null pronouns were significantly more likely to be accepted than overt pronouns ($p < .001$) while in the referential subject conditions, the acceptance rates of overt and null pronouns are not significantly different from each other. The analysis also revealed that for overt pronouns, referential subjects were significantly more likely to be accepted as antecedents than quantificational subjects ($p < .001$), but for

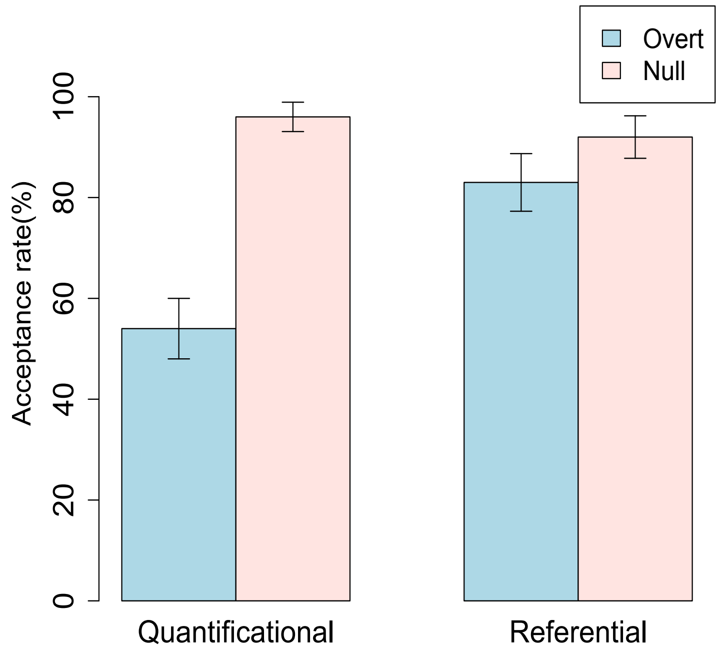


Figure 2.2: Mean rates of acceptance and standard errors in Experiment 1A

null pronouns, no significant difference was found between the acceptance rates of quantificational and referential subjects. Taken together, the results suggest that the acceptance rates in the Referential-Overt, Referential-Null, and Quantificational-Null conditions (but not the Quantificational-Overt condition) are uniformly high. In fact, this is predicted from and compatible with the earlier discussion on coreference and bound variable anaphora in Korean: *ku* can enter into coreference, and a null pronoun can enter into both coreference and binding. This result strongly supports that the experimental design was appropriate to assess participants' grammars of anaphora, thus ensuring that the 54% acceptance rate in the Quantificational-Overt condition, the main concern of the experiment, was indeed a result of *ku* being interpreted through the variable binding mechanism.[27]

In order to characterize the acceptance rate in the Quantificational-Overt condition, the data from each participant was further inspected in the following way. Following the common practice in the literature (e.g., Han et al. 2007; J. S. Kim 2012), all participants (n=18) were assigned into three different groups according to their mean individual acceptance rates on the bound variable interpretation for *ku*: ACCEPT (> 75% acceptance: assignment of 1 to three or four target sentences), AMBIVALENT (= 50% acceptance: as-

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[27] The mean acceptance rates in the Quantificational- and Referential-Discourse filler conditions ((33) and (34)) were 94% and 92%, both of which were not significantly different from all the test conditions except for the Quantificational-Overt condition. These results are compatible with the widely held view that *ku* can readily induce a deictic reading, further ensuring the reliability of the results obtained in the test conditions.

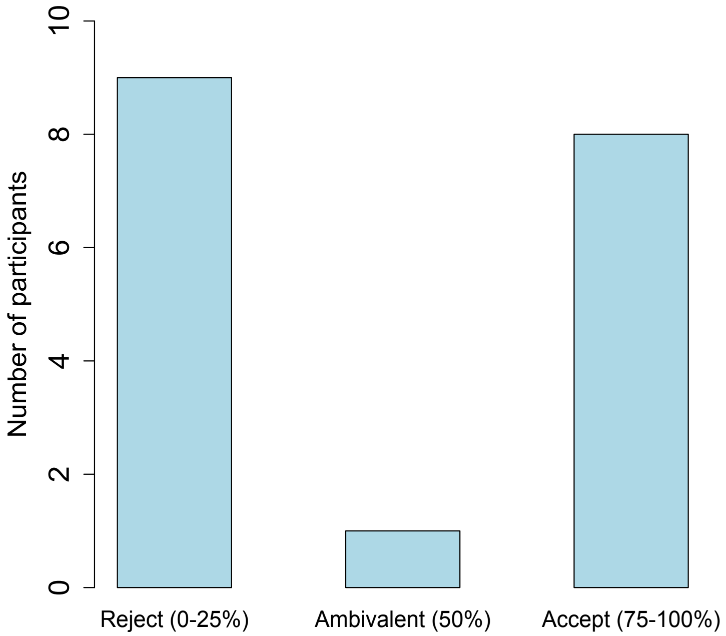

Figure 2.3: Distribution of responses in Quantificational-Overt condition in Experiment 1A

signment of 1 to two target sentences), and REJECT (< 25% acceptance: assignment of 1 to none or one target sentence). Consequently, a bimodal distribution of responses was observed, as demonstrated in Figure 2.3 above: the participants either nearly always accepted or nearly always rejected the bound variable interpretation for *ku*. In other words, the 54% in the Quantificational-Overt condition is not derived from each participant accepting the bound variable reading of *ku* 54% of the time, but from about half of the participants who consistently accepted it. This finding supports the presence of between-speaker, not within-speaker, variation in Korean regarding the binding property of *ku*.[28,29]

As mentioned previously, Experiment 1A was also designed to investigate whether there is a competition between overt and null pronouns for a bound variable interpretation. Re-

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[28] As pointed out by William O'Grady (personal communication, May 2016), a discourse antecedent is generally preferred over an intra-sentential antecedent for *ku* (see also Suh 1990 and H. N. Kim 2007). However, the high mean acceptance rate in the Referential-Overt condition in Figure 2.2 indicates that *ku* can have a (referential) antecedent in the same sentence as long as an appropriate context is provided. This thus implies that the result obtained in the Quantificational-Overt condition is not relevant to the "general" dispreference of *ku* to take an intra-sentential antecedent.

[29] One might possibly maintain that the split among the participants in the availability of the bound variable reading for *ku* could have been attributed to their inability to "entertain" the other interpretation once one of the two possible interpretations (i.e., a bound variable reading and a referential reading) was initially accessed. However, this line of argument cannot be sustained since it fails to provide a principled account for why then such a split was *never* found in the other test and filler conditions, e.g., Quantificational-Null, Referential-Overt, Referential-Null, Quantificational-Discourse and Referential-Discourse conditions, where one of two possible interpretations would have been initially accessed to the participants in the same way as in the Quantificational-Bound condition, but high acceptance rates were uniformly observed.

call that according to the competition-based approach (e.g., Montalbetti 1984), an overt pronoun cannot be construed as a bound variable if a null pronoun can be so construed in the same configuration. Given that the acceptance rate in the Quantificational-Null condition is near 100%, the 54% acceptance in the Quantificational-Overt condition vitiates the validity of the competition-based approach in a strict sense, as it would predict (near) 0% acceptance of bound variable interpretation for *ku*.[30] Additionally, under the competition-based approach, a split found between speakers regarding the acceptance of bound variable *ku* would mean that there are two groups of speakers: those who accepted only the bound variable reading of *pro* belong to the group who is sensitive to the putative "*pro*-*ku* competition mechanism", and those who accepted the bound variable reading of *ku* as well as *pro* belong to the group who is not sensitive to the mechanism at all. This is, however, an undesirable explanation which raises a rather complicated question as to what would cause such differences in speakers' sensitivity to the competition mechanism. Given the other problems with the competition-based approach discussed earlier, it is difficult to conclude that *ku* indeed competes with a null pronoun for a bound variable interpretation.

2.3.2 Experiment 1B

Experiment 1B was motivated by M. Y. Kang's (1988) observation that the availability of a bound variable construal of *ku* may differ depending on clause type. Kang reports that a bound variable reading of *ku* is fine in a single clause, as shown in (35a), while it is, according to his informants' intuitions, very marginal across a clause boundary, as shown in (35b).[31] Note that only sentences with embedded clauses, as in (35b), were employed as test stimuli in Experiment 1A.[32]

(35) a. Motwu$_1$-ka **ku**$_1$-uy emeni-lul coaha-n-ta.
everyone-NOM he-GEN mother-ACC like-PRES-DECL
'Everyone$_1$ likes his$_1$ mother.'
(adapted from M. Y. Kang 1988: 195, ex.(37))

b. ?? Motwu$_1$-ka **ku**$_1$-ka hyenmyengha-ta-ko sayngkakha-n-ta.
everyone-NOM he-NOM wise-COMP-DECL think-PRES-DECL
'Everyone$_1$ thinks that he$_1$ is wise.'
(adapted from M. Y. Kang 1988: 194, ex.(33))

Experiment 1B was thus carried out to address the following research questions.[33]

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[30] See Kweon (2017) for a similar conclusion reached in her experimental research on the bindability of *ku*, which uses a forced-choice picture-matching task with audio stimuli, but the same experimental design as in Experiment 1A.

[31] In Kang's original data, *nwukwuna* 'everyone' is used instead of *motwu*.

[32] Kang maintains that *ku* generally can be interpreted as a bound variable while the degraded cases such as (35b) are exceptions, and are probably controlled by some unknown pragmatic factors.

[33] The work based on Experiment 1B was presented at the Impact of Pronominal Form on Interpretation Workshop at the University of Tübingen in November 2013.

(36) RESEARCH QUESTIONS:

(i) Is there a difference between the bound variable construal of *ku* in a single clause and across clauses? And subsequently,

(ii) Could the findings from Experiment 1A (i.e., the inter-speaker variation phenomenon) be further substantiated?

2.3.2.1 Methodology

2.3.2.1.1 Participants

Thirty-seven native Korean adult speakers living in Vancouver, Canada, who did not participate in Experiment 1A, participated in Experiment 1B. They all met the same eligibility requirement for participation as in Experiment 1A. They were between the ages of 20 and 26 (the mean age was 24), and were all university students in Korea, but came to Canada to work part-time or study English at ESL institutions temporarily.

2.3.2.1.2 Task

The same TVJ task was employed as in Experiment 1A. That is, the participants were instructed to judge whether a target sentence was a true or false description of a given context by entering 1 for 'True' and 0 for 'False'.

2.3.2.1.3 Design and Materials

Each target sentence was either a simple sentence or a complex sentence containing an embedded clause, both of which had *motwu* 'everyone' as a matrix subject. The simple sentence contained *ku* as a possessor while the complex sentence contained *ku* as an embedded subject. Each given context "forced" *ku* to be interpreted as anaphorically linked to the matrix subject. The experiment thus had one within-subjects factor with two levels: CLAUSE TYPE (Simple vs. Complex). Consider a sample set of test items below, where the target sentences are in boldface.[34]

(37) SIMPLE condition:

Hanswu, Cinswu, Minswu-ka nongkwucang-eyse nongkwu-lul ha-ko
Hanswu, Cinswu, Minswu-NOM basketball.court-at basketball-ACC do-PROG
iss-ess-ta. Hanswu-ka caki-uy umlyoswu-lul masi-ess-ta. Cinswu-to
PAST-DECL Hanswu-NOM self-GEN beverage-ACC drink-PAST-DECL Cinswu-also
caki-uy umlyoswu-lul masi-ess-ta. Minswu-to caki-uy umlyoswu-lul
self-GEN beverage-ACC drink-PAST-DECL Minswu-also self-GEN beverage-ACC
masi-ess-ta.
drink-PAST-DECL

---

[34] A complete set of all test items can be found in Appendix B. The test items for the Complex condition were drawn from the Quantificational-Overt condition in Experiment 1A.

‘Hanswu, Cinswu, and Minswu were playing basketball at a basketball court. Hanswu drank his own beverage. Cinswu also drank his own beverage. Minswu also drank his own beverage.’

Motwu-ka nongkwucang-eyse ku-uy umlyoswu-lul masi-ess-ta.
everyone-NOM basketball.court-at he-GEN beverage-ACC drink-PAST-DECL

‘Everyone drank his beverage at a basketball court.’

(38) COMPLEX condition:
(repeated from (29))

Hanswu, Cinswu, Minswu-ka nongkwucang-eyse nongkwu-lul ha-ko
Hanswu, Cinswu, Minswu-NOM basketball.court-at basketball-ACC do-PROG
iss-ess-ta. Hanswu-ka caki-ka nongkwu-lul cal ha-n-tako
PAST-DECL Hanswu-NOM self-NOM basketball-ACC well do-PRES-COMP
malha-yess-ta. Cinswu-to caki-ka nongkwu-lul cal ha-n-tako
say-PAST-DECL Cinswu-also self-NOM basketball-ACC well do-PRES-COMP
malha-yess-ta. Minswu-to caki-ka nongkwu-lul cal ha-n-tako
say-PAST-DECL Minswu-also self-NOM basketball-ACC well do-PRES-COMP
malha-yess-ta.
say-PAST-DECL

‘Hanswu, Cinswu, and Minswu were playing basketball at a basketball court. Hanswu said that he plays basketball well. Cinswu also said that he plays basketball well. Minswu also said that he plays basketball well.’

Motwu-ka nongkwucang-eyse ku-ka nongkwu-lul cal
everyone-NOM basketball.court-at he-NOM basketball-ACC well
ha-n-tako malha-yess-ta.
do-PRES-COMP say-PAST-DECL

‘Everyone said at a basketball court that he plays basketball well.’

2.3.2.1.4 Procedure

Experiment 1B used the same procedure as in Experiment 1A, except that eight test trials (i.e., four trials per condition) and 46 filler trials were presented to the participants in a uniquely generated random order.[35] The participants took 10-15 minutes to complete the entire experiment, and were paid $10 each for their participation.

2.3.2.2 Findings and Discussion

Figure 2.4 below summarizes the mean acceptance rates by condition: 43% in the Simple condition and 36% in the Complex condition. Generalized linear mixed-effects models were

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[35] The filler items were taken from Experiment 1A.

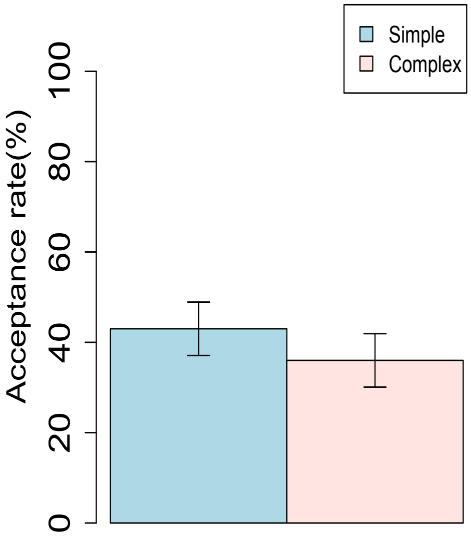

Figure 2.4: Mean rates of acceptance and standard errors in Experiment 1B

used to analyze the participants' responses as a function of CLAUSE TYPE, with participants and items as random effects. The analysis revealed no significant effect of CLAUSE TYPE, indicating that the acceptance rates in the Simple and Complex conditions were not significantly different from each other, although the former was numerically higher than the latter.

As in Experiment 1A, the acceptance rates of each participant in both conditions were examined. It was found that some participants consistently accepted the bound variable interpretation of *ku* while others consistently rejected it, as illustrated in Figure 2.5 below. In other words, the 43% and 36% acceptance rates in the Simple and Complex conditions were derived from 43% and 36% of the participants who always accepted the bound variable reading of *ku*, not from each participant accepting it 43% and 36% of the time. Therefore, as in Experiment 1A, these findings substantiate the existence of inter-speaker variation regarding the binding property of *ku*.

A linear regression analysis was carried out to test the correlation between the participants' mean acceptance rates in both conditions. The analysis revealed that the correlation coefficient is significantly different from zero ($r = .62$, $t = 7.49$, $p < .001$), indicating that an individual speaker's acceptance of the bound variable reading in the Complex condition is predictable from her acceptance of the bound variable reading in the Simple condition. In other words, those participants who accepted the bound variable reading of *ku* did so for both simple and complex clause types, and those who rejected the bound variable reading did so for both clause types (see Figure 2.6 below). Taken together, it can be concluded

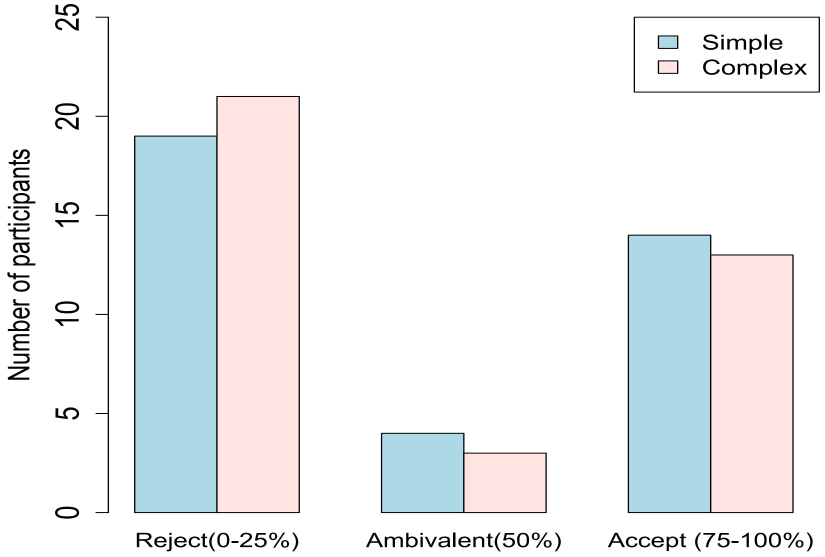

Figure 2.5: Distribution of responses in Simple and Complex conditions in Experiment 1B

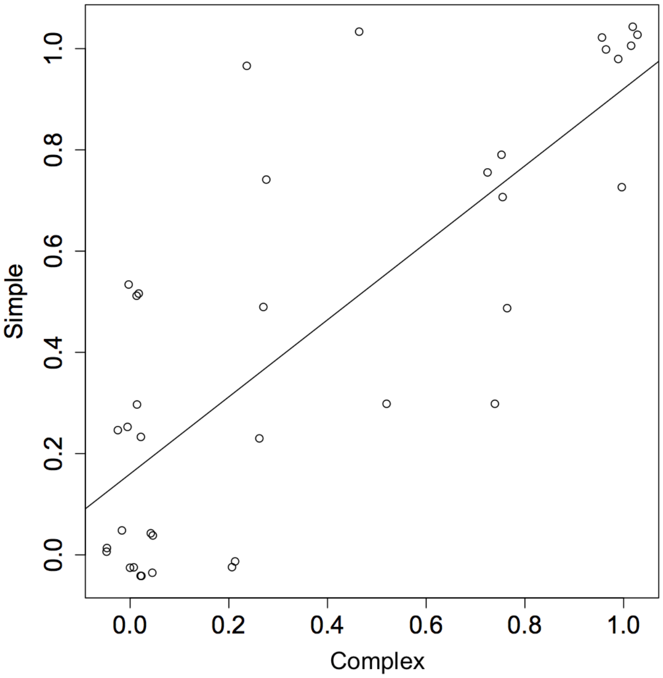

Figure 2.6: Correlation between mean acceptance rates in Simple and Complex conditions in Experiment 1B

that there is no significant difference between the availability of a bound variable construal of *ku* in a single clause or across a clause boundary, contradicting M. Y. Kang's (1988) observation that clause type may affect the bound variable construal of *ku*.

2.4 Experiment 2

We have concluded from the findings of Experiments 1A and 1B that there *does* exist considerable variation across speakers as to whether the Korean pronoun *ku* can be construed as a bound variable. At this point, recall from footnote 21 that a TVJ task is assumed to be a methodology that can access a participant's grammatical competence or knowledge. That is, a participant's judgment in a TVJ task, whether it is acceptance or rejection, can be interpreted as revealing the state of her grammar regarding the linguistic phenomenon being investigated (Crain & McKee 1985; Crain & Thornton 1998; Gordon 1998). In light of this, we can reasonably assume that the phenomenon of inter-speaker variation observed in Experiments 1A and 1B is a reflection of speakers each having a distinct grammar of *ku*. That is, some speakers may have a grammar that does license a bound variable construal for *ku*, while others may have a grammar that does not license it. To the extent that this assumption is on the right track, it would then be predicted that an individual speaker's judgment regarding the bindability of *ku* would be consistent over time, since she would, in principle, maintain one single grammar for *ku*. Experiment 2 was thus conducted to address the following research question.[36]

(39) RESEARCH QUESTION:
Do Korean speakers exhibit the same judgment over time on the bound variable construal of *ku*?

2.4.1 Methodology

2.4.1.1 Participants

Thirty-seven native Korean adult speakers living in Vancouver, Canada, who did not participate in any of the previous experiments, participated in Experiment 2. The participants met the same eligibility requirements for participation as in the previous experiments, and were between the ages of 19 and 28 (the mean age was 23). Most of them were university students in Korea, but came to Canada to work part-time or study English at ESL institutions temporarily.

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[36] The study based on Experiment 2 was presented at the joint meeting of the 19th International Circle of Korean Linguistics Conference (ICKL19) and the 16th Harvard International Symposium on KoreanLinguistics (ISOKL16) at the University of Chicago in July 2015.

CONTEXT TYPE	TEST SESSION
Bound	August
	September
Free	August
	September

Table 2.2: Test conditions in Experiment 2

2.3.3.1.1 Task

The same TVJ task was used as in the previous experiments.

2.4.1.2 Design and Material

The experiment consisted of two different test sessions that took place one month apart (August and September 2014). Each target sentence was a simple sentence containing *motwu* 'everyone' as the subject and *ku* as the possessor. Each context was biased towards the bound or free (deictic) interpretation of *ku* in the target sentence. Thus, two within-subjects factors with two levels each were tested: CONTEXT TYPE (Bound vs. Free) × TEST SESSION (August vs. September). The test conditions are summarized in Table 2.2 above. Crucially, the test items were different between sessions.[37] (40) and (41) illustrate a sample set of test items, where the target sentences are in boldface.[38]

(40) BOUND condition:
(repeated from (37))

Hanswu, Cinswu, Minswu-ka nongkwucang-eyse nongkwu-lul ha-ko
Hanswu, Cinswu, Minswu-NOM basketball.court-at basketball-ACC do-PROG
iss-ess-ta. Hanswu-ka caki-uy umlyoswu-lul masi-ess-ta. Cinswu-to
PAST-DECL Hanswu-NOM self-GEN beverage-ACC drink-PAST-DECL Cinswu-also
caki-uy umlyoswu-lul masi-ess-ta. Minswu-to caki-uy umlyoswu-lul
self-GEN beverage-ACC drink-PAST-DECL Minswu-also self-GEN beverage-ACC
masi-ess-ta.
drink-PAST-DECL

'Hanswu, Cinswu, and Minswu were playing basketball at a basketball court. Hanswu drank his own beverage. Cinswu also drank his own beverage. Minswu also drank his own beverage.'

---

[37] Filler items were taken from Experiments 1A and 1B. Unlike the test items, the filler items were the same between sessions.

[38] A complete set of all test items can be found in Appendix C. The test items for the Bound-August condition were adapted from those for the Simple condition in Experiment 1B.

Motwu-ka ku-uy umlyoswu-lul masi-ess-ta.
everyone-NOM he-GEN beverage-ACC drink-PAST-DECL

'Everyone drank his beverage.'

(41) FREE condition:

Hanswu, Cinswu, Minswu-ka nongkwucang-eyse, Kiswu-ka oki-lul
Hanswu, Cinswu, Minswu-NOM basketball.court-at Kiswu-NOM coming-ACC
kitalimye, nongkwu-lul ha-ko iss-ess-ta. Hanswu-ka Kiswu-uy
waiting basketball-ACC do-PROG PAST-DECL Hanswu-NOM Kiswu-GEN
umlyoswu-lul masi-ess-ta. Cinswu-to Kiswu-uy umlyoswu-lul
beverage-ACC drink-PAST-DECL Cinswu-also Kiswu-GEN beverage-ACC
masi-ess-ta. Minswu-to Kiswu-uy umlyoswu-lul masi-ess-ta.
drink-PAST-DECL Minswu-also Kiswu-GEN beverage-ACC drink-PAST-DECL

'Hanswu, Cinswu, and Minswu were playing basketball at a basketball court, waiting for Kiswu to come. Hanswu drank Kiswu's beverage. Cinswu also drank Kiswu's beverage. Minswu also drank Kiswu's beverage.'

Motwu-ka ku-uy umlyoswu-lul masi-ess-ta.
everyone-NOM he-GEN beverage-ACC drink-PAST-DECL

'Everyone drank his beverage.'

2.4.1.3 Procedure

The experiment for each session was implemented using PsychoPy software (Peirce 2007, 2009). The same procedure was employed as in the previous experiments, except that eight test items (i.e., four per condition) and 56 filler items were presented in a uniquely generated random order. The participants took 15-25 minutes to complete the entire experiment of each session, and were compensated $20 for participation.

2.4.2 Findings and Discussion

The mean acceptance rates by condition are summarized in Figure 2.7 below. The results for both sessions are numerically similar: 37% and 87% in the Bound-August condition and the Free-August condition, and 39% and 84% in the Bound-September condition and the Free-September condition.[39] A bimodal distribution of participants' responses in the Bound condition was observed in each session, as illustrated in Figure 2.8 below: participants tended to either always accept the bound variable reading of *ku* or always reject it.

Generalized linear mixed-effects models were constructed to analyze the participants' responses as a function of CONTEXT TYPE and TEST SESSION, with participants and items

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[39] As in the Quantificational-Discourse and Referential-Discourse filler conditions in Experiment 1A (see again footnote 27), the mean acceptance rates in the Free conditions were uniformly high, assuring the accuracy and reliability of the experimental data obtained.

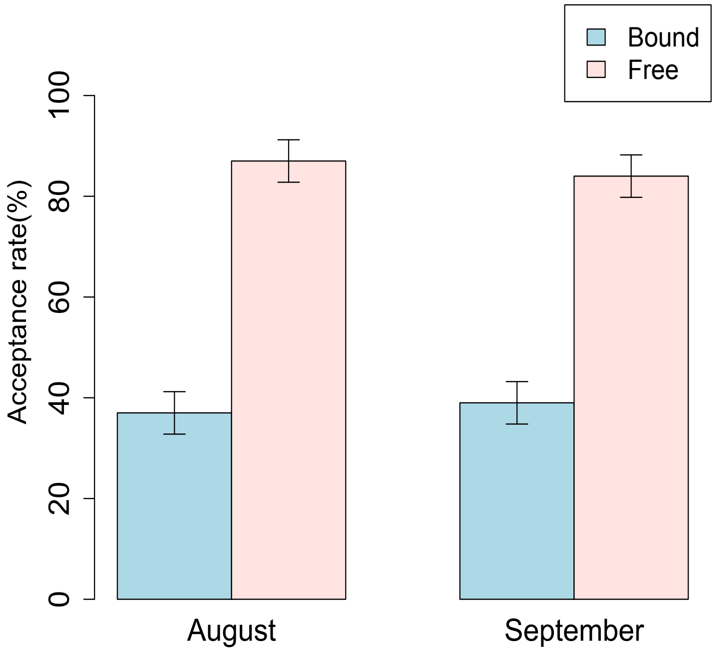

Figure 2.7: Mean rates of acceptance and standard errors in Experiment 2

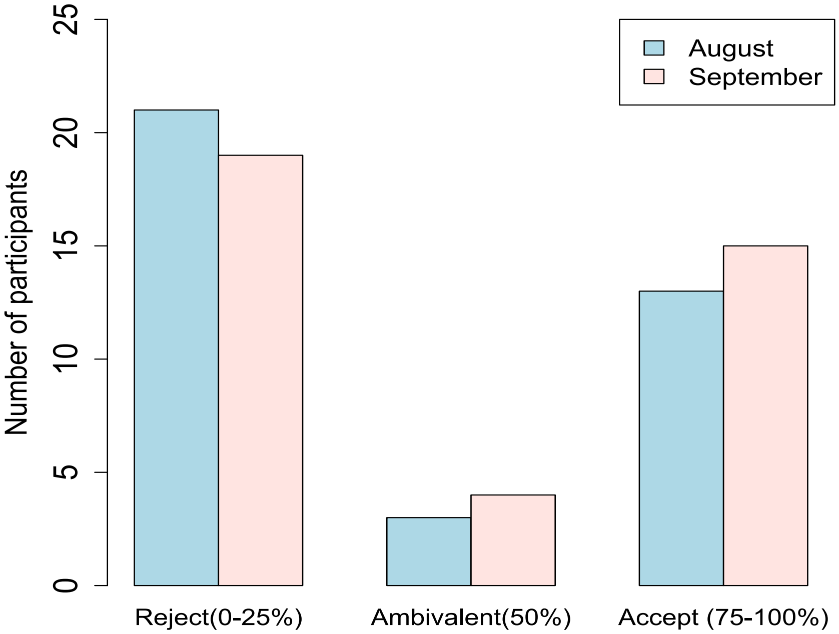

Figure 2.8: Distribution of responses in Bound conditions for August and September sessions in Experiment 2

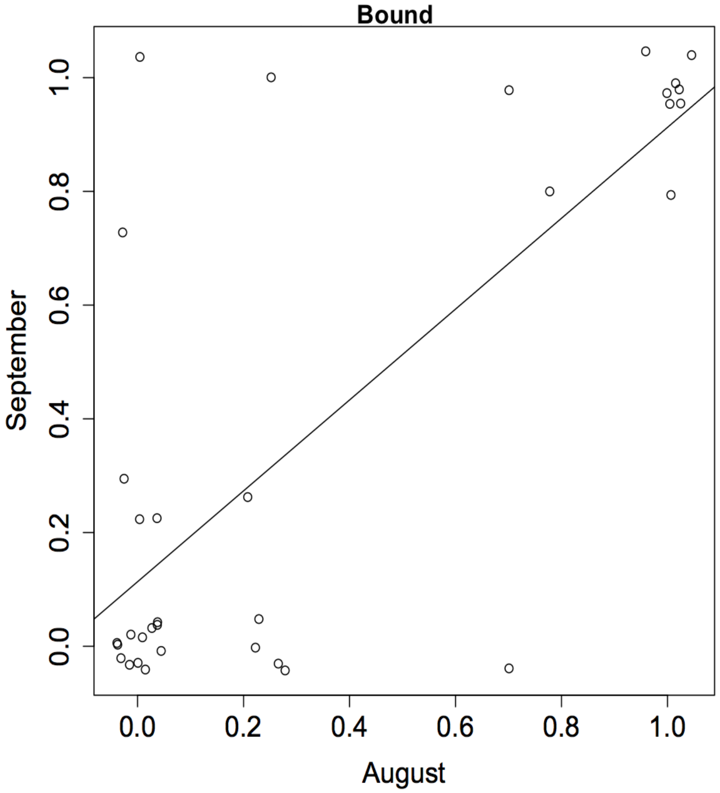

Figure 2.9: Correlation between mean acceptance rates in Bound conditions for August and September sessions in Experiment 2

included as random effects. The analysis revealed no main effect of TEST SESSION, and no interaction between CONTEXT TYPE and TEST SESSION. Thus, no significant difference was found in the patterns of participants' responses in the Bound-August and Bound-September conditions: in both sessions, only about 40% of the participants accepted the bound variable reading for *ku*. Furthermore, a linear regression analysis revealed a strong correlation ($r = 0.74$, $t = 6.43$, $p <. 001$) between the mean acceptance rates in the Bound-August and Bound-September conditions, as illustrated in Figure 2.9 above. This indicates that participants who accepted the quantificational binding of *ku* in August session did so as well in September session, and those who rejected the quantificational binding of *ku* in August session did so as well in September session. Taken all together, it can reasonably be concluded that each participant *did* exhibit the same judgment over time on the availability of a bound variable construal for *ku*, thus confirming the possibility that the phenomenon of inter-speaker variation may be a consequence of existence of two distinct grammars for *ku*. We will see in the next section that these findings can be seen as supporting the main proposal of this chapter based on the *two grammar hypothesis* by Han, Lidz, and Musolino (2007).

2.5 General discussions

Using an experimental methodology, novel empirical evidence has been established that there is indeed variation across Korean speakers regarding the bindability of *ku*, as a synchronically "active" linguistic phenomenon. Therefore, it seems that the lack of consensus on the status of *ku* in the literature is actually a reflection of this inter-speaker variation. An important question arises at this point: why and how does the variation phenomenon emerge and exist in Korean language? As a preliminary step in attempting to provide a principled answer to this question, we first consider the historical background of *ku* and its present status, from the perspective of language acquisition.

Interestingly enough, the Korean third-person pronoun *ku* has a somewhat idiosyncratic status among pronouns across languages. That is, in contrast to pronouns in other languages such as *he* in English, it is a rather rare pronominal item which was "artificially" introduced into the language by a certain group of speakers. It is generally accepted by Korean linguists that *ku* was first used by Korean writers in the early 20th century (K. M. Lee 1978; H. C. Kim 1981; C. H. Kim 1984; Y. H. Kim 2016b).[40] It is worth noting the following extract from the autobiographical essay by the novelist Dong-In Kim, who is generally considered to have pioneered the use of *ku* as a third-person pronoun.[41]

> "I sometimes felt annoyed and tired of repeating the same names to refer to a character in a novel or an essay. I wanted to use a lexical item corresponding to English *he* or *she*, but Korean has nothing like that [...] Among the candidates for a third-person pronoun, the demonstrative *ku* 'that' seemed to be nicer conventionally than the demonstrative *ce* 'that' and others, so I just chose it and used it without any hesitation."
>
> (D. I. Kim 1948, compiled by C. H. Kim 1984: 424)

As implied from above, the pronominal *ku* historically originated from and is thus homophonous with the demonstrative *ku* 'that', which forms one part of the Korean tripartite demonstrative system, as illustrated in (42) and (43).[42] Note that in deictic contexts, *ku* is used to indicate an entity that is closer to the hearer than the speaker,[43] while *i* 'this' is used for an entity close to the speaker, and *ce* 'that over there' for an entity distant from both the hearer and the speaker (e.g., Hoji 1990; Sohn 1999).[44,45]

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[40] *Ku* 'he' was initially used only as a gender-neutral pronoun. *Kunye* 'she' was later coined by those writers who were using *ku* as a masculine pronoun and thus needed a corresponding feminine form (e.g., An 2008; Y. H. Kim 2016b).

[41] This quote was originally written in Korean, and translated here into English by the author.

[42] Koulidobrova and Lillo-Martin (2016: 228) point out that cross-linguistically, demonstrative determiners are often used independently, i.e., without combining with nominals, to function as personal pronouns.

> "The idea that pronouns are related to demonstratives is not entirely odd. In Eastern Armenian, for instance, demonstratives *na*, *sa*, and *da* are used in lieu of personal pronouns (Kozintseva 1995). The same can be said for the Basque *hau'*, *hori*, and *hura* (Saltarelli et al. 1988) as well as the Korean *ku*."

We will consider examples of German demonstrative pronouns in (51).

[43] The demonstrative *ku* can also be used in anaphoric contexts, and thus can refer to a person or an object that has been mentioned in the previous discourse or that is not invisible but known to both the hearer and

(42) a. i chayk 'this book'
b. **ku** chayk 'that book' (or 'the book')
c. ce chayk 'that book over there'

(43) a. i salam 'this person'

---

the speaker (e.g., Chang 2009; Oh 2010; Ionin et al. 2012). Therefore, *ku chayk* and *ku salam* in (42b) and (43b) can alternatively be translated as *the book* and *the person* in English.

[44] The three types of demonstratives can also be combined with a wide variety of bound morphemes, thus forming morphologically "complex" words, as illustrated in the following table.

(i) *Demonstrative paradigm in Korean* (based on Noguchi 1997 and Chang 2009)

i-series	*ku*-series	*ce*-series
i-ke(s) 'this thing'	**ku**-ke(s) 'that thing'	**ce**-ke(s) 'that thing'
i-len 'like this'	**ku**-len 'like that'	**ce**-len 'like that'
i-li 'this way'	**ku**-li 'that way'	**ce**-li 'that way over there'
i-ttay 'this time'	**ku**-ttay 'that time'	**ce**-ttay 'that way over there'
i-kos 'here'	**ku**-kos 'there'	**ce**-kos 'over there'

[45] Noticeably, the demonstratives *i* and *ce*, unlike *ku*, cannot be used independently as personal pronouns, as shown in (i).

(i) **ku/*i/*ce**-ka nwukwu-ci?
he-NOM who-Q
'Who is he?' (Yu 2005: 197, ex.(15))

As noted by N. R. Han (2006: 40-41), however, *i* alone can be used to refer to "an event-like semantic content denoted by a previous clausal segment", as shown in (ii).

(ii) Yosay elini-tul-uy silyek-i nappaci-ko iss-nuntey, **i**-nun olayn TV
recently child-PL-GEN sight-NOM deteriorate-AuxEnd be-CoordEnd this-TOP long TV
sicheng-uy yenghyang-i-ta.
watch-GEN influence-COP-DECL
'Children's eyesight is deteriorating these days, and this is the influence of long TV watching.'
(N. R. Han 2006: 41, ex.(48c))

Note also that the plural forms of *i* and *ce*, *i-tul* and *ce-tul*, can be used as personal pronouns, as shown in (iii) and (iv).

(iii) Taypepwen-un saken kwankyeyca-tul-ey tayha-n phankyel-eyse **i-tul**-eykey calmos-i
supreme.court-TOP case associate-PL-DAT regard-ADN sentence-at this-PL-DAT guilt-NOM
eps-tako kyellon-cis-ess-ta.
lack-DECL conclusion-make-PAST-DECL
'The Supreme court concluded in its sentence on case associates that there is no guilt to these people.'

(iv) **Ce-tul**-i wuli cwunim-ul wangwi-eyse kkul-e nayli-ess-tota.
that-PL-NOM our lord-ACC throne-from pull down-PAST-DEC
'Those people (they) pulled down our lord from the throne.'
(N. R. Han 2006: 41, ex.(48b) and (48d))

b. **ku** salam ‘that person’ (or ‘the person’)
c. ce salam ‘that person over there’

(Hoji 1990: 6, ex.(12) and (13))

The use of *ku* as a personal pronoun seems to have been introduced to Korean speakers about 100 years ago. It is thus a relatively recent linguistic evolution in the Korean language, while the use of *ku* as a demonstrative determiner has a much longer history (M. Y. Kang 1988). This historical background of *ku* may have resulted in its unique status in present-day Korean. That is, while the pronoun *ku* is predominantly used in written texts, it is almost never used in (informal) colloquial speech (O’Grady 1984; S. H. Kang 1990; Suh 1990; Hwang 1991; N. R. Han 2006; An 2008; Oh 2010; B. M. Kim 2016).[46] Accordingly, native speakers of Korean are scarcely exposed to the pronominal usage of *ku* in the early stage of language acquisition.[47] Rather, they generally first encounter it in written forms in essays, novels, or song lyrics at school age. Even in the written contexts, however, the pronoun *ku* tends to be avoided or omitted if possible, as shown in (44).[48]

(44) George-nun **(ku-ka)** ha-ko-siph-ul ttay-ey **(ku-uy)**
George-TOP (he-NOM) do-AuxEnd-want-RelEnd time-at (he-GEN)
il-ul ha-n-ta.
work-ACC do-PRES-DECL.
‘George does **his** work when **he** feels like it.’

(N. R. Han 2006: 38, ex.(47))

Note also that personal names, kinship terms, professional titles (e.g., *sensayng-nim* ‘(honoured) teacher’), and general nouns preceded by demonstratives are frequently preferred over the pronouns *ku* and *kunye* in anaphoric contexts (e.g., H. Y. Kim 1989; Y. S. Kang 2004; N. R. Han 2006; Oh 2010; Bak 2015). In (45)-(47), for example, *Kimyuna*, *nwuna* ‘sister’, and *ku yeca* ‘that woman (or the woman)’ appear at positions where the feminine pronoun *kunye* could otherwise be used (indicated by underline).

(45) Sipil-il, J.Estina-nun pulayntu mywucu-in Kimyuna-uy say hwapo-lul
11th J.Estina-TOP brand muse-ADN Kimyuna-GEN new picture-ACC
kongkayha-yess-ta. **Kimyuna**-nun i hwapo-eyse ikwukcek-in eymelaltu
release-PAST-DECL Kimyuna-TOP this picture-in exotic-ADN emerald
kalla-uy cwuelli-lul chakyongha-yess-ta [...] Yelum kwangko sok
color-GEN jewelry-ACC wear-PAST-DECL summer advertisement inside

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[46] Oh (2010: 1222) reports that “there was not even a single instance of [*ku* and *kunye*] in the conversational data used in [her] study”. See also H. Y. Kim (1989) and Y. S. Kang (2004) for similar results in their studies on Korean speakers’ choices among overt pronouns (*ku* and *kunye*), null pronouns, and full nominal expressions (e.g., *ku sonyen* ‘that (or the) boy’) in anaphoric contexts.

[47] As a piece of anecdotal evidence, I still remember the first time I heard the word *ku*–at the age of 8 from a popular Korean pop song. I had to ask my mother what it meant.

[48] As noted in footnote 27, even when the pronoun *ku* is used in written contexts, it mostly takes a discourse referent rather than an intra-sentential one.

Kimyuna-ka chakyongha-n cwuelli-nun cenkuk J.Estina maycang-eyse
Kimyuna-NOM wear-ADN jewelry-TOP nationwide J.Estina store-in
manna-l swu iss-ta.
meet-ADN BN exist-DECL

'On the 11th, J.Estina has released a new picture of its brand muse, Yuna Kim. In this picture, **Yuna Kim** wore exotic emerald-coloured jewelry [...] The jewelry worn by **Yuna Kim** in the summer advertisement is available in J.Estina stores nationwide.'

(http://stylem.mt.co.kr/stylemView.php?no=2017051110551135769type=1)

(46) Nwuna-nun pwusan-eyse tayena-ss-ta. **Nwuna**-ka
older.sister-TOP Pusan-at born-PAST-DECL older.sister-NOM
kohyang-i-n pwusan-ul ttena-n kes-un kotunghakkyo-lul
hometown-COP-ADN Pusan-ACC leave-ADN that-ADN highschool-ACC
colepha-kose-i-ess-ta. Ku hwu **nwuna**-nun tasi-nun pwusan-ey
graduate-after-COP-PAST-DECL that later older.sister-TOP again-TOP Pusan-to
ka-ci mosha-yess-ta. kulena kohyang-ul hyangha-n
go-AUXEND cannot-PAST-DECL but hometown-ACC face-ADN
nwuna-uy ayceng-un hansi-to sik-un cek-i
older.sister-GEN affection-TOP moment-even cool-ADN time-NOM
eps-ess-ta.
not-exist-PAST-DECL

'My sister was born in Pusan. It was after graduating high school that **my sister** left hometown Pusan. After that, **my sister** couldn't go back to Pusan again. But **my sister** 's affection towards the hometown never cooled off for a moment.'

(N. R. Han 2006: 42, ex.(49), originally from I. S. Lee et al. 1997)

(47) Yeca hanmyeng-i mwutay oynccok-eyse tulewa-ss-ta. talun yeca
woman one-NOM stage left-from enter-PAST-DECL different woman
hanmyeng-i mwutay olunccok-eyse tulewassta. **Ku yeca**-nun kkoch
one-NOM stage right-from enter-PAST-DECL that woman-TOP flower
pakwuni-lul tul-ko iss-ess-ta.
basket-ACC carry-COMP PROG-PAST-DECL

'A woman entered from stage left. Another woman entered from stage right. **That (or the) woman** was carrying a basket of flowers.'

(Ionin et al. 2012: 76, ex.(10b))

Given this context, it seems reasonable to conclude that child learners of Korean may not receive sufficient or clear evidence from the input language data with regard to the grammar of *ku*.[49]

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[49] As noted in Section 2.3, this does not necessarily mean that the child learners are not able to establish bound variable anaphora as they might already have acquired it easily with the long-distance anaphor *caki* 'self' or null pronouns.

Following the *two-grammar hypothesis* by Han, Lidz, and Musolino (2007), I propose that such a paucity in input concerning the pronoun *ku* may be the source of the inter-speaker variation regarding the availability of its bound variable construal. According to Han et al.'s proposal, when the primary linguistic data that child learners of a given language are exposed to is compatible with (at least) two competing grammars, along with the lack of relevant input data that would otherwise assist them to choose between the two, they may have to choose one grammar at random. As a consequence, some learners may acquire one grammar and others may acquire another, thus resulting in the presence of two groups of speakers in the given language community.[50]

I argue that the situation of *ku* is similar to the situation described in Han et al. (2007). The input data regarding *ku* to child learners of Korean is compatible with two competing grammars, the "pronominal grammar" and the "demonstrative grammar". The relevant input to aid the child learners to choose one grammar over the other is scarce, and so they must choose one grammar at random. Accordingly, some may acquire the "pronominal grammar" for *ku*, in which case it can be bound and be (co)referential as well, and others may acquire the "demonstrative grammar" for *ku*, in which case it can only be referential. I propose that this is why and how the inter-speaker variation in the bound variable construal of *ku* arises and exists in contemporary Korean.[51]

To the extent that these arguments based on the *two grammar hypothesis* are valid, it is naturally predicted that Korean speakers should show consistent and persistent behaviours with regard to the bound variable construal for *ku*, because they would each maintain one single grammar over time, "pronominal grammar" or "demonstrative grammar" (cf. Han et al. 2016). This prediction has already been confirmed by the findings of Experiment 2, which showed that the participants exhibited the same judgments on the bindability of *ku* across test sessions separated by one month.

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[50] Han et al.'s proposal is based on the experimental evidence of the inter-speaker variation in negation and quantifier scope judgment in Korean, which is argued to be compatible with two competing grammars: verb-raising grammar and non-verb-raising grammar. As Korean is a head-final language, they argue, the input data provide little indication of (non-)verb raising to child learners, and the leaners thus have to choose one grammar at random.

[51] Costa and Martins (2011) report that there is inter-speaker variation regarding the availability of contrastive focus fronting (CFF) in contemporary European Portuguese (EP). Consider the following data (the expression in boldface is a fronted constituent).

(i) A: Estas a.dizer que ele te disse uma mentira?
are-2SG saying that he you-DAT told a lie
'Are you saying he lied to you?'

B: Pois disse. E **com** **isso** me convenceu.
indeed told-3SG and with that me convinced
'Indeed, he did. And **so** he convinced me'

B′: * Pois disse. E **com** **a** **mentria** me convenceu.
indeed told-3SG and with the lie me convinced

For some speakers of EP (including the first author of the study), B and B′ are both acceptable while for others (including the second author), only B is acceptable. Costa and Martins (p.218) attribute this split to the existence of two distinct grammars regarding CFF. That is, some EP speakers have a more restrictive grammar that only allows fronting of constituents with [deictic] feature (labelled as 'Grammar B'), but others have a less restrictive grammar that involves no such restriction (labelled as 'Grammar A'). It is, of course, not clear at this point whether the situation of CFF is similar to that of *ku* in terms of a deficiency in the relevant input data, compatible with the *two grammar hypothesis.* Their argument, however, can be taken to provide theoretical support to the current proposal in the sense that it shares the idea that inter-speaker variation regarding the availability of a given linguistic phenomenon may be derived from the co-existence of two competing grammars.

Additionally, it can reasonably be postulated that there exist two kinds of pronoun *ku*: one which can be construed as a bound variable ("pronominal grammar") and one which cannot be so construed ("demonstrative grammar"). If this is so, another important question then arises: how can the two kinds of *ku* with contrasting binding possibilities be accounted for in binding-theoretic terms? I attempt a proposal based on the work of Déchaine and Wiltschko (2002). Recall that Déchaine and Wiltschko propose three types of pronouns, which respectively have different maximal projections: Pro-DP, Pro-ϕP, and Pro-NP. This three-way distinction in pronouns is fundamentally distinguished from the structural approaches of Noguchi (1997) and Panagiotidis (2002), wherein two types of pronouns (D-pronoun and N-pronoun) are placed at different syntactic heads, D and N, but are uniformly of the same syntactic category DP. It has been discussed that such a fundamental contrast between the structural approaches is a reflection of their different underlying views on whether distinct binding-theoretic properties must be represented by distinct syntactic projections (Déchaine and Wiltschko) or distinct internal structures (Noguchi, Panagiotidis). I follow Déchaine and Wiltschko in assuming that the grammar of binding cannot "look into" a pronominal structure, and therefore internal structural differences of pronouns cannot result in their "external" differences (i.e., binding possibilities). I follow their argument that the Binding Conditions are only sensitive to the outer layer (i.e., the maximal projection) of a given pronoun (see, however, Koak 2008 for a different point of view).

Adopting Déchaine and Wiltschko's (2002) typology of pronouns, I argue that the two types of *ku* exhibit distinct binding properties because they are of different syntactic categories. Recall that Déchaine and Wiltschko's three pronoun types are argued to have different binding-theoretic status, as summarized below.

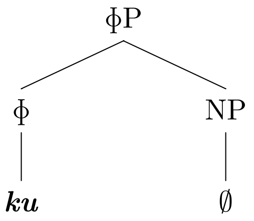
(48) a. Pro-DPs are demonstrably definite and function like R-expressions, subject to Condition C (e.g., (Upriver) Halkomelem *tú-tl'ò* 'he' and *thú-tl'ò* 'she').

b. Pro-ϕPs behave as variables, equal to the classical "Condition B pronouns" (e.g., English *he* and *she*, Shuswap *newí7-s* 'he or she').

c. Pro-NPs are inherently constants, undefined with respect to binding theory (e.g., Japanese *kare* 'he' and *kanozyo* 'she').

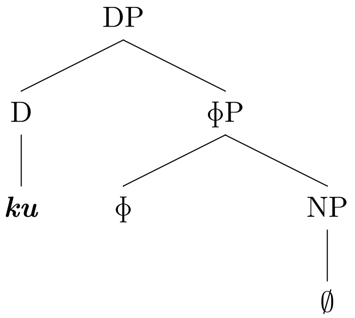
First, one type of *ku* is of the category ϕP, as illustrated in (49), with the binding-theoretic status of an ordinary "Condition B pronoun" such as English *he*. It can thus be used as a bound variable or a free variable.

(49) Pro-ϕP *ku*



The other *ku* is of the category DP, as illustrated in (50), and has the binding-theoretic status of an R-expression (see Kwon et al. 2009 for a similar argument that *ku* functions as an R-expression).[52] The Pro-DP *ku*, subject to Condition C, cannot be construed as a bound variable, and can only refer.

(50) Pro-DP *ku*



Under the assumption that the Korean demonstrative determiners, *ku* 'that', *ce* 'that over there', and *i* 'this', are heads of DP (M.Y. Kang 2001, Chang 2009, among many others), the Pro-DP *ku* shares the same syntactic structure with the demonstrative *ku*, and thus can be claimed to be a demonstrative pronoun (i.e., a demonstrative determiner used pronominally with a null NP).[53]

---

[52] Much work on Korean nominals assume that they have a DP projection, following M. Y. Kang (2001), Ahn and Cho (2006), Chang (2009), and many others. See, however, e.g., Im (1998), J. B. Kim (2016), for an argument that there are only NPs, not DPs, in Korean and the demonstratives are placed in Spec-NP, instead.

[53] Similar to Halkomelem, Korean has morphologically complex third-person pronouns, which are composed of demonstrative determiners followed by a variety of bound nouns denoting 'person', as illustrated in (i). Following Oh (2010), I will refer to these pronouns as 'quasi-pronouns' (note that Sohn 1999 uses the term 'compound pronouns', instead).

(i) *Quasi-pronouns in Korean* (based on Oh 2010: 1222)

Style	Singular	Plural
Child or Adult-Plain	D-ay	D-ay-tul
Adult-Familiar	D-i	D-i-tul
Adult-Polite	D-pwun	D-pwun-tul
Male-Derogatory	D-nom	D-nom-tul
Female-Derogatory	D-nyen	D-nyen-tul

(D=demonstratives *i*, *ku*, and *ce*)

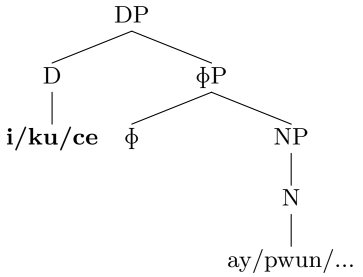
This PRO-DP analysis of *ku* is cross-linguistically supported by German demonstrative pronouns, which are argued to be PRO-DPs in Déchaine and Wiltschko (2002) and Baltin et al. (2013). In (spoken) German, the definite articles *der*, *die*, and *das* can be used as demonstrative pronouns that are inflected for case, gender, and number (Wiltschko 1998; Bosch et al. 2003). Much like the proposed PRO-DP *ku*, the German demonstrative pronouns can refer to individuals, as in (51a) and (51b), but cannot be construed as bound variables, as in (52). Note that in contrast to the demonstrative pronouns, the corresponding personal pronouns in German (*ihn*, *sie*, *er*), which are analyzed as PRO-ϕPS in Déchaine and Wiltschko and Baltin et al., can be bound as well as referential.

(51) a. Maria hat {ihn/**den**} gesehen.
Mary has {him/DEM} seen
'Mary has seen him.'

(Wiltschko 1998: 144, ex.(1))

Within the framework of Déchaine and Wiltschko's (2002) pronominal typology, the Korean quasi-pronouns can be analyzed as PRO-DPs, as illustrated below, where the demonstrative part is placed in D and the nominal part in N (cf. Koak 2008).

(ii)



This PRO-DP analysis would then lead us to expect that the *ku*-based quasi-pronouns may receive a referential reading, but not a bound variable reading. This expectation is in fact borne out, as the following examples illustrate (*kyay* in (iiia) and (iva) is a contracted form of *ku-ay*).

(iii) a. Chinkwu$_1$-ka **kyay**$_1$ chinkwu cip sacin ccik-ese ponay-cwu-ess-e.
friend-NOM he friend house picture take-and send-give-PAST-DECL
'My friend$_1$ took a picture of his$_1$ house and sent it to me.'

b. Hanunim$_1$-kkeyse **kupwun**$_1$-i sinloyha-l swu iss-nun salam-tul-ul sayongha-si-ess-ta.
God-HON.NOM he-NOM trust-ADN can exist-ADN person-PL-ACC use-HON-PAST-DECL
'God$_1$ used people who he$_1$ could trust.' (Google)

(iv) a. Nay motun chinkwu$_1$-ka Mina-ka **kyay**$_{*1/2}$-lul coaha-yss-ta-ko sayngkakha-yss-e.
My every friend-NOM Mina-NOM he-ACC like-PAST-DECL-COMP think-PAST-DECL
'Every friend of mine$_1$ thought Mina liked him$_{*1/2}$.'

b. Enu sensayng$_1$-nim-ina **kupwun**$_{*1/2}$-ul conkyengha-nun haksayng-ul coaha-n-ta.
every teacher-HON-also he-ACC respect-ADN student-ACC like-PRES-DECL
'Every teacher$_1$ likes a student who respects him$_{*1/2}$.' (adapted from Koak 2008)

As noted by researchers such as Cho 1992, H. Y Kim 1989, and Oh 2010, in contrast to the pronoun *ku*, the quasi-pronouns (especially, the Child/Adult-Plain style) are quite frequently used in both spoken and written Korean. Therefore, in the context of the current discussion, it can reasonably be said that with sufficient relevant linguistic input, child learners of Korean would all acquire the PRO-DP quasi-pronouns, which would uniformly employ "demonstrative grammar".

b. Paul sah eine Frau hereinkommen. {Sie/**Die**} trug einen
Paul saw a woman enter {she/DEM} wearing a
schwarzen Mantel.
black coat
'Paul saw a woman$_1$ enter. She$_1$ was wearing a black coat.'
(Bosch et al. 2003: 1, ex.(2))

(52) Jeder Mann$_1$ glaubt, daβ {er$_1$/***der**$_1$} dumm ist.
every man believes that {he/DEM} stupid is
'Every man$_1$ believes that he$_1$ is stupid.'
(Wiltschko 1998: 144, ex.(3))

Returning to the question of why and how the phenomenon of inter-speaker variation emerges and exists, we can now attempt to provide a more principled answer as follows. There exists two types of *ku*, PRO-DP *ku* and PRO-ϕP *ku*, in Korean.[54] Given the lack of relevant input data, however, child learners of Korean must choose at random either of the two pronouns. That is, some may acquire the Pro-ϕP *ku*, which complies with the pronominal grammar and thus can be bound as well as be referential; others may acquire the Pro-DP *ku*, which complies with the demonstrative grammar and thus can only be referential.[55]

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[54] The idea that a pronominal in a given language may be categorized into two structurally different types is not new in the literature. As briefly mentioned in footnote 11, in contrast to the standard observation that Japanese third-person pronouns can refer but cannot be bound, as shown in (i) and (ii), some researchers argue that the pronouns can have a bound variable reading in certain contexts, as shown in (iii).

(i) Taroo$_1$-wa **kare**$_1$-ga daihyoo-ni erabareru to omotte-iru.
Taroo-TOP he-NOM representative-as be.selected COMP think-PRES
'Taro$_1$ thinks that he$_1$ will be selected as a representative.'

(ii) ?* Dono gakusei$_1$-mo **kare**$_1$-ga daihyoo-ni erabareru to omotte-iru.
every student-PART he-NOM representative-as be.selected COMP think-PRES
'Every student$_1$ thinks that he$_1$ will be selected as a representative.'
(Yashima 2015: 1433, ex.(45a) and (45b))

(iii) Dono nooberusyoo zyusyoo sakka$_1$-ga **kare**$_1$-no kuruma-de kita-no?
which Nobel.Prize winning author-NOM he-GEN car-in came-PRES
'Which Nobel Prize winning author$_1$ came in his car?'
(Hoji 1991: 142, ex.(32c))

To account for the above observations, Yashima (2015: 1433) claims that the Japanese pronouns are in fact epithets (e.g., *the bastard*, *the idiot*, and *the damn thing* in English), but can be divided into two types, each with a distinct structure, as illustrated below.

(iv) [$_{\text{DP}}$ **kare/kanozyo** (=epithet phrase)]

(v) [$_{\text{DP}}$ *pro* [$_{\text{AppositiveP}}$ **kare/kanozyo** (=epithet phrase)]]

First, one type of *kare/kanozyo* is a full DP epithet phrase, as in (iv), which can be bound or coreferential only when "Condition B and the so-called anti-logophoricity constraint are simultaneously satisfied"(p.1423), compatible with Dubinsky and Hamilton's (1998) theory of epithets in general. Thus, (ii) is ungrammatical since *kare* is bound by the "agent of the attitude report", i.e., a logophoric center, and thus the anti-logophoricity constraint is not satisfied. (Condition B is satisfied, though.) (iii), on the other hand, is grammatical since the antecedent of *kare* is not an attitude holder, thus satisfying the anti-logophoricity constraint as well as Condition B. The other type is an appositive epithet phrase justaposed with "a null pronominal anchor", as in (v). Yashima argues that, being insensitive to anti-logophoricity constraint, this type of *kare/kanozyo* can be referential but not bound. Thus, in (i), *kare* can be coreferential with the matrix subject, a logophoric center (for further details of these arguments, see Yashima 2015: 1433-1434). A crucial point to be made here is that Yashima's proposal theoretically supports the current proposal in the sense that it postulates two different syntactic structures for a given pronominal. Note, however, that his proposal implies that the two types of *kare/kanozyo* are acquired by all Japanese speakers, rather than each type being acquired by a distinct group of speakers.

It follows from the current proposal that, in contrast to personal pronoun *ku*, the grammar of demonstrative *ku* should be uniform, as child learners of Korean are provided with sufficient input regarding demonstrative *ku*. An analysis consistent with the current proposal on personal pronoun *ku* given here would be to uniformly place demonstrative *ku* in the Pro-DP category of Déchaine and Wiltschko's typology. This then predicts that all Korean speakers should disallow bound variable reading for definite descriptions with demonstrative *ku*. In light of observations found in the literature that English and other languages (Evans 1980; Hoji 1990; Nishigauchi 1990; Noguchi 1997; Elbourne 2008) allow a bound variable reading for definite descriptions headed by a demonstrative in certain contexts (e.g., *that logician*), it remains an important task to test for the availability of such a reading in Korean. I return to this issue in Chapter 5, which is devoted to a discussion of future research.

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[55] It is noteworthy at this point that just like Japanese pronouns *kare* and *kanozyo*, Korean pronouns *ku* and *kunye* can be preceded by adjectives, as illustrated in (i) (see again footnote 16 for the corresponding Japanese examples). In light of this observation, it might be tempting to argue that the Korean pronouns are nouns (e.g., Sohn 1994), and thus under Déchaine and Wiltschko's (2002) pro-form typology, they should be treated as Pro-NPs (i.e., Ns contained within NPs) rather than Pro-DPs or Pro-ϕPs.

(i) a. twungtwungha-n **ku** b. yepkicek-in **kunye**
fat-ADN he bizarre-ADN she

As pointed out to me by Chung-hye Han (personal communication, April 2017), however, the adjectives followed by the pronouns *ku* and *kunye* might better be analyzed as non-restrictive modifiers (see also Elbourne 2005: 163 for a similar argument for the Japanese cases). Indeed, (ia) and (ib) seem to mean 'he, who is fat' and 'she, who is bizarre' rather than '(lit.) fat he' and '(lit.) bizarre she', similarly to the example in (ii), where the adjective is understood as a non-restrictive relative clause modifying the nominal headed by the demonstrative *ku*. If this is the case, (i) does not constitute evidence that the Korean pronouns are lexical nouns, i.e., pro-NPs.

(ii) ketara-n [ku namwu]
big-ADN that tree
'that (or the) tree, which is big'
(compare: ku ketara-n namwu 'that big tree') (Y. K. Kim 1997: 1)

Furthermore, the Korean pronouns are in fact not as noun-like as their Japanese counterparts are. First, *ku* and *kunye* cannot be modified by demonstratives, as in (iii), in contrast to *kare* and *kanozyo*.

(iii) a. * i **ku** b. * ce **kunye**
this he that she

Note also that *ku* and *kunye* cannot mean 'boyfriend' and 'girlfriend', as in (iv), in contrast to *kare* and *kanozyo*, which *do* allow such a semantic shift.

(iv) a. Na-to hankukin {namcachinkwu/??***ku**}-ka iss-ta.
I-also Korean boyfriend-NOM exist-DECL
'I also have a Korean boyfriend.'

b. Minsen-iga ni {yecachinkwu/??***kunye**}-ni?
Minsen-NOM you.GEN girlfriend-Q
'Minsen is your girlfriend?'

Based on the above discussion, I argue that the Korean pronouns should not be analyzed as pro-NPs.

Chapter 3

The syntax of Korean VP anaphora

3.1 Introduction

Cross-linguistically, it is possible to convey intended ideas without using full verbal expressions that would otherwise be necessary. A well-known example illustrating this fact is the English VP ellipsis construction given in (1). Here, a VP appears to have been omitted after *will* in the second conjunct (denoted by [VP]), but is nevertheless readily interpreted as identical to the phonologically overt VP in the first conjunct [VP *happily eat those Paleo carrot flatbread rounds with butter and jelly*].

(1) The boys will [VP happily eat those Paleo carrot flatbread rounds with butter and jelly], and Boogie will [VP], too.
(www.unfancymama.com/20140301archive.html)

The Korean VP anaphora construction, which is the linguistic phenomenon of interest in the current chapter, is another case in point, as illustrated by the examples in (2) and (3).

(2) Wangca-tul-i [VP ku-eyke yelsimi kul-kwa yepep-ul paewu]-ess-ko,
prince-PL-NOM he-from hard writings-and manners-ACC learn-PAST-CONJ
Cwumong-to **kuleha**-yess-ta.
Cwumong-also so.do-PAST-DECL
'The princes learned writings and manners hard from him, and Cwumong did so, too.' (www.dev.emcampus.com)

(3) A: [VP Eceypam-ey ku kongphoyenghwa-lul poko-naseo cam-ul
last.night-at the scary.movie-ACC watch-after sleep-ACC
selchi]-ess-e.
bad.sleep-PAST-DECL
'I had a bad sleep last night after watching the scary movie.'

B: Na-to **kulay**-ss-e.
I-also SO.DO-PAST-DECL

'I did so, too.'

The VP anaphor *kuleha* 'do so' and its phonological variant *kulay* in (2) and (3) are immediately interpreted as identical to the longer and structurally more complex VPs in the first conjunct, [$_{\text{VP}}$ *ku-eyke yelsimi kul-kwa yepep-ul paewu*] 'learn writings and manners hard from him' and [$_{\text{VP}}$ *eceypam-ey ku kongphoyenghwa-lul poko-naseo cam-ul selchi*] 'have a bad sleep last night after watching the scary movie', respectively.[1] The primary aim of this chapter is to provide novel empirical evidence that sheds new light on the syntactic status of the Korean VP anaphors, which is the key to understanding how they come to receive intended interpretations, despite the absence of otherwise expected lexical elements.

As already mentioned in Chapter 1, the existing proposals on the syntax of Korean VP anaphora can be partitioned into two distinct ways. First, the VP anaphors can conceivably be analyzed as base-generated verbal pro-forms (Bae & Kim 2012; M. K. Park 2013). Under this view, *kuleha* in (2) or *kulay* in (3) can be taken to make reference to the event or situation introduced into the discourse by the VP in the first conjunct, analogous to how an overt pronoun such as *him* in (4) may refer to the entity denoted by an antecedent DP.

(4) Mary hated [$_{\text{DP}}$ the old man who moved in from the east coast], but Lisa liked **him** very much!

In contrast, an alternative, and relatively more prevalent, view takes the VP anaphors to be instances of the ellipsis phenomena (e.g., Cho 1996; Son 2006; Storoshenko 2008; Kim & Yoon 2009; Ha 2010; Madigan 2015; M. K. Park 2015). To illustrate, consider the example of English VP ellipsis (1), which is repeated below in (5) (hereafter, strikethrough texts indicate elided material).

(5) The boys will [$_{\text{VP}}$ happily eat those Paleo carrot flatbread rounds with butter and jelly], and Boogie will [$_{\text{VP}}$ ~~happily eat those Paleo carrot flatbread rounds with butter and jelly~~], too.

---

[1] The VP anaphors *kuleha* and *kulay* can be interchangeably used in (2) and (3), with no apparent difference in meaning, as illustrated in (i) and (ii).

(i) Wangca-tul-i ku-eyke yelsimi kul-kwa yepep-ul paewu-ess-ko, Cwumong-to
prince-PL-NOM he-from hard writings-and manners-ACC learn-PAST-CONJ Cwumong-also
kulay-ss-ta.
so.do-PAST-DECL
'The princes learned writings and manners hard from him, and Cwumong did so, too.'

(ii) A: Eceypam-ey ku kongphoyenghwa-lul poko-naseo cam-ul selchi-ess-e
last.night-at the scary.movie-ACC watch-after sleep-ACC bad.sleep-PAST-DECL
'I had a bad sleep last night after watching the scary movie.'

B: Na-to **kuleha**-yess-e.
I-also so.do-PAST-DECL
'I did so, too.'

With regard to the nature of the "missing VP" in the second conjunct, as Chung et al. (2011: 2) put it, "the standard view in current research in the Principles and Parameters framework and in the Minimalist Program" is what is generally referred to as the 'PF-deletion' approach (see also, among many others, Sag 1976, Chomsky & Lasnik 1993, Heim & Kratzer 1998, Tancredi 1992, Lappin 1996, Wilder 1997, Johnson 2001, Merchant 2001, Kennedy 2003, Büring 2005).[2] The gist of it is as follows. A regular VP is constructed in overt syntax (e.g., *happily eat those Paleo carrot...with butter and jelly* in (5)), but may be "deleted" at the level of Phonological Form (PF) under identity with an antecedent VP, i.e., an overt VP elsewhere in the discourse.[3] At the level of Logical Form (LF), however, the inaudible VP constituent remains intact with a fully represented structure, and thus it is this LF structure that gets passed to the semantic component to be assigned a proper semantic interpretation.

In a similar vein, the Korean VP anaphora phenomena could also be analyzed as an output of the PF-deletion process. That is, a fully-articulated VP generated in overt syntax may get "replaced" (and thus "deleted") at PF by certain surface forms such as *kuleha* or *kulay*, complying with "a pronunciation rule that applies only when [the] VP is identical to another one" in the discourse context (Cecchetto and Percus 2006: 79). Under this ellipsis analysis, the derivation of the second conjunct in (2), repeated below in (6), can be understood as is illustrated (7) (with irrelevant details suppressed).[4]

---

[2] I assume the standard (inverted) Y-model of grammar (Chomsky 1995, among others), according to which linguistic objects constructed in overt syntax are sent to the PF (an interface with the sensory-motor system) and the LF (an interface with the conceptual-intentional system).

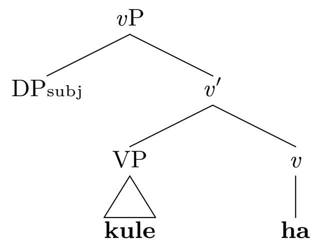
[3] For expository purposes, I follow Sag (1976), Heim and Kratzer (1998), Fox (2000), Kennedy (2003) in imposing a parallelism condition on (VP) ellipsis constructions requiring that the elided constituent has an antecedent constituent with an identical representation at LF. This syntactic identity requirement can be understood as stated in Heim and Kratzer (1998: 250).

i. LF IDENTITY CONDITION ON ELLIPSIS:
A constituent may be deleted at PF only if it is a copy of another constituent at LF.

Alternative semantic accounts of parallelism/identity, such as Merchant's (2001) E-GIVENness, are consistent with the proposals in this chapter.

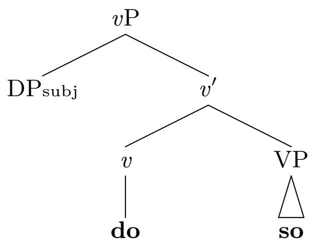
[4] The VP anaphor *kuleha* consists of two components *kule* 'so' and *ha* 'do', but the issue of how they are syntactically distributed within a verbal projection does not fall within the scope of the current study. Throughout this chapter, *kuleha* is treated as if it is an indecomposable string that simply corresponds to a VP, as shown in (7b) and (9b). See, however, Park (2015) for the claim that *ha*, as a light verb, comes under *v*, and it takes a VP complement that is replaced by *kule*, as shown in (i). See also Stroik (2001) and Hallman (2004) for a similar analysis of *do so* in English, as shown in (ii).

(i)



(Park 2015: 704, ex.(24))

(ii)

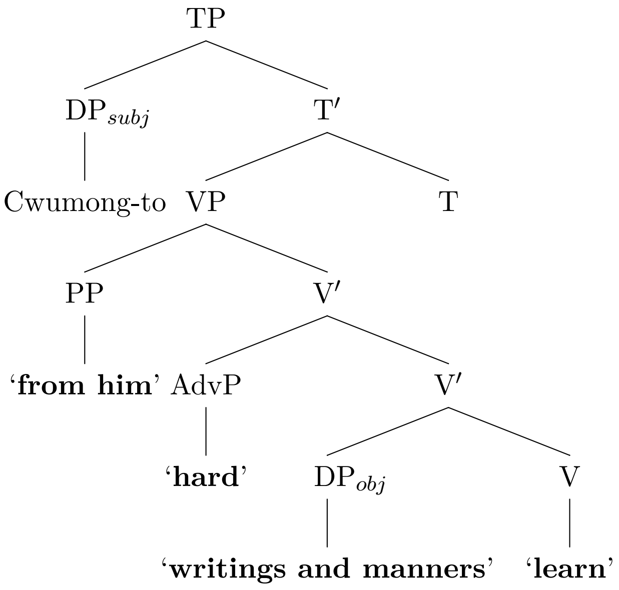


(Hallman 2004: 108, ex.(26b))

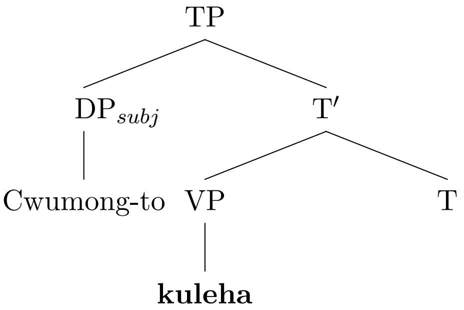
(6) ..., Cwumong-to **kuleha**-yess-ta.
..., Cwumong-also so.do-PAST-DECL
'(The princes learned writings and manners hard from him, and)
Cwumong did so, too.'

(7) VP Ellipsis

a. Overt syntax and LF:



b. PF:



Note above that a richly articulated VP structure *does* exist at the syntactic levels of representation (i.e., overt syntax and LF), albeit obscured by the surface form *kuleha* at PF. Thus, it is from this syntactic structure in (7a) that the intended meaning is derived.

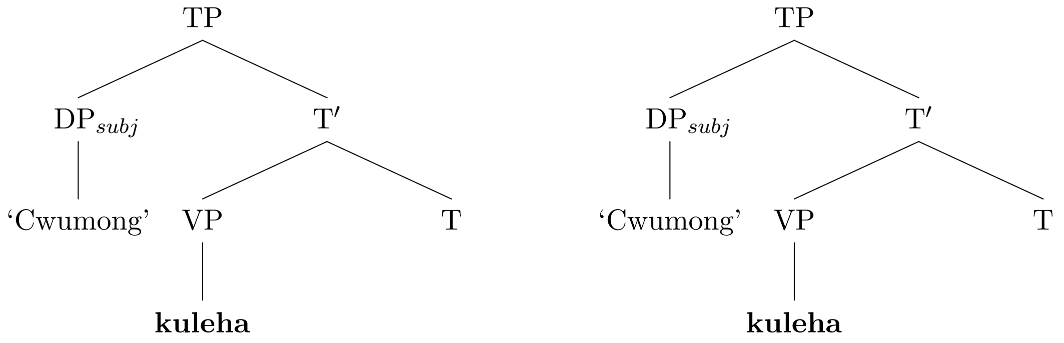
In Section 3.2 and Section 3.3, however, I present empirical data that contradict the ellipsis account of Korean VP anaphora. In two experimental studies to diagnose the presence of 'hidden' syntactic structure within the VP anaphors, I examined whether they license sloppy identity readings (Experiment 3 in Section 3.2) and overt extraction (Experiment 4 in Section 3.3). I demonstrate that the experimental results from the two studies could only be obtained if no deletion of syntactic structure was involved in deriving the VP anaphors.

For simplicity, the current paper eschews the *v*P/VP distinction, and *v*P-internal subjects.

On the basis of these empirical findings, I defend the claim that the Korean VP anaphors begin their lives as pro-forms in the derivation, and thus can accommodate no more structure than what must be present for the surface lexical string, and retrieve their semantic values from the context through interpretive rules, as in the case of pronominal resolution. To the extent that this VP pro-form analysis is on the right track, the second conjunct of (2), repeated below in (8), should be represented as in (9).

(8) ..., Cwumong-to **kuleha**-yess-ta.
..., Cwumong-also so.do-PAST-DECL
'(The princes learned writings and manners hard from him, and)
Cwumong did so, too.'

(9) VP pro-form


a. Overt syntax and LF:
b. PF:

3.2 Experiment 3: Sloppy identity reading in Korean VP anaphora

3.2.1 Theoretical background

Since at least the classic work of Sag (1976), it has become a widespread practice in the literature to take the availability of a sloppy reading as an indication of the presence of unpronounced syntactic structure (i.e., the presence of ellipsis). Consider the English VP ellipsis construction in (10), in which the antecedent VP in the first conjunct contains a possessive pronoun.

(10) John will [$_{\text{VP}}$ drink **his** beverage], and Mike will [$_{\text{VP}}$] too.

Given that the first conjunct is intended to mean "John will drink John's beverage", the sentence as a whole may give rise to two different interpretations, as illustrated in (11), which have been referred to as the sloppy identity and the strict identity readings since Ross (1967: 348).

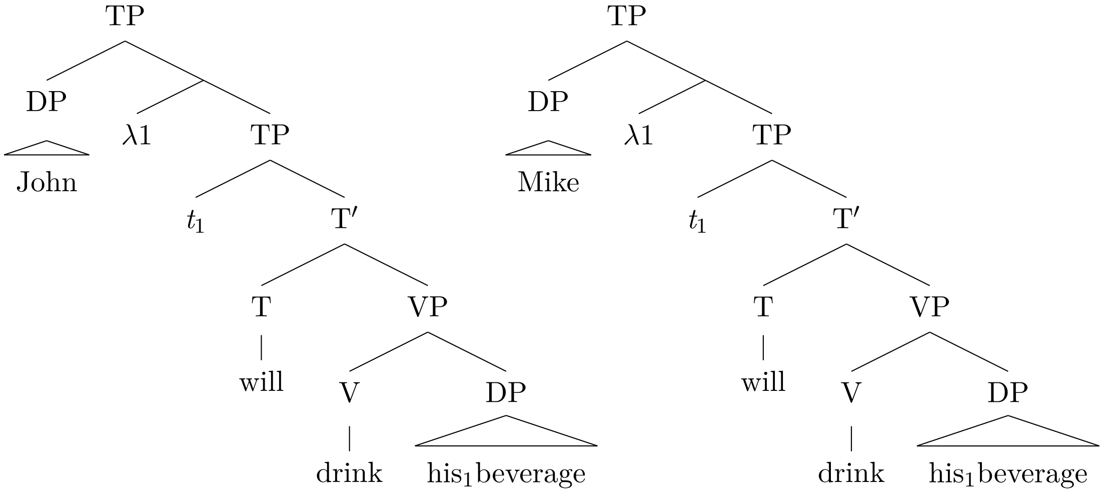
(11) a. 'John will drink John's beverage, and Mike will drink Mike's beverage, too.' [sloppy identity]

b. 'John will drink John's beverage, and Mike will drink John's beverage, too.' [strict identity]

In the sloppy reading in (11a), both John and Mike will drink their own beverage, while in the strict reading in (11b), both John and Mike will drink the beverages that belongs to the same individual, John.[5]

In Sag (1976) and much subsequent work influenced by it (e.g., Reinhart 1983; Heim & Kratzer 1998; Büring 2005), the sloppy−strict ambiguity is ascribed to a pronoun embedded within the ellipsis site [VP], behaving as either a bound pronoun or a free pronoun. Specifically, according to their proposals, the antecedent VP in the first conjunct in (10) may be represented at the level of LF in two distinct ways, depending on whether the pronoun *his* is construed as a bound variable or a free variable, and the elided VP in the second conjunct has−and must have−an LF representation that is identical to that of the antecedent VP, as shown in (12) and (13).[6]

(12)



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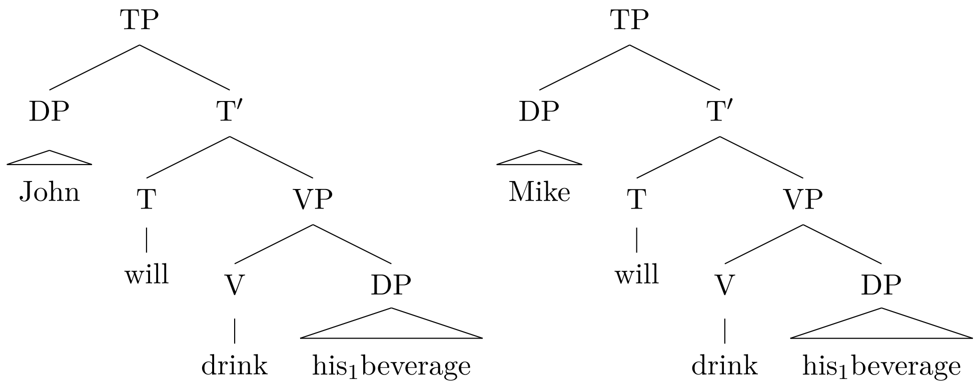
[5] If the owner of the beverage that John will drink is Mike or an individual other than John and Mike, say Robert, then two other strict identity readings can also be available, as illustrated in (i) and (ii).

(i) 'John will drink Mike's beverage, and Mike will drink Mike's beverage, too.'

(ii) 'John will drink Robert's beverage, and Mike will drink Robert's beverage, too.'

[6] For further details of this line of explanation, see e.g., Heim and Kratzer 1998 and Büring 2005.

(13)



(12) illustrates an LF that would license the sloppy reading in (11a). In the first conjunct, quantifier raising (henceforth, QR) has been applied to the DP subject *John*, introducing a variable binder (or lambda operator), $\lambda 1$. The pronoun *his*$_1$ in the antecedent VP is then co-indexed with and c-commanded by that variable binder, and is thus semantically bound, i.e., a bound variable (Heim & Kratzer 1998).[7] In the semantic component, the sister constituent of the QR'd DP is represented as a lambda function, in which each occurrence bearing the index 1 (i.e., the trace and the pronoun) is construed as a variable whose value is bound to that of the argument passed to the function, in this case, the subject of the first conjunct; therefore, the identity of the overt pronoun *his*$_1$ is the individual *John.* Likewise, a variable binding configuration is also established in the second conjunct, wherein the pronoun *his*$_1$ in the elided VP would be semantically bound by a variable binder. A lambda function is computed here as well, where the subject of the second conjunct, not the first conjunct, is taken as an argument, and therefore the elided pronoun *his*$_1$ denotes the individual *Mike.*

On the other hand, the LF structure in (13) would license the strict reading in (11b). Unlike (12), no variable binder is introduced in either conjunct due to the non-application of QR; subsequently, *his*$_1$ in the antecedent VP and *his*$_1$ in the elided VP are both free variables. In other words, they are both considered to be semantically free and their values are determined contextually. Therefore, given the context where the index 1 is mapped to the individual *John*, the overt and elided occurrences of *his*$_1$ will both be interpreted as coreferential with *John*, the subject of the first conjunct.

---

[7] Heim and Kratzer's (1998) definition of 'semantic binding' can be stated as below (paraphrased by McKillen 2016: 4).

(i) β semantically binds α if and only if:

a. α is an occurrence of a variable

b. β is an occurrence of a variable binder

c. β c-commands α

d. β is co-indexed with α

e. β does not c-command any other variable binder occurrence which also c- commands and is co-indexed with α

Heim and Kratzer (1998: 263) also provide a derivative notion of semantic binding, as stated in (ii).

(ii) A DP α semantically binds a DP β (in the derivative sense) iff β and the trace of α are (semantically) bound by the same variable binder.

Given this derivative notion, the subject of each conjunct in (12) can be said to semantically bind each occurrence of the pronoun *his*$_1$, although "the real binder" is actually the variable binder $\lambda 1$.

Based on the foregoing discussion, it could be said that sloppy identity readings are licensed in (VP) ellipsis contexts because the ellipsis site is the result of the deletion of a fully represented syntactic structure at PF, and thus there exists a pronoun at the ellipsis site at LF to be construed as a bound variable, in parallel with the overt bound pronoun in the antecedent clause. However, if the ellipsis site contained no internal syntactic structure (i.e., it was some kind of silent pro-form (cf. Lobeck 1995)), then a pronoun would never be available within the ellipsis site to serve as a bound variable, and consequently sloppy readings would never arise.

As mentioned previously, the availability of a sloppy reading has been widely taken as a 'sign' for an unpronounced syntactic structure hosting a bound variable element. For example, Takahashi (1994) analyzes the so-called sluicing construction in Japanese as being derived by TP deletion (preceded by *wh*-movement), citing the presence of its sloppy reading as a supporting argument. Consider (14) below.[8]

(14) John-wa zibun-ga naze sikarareta ka wakattei-nai-ga, Mike-wa [$_{\text{CP}}$ naze$_1$ [~~TP~~
John-TOP self-NOM why be-scolded Q knows-not-but Mike-TOP why
~~zibun-ga~~ ~~t_1~~ ~~sikarareta~~] -ka] wakatteiru.
-Q knows

'John doesn't know why John himself was scolded, but Mike knows why.'

(Takahashi 1994: 268, ex.(11))

The second conjunct containing sluicing can mean either that Mike knows why Mike himself was scolded, the sloppy reading, or that Mike knows why John was scolded, the strict reading. Takahashi (1994) argues that the sloppy reading is available in (14) because the sluicing site consists of an internally structured, but PF-deleted, TP constituent, where the anaphor *zibun* 'self' is construed as a bound variable.

It is noteworthy, however, that a number of researchers have cautioned against taking the availability of a sloppy reading as a decisive indicator of the presence of ellipsis by demonstrating that sloppy readings can even be licensed in non-elliptical sentences such as those in (15), where overt pro-forms are involved (e.g., Fiengo & May 1994; Hoji 1998; 2003; Depiante 2000; Culicover & Jackendoff 2005; Dalrymple 2005; Houser 2010; Frazier 2013; Merchant 2013a, 2013b; Kasai 2014).[9]

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[8] See Takahashi (1994) for his argument that sluiced remnant in Japanese undergoes *wh*-movement to SpecCP.

[9] Merchant (2013a: 540) also provides pro-form examples such as (i)-(iii) below, where, he argues, "ellipsis cannot be implicated", but sloppy readings are still found. Based on these examples, Merchant claims that the presence of sloppy readings is a "non-diagnostics" or "problematic diagnostics" for ellipsis.

(15) a. Betty cleaned her living room, and Jane [$_{\text{VP}}$ **did the same thing**], too.[10]
(compare: Betty cleaned her living room, and Jane did, too.)
(i) '..., and Jane cleaned her own living room.' [sloppy identity]
(ii) '..., and Jane cleaned Betty's living room.' [strict identity]
(Frazier 2013: 499, ex.(12a))

b. Max hit his friend, and Oscar [$_{\text{VP}}$ **did it**], too.
(compare: Max hit his friend, and Oscar did, too.)
(i) '..., and Oscar hit his own friend.' [sloppy identity]
(ii) '..., and Oscar hit Max's friend.' [strict identity]
(Houser 2010: 15, ex.(31), originally from Fiengo & May 1994)

Given that *do the same thing* and *do it* are arguably verbal pro-forms that are syntactically atomic, i.e., they have no additional structure other than the one represented by the overt lexical items (Hankamer & Sag 1976), it is difficult to maintain that the sloppy readings in (15) are resulted from a bound variable pronoun, which would be non-existent inside *do the same thing* and *do it.* Rather, the sloppy readings should be attributed to other sources such as semantic or pragmatic inferences, as put forward by Hoji (1998, 2003).[11] For instance, *do the same thing* in (15a) may induce a sloppy reading by referring to the event or situation, say cleaning one's own living room, that is inferred from the antecedent VP. Note also that in (16) below, *do the same thing* and *do it* allow sloppy readings even when there are no explicit linguistic antecedents in the discourse, further supporting that in pro-form contexts, sloppy interpretation can be resolved without recourse to a bound variable element.

(16) a. (Observing John touch his finger to his nose)
Bill [$_{\text{VP}}$ **did the same thing**].
(i) 'Bill touched his own finger to his own nose.' [sloppy identy]
(ii) 'Bill touched John's finger to John's nose.' [strict identy]
(Hoji 2003: 176, ex.(14))

(i) Harvey stubbed his toe on the doorstop, and **it** happened to Max, too.
(ii) Undergraduates can be covered under their parents' health plans if desired; {likewise for graduate students. | **that** goes for grad students, too.}
(iii) A professor who pays down her mortgage with her paycheck is wiser than one who gambles **it** away in online poker.
(Merchant 2013a: 540, ex.(7b-d))

[10] According to Frazier (2013), it was found in Clifton and Frazier's (forthcoming) written interpretation study that sentences containing *do the same thing* such as (15a) are even more likely to induce sloppy readings than their ellipsis counterparts. In light of this finding, Frazier (2013: 499) concludes that "sloppy readings may have many and varied sources" other than the variable binding mechanism, and therefore "sloppy readings do not diagnose ellipsis".

[11] The sloppy readings that are derived by a mechanism other than variable binding are not genuine sloppy readings, but "sloppy-like readings", in the sense of Hoji (1998).

b. (John touches his finger to his nose. John says to Bill:)
Now you [VP **do it**]!
(i) 'Bill touches his own finger to his own nose.' [sloppy identity]
(ii) 'Bill touches John's finger to John's nose.' [strict identity]
(Dalrymple 2005: 36, ex.(17))

It therefore follows that, as emphasized by Depiante (2000: 34), the availability of a sloppy reading is not, and should not be, "a necessary or sufficient condition" for determining the presence of ellipsis in that pro-forms can also induce sloppy interpretation; if an anaphoric element exhibits a sloppy reading, it might either involve deleted material or be an instance of a pro-form.

3.2.2 Research question and predictions

The above discussion clearly indicates that it is problematic to take the availability of a sloppy reading as a diagnostic for ellipsis in general. However, I will demonstrate that, with the aid of the overt third-person pronoun *ku* 'he', the (un)availability of a sloppy reading can be employed as a reliable tool to identify the syntactic nature of Korean VP anaphora, i.e., whether it is an instance of VP ellipsis or VP pro-form. We have already seen in Chapter 2 that the pronoun *ku* has a distinctive interpretative status from pronouns of other languages like English. In Experiments 1A, 1B, and 2, it was revealed that there was considerable inter-speaker variation in the acceptance of the bound variable construal of *ku*. That is, with regard to the interpretation of quantificational sentences such as (17), one group of Korean speakers consistently accepted a bound variable reading for *ku* (17a), while another group of Korean speakers consistently rejected such a reading. This is in sharp contrast to the English *his* in similar sentences which uncontroversially allows a bound variable reading.

(17) Motwu-ka **ku**-uy umlyoswu-lul masi-ess-ta.
everyone-NOM he-GEN beverage-ACC drink-PAST-DECL
'Everyone drank his beverage.'

a. 'Each person drank his own beverage.'

b. 'Everyone drank one particular person's beverage.'

On the basis of these empirical findings, it was proposed that the inter-speaker variation is indeed a robust linguistic phenomenon in present-day Korean, resulting from the co-existence of two competing grammars of *ku*; some Korean speakers may acquire one grammar for *ku* where it can be construed as a bound variable, but others may acquire another for *ku* where it cannot be so construed. Recall also from Experiments 1A, 1B, and 2 that *ku* was readily interpreted as coreferential with a referring expression elsewhere in the sentence, as illustrated in (18a), or as referring to some individual in the extra-linguistic context, as illustrated in (17b) and (18b).

(18) Minswu-ka **ku**-uy umlyoswu-lul masi-ess-ta.
Minswu-NOM he-GEN beverage-ACC drink-PAST-DECL
'Minswu drank his beverage.'

a. 'Minswu drank Minswu's beverage.'

b. 'Minswu drank one particular person's beverage.'

Building upon findings regarding the nature of *ku*, Experiment 3 was designed to address the following research question.

(19) RESEARCH QUESTION:
Does the distribution of sloppy reading for VP anaphora follow from the distribution of the bound-variable pronoun in Korean?

In order to tackle this research question, the experiment examined the availability of sloppy readings in VP anaphora sentences as in (20) and bound variable readings in quantificational sentences as in (17).

(20) Minswu-ka [$_{\text{VP}}$ **ku**-uy umlyoswu-lul masi]-ess-ko, Kiswu-to
Minswu-NOM he-GEN beverage-ACC drink-PAST-CONJ Kiswu-also
kuleha-yess-ta.
SO.DO-PAST-DECL
'Minswu drank his beverage, and Kiswu did so, too.'

a. 'Minswu drank Minswu's beverage and, Kiswu drank Kiswu's beverage, too.' [sloppy identy]

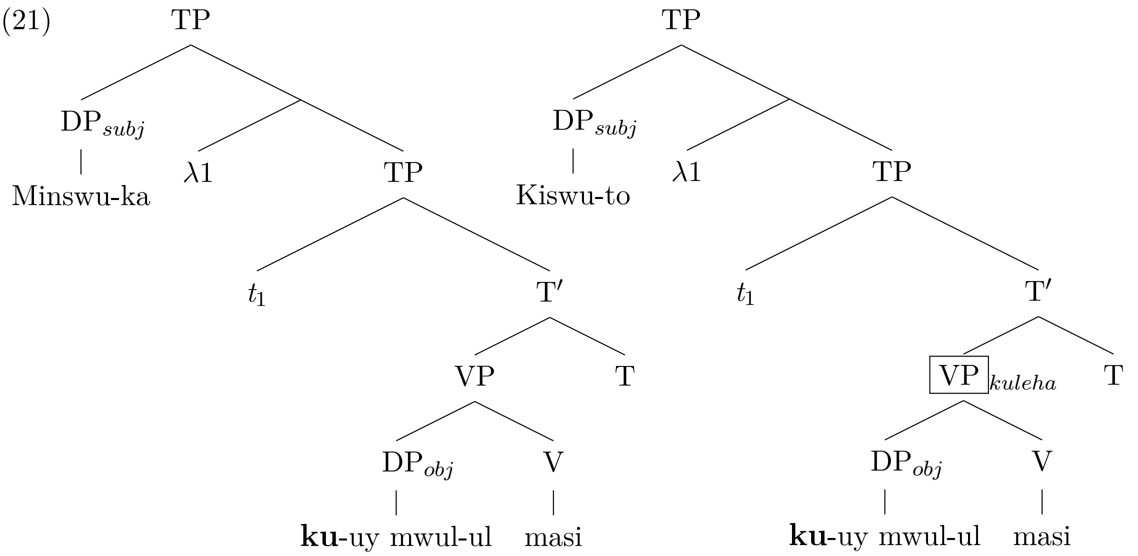
b. 'Minswu drank Minswu's beverage and, Kiswu drank Minswu's beverage, too.' [strict identy]

Given the context where *ku* in the first conjunct of (20) is understood as *Minswu*, the ellipsis and pro-form analyses of Korean VP anaphora yield different predictions regarding the relation between the distribution of the sloppy readings for *kuleha* and the quantificational binding of *ku*. This is so since the ellipsis analysis assumes *kuleha* to have syntactically accessible internal structure while the pro-form analysis does not. The predictions of the two analyses are given in detail below.

Predictions of the VP ellipsis analysis

If the VP anaphor *kuleha* involves PF-deletion of a fully articulated VP structure that is identical to its antecedent, then the pronoun *ku* must be present inside the VP anaphor, as represented in (21), and its (un)bindability would thus remain intact, which has been shown in Experiments 1A, 1B, and 2 to reveal substantial variation across Korean speakers.

(21)

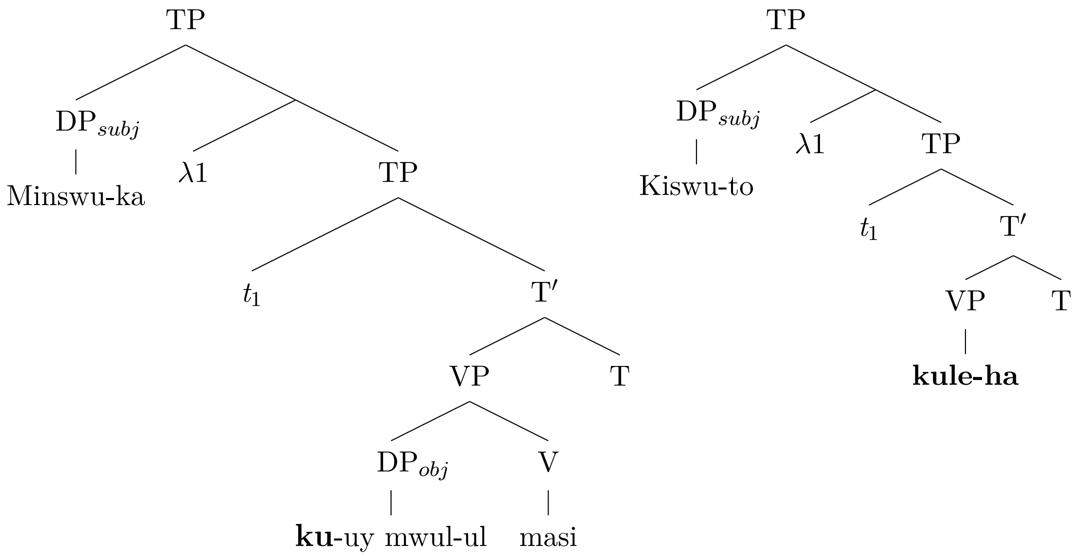


Accordingly, we would expect to find inter-speaker variation in the acceptance of sloppy readings in VP anaphora sentences as in (20) as well as in the acceptance of bound variable readings in quantificational sentences as in (17). And, more crucially, we should be able to observe a strong correlation between the distribution of the two readings. This would mean that an individual speaker's acceptance of the sloppy reading in VP anaphora sentences should be predictable from her acceptance of the bound variable reading in quantificational sentences (and vice versa). For instance, speakers who allow the bound variable reading in (17a) would be expected to accept the sloppy reading in (20a), while speakers who do not allow the bound variable reading would be expected to reject the sloppy reading. Note that the strict reading in (20b), on the other hand, should be uniformly available to Korean speakers, since *ku* inside the VP anaphor would freely serve as a coreferential pronoun, which has been argued to be the source of strict identity under ellipsis.

Predictions of the VP pro-form analysis

If the Korean VP anaphor *kuleha* originates as an overt pro-form, then it would not accommodate an internal syntactic structure, and thus *ku* 'he' would never be present, as illustrated in (22).

(22)



Given that *kuleha* would never internally host the pronoun *ku*, the availability of its sloppy reading would not be contingent upon the (un)bindability of *ku*, and thus should not correlate with the availability of the quantificational binding of *ku* (as opposed to the predictions of the VP ellipsis analysis given above). Rather, given that pro-forms (e.g., English *do it* and *do the same thing*) can license sloppy readings through semantic or pragmatic inferences, we should expect the sloppy readings for *kuleha* to be uniformly available to Korean speakers. And we should reasonably expect the same for the strict readings for *kuleha*.

In the following sections, the design and methodology of Experiment 3 are sketched, followed by the presentation and discussion of the results, which confirm the predictions of the VP pro-form analysis.

3.2.3 Methodology

3.2.3.1 Participants

Forty-four native Korean adult speakers living in Vancouver, Canada, who did not participate in any of the previous experiments participated in Experiment 3. To avoid probable L2 effects on L1 grammatical intuitions, the participants were required to not have lived in any foreign countries (including Canada) for more than 6 months.[12] They were between the ages of 19 and 25 (the mean age was 22), and were all university students in Korea, but came to Canada to work part-time or study English at ESL institutions temporarily.

3.2.3.2 Task

A truth-value judgment task was employed, as in Experiments 1A, 1B, and 2. The participants were presented with sentences describing a context on a computer screen, followed by

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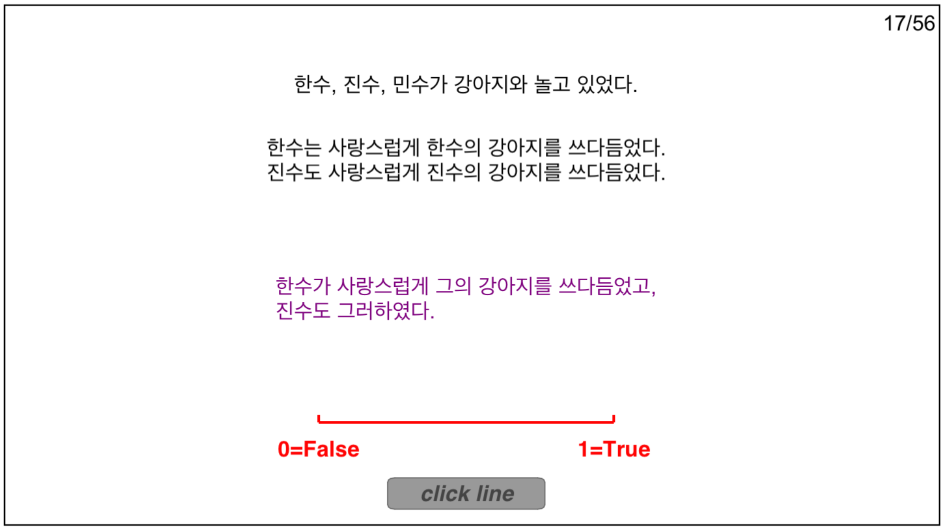
[12] None of the participants had ever lived in a foreign country other than Canada. The mean period of their stay in Canada was 3 months at the time of participation.



한수, 진수, 민수가 강아지와 놀고 있었다.

한수는 사랑스럽게 한수의 강아지를 쓰다듬었다.
진수도 사랑스럽게 진수의 강아지를 쓰다듬었다.

한수가 사랑스럽게 그의 강아지를 쓰다듬었고,
진수도 그러하였다.

Figure 3.1: Screenshot of a test trial in Experiment 3

a target sentence. They were then instructed to judge whether the target sentence truthfully described the given context by clicking 1 for 'True' and 0 for 'False' (see Figure 3.1 above).

3.2.3.3 Design and Materials

Each target sentence was either a VP anaphora sentence or a quantificational sentence, both of which contained *ku* as a possessive pronoun. Each context was biased to either bound or free interpretation of *ku* in the target sentence. Thus, two within-subjects factors were crossed to create four conditions: SENTENCE TYPE (VP anaphora (VPA) vs. Quantificational) × CONTEXT TYPE (Bound vs. Free). Consider a sample set of test items given in (23)-(26), where the target sentences are in boldface.[13]

(23) VPA-BOUND (sloppy reading) condition:

Minswu, Kiswu, Cinswu-ka uwntong hwu swui-ko iss-ess-ta.
Minswu Kiswu Cinswu-NOM exercise after rest-PROG PAST-DECL
Minswu-ka Minswu-uy umlyoswu-lul masi-ess-ta. Kiswu-to
Minswu-NOM Minswu-GEN beverage-ACC drink-PAST-DECL Kiswu-also
Kiswu-uy umlyoswu-lul masi-ess-ta.
Kiswu-GEN beverage-ACC drink-PAST-DECL

'Minswu, Kiswu, and Cinswu were taking a rest after exercise. Minswu drank Minswu's beverage. Kiswu also drank Kiswu's beverage.'

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[13] A complete set of all test items can be found in Appendix D.

Minswu-ka ku-uy umlyoswu-lul masi-ess-ko, **Kiswu-to**
Minswu-NOM he-GEN beverage-ACC drink-PAST-CONJ Kiswu-also
kuleha-yess-ta.
SO.DO-PAST-DECL

‘Minswu drank his beverage, and Kiswu did so, too.’

(24) VPA-Free (strict reading) condition:

Minswu, Kiswu, Cinswu-ka uwntong hwu swui-ko iss-ess-ta.
Minswu Kiswu Cinswu-NOM exercise after rest-PROG PAST-DECL
Minswu-ka Minswu-uy umlyoswu-lul masi-ess-ta. Kiswu-to
Minswu-NOM Minswu-GEN beverage-ACC drink-PAST-DECL Kiswu-also
Minswu-uy umlyoswu-lul masi-ess-ta.
Minswu-GEN beverage-ACC drink-PAST-DECL

‘Minswu, Kiswu, and Cinswu were taking a rest after exercise. Minswu drank Minswu’s beverage. Kiswu also drank Minswu’s beverage.’

Minswu-ka ku-uy umlyoswu-lul masi-ess-ko, **Kiswu-to**
Minswu-NOM he-GEN beverage-ACC drink-PAST-CONJ Kiswu-also
kuleha-yess-ta.
SO.DO-PAST-DECL

‘Minswu drank his beverage, and Kiswu did so, too.’

(25) Quantificational-Bound condition:

Minswu, Kiswu, Cinswu-ka uwntong hwu swui-ko iss-ess-ta.
Minswu Kiswu Cinswu-NOM exercise after rest-PROG PAST-DECL
Minswu-ka Minswu-uy umlyoswu-lul masi-ess-ta. Kiswu-to
Minswu-NOM Minswu-GEN beverage-ACC drink-PAST-DECL Kiswu-also
Kiswu-uy umlyoswu-lul masi-ess-ta. Cinswu-to Cinswu-uy
Kisuw-GEN beverage-ACC drink-PAST-DECL Cinswu-also Cinswu-GEN
umlyoswu-lul masi-ess-ta.
beverage-ACC drink-PAST-DECL

‘Minswu, Kiswu, and Cinswu were taking a rest after exercise. Minswu drank Minswu’s beverage. Kiswu also drank Kiswu’s beverage. Cinswu also drank Cinswu’s beverage.’

Motwu-ka ku-uy umlyoswu-lul masi-ess-ta.
everyone-NOM he-GEN beverage-ACC drink-PAST-DECL

‘Everyone drank his beverage.’

(26) Quantificational-Free condition:

Minswu, Kiswu, Cinswu-ka uwntong hwu, Thayswu-ka oki-lul
Minswu Kiswu Cinswu-NOM exercise after Thayswu-NOM coming-ACC
kitalimye, swui-ko iss-ess-ta. Minswu-ka Thayswu-uy umlyoswu-lul
waiting rest-PROG PAST-DECL Minswu-NOM Thayswu-GEN beverage-ACC
masi-ess-ta. Kiswu-to Thayswu-uy umlyoswu-lul masi-ess-ta.
drink-PAST-DECL Kiswu-also Thayswu-GEN beverage-ACC drink-PAST-DECL
Cinswu-to Thayswu-uy umlyoswu-lul masi-ess-ta.
Cinswu-also Thayswu-GEN beverage-ACC drink-PAST-DECL

'Minswu, Kiswu, and Cinswu were taking a rest after exercise, waiting for Thayswu to come. Minswu drank Thayswu's beverage. Kiswu also drank Thayswu's beverage. Cinswu also drank Thayswu's beverage.

Motwu-ka ku-uy umlyoswu-lul masi-ess-ta.
everyone-NOM he-GEN beverage-ACC drink-PAST-DECL

'Everyone drank his beverage.'

In (23), the context is compatible with the sloppy interpretation for *kuleha* in the target sentence, which would be, according to the ellipsis analysis, attributed to *ku* serving as a bound variable, while in (24), the context is compatible with the strict interpretation for *kuleha* in the target sentence, which would be attributed to *ku* being a free variable. In (25), the context is compatible with the quantificational binding interpretation for *ku* in the target sentence while in (26), the context is compatible with the referential (or deictic) interpretation for *ku* in the target sentence. The conditions that were key to the experiment were the VPA-Bound (sloppy reading) and the Quantificational-Bound conditions since the research question asks whether or not the distribution of sloppy readings for Korean VP anaphora patterns with the distribution of the bound variable construal of *ku.* The VPA-Free (strict reading) and Quantificational-Free conditions were taken to be controls, where 'high' acceptance rates were expected to be obtained, as discussed in Section 3.2.2.

Sixteen sets of test items were constructed on the basis of the pattern illustrated in (23)-(26). The resulting 64 test items (16 items for each of the four conditions) were then distributed to four presentation lists using a Latin Square design, such that each list contained four items from each condition and, each participant saw exactly one version of each item. The same 40 filler items were then added to each list. Half of the fillers contained a target sentence which had a 'True' target truth-value, as illustrated in (27), and the other half contained a target sentence which had a 'False' target truth-value, as illustrated in (28).

(27) VPA-TRUE condition:

Kwangho, Changho, Yengho-ka yayengha-ko iss-ess-ta. Kwangho-ka
Kwangho Changho Yengho-NOM camping-PROG PAST-DECL Kwangho-NOM
swupak-ul mek-ess-ta. Changho-to swupak-ul mek-ess-ta.
watermelon-ACC eat-PAST-DECL Changho-also watermelon-ACC eat-PAST-DECL

‘Kwangho, Changho, and Yengho were camping. Kwangho ate watermelon. Changho also ate watermelon.’

Kwangho-ka swupak-ul mek-ess-ko, **Changho-to kuleha-yess-ta**.
Kwangho-NOM watermelon-ACC eat-PAST-CONJ Changho-also so.do-past-decl

‘Kwangho ate watermelon, and Changho did so, too.’

(28) VPA-FALSE condition:

Cinho, Kyuho, Dayho-ka swulcip-eyse iyakiha-ko iss-ess-ta. Cinho-ka
Cinho Kyuho Dayho-NOM bar-at talking-PROG PAST-DECL Cinho-NOM
maykcwu-lul masi-ess-ta. Kyuho-nun Vodka-lul masi-ess-ta.
beer-ACC drink-PAST-DECL Kyuho-TOP Vodka-ACC drink-PAST-DECL

‘Cinho, Kyuho, and Dayho were talking at the bar. Cinho drank beer. Kyuho drank Vodka.’

Cinho-ka beer-lul masi-ess-ko, **Kyuho-to kuleha-yess-ta**.
Cinho-NOM beer-ACC eat-PAST-CONJ Kyuho-also so.do-past-decl

‘Cinho drank beer, and Kyuho did so, too.’

3.2.3.4 Procedure

Experiment 3 was administered using Psychopy (Peirce 2007, 2009). All the participants began the experiment with six practice trials such that they could familiarize themselves with the required task. Sixteen test trials (four trials per condition) and 40 filler trials were then presented in a uniquely generated random order. They could read the context and target sentences at their own pace, but they were instructed not to spend too much time on the truth-value judgement. On average, participants took 15-20 minutes to complete the entire experiment. They were paid $10 each as compensation for participation.

3.2.4 Findings

Out of a total of 44 participants, four participants were excluded from the data analysis because their accuracy rates on the filler trials were lower than 80%. Consequently, only results from 40 participants were analyzed in Experiment 3. Figure 3.2 below summarizes mean rates of acceptance (i.e., assignment of 1 ‘True’) by condition: 41% in the Quantificational-Bound condition, 80% in the VPA-Bound (sloppy reading) condition, 81% in the Quantificational-Free condition, and 79% in the VPA-Free (strict reading) condition.

A generalized linear mixed-effects analysis of the participants’ responses was carried out using the lme4 function in the R statistical software; the factors SENTENCE TYPE and CONTEXT TYPE were entered as fixed effects, with participant and item as random effects. First, the analysis revealed a main effect of SENTENCE TYPE (estimated coefficient = 1.88, *se*

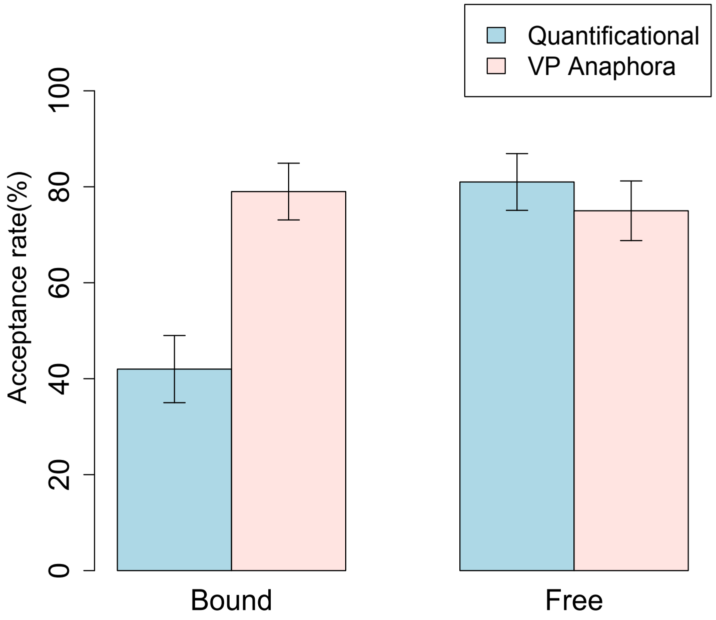

Figure 3.2: Mean rates of acceptance and standard errors in Experiment 3

= .27, $z = 6.91$, $p < .001$). That is, regardless of CONTEXT TYPE, VP anaphora sentences are more likely to be accepted than quantificational sentences. Second, an interaction between SENTENCE TYPE and CONTEXT TYPE was found (estimated coefficient = -1.96, $se = .40$, $z = -4.95$, $p < .001$). That is, while speakers are equally likely to accept both bound and free readings for the VP anaphora sentences, they are more likely to accept free readings than bound readings for the quantificational sentences. Additionally, pairwise comparisons of mean acceptance rates in each of the conditions were conducted using a Tukey's test. The results revealed that the acceptance rate in the VPA-Bound (sloppy reading) condition is significantly higher than the rate in the Quantificational-Bound condition ($p < .001$), while the acceptance rates in the VPA-Free (strict reading) and Quantificational-Free conditions are not different from each other. It was also revealed that the acceptance rate in the Quantificational-Free condition is significantly higher than the rate in the Quantificational-Bound condition ($p <. 001$), while the ratings in the VPA-Bound (sloppy reading) and the VPA-Free (strict reading) conditions are not different from each other.

As in Experiments 1A, 1B, and 2, in order to investigate how the acceptance rate in the Quantificational-Bound condition was derived, all the participants were put into three different groups on the basis of their individual acceptance rates in that condition: ACCEPT ($>$ 75% acceptance: assignment of 1 to three or four target sentences), AMBIVALENT (= 50% acceptance: assignment of 1 to two target sentences), and REJECT ($<$ 25% acceptance: assignment of 1 to none or one target sentence). Consequently, a clear bimodal distribution

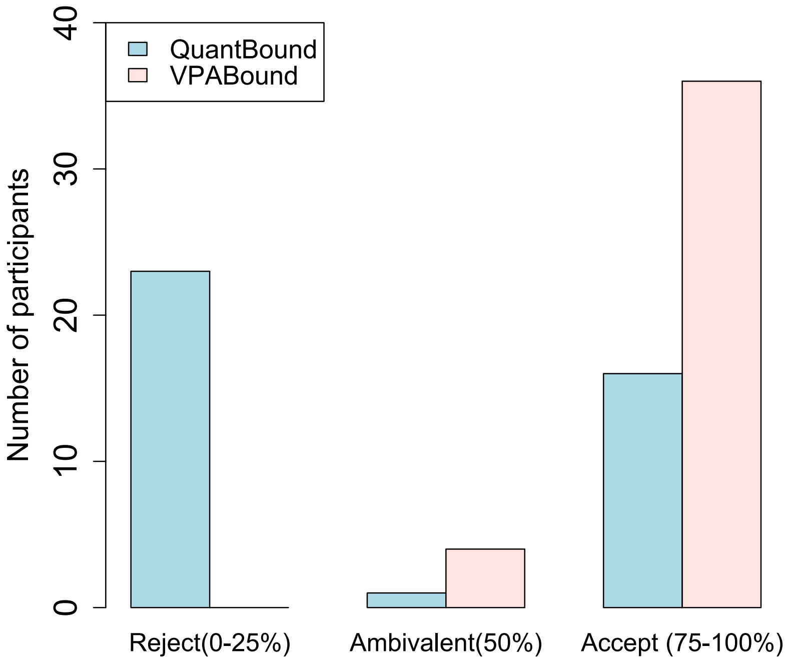

Figure 3.3: Distribution of responses in Quantificational-Bound and VPA-Bound (sloppy reading) conditions in Experiment 3

was found, as illustrated in Figure 3.3 above. That is, 16 participants were assigned to ACCEPT while 23 participants were assigned to REJECT; there was only one participant who belonged to AMBIVALENT. Given this assortment, the 41% of acceptance rate in the Quantificational-Bound condition does not actually mean that each participant accepted the quantificational binding interpretation for *ku* 41% of the time; rather, it can be seen as an indication that the 16 participants who are in the ACCEPT group, who also happen to make up 40% of the total number of participants, (almost always) consistently accepted the quantificational binding of *ku*. These findings thus replicate the inter-speaker variation reported in Experiments 1A, 1B, and 2: some Korean speakers allow *ku* to be construed as a bound variable while other Korean speakers do not.[14]

Additionally, the participants' responses in the VPA-Bound (sloppy reading) condition were inspected in the same way as they were in the Quantificational-Bound condition.[15] Crucially, the results revealed no such bimodal distribution as in the Quantificational-Bound condition, and thus no inter-speaker variation (see again Figure 3.3). That is, except for 4 ambivalent participants, the rest of the participants assigned 1 'True' to three or four (out of four) target sentences (i.e., >75% acceptance), indicating that (nearly) all participants accepted the sloppy readings for the VP anaphors. This suggests that Korean speakers may be divided into two groups; those speakers who allow both bound variable readings for *ku* (in quantificational contexts) and sloppy readings for Korean VP anaphors, and those speakers who disallow the former, but allow the latter. This in turn suggests that the interaction between SENTENCE TYPE and CONTEXT TYPE is a result of the distinct acceptance behaviours in the Bound conditions between the two groups of participants.

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[14] In a separate experiment of a similar design, which consisted of two sessions separated by one month, a clear bimodal distribution was found in the Quantificational-Bound condition in each session, with about 40% of the participants accepting the quantificational binding of *ku*. Moreover, a linear regression analysis revealed a strong correlation ($r = 0.74$, $t = 6.43$, $p < .001$) between the two sessions in the Quantificational-Bound condition. These results show that the participants exhibited the same judgment over time on the bound variable construal of *ku*, further supporting that the inter-speaker variation reported in the present study is indeed a synchronically active phenomenon in Korean.

[15] I am indebted to Jeff Runner for his suggestion of conducting this additional inspection.

A linear regression analysis testing the correlation between the participants' acceptance rates in the two Bound conditions revealed that the correlation coefficient is not significantly different from zero, indicating that an individual speaker's acceptance of the sloppy readings for the VP anaphors is not predictable from her acceptance of the quantificational binding of *ku* (and vice versa), as illustrated in Figure 3.4 below. This result was expected since about half of the participants (represented by the dots in the dotted box in Figure 3.4) rejected the quantificational binding of ku but at the same time accepted the sloppy reading for the VP anaphors.

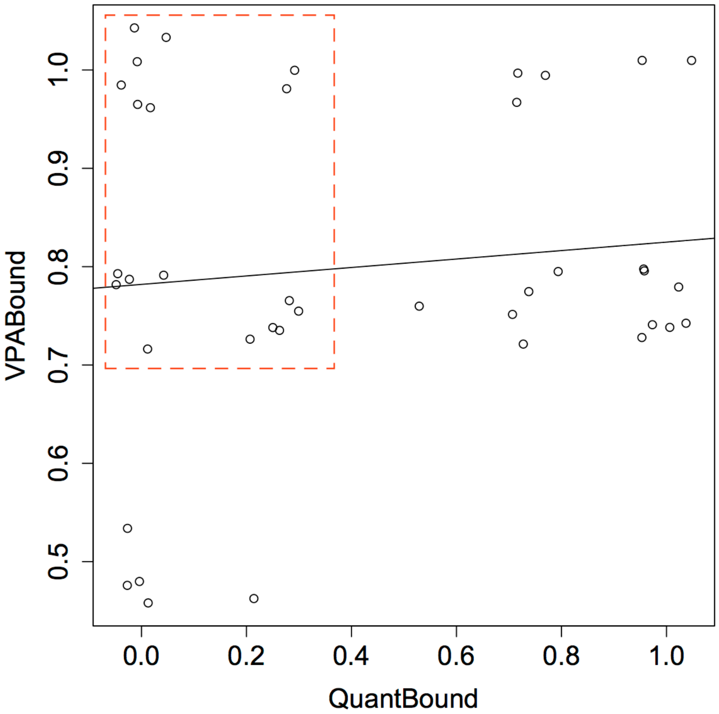

Figure 3.4: Correlation between mean acceptance rates in Quantificational-Bound and VPA-Bound (sloppy reading) conditions in Experiment 3

3.2.5 Discussion of Experiment 3

The findings of Experiment 3 provide empirical evidence that is incompatible with the view that Korean VP anaphors involve ellipsis. As discussed earlier, if *kuleha* in sentences such as (20), repeated in (29) below, was indeed derived by PF-deletion of a fully specified verb phrase housing *ku*, then the availability of its sloppy reading would be expected to correlate with the bindability of *ku*, which has been repeatedly found to exhibit inter-speaker variation through the examination of the bound variable readings in quantificational sentences such as in (17), repeated in (30) below.

(29) Minswu-ka [$_{\text{VP}}$ **ku**-uy umlyoswu-lul masi]-ess-ko, Kiswu-to
Minswu-NOM he-GEN beverage-ACC drink-PAST-CONJ Kiswu-also
kuleha-yess-ta.
SO.DO-PAST-DECL
'Minswu drank his beverage, and Kiswu did so, too.'

a. 'Minswu drank Minswu's beverage and, Kiswu drank Kiswu's beverage, too.' [sloppy identy]

b. 'Minswu drank Minswu's beverage and, Kiswu drank Minswu's beverage, too.' [strict identy]

(30) Motwu-ka **ku**-uy umlyoswu-lul masi-ess-ta.
everyone-NOM he-GEN beverage-ACC drink-PAST-DECL
'Everyone drank his beverage.'

a. 'Each person drank his own beverage.'

b. 'Everyone drank one particular person's beverage.'

Contrary to the above expectation, however, Experiment 3 has found no correlation between the distribution of sloppy readings and that of bound variables. Specifically, it was found that in addition to a group of Korean speakers who accept both quantificational binding of *ku* (as in (30a)) and sloppy readings for *kuleha* (as in (29a)), there exists another group of Korean speakers who reject the former but, nevertheless, accept the latter; in other words, Korean speakers uniformly accept sloppy readings with Korean VP anaphors, irrespective of their acceptance or rejection of *ku* as a bound variable pronoun. As foreshadowed in the previous section, these findings are evidence that the VP anaphors are base-generated pro-forms. That is, they are atomic anaphoric elements that do not contain syntactic structure other than the lexical material that surfaces, and their interpretations are resolved by "a meaning recovery strategy similar to pronominal anaphora resolution" (Tomioka 2008: 210), which allows for semantic/pragmatic inferences to derive "sloppy-like" interpretations. Therefore, as long as relevant contexts are clearly provided, the sloppy readings for *kuleha* should be readily available, as confirmed in Experiment 3.[16]

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[16] One might attempt to defend the ellipsis analysis of *kuleha* (thus, the presence of an internal structure), by postulating that those speakers who only allow *ku* to be (co)referential could nevertheless accept the

Before closing this section, note that the acceptance rates in the Quantificational-Free condition and in the VPA-Free (strict reading) condition are uniformly high. As discussed earlier, the high rate in the former was expected since it is commonly agreed that *ku* can readily induce referential (or deictic) readings as in (30b). The high rate in the latter was also expected since both the ellipsis and pro-form analyses predicted that strict readings as in (29b) should be readily available with the Korean VP anaphors. Therefore, these findings strongly suggest that the experimental design and test items were appropriate in assessing participants' knowledge of anaphora, which, in turn, ensured the reliability of the results obtained in the two Bound conditions. The next section starts with a discussion of another diagnostic test that the present study has adopted to explore the syntactic status of Korean VP anaphora: the availability of overt extraction.

3.3 Experiment 4: Overt extraction out of Korean VP anaphora

3.3.1 Theoretical background

In the generative syntax literature, the availability of overt extraction has been widely taken to be a reliable tool to diagnose whether an (overt or null) anaphoric element involves ellipsis or pro-form resolution (Haïk 1987; Tancredi 1992; Fiengo & May 1994; Johnson 2001; Schuyler 2001; Haddican 2007; Houser 2010; Bentzen et al. 2013; van Craenenbroeck & Merchant 2013; Merchant 2013a, 2013b; Kasai 2014, among others). The principle that underlies this diagnostic test is quite straightforward: if overt extraction is allowed out of the site of a target anaphoric item, it would mean that the target item must involve a deletion of syntactic structure that can host the trace (or copy, in the Copy Theory of Movement) of the extracted phrase; by contrast, if overt extraction is not available to a target anaphoric item, it would mean that the target item must be a pro-form that is syntactically atomic, and thus is unable to host any traces of movements. In light of this, VP ellipsis in English has been shown to contain internal syntactic structure, on the basis

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sloppy interpretation for *kuleha* via the operation of 'vehicle change' (Fiengo & May 1994; Safir 1999), "by which one type of expression (say, a name) can be [turned into] a distinct type of expression (say, a pronoun)" (S. W. Kim 1999: 270). Under this view, then, *ku* in the VPA site would transform to an LF object (α) that would have to be, for a sloppy reading, coreferential with the subject of the VPA clause, as illustrated in (i).

(i) [$_{TP}$ Minswu$_1$-ka [$_{VP}$ [$_{DP}$ **ku**$_1$-uy umlyoswu-lul] masi]-ess]-ko,
[$_{TP}$ Kiswu$_2$-to [$_{VP}$ [$_{DP}$ α_2-uy umlyoswu-lul] masi]-ess]-ta.

'Minswu drank Minswu's beverage, and Kiswu drank Kiswu's beverage, too.'

Crucially, however, this idea is incompatible with Fiengo and May's (1994: 218) claim that a nominal can only be 'vehicle-changed' into another form when its index value remains the same. Even if the alleged vehicle change could somehow derive an LF structure as in (i), PF-deletion (thus, ellipsis) would not be licensed since the indices assigned to the overt *ku* and the vehicle-changed entity are different and therefore does not satisfy the LF identity requirement that the elided material be identical to its antecedent (see footnote 3).

of sentences as in (31a)-(31d), where the first conjuncts all involve movement operations within the framework of (Chomskyan) generative grammar.[17]

(31) a. INDIRECT WH-QUESTION
I don't know [$_{\text{DP}}$ which puppy]$_1$ you should [$_{\text{VP}}$ adopt t_1], but I know [$_{\text{DP}}$ which one] you shouldn't [$_{\text{VP}}$].[18] (adapted from Schuyler 2001: 1, ex.(1))

b. DIRECT WH-QUESTION
[$_{\text{DP}}$ Which films]$_1$ did you refuse to [$_{\text{VP}}$ see t_1], and [$_{\text{DP}}$ which films] did he agree to [$_{\text{VP}}$]? (Merchant 2013b: 19, ex.(92a))

c. RELATIVIZATION
This is the book [$_{\text{DP}}$ which]$_1$ O.J. Berman [$_{\text{VP}}$ reviewed t_1], and this is the one [[$_{\text{DP}}$ which] Fred won't [$_{\text{VP}}$]. (adapted from Johnson 2001: 18, ex.(62b))

d. TOPICALIZATION
[$_{\text{DP}}$ Potatoes]$_1$ I [$_{\text{VP}}$ like t_1], but [$_{\text{DP}}$ tomatoes] I don't [$_{\text{VP}}$].
(van Craenenbroeck & Merchant 2013: 705, ex.(8b))

Let us focus on the sentence in (31a). Here, *which one* in the second conjunct, being readily interpreted as part of the indirect question that the verb *know* takes, can reasonably be viewed as a moved *wh*-phrase in an analogous way as *which puppy* in the first conjunct. The origin of this moved *wh*-phrase is then easily accounted for if we postulate that there is an elided full-fledged VP after *shouldn't* embedding a trace of the moved *wh*-phrase. This is illustrated in (32).

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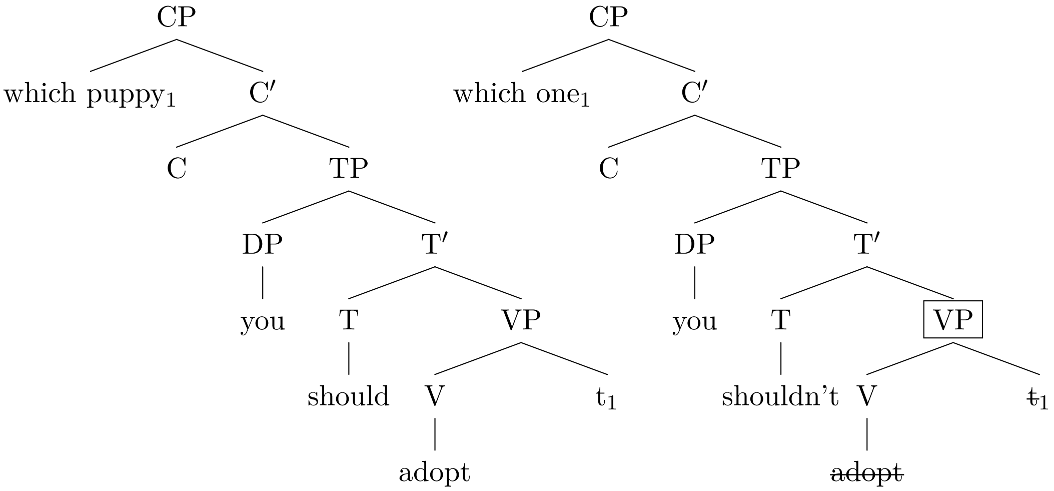
[17] The possibility that the *wh*-phrase is base-generated in situ is not considered in the current study. See, however, Gazdar (1982), Pollard and Sag (1994), and Kim and Sells (2008) for a non-movement analysis of English *wh*-questions that posits feature percolation mechanism.

[18] Schuyler (2001: 18) argues that for extraction out of the VP ellipsis site to be allowed, "there must be a contrastively focused expression in the c-command domain of the extracted phrase". In his original example in (31a), for instance, focal stress is placed on the auxiliaries *should* and *shouldn't*, which is indicated by capitalization (e.g., SHOULD and SHOULDN'T). He judges sentences like that in (i) below to be ungrammatical, where none of focused elements are included in the c-command domain of the extracted phrases.

(i) *PETE knows [$_{\text{DP}}$ which puppy]$_1$ you should [$_{\text{VP}}$ adopt t_1], but JAN doesn't know [$_{\text{DP}}$ which one] you should [$_{\text{VP}}$]. (Schuyler 2001: 10, ex.(59))

However, the alleged prosodic effects is not considered in examining the availability of extraction out of Korean VP anaphora, and I will leave this issue for future investigation.

(32)



In the structure for the second conjunct, *which one* has been extracted to the specifier of the CP from within the VP, the remnant of which ([VP *adopt* t_1]) is subsequently deleted under identity with the antecedent VP in the first conjunct. If the ellipsis site were a null pro-form and thus could not contain any structure to host traces of any movements, the *wh*-phrase would end up violating Chomsky's (1986) restriction on vacuous quantification (e.g., Johnson 2001; Schuyler 2001).[19]

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[19] Crucially, whether an anaphor has a null phonological realization is irrelevant to whether it can license overt extraction or not. For instance, Null Complement Anaphora (NCA), which has been argued to be a null pro-form, does not pass the extraction diagnostics, as illustrated in (i)-(ii) below (e.g., Hankamer & Sag 1976; Depiante 2000; Merchant 2013).

(i) *I know [which book]$_1$ Mary volunteered to read t_1, and Peter knows which article Sally volunteered [NCA].
(compare: I know Mary volunteered to read Harry Potter, and Peter knows Sally volunteered [NCA], too.) (J. S. Kim 2010: 311, fn.14, originally from Depiante 2000)

(ii) *Which films did you refuse to see, and which films did he refuse [NCA]?
(compare: You refused to see those films, and he refused [NCA], too.)
(Merchant 2013b: 19, ex.(92b))

Japanese null clausal complement has also been claimed to be a null pro-form, resisting overt extraction out of it, as illustrated in (iii) below (e.g., Shinohara 2006; Tanaka 2008; Kasai 2014).

(iii) *Sono hon-o$_1$ Taroo-wa [CP Hanako-ga t_1 katta to] itta si, sono hon-o$_2$
that book-ACC Taroo-TOP Hanako-NOM bought COMP said and that book-ACC
Ziroo-mo [CP ~~Hanako-ga~~ ~~t_2~~ ~~katta~~ ~~to~~] itta.
Ziroo-also Hanako-NOM bought COMP said
Indented: 'Taroo said that Hanako bought that book, and Ziroo also said that she bought that book.'
(Kasai 2014: 181, ex.(37), originally from Saito 2007)

Note that the non-extraction counterpart in (iv) is totally acceptable.

(iv) Taroo-wa [CP Hanako-ga Sono hon-o katta to] itta si, Ziroo-mo [CP ~~Hanako-ga~~
Taroo-TOP Hanako-NOM that book-ACC bought COMP said and Ziroo-also Hanako-NOM
~~sono~~ ~~hon-o~~ ~~katta~~ ~~to~~] itta.
that book-ACC bought COMP said
Indented: 'Taroo said that Hanako bought that book, and Ziroo also said that she bought that book.'

Consider now the following examples, in which the elided VPs in (31a)-(31d) have been replaced with the VP pro-form *do it*.

(33) a. * I don't know [DP which puppy]$_1$ you should [VP adopt t_1], but I know which one you shouldn't [VP **do it**].

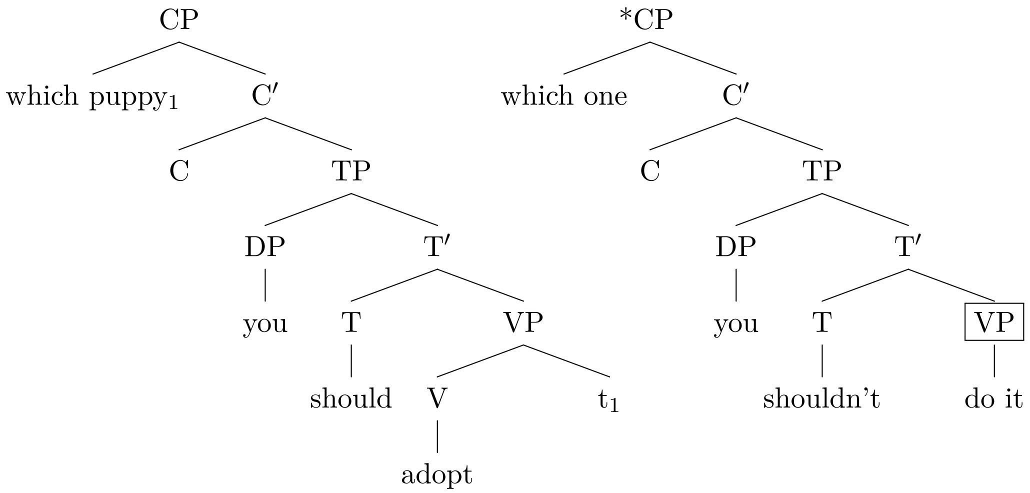
b. * [DP Which films]$_1$ did you refuse to [VP see t_1], and which films did he agree to [VP **do it**]?

c. * This is the book [DP which]$_1$ O.J. Berman [VP reviewed t_1], and this is the one which Fred won't [VP **do it**].

d. * [DP Potatoes]$_1$ I [VP like t_1], but tomatoes I don't [VP **do it**].

The sentences above are all regarded as ungrammatical in contrast to their VP ellipsis counterparts, indicating that *do it* does not tolerate the intended movement operations. These extraction impossibilities can be easily accounted for if we assume that *do it* has no internal structure other than the one represented by the lexical items 'do' and 'it', and thus extractable elements are never internally existent (e.g., Johnson 2001; Schuyler 2001; Haddican 2007; Houser 2010), as illustrated in the following structure (34) for (33a).

(34)



Here, if the site of *do it* contained the syntactic material [VP [V *adopt*] [DP *which one*]] in the early stages of derivation, we would then expect that the VP-internal object, *which one*, would undergo *wh*-movement to its surface position, and the remnant VP might be "masked" by *do it* at PF under identity with the antecedent VP in the first conjunct. Under this reasoning, then, the whole second conjunct should be a legitimate output, which is contrary to fact.

Turning now to Korean VP anaphora, note that Korean is generally assumed to have no overt *wh*-movement (i.e., a *wh*-in-situ language), but it exhibits "scrambling", which is standardly analyzed as an overt movement process that derives non-canonical (i.e., scrambled) word orders (e.g., Ross 1967, Harada 1977, Saito 1985, 1992, Mahajan 1990, Fukui 1993, Bailyn 2001; for Korean, see Y. S. Lee and Santorini 1994, Ko 2007, and E. S. Lee 2007).[20] Consider (35) and (36) below, where the examples in (a) are sentences with the canonical SOV word order of Korean while the examples in (b) are their scrambled counterparts.[21]

(35) a. Yuri-ka [$_{\text{VP}}$ sakwa-lul mek]-ess-e.
Yuri-NOM apple-ACC eat-PAST-DECL
'Yuri ate apples.'

b. Sakwa-lul$_1$ Yuri-ka [$_{\text{VP}}$ t_1 mek]-ess-e.
apple-ACC Yuri-NOM eat-PAST-DECL
'Yuri ate apples.'

(36) a. Minswu-ka [$_{\text{VP}}$ [$_{\text{CP}}$ Yuri-ka sakwa-lul mek-ess-tako]
Minswu-NOM Yuri-NOM apple-ACC eat-PAST-COMP
sayngkakha]-yss-e.
think-PAST-DECL
'Minswu thought that Yuri ate apples.'

b. Sakwa-lul$_1$ Minswu-ka [$_{\text{VP}}$ [$_{\text{CP}}$ Yuri-ka [$_{\text{VP}}$ t_1 mek]-ess-tako]
apple-ACC Minswu-NOM Yuri-NOM eat-PAST-COMP
sayngkakha]-yss-e.
think-PAST-DECL
'Minswu thought that Yuri ate apples.'

According to the standard approach, the scrambled sentence in (35b) is derived from the canonical simple sentence in (35a) by the movement of *sakwa-lul* 'apple-ACC' out of the VP across the subject; the scrambled sentence in (36b) is derived from the canonical complex sentence containing an embedded clause in (36a) by the movement of *sakwa-lul* 'apple-ACC' out of the embedded VP across the matrix subject as well as the embedded subject. In the literature, the former type of scrambling is often called "short distance scrambling" (or "clause-internal scrambling"), since an element moves within the boundary of the clause it originates from, while the latter type is called "long distance scrambling" (or "clausal scrambling") since an element moves across the clause boundary.

Accordingly, to the extent that it is an overt movement operation, the phenomenon of scrambling could reasonably be employed to diagnose the syntactic status of the VP anaphora in Korean, in an analogous fashion as in the extraction tests done for English VP ellipsis and *do it*.[22] That is, if the Korean VP anaphors allow scrambling, it would mean that they contain elided material; if they resist scrambling, however, it would mean that they are pro-forms with no internal syntactic structure. However, determining the (un)availability of scrambling out of the VP anaphors might not be as simple and straightforward as it appears to be. First, to the best of my knowledge, there have been no studies other than Park (2015) in the literature of Korean syntax addressing the issue in question with a set of relevant data. Moreover, according to Park's (and presumably his informants') introspective judgments, scrambling may or may not be possible out of the VP anaphors, depending on whether it is short distance or long distance scrambling, as illustrated in (37) and (38).

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[20] For base-generation (i.e., non-movement) accounts of scrambling, see Neeleman (1994) and Boskovic and Takahashi (1998).

[21] As can be known from their translations, the scrambled sentences and the canonical sentences share the same meaning (or proposition), though they might be used in different pragmatic contexts since some kind of emphasis would be put on the scrambled object *sakwa-lul* 'apple-ACC'.

[22] Hereafter, the terms "extraction" and "scrambling" will be used interchangeably.

(37) a. A: Say-lul$_1$ Chelswu-ka [$_{\text{VP}}$ t_1 koylophi]-nta.
bird-ACC Chelswu-NOM nag-DECL.
'Chelswu is nagging a bird.'

B: Cwi-lul Yenghuy-ka **kulay**.
mouse-ACC Yenghuy-NOM so.do
Intended: 'Yenghuy is nagging a mouse.'
(adapted from Park 2015: 695, ex.(4))

b. Sakwa-lul$_1$ nay-ka [$_{\text{VP}}$ mayil t_1 mek]-ess-ko, photo-lul nay tongsaying-i **kulay**-ss-e.
Apple-ACC I-NOM everyday eat-PAST-and grape-ACC my brother-NOM so.do-PAST-DECL
Intended: 'I ate apples everyday, and my brother ate grapes everyday.'
(adapted from Park 2015: 698, ex.(11))

(38) A: LGB-lul$_1$ Cheli-nun [$_{\text{VP}}$ [$_{\text{CP}}$ Yenghi-ka [$_{\text{VP}}$ t_1 ilk]-ess-tako] sayngkakha]-yss-e.
LGB-ACC Cheli-TOP Yenghi-NOM read-PAST-DECL think-PAST-DECL.
'Cheli thought that Yenghi read LGB.'

B: *Barriers-lul Toli-nun **kulay**-ss-e.
Barriers-ACC Toli-TOP so.do-PAST-DECL
Intended: 'Toli thought that Yenghi read Barriers.'
(adapted from Park 2015: 709, ex.(29))

Park (2015) reports that the second conjuncts in (37a) and (37b) are grammatical, where the objects in the sentence-initial position, *cwi-lul* 'mouse-ACC' and *photo-lul* 'grape-ACC', are taken to have been short-scrambled out of *kulay.* On the other hand, the second conjunct in (38) is ungrammatical, where the sentence initial object, *Barriers-lul* 'Barriers-ACC', is taken to have been long-scrambled out of *kulay.* Assuming that the short distance scrambling is an A-movement operation while the long distance scrambling is an Ā-movement operation (cf. Mahajan 1990; Saito 1992), Park claims that the VP replacement by *kulay* can only target a VP constituent containing an A-trace (or no trace at all),[23] but not a VP constituent containing an Ā-trace, thereby resulting in the asymmetry observed above.

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[23] Park (2015) follows Lasnik's (1999) proposal that A-movement, unlike Ā-movement, does not necessarily leave an (A-)trace.

In brief, according to Park (2015), Korean VP anaphora is derived by ellipsis, and thus can permit overt extraction, but only when it is an instance of A-movement, e.g., short distance scrambling.[24] Obviously, this is not compatible with the VP ellipsis analysis we have discussed so far, which predicts that both types of scrambling, in principle, could take place out of the VP anaphora. This also does not align with what follows from the VP pro-form analysis confirmed by Experiment 3: if the VP anaphora is a pro-form, neither type of scrambling should be acceptable since any extractable syntactic objects would be non-existent to begin with.

3.3.2 Research question and predictions

Contrary to what has been observed by Park (2015), however, all of the eight Korean native speakers I informally consulted shared the same intuition that the short distance examples in (37) and the long distance example in (38) are both completely unacceptable.[25] Experiment 4 was motivated by the discrepancy between Park's (2015) and my informants' acceptability judgments (or intuitions) on the availability of extraction from Korean VP anaphora. It addresses the following research question.

(39) RESEARCH QUESTION:
Is overt extraction out of the Korean VP anaphora available in both the short distance and long distance scrambling contexts?
(Is the short−long scrambling asymmetry reported by Park (2015) a real linguistic phenomenon that exists in Korean?)

The experiment thus examined the acceptability of VP anaphora sentences involving short scrambling, as in (40), and those involving long scrambling, as in (41), with respect to which the ellipsis and pro-form analyses make different predictions.

(40) A: Manhwa-lul$_1$ na-nun [$_{VP}$ cacwu t_1 ilk]-ess-e. Ne-nun?
comic.book-ACC I-TOP often read-PAST-DECL you-TOP
'I often read comic books. How about you?'

B: Manhwa-lul na-to **kulay**-ss-e.
comic.book-ACC I-also so.do-PAST-DECL

Intended: 'I often read comic books, too.'

(41) A: Manhwa-lul$_1$ na-nun [$_{VP}$ [$_{CP}$ Yuli-ka cacwu t_1 ilk-ess-tako]
comic.book-ACC I-TOP Yuli-NOM often read-PAST-COMP
tul]-yess-e. Ne-nun?
hear-PAST-DECL you-TOP

---

[24] In his earlier work, however, Park (2013: 56) argues that "*kulay* 'do so' anaphora" is a pro-form rather than an ellipsis phenomenon.

[25] We will see in the next section that these informant's introspective judgments were replicated in Experiment 4.

‘I heard that Yuli often read comic books. How about you?’

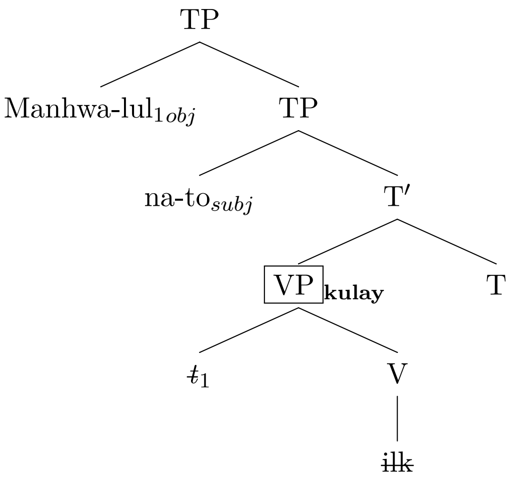
B: Manhwa-lul na-to **kulay**-ss-e.
comic.book-ACC I-also so.do-PAST-DECL

Intended: ‘I also heard that Yuli often read comic books.’

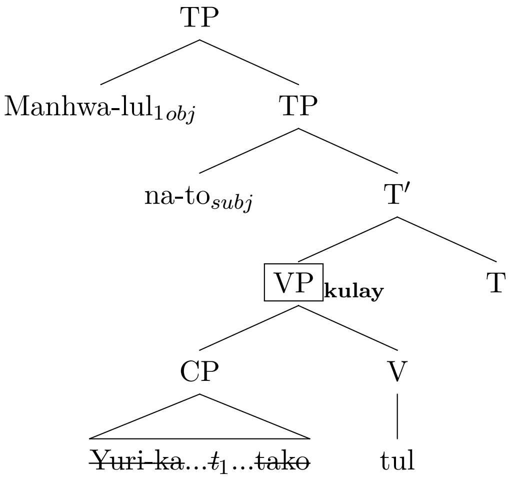
Predictions of the VP ellipsis analysis

If the VP anaphor *kulay* is an instance of ellipsis, overt object scrambling should be possible in both the short distance and long distance contexts since there exists a syntactic structure that hosts an extractable object, as illustrated in (42a)-(42b) below.[26]

(42) a.


TP
Manhwa-lul$_{1obj}$
TP
na-to$_{subj}$
T′
VP kulay
T
~~t_1~~
V
~~ilk~~

b.


TP
Manhwa-lul$_{1obj}$
TP
na-to$_{subj}$
T′
VP kulay
T
CP
V
~~Yuri-ka~~...~~t_1~~...~~tako~~
tul

---

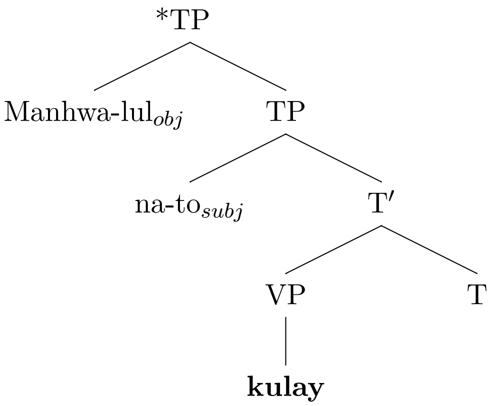
[26] Although there are proposals in the extant literature that the landing sites for short and long-scrambled objects are not uniform (for example, Mahajan 1990), in this paper, we simply assume that both short and long-scrambled objects adjoin to TP, in the spirit of Saito (1992), for the sake of convenient illustration. Whether the landing site of short and long-scrambled objects are distinct is not directly pertinent to the current discussion.

Given the structures above, the surface string '(scrambled)Object−Subject−*kulay*' should be readily acceptable to Korean speakers. Alternatively, if Park's (2015) version of ellipsis analysis is indeed on the right track, we should be able to observe the short−long scrambling asymmetry.

Predictions of the VP pro-form analysis

If the VP anaphor *kulay* is a base-generated pro-form, and thus does not have an internal structure to host an extractable object, then overt object scrambling should not be possible in either the short distance or long distance contexts, as illustrated in (43) for both short distance and long distance scrambling.

(43)



Given the structures above, the surface string '(scrambled)Object-Subject-*kulay*' should be unacceptable to Korean speakers. In the following sections, we sketch the design and methodology of Experiment 4, and then present and discuss its results, which are consistent with the predictions of the VP pro-form analysis.

3.3.3 Methodology

3.3.3.1 Participants

Forty-eight adult native speakers of Korean living in Vancouver, Canada, took part in Experiment 4. They all met the eligibility criteria for participation, which are identical to those for Experiment 3. They were between the ages of 20 and 25 (the mean age was 23), and they came to Vancouver to work part-time or study English. Except for eight participants, the rest were university students in Korea.[27]

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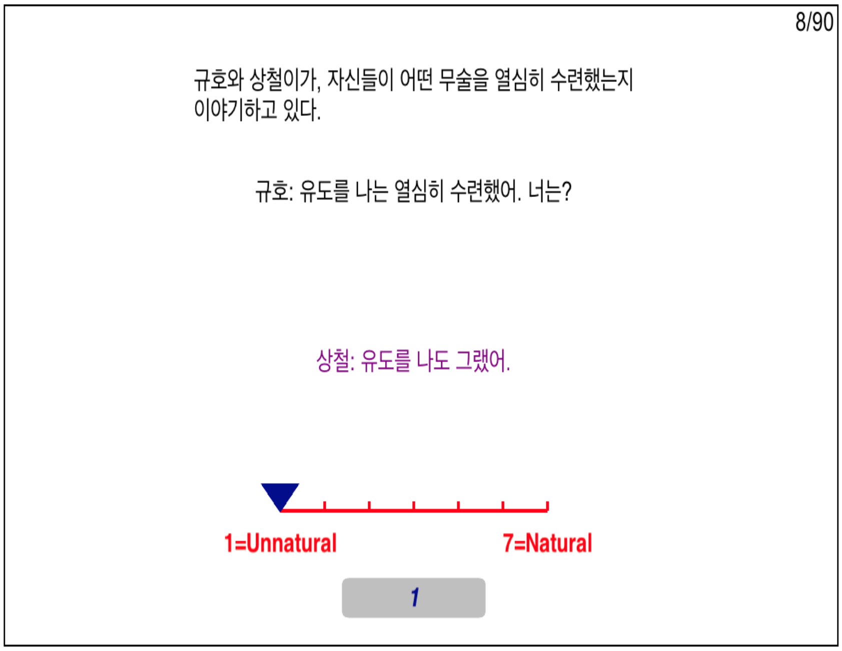
[27] As in Experiment 3, all participants had never lived in any foreign countries other than Canada. The mean period of their stay in Canada was 5 months at the time of participation.



규호와 상철이가, 자신들이 어떤 무술을 열심히 수련했는지
이야기하고 있다.

규호: 유도를 나는 열심히 수련했어. 너는?

상철: 유도를 나도 그랬어.

Figure 3.5: Screenshot of a test trial in Experiment 4

3.3.3.2 Task

A 7-point Likert scale task (e.g., Weskott and Fanselow 2011, Sprouse and Almeida 2011, Sprouse et al. 2013) was employed in Experiment 4. The participants were presented with a context sentence on a computer screen, followed by a dialogue between two people. The dialogue consisted of two sentences, the first one played the role of an "antecedent sentence" and the second one was the target sentence. The participants' task was to rate the acceptability of the target sentences by clicking on a number from 1 (labelled as "Unnatural") to 7 (labelled as "Natural") (see Figure 3.5 above).

3.3.3.3 Design and Materials

Each target sentence contained the VP anaphor *kulay*, and from the perspective of the ellipsis analysis, either had or didn't have object scrambling to the sentence initial position.[28] Each antecedent sentence had either a "simple VP" or a "complex VP" containing an embedded clause. These VPs served as an antecedent to the VP anaphor in the target sentence. Two within-subjects factors were thus crossed to create four conditions: ANTECEDENT VP TYPE (Simple vs. Complex) × EXTRACTION (Extraction vs. NoExtraction). Consider a sample set of test items given in (44)-(47), where the target sentences are in boldface.[29]

---

[28] Unlike in Experiment 3, the VP anaphor *kulay*, not *kuleha*, was used for the target sentences in Experiment 4, because it is generally deemed to sound more natural or authentic in colloquial contexts.

[29] A complete set of all test items are provided in Appendix E.

(44) Simple-Extraction (short distance scrambling) condition:

Minswu-wa Hanswu-ka kakca etten kwamok-ul yelsimhi
Minswu-and Hanswu-NOM each which subject-ACC hard
kongpwuha-yess-nunci malha-ko iss-ess-ta.
study-PAST-COMP talk-PROG PAST-DECL

'Minswu and Hanswu were talking about which subject they each studied hard.'

M: Swuhak-ul$_1$ na-nun [$_{VP}$ yelsimhi t_1 kongpwuha]-yss-e. Ne-nun?
math-ACC I-TOP hard study-PAST-DECL you-TOP

'I studied math hard. How about you?'

H: **Swuhak-ul na-to kulay-ss-e.**
math-ACC I-also so.do-PAST-DECL

Intended: 'I studied math hard, too.'

(45) Simple-NoExtraction condition:

Minswu-wa Hanswu-ka kakca etten kwamok-ul yelsimhi
Minswu-and Hanswu-NOM each which subject-ACC hard
kongpwuha-yess-nunci malha-ko iss-ess-ta.
study-PAST-COMP talk-PROG PAST-DECL

'Minswu and Hanswu were talking about which subject they each studied hard.'

M: Na-nun [$_{VP}$ yelsimhi swuhak-ul kongpwuha]-yss-e. Ne-nun?
I-TOP hard math-ACC study-PAST-DECL you-TOP

'I studied math hard. How about you?'

H: **Na-to kulay-ss-e.**
I-also do.so-PAST-DECL

Intended: 'I studied math hard, too.'

(46) Complex-Extraction (long distance scrambling) condition:

Minswu-wa Hanswu-ka kakca etten kwamok-ul Yuli-ka yelsimhi
Minswu-and Hanswu-NOM each which subject-ACC Yuli-NOM hard
kongpwuha-yess-tako tul-ess-nunci malha-ko iss-ess-ta.
study-PAST-COMP hear-PAST-COMP talk-PROG PAST-DECL

'Minswu and Hanswu were talking about which subject they each heard that Yuli studied hard.'

M: Swuhak-ul$_1$ na-nun [$_{VP}$[$_{CP}$ Yuli-ka yelsimhi t_1 kongpwuha-yss-tako]
math-ACC I-TOP Yuli-NOM hard study-PAST-COMP
tul]-ess-e. Ne-nun?
hear-PAST-DECL you-TOP

‘I heard that Yuli studied math hard. How about you?’

H: **Swuhak-ul na-to kulay-ss-e.**
math-ACC I-also do.SO-PAST-DECL

Intended: ‘I also heard that Yuli studied math hard.’

(47) COMPLEX-NOEXTRACTION condition:

Minswu-wa Hanswu-ka kakca etten kwamok-ul Yuli-ka yelsimhi
Minswu-and Hanswu-NOM each which subject-ACC Yuli-NOM hard
kongpwuha-yess-tako tul-ess-nunci malha-ko iss-ess-ta.
study-PAST-COMP hear-PAST-COMP talk-PROG PAST-DECL

‘Minswu and Hanswu were talking about which subject they each heard that Yuli studied hard.’

M: Na-nun [$_{\text{VP}}$[$_{\text{CP}}$ Yuli-ka yelsimhi swuhak-ul kongpwuha-yss-tako]
I-TOP Yuli-NOM hard math-ACC study-PAST-COMP
tul]-ess-e. Ne-nun?
hear-PAST-DECL you-TOP

‘I heard that Yuli studied math hard. How about you?’

H: **Na-to kulay-ss-e.**
I-also do.SO-PAST-DECL

Intended: ‘I also heard that Yuli studied math hard.’

In (44), the target sentence is assumed to have been derived by “short-scrambling” *swuhak-ul* ‘apple-ACC’ out of *kulay*, which would correspond to the simple VP in the antecedent sentence, [$_{\text{VP}}$ *yelsimhi* t_1 *kongpwuha*] ‘study t_1 hard’. In (45), the target sentence does not involve scrambling, and *kulay* corresponds to the simple VP in the antecedent sentence, [$_{\text{VP}}$ *yelsimhi swuhak-ul kongpwuha*] ‘study math hard’. In (46), *swuhak* ‘apple-ACC’ in the target sentence is assumed to have been “long-scrambled” out of *kulay*, which would correspond to the complex VP in the antecedent sentence, [$_{\text{VP}}$ [$_{\text{CP}}$ *Yuli-ka yelsimhi* t_1 *kongpwuha-yss-tako*] *tul*] ‘hear that Yuli studied t_1 hard’. In (47), the target sentence involves no scrambling, and *kulay* corresponds to the complex VP in the antecedent sentence [$_{\text{VP}}$ [$_{\text{CP}}$ *Yuli-ka yelsimhi swuhak-ul kongpwuha-yss-tako*] *tul*] ‘hear that Yuli studied math hard’. The primary conditions of interest were the Simple-Extraction and Complex-Extraction conditions, since the aim of the experiment was to investigate whether or not both short distance and long distance scrambling are available out of the VP anaphora. The Simple-NoExtraction and Complex-NoExtraction conditions, on the other hand, served as controls since the target sentences in these conditions are generally acceptable to Korean speakers.

Following the pattern illustrated above, 24 sets of test items were constructed, generating 96 items (24 items for each of the four conditions). These items were then distributed across four separate lists using a Latin Square design such that each list contained 24 test items, and each participant saw only one version of each item. The same 66 fillers were then added to each list. Crucially, 24 of the filler items had a similar design as the 24 test items in each list, except that their target sentences did not contain the VP anaphor *kulay*. These 24 filler items are termed "non-VPA control(s)" and used for subsequent statistical analysis. Sample sentences for these 24 filler items are given in (48)-(51) below, where the context sentences are given in English here for convenience and the target sentences are in boldface.

(48) SIMPLE-EXTRACTION (short distance scrambling) condition:
Minswu and Hanswu were talking about which subject they each studied hard.

M: Swuhak-ul$_1$ na-nun [$_{VP}$ yelsimhi t_1 kongpwuha]-yss-e. Ne-nun?
math-ACC I-TOP hard study-PAST-DECL you-TOP

'I studied math hard. How about you?'

H: **Swuhak-ul na-to** [$_{VP}$ **yelsimhi** t_1 **kongpwuha**]**-yss-e.**
math-ACC I-also hard study-PAST-DECL

'I studied math hard, too.'

(49) SIMPLE-NOEXTRACTION condition:
Minswu and Hanswu were talking about which subject they each studied hard.

M: Na-nun [$_{VP}$ yelsimhi swuhak-ul kongpwuha]-yss-e. Ne-nun?
I-TOP hard math-ACC study-PAST-DECL you-TOP

'I studied math hard. How about you?'

H: **Na-to** [$_{VP}$ **yelsimhi swuhak-ul kongpwuha**]**-yss-e.**
I-also hard math-ACC study-PAST-DECL

'I studied Math hard, too.'

(50) COMPLEX-EXTRACTION (long distance scrambling) condition:
Minswu and Hanswu were talking about which subject they each heard that Yuli studied hard.

M: Swuhak-ul$_1$ na-nun [$_{VP}$[$_{CP}$ Yuli-ka yelsimhi t_1 kongpwuha-yss-tako]
math-ACC I-TOP Yuli-NOM hard study-PAST-COMP
tul]-ess-e. Ne-nun?
hear-PAST-DECL you-TOP

'I heard that Yuli studied math hard. How about you?'

H: **Swuhak-ul na-to** [$_{VP}$[$_{CP}$ **Yuli-ka yelsimhi** t_1 **kongpwuha-yss-tako**]
math-ACC I-also Yuli-NOM hard study-PAST-COMP
tul]**-ess-e.**
hear-PAST-DECL

‘I also heard that Yuli studied math hard.’

(51) Complex-NoExtraction condition:
Minswu and Hanswu were talking about which subject they each heard that Yuli studied hard.

M: Na-nun [VP[CP Yuli-ka yelsimhi swuhak-ul kongpwuha-yss-tako]
I-TOP Yuli-NOM hard math-ACC study-PAST-COMP
tul]-ess-e. Ne-nun?
hear-PAST-DECL you-TOP

‘I heard that Yuli studied math hard. How about you?’

H: **Na-to** [VP[CP **Yuli-ka yelsimhi swuhak-ul kongpwuha-yss-tako**]
I-also Yuli-NOM hard math-ACC study-PAST-COMP
tul]-ess-e.
hear-PAST-DECL

‘I also heard that Yuli studied math hard.’

3.3.3.4 Procedure

The experiment was implemented using PsychoPy, as in Experiment 3. Each participant started the experiment with six practice trials, followed by 24 test trials (six trials per condition) and 66 fillers in a uniquely generated random order. On average, each participant took 25-30 minutes to complete the experiment. They were paid $10 each as compensation for participation.

3.3.4 Findings

Figure 3.6 below summarizes mean acceptability ratings by condition: 1.71 in the Complex-Extraction (long distance scrambling) condition, 2.31 in the Simple-Extraction (short distance scrambling) condition, 5.63 in the Complex-NoExtraction condition, and 6.37 in the Simple-NoExtraction condition.[30] Based on Sprouse’s (2016) recommendation on mapping grammaticality to a 7-point acceptability scale, it could be qualitatively said that while the target sentences for the two NoExtraction conditions were judged grammatical ($>$ 5 mean rating), those for the two Extraction conditions were judged ungrammatical ($<$ 3 mean rating). Contra Park (2015), this suggests that short distance as well as long distance scrambling are not available to Korean VP anaphora, which is further substantiated by the statistical analysis below.

A linear mixed-effects analysis of the participants’ acceptability ratings, with ANTECEDENT VP TYPE and EXTRACTION as fixed effects and participant and item as random effects, revealed a main effect of EXTRACTION (estimated coefficient = 3.92, *se* = .09, t = 41.89,

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[30] “(+VPA)” is used in Figure 3.6 to indicate that the target sentences for all four test conditions include the VP anaphor *kulay*.

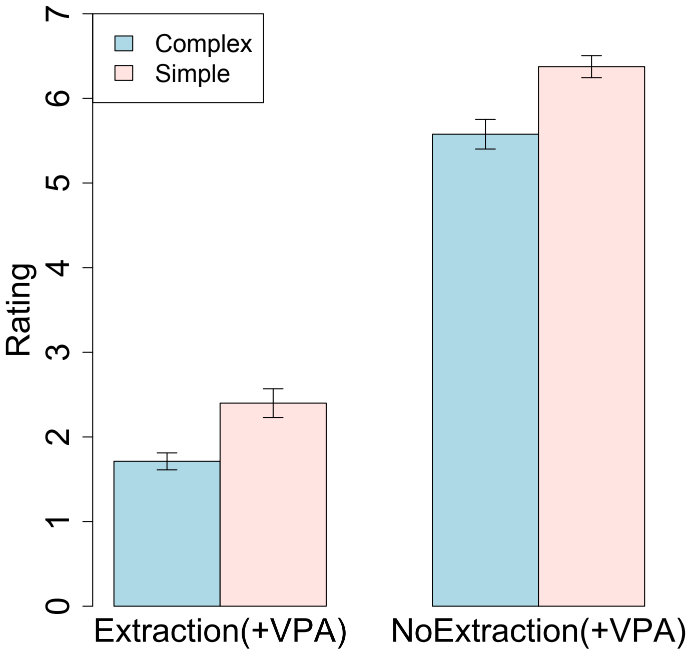

Figure 3.6: Mean acceptability ratings and standard errors for test conditions in Experiment 4

$p < .001$). This indicates that regardless of the antecedent VP type, speakers are likely to rate VP anaphora sentences with no scrambling higher than those with scrambling. In other words, sentences involving either short or long distance scrambling out of *kulay* are likely to be judged less acceptable than their corresponding non-scrambled sentences. Accordingly, the EXTRACTION effect could, indeed, be interpreted as an indication that overt extraction out of the VP anaphora is hardly available in Korean. The analysis also revealed a main effect of ANTECEDENT VP TYPE (estimated coefficient = .61, $se = .09$, $t = 6.54$, $p < .001$). That is, regardless of whether scrambling has been involved or not, speakers are likely to rate VP anaphora sentences with simple VP antecedents higher than those with complex VP antecedents. This was also substantiated by the pairwise comparisons of the mean ratings using a Tukey's test, which revealed that not only is the rating in the Simple-Extraction condition significantly higher than the rating in the Complex-Extraction condition ($p < .001$), but also the rating in the Simple-NoExtraction is significantly higher than the rating in the Complex-NoExtraction condition ($p < .001$). Crucially, however, no interaction between EXTRACTION and ANTECEDENT VP TYPE was found. These results thus suggest that VP anaphora sentences with short distance scrambling were rated higher than the sentences with long distance scrambling, not because the VP anaphor only allows for short distance scrambling, but because shorter and simpler antecedents are generally easier to comprehend than longer and more complex antecedents (Murphy 1985; cf. Frazier & Clifton 2001).

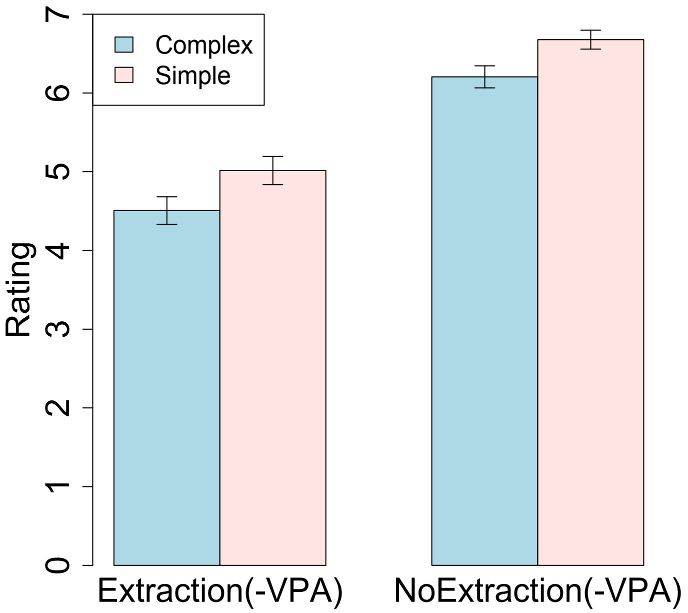

Figure 3.7: Mean acceptability ratings and standard errors for "non-VPA control" conditions in Experiment 4

There is a possibility that the effect of EXTRACTION observed above (or the low mean ratings in the Complex-Extraction and Simple-Extraction conditions) has merely stemmed from the general scrambling effect, which has often been reported to exist in the Korean language. Jackson (2008: 81), for instance, demonstrates in his experimental research that scrambled sentences in Korean are generally more difficult to understand (or process) than their corresponding non-scrambled counterparts, and that "the difficulty associated with scrambling can be reduced by contexts containing prior mention of the scrambled item", but nevertheless does not completely disappear (see also Miyamoto 2003 and J. H. Kim et al. 2009 for a similar argument for scrambling in Japanese). Indeed, this scrambling effect was also borne out in the present experiment. That is, a linear mixed-effects analysis of the participants' responses in the "non-VPA control" fillers revealed a main effect of EXTRACTION (estimated coefficient = 2.02, $se = .09$, $t = 21.30$, $p < .001$), as well as a main effect of ANTECEDENT VP TYPE (estimated coefficient = .83, $se = .09$, $t = 8.7$, $p < .001$) (see Figure 3.7 above).[31]

Given these results, a further analysis was carried out to investigate whether the EXTRACTION effect observed in the VP anaphora sentences in the test conditions can be reduced to the general scrambling effect. To do so, we compared "VPA difference score(s)" to "NonVPA differences score(s)". First, in the VP anaphora contexts, each participant's VPA difference scores were calculated by subtracting her mean rating in the Complex-Extraction condition from that in the Complex-NoExtraction condition; and by subtracting her mean rating in the Simple-Extraction condition from that in the Simple-NoExtraction condition. For instance, if a participant's mean ratings for the Complex-Extraction and -NoExtraction conditions are 2 and 3, then her (Complex) VPA difference score is 1; also, if a participant's mean ratings for the Simple-Extraction and -NoExtraction conditions are 1 and 6, then her (Simple) VPA difference score is 5. In a similar way, the NonVPA difference scores were calculated with the non-VPA control fillers. Now a prediction can be formulated as follows.

---

[31] As opposed to "(+VPA)" in Figure 3.6, "(-VPA)" is used here to indicate that the target sentences for the four control conditions did not include the VP anaphor *kulay*.

(52) PREDICTION:
If the effect of EXTRACTION in the VP anaphora contexts indeed falls out from the 'general' scrambling effect, then the mean VPA difference scores should not be significantly different from the mean NonVPA difference scores.

A linear mixed-effects analysis of the participant's difference scores revealed that regardless of Complex versus Simple, the mean VPA difference scores were significantly higher than the mean NonVPA difference scores (estimated coefficient = 1.90, *se* = .20, $t = 9.54$, $p < .001$) (see Figure 3.8 below). This result does not cohere with the prediction given in (52), and thus it is now safe to say that the EXTRACTION effect in the VP anaphora contexts cannot be reduced to the general scrambling effect; rather, it must be because scrambling has been applied to the VP anaphora. These results taken together suggest that movement out of VP anaphora is not permissible in Korean.

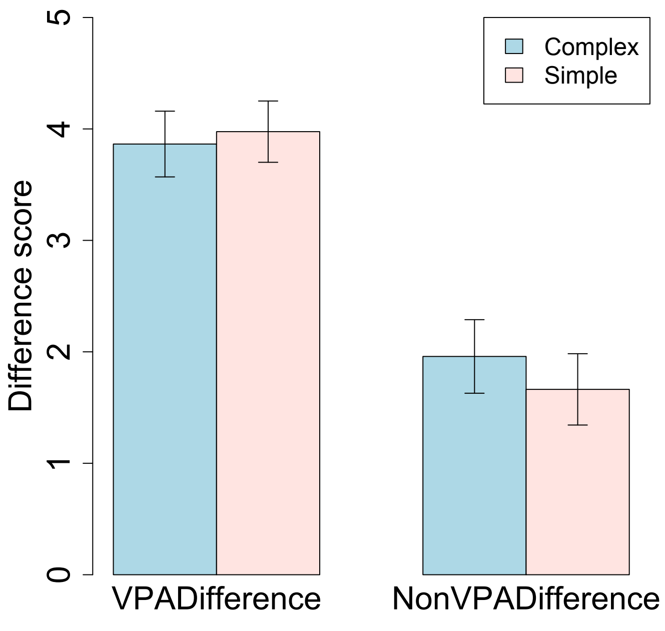

Figure 3.8: Mean VPA difference and NonVPA difference scores and standard errors in Experiment 4

3.3.5 Discussion of Experiment 4

In addition to Experiment 3, the findings of Experiment 4 provide empirical evidence supporting the pro-form analysis of Korean VP anaphora. As discussed previously, if the VP anaphora were derived via deletion, it would, in principle, allow either short distance scrambling or long distance scrambling out of it, as illustrated in (53B) and (54B) (repeated from (40) and (41)), since it would contain enough structure to house the trace of a movement. Alternatively, if the deletion process were subject to the 'anti-Ā trace constraint', as claimed by Park (2015), only the short distance scrambling example in (53B), not the long distance one in (54B), would be acceptable to Korean speakers. However, it has been demonstrated in Experiment 4 that neither short distance nor long distance scrambling is possible out of the VP anaphora. Our results can be readily accounted for if the VP anaphora is a pro-form, which is a syntactically atomic object from the outset of the derivation, so that there is no extractable phrase to begin with.

(53) A: Manhwa-lul$_1$ na-nun [$_{\text{VP}}$ cacwu t_1 ilk]-ess-e. Ne-nun?
comic.book-ACC I-TOP often read-PAST-DECL you-TOP
'I often read comic books. How about you?'

B: Manhwa-lul na-to **kulay**-ss-e.
comic.book-ACC I-also so.do-PAST-DECL

Intended: 'I often read comic books, too.'

(54) A: Manhwa-lul$_1$ na-nun [$_{\text{VP}}$ [$_{\text{CP}}$ Yuli-ka cacwu t_1 ilk-ess-tako]
comic.book-ACC I-TOP Yuli-NOM often read-PAST-COMP
tul]-ess-e. Ne-nun?
hear-PAST-DECL you-TOP
'I heard that Yuli often read comic books. How about you?'

B: Manhwa-lul na-to **kulay**-ss-e.
comic.book-ACC I-also so.do-PAST-DECL

Intended: 'I also heard that Yuli often read comic books.'

Although our data does not support the short−long scrambling asymmetry observed in Park (2015) that short scrambling from the VP anaphora is grammatical but long scrambling is ungrammatical, we did find a statistically significant difference between the mean acceptability ratings for the Complex-Extraction (long distance scrambling) and Simple-Extraction (short distance scrambling) conditions (1.71 and 2.31).[32] As noted earlier in

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[32] Note that the mean ratings for the two scrambling conditions were as low as the mean ratings for the two filler conditions (i) and (ii) below, both of which contained a target sentence that was expected to be (completely) unacceptable.

(i) Simple-"No maching" condition (mean rating: 1.75):
Minho and Yengho were talking about what type of movie they often watched.

Subsection 3.3.4, however, this can reasonably be attributed to the main effect of ANTECEDENT VP TYPE: in both scrambling and non-scrambling sentences, the ones with simple antecedent VPs were rated slightly higher than the ones with complex antecedent VPs. Also, even in non-VPA control sentences, simple sentences were rated slightly higher than complex sentences, regardless of scrambling, as shown in Figure 3.7. The current findings are, therefore, very likely to be reducible to the ease of comprehensibility or processing of simple clauses as opposed to more complex clauses. In light of our findings, the source of short-long scrambling asymmetry reported in Park (2015) may be processing/comprehensibility, or idiolectal/dialectal variation that might exist in Korean.[33]

3.4 General discussions

In this chapter, I have provided two bodies of novel empirical data that converge to support that Korean VP anaphora has no internal syntactic structure. In particular, I have found that Korean speakers unequivocally accept sloppy readings for the VP anaphora, irrespective of whether the pronoun *ku* can behave as a bound variable in their own grammar, and also that they are intolerant towards overt extraction out of the VP anaphora. Either of

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M: Na-nun cacwu kongphoyenghwa-lul po-ass-e.
I-TOP often scary.movie-ACC watch-PAST-DECL
'I often watched scary movies.'

Y: **Na-to cacwu kongphoyenghwa-lul an po-ass-e.**
I-also often scary.movie-ACC NEG watch-PAST-DECL
'I did not often watch scary movies, neither.'

(ii) RIGHT SCRAMBLE condition (mean rating: 1.95):
Minswu and Hanswu were talking about which subject they each heard that Yuli studied hard.

M: Na-nun Yuli-ka yelsimhi swuhak-ul kongpwuha-yss-tako tul-ess-e.
I-TOP Yuli-NOM hard math-ACC study-PAST-COMP hear-PAST-DECL
'I heard that Yuli studied math hard.'

H: **Na-to Yuli-ka yelsimhi** t_1 **kongpwuha-yss-tako swuhak-ul**$_1$
I-also Yuli-NOM hard study-PAST-COMP math-ACC
tul-ess-e.
hear-PAST-DECL
Intended: 'I also heard that Yuli studied math hard.'

In the target sentence in (ii), the embedded object *swuhak-ul* 'math-ACC' has been "right-scrambled" over the embedded verb *kongpwuha* 'study'. According to E. S. Lee (2008), a sentence with such scrambling is not acceptable in Korean.

[33] One difference between Park's scrambling examples and ours is that while the scrambled constituents in Park were contrastive, ours were not. For instance, in Park's example in (37a), *say-lul* 'bird-ACC' in the antecedent clause contrasts with *cwi-lul* 'mouse-ACC' in the VPA clause, while in our example in (44), the scrambled constituent in both the antecedent clause and the VPA clause is the same, *swuhak-ul* 'math-ACC'. Perhaps contrastive constituents in short scrambling (but not in long scrambling) have an ameliorating effect for some speakers, contributing to the reported enhanced acceptability of Park's short scrambling examples. In any event, this does not affect our results since short and long non-contrastive scrambling were judged acceptable without *kulay* 'do so', but both short and long scrambling with the VP anaphor were judged unacceptable in comparison. I leave it to future work to determine whether contrastive scrambling interacts with the type of scrambling (short vs. long) and with VP anaphora.

these findings would be unexpected if the VP anaphora did indeed contain 'silent' structure. Drawing on these empirical findings, I argue that the VP anaphora in Korean does not result from the deletion process, but originates as a verbal pro-form, and is interpreted through semantic rules building an anaphoric dependency with semantic entities, e.g., events or situations, in a discourse.

The pro-form analysis of Korean VP anaphora receives cross-linguistic support from its counterparts in other East Asian languages (e.g., Chinese and Japanese), which have been consistently analyzed as instances of pro-form anaphora in the existing literature. For example, in their recent extensive research on the syntactic structure and derivation of Mandarin Chinese VP anaphora *zheme-zuo* 'do so', Wei and Li (2016: 198) argue that the VP anaphor is "base-generated as it is, not derived by deleting a VP licensed by an antecedent", using the impossibility of overt extraction as a supporting argument, as illustrated below.[34]

(55) Juzi$_1$, wo xiwang ta manman chi t_1; *pingguo, wo xiwang ta ye **zheme**
orange I hope he slowly eat apple I hope he also so
zuo.
do
Intended: 'I hope that he slowly eats oranges; I hope that he also slowly eats apples.' (adapted from Wei & Li 2016: 198, ex.(35))

The Japanese VP anaphor *soo-su* 'do so' has also been argued to be a pro-form (e.g., Hoji 1998, 2003; Fukaya & Hoji 1999). Observing that sloppy readings for pro-forms are characteristically different from those under ellipsis, Hoji (2003) shows that *soo-su* 'do so' can induce a sloppy reading with an R-expression, as in (56), while instances of ellipsis phenomena in Japanese cannot.[35]

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[34] Wei and Li (2016) also show that *zheme-zuo* 'do so' does not necessarily need a linguistic antecedent, as in (i), and can have split antecdents, as in (ii), either of which has been widely taken as an indication that an anaphoric object is a pro-form, not an instance of ellipsis, since Hankamer and Sag (1976) (cf. Merchant 2013a, 2013b).

(i) Observing John ripping a book in half:

a. Ni Kebie **zheme zuo**!
you do.not so do
'You should not do so.' (Wei & Li 2016: 196, ex.(29a))

b. Ni keneng **zheme zuo** ma?
you possible so do Q
'Will you possibly do so?' (Wei & Li 2016: 196, ex.(29b))

(ii) Lisi keyi zhu fan, Zhangsan keyi xi cai, wo ye keyi **zheme zuo**, yiqi zhunbei.
Lisi can cook meal Zhangsan can wash vegetable I also can so do together prepare
'Lisi can cook meal; Zhangsan can wash vegetables; I can do so (=cook meal and wash vegetables) as well, (let's) prepare together.' (Wei & Li 2016: 196, ex.(30))

[35] Hoji (2003) demonstrates that in the Japanese "comparative ellipsis" construction in (i) below, the sloppy reading (ia) is marginally possible or simply impossible with the R-expression *Bill* within the CP.

(56) John-ga [VP **John**-no kuruma-o ara]-tta; Bill-mo **soo sita**.
John-NOM John-GEN car-ACC wash-PAST Bill-also so did
'John washed John's car; Bill did so, too.'

a. 'John washed John's car; Bill washed Bill's car, too.' [sloppy identity]
b. 'John washed John's car; Bill washed John's car, too.' [strict identity]

(Hoji 2003: 191, ex.(46))

Given that the proper name *John* cannot be semantically bound, *soo su* 'do so' could never involve the deletion of a syntactic constituent containing a bound variable element, which would otherwise be the source of the sloppy interpretation in (56a). It is thus reasonable to postulate that *soo su* 'do so' is a pro-form, and the sloppy reading is licensed via semantic/pragmatic inferences. Note that in line with Hoji (2003), both Bae and Kim (2012) and Park (2013) support the pro-form analysis of the Korean VP anaphor by demonstrating that it can also allow a sloppy reading with an R-expression, as illustrated in (57).[36]

(57) John-i [VP pi onun nal-e **John**-uy cha-lul takk]-ass-e.
John-NOM rain falling day-at John-GEN car-ACC wash]-PAST-DECL
Bill-to **kulay**-ss-e.
Bill-also so.do-PAST-DECL
'John washed John's car on a rainy day. Bill did so, too.'

a. '...Bill washed Bill's car on a rainy day, too.' [sloppy identity]
b. '...Bill washed John's car on a rainy day, too.' [strict identity]

(Bae & Kim 2010: 63, ex.(34))

Before concluding this chapter, there is one remaining issue that needs to be addressed. As stated previously, the ellipsis analysis is relatively more prevalent in the extant literature

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(i) John-ni yorimo sakini sensei-wa Bill-ni [CP Mary-ga **Bill**-o butta to] iw-aseta.
John-DAT than earlier teacher-TOP Bill-DAT Mary-NOM Bill-ACC hit COM say-made
'The teacher made Bill say that Mary had hit Bill earlier than John.'

a. 'The teacher made John say that Mary had hit John.' [*/*?sloppy identity]
b. 'The teacher made John say that Mary had hit Bill.' [strict identity]

(Hoji 2003; 194, ex.(53))

[36] Following J. S. Kim's (1997) proposal that the Korean focus construction involves VP ellipsis, Bae and Kim (2012) show that sloppy readings are not available with an R-expression in that construction, as illustrated in (i).

(i) John-i pi onun nal-e **John**-uy cha-lul takk-ass-e. Bill-to$_1$ [VP t_1
John-NOM rain falling day-at John-GEN car-ACC wash]-PAST-SE Bill-also
~~pi onun nal-e **John**-uy cha-lul takk~~] ya.
be
'John washed John's car on a rainy day. Bill (washed John's/*Bill's car on a rainy day), too.'

(Bae & Kim 2010: 62, ex.(32))

than the pro-form analysis. Notably, most of the proponents of the former analysis (e.g., Son 2006; Storoshenko 2008; Kim & Yoon 2009; Madigan 2015) uniformly rely on the well-known observation made by Cho (1996: 631) that VP anaphora sentences involving *caki* 'self' can only give rise to a sloppy reading, as illustrated in (58).

(58) John-i$_1$ [$_{VP}$ **caki**-lul$_1$ kwasinhay]-ss-ko, Mary-to **kuleha**-yess-ta.
John-NOM self-ACC overtrust-PAST-CONJ Mary-also so.do-PAST-DECL
'John overtrusted himself, and Mary did, too.'
a. 'John overtrusted John, and Mary overtrusted Mary.' [sloppy identity]
b. 'John overtrusted John, and Mary overtrusted John.' [*strict identity]
(Cho 1996: 631, ex.(34))

Given the assumption that *caki* 'self' can (and should) only be construed as a bound variable, but not as a free variable (e.g., Han & Storoshenko 2012), the ellipsis analysis can easily account for the sloppy−strict asymmetry in (58) by positing that *caki* is present within the site of *kuleha*, with its intrinsic property intact, so that it cannot be coreferential with the subject of the first clause (i.e., *John*), and can only be bound to the clausemate subject (i.e., *Mary*). Under the pro-form analysis, the unavailability of the strict reading seems to be problematic because it seems difficult to provide a principled reason to prevent the VP anaphor from referring to the "overtrusting John" event, which could plausibly be inferred from the antecedent VP. It should be noted here, however, that the unavailability of the strict reading is subject to pragmatic influence. For example, the strict reading in (58b) becomes readily available if the sentence is presented in a pragmatic context favouring the strict reading, as in (59).

(59) John and Mary are high school students. John is very good at biology, but Mary is not really good at it. They were studying together at the library for a biology exam the next day. Unlike John, Mary was not really ready for it. John wanted to help her, so he said, "Hey, I am pretty sure about what questions will be asked in the exam. I will explain them to you now, so you only focus on them, ok? Trust me, you will get at least a B+." "Thanks a lot! I trust you, John," said Mary. On the next day, they took the biology exam. It turned out that most of the questions covered in the exam were not relevant to what they studied the previous day. Eventually, they both ended up getting a C−.

Also, even in the absence of context, the sentence in (60) below can easily have the strict reading in (60b), where the subject of the second conjunct is lower in the social hierarchy than the subject of the first conjunct, according to general pragmatic knowledge.

(60) Leehwuechang-i$_1$ [$_{VP}$ **caki**-lul$_1$ kwasinhay]-ss-ko, ku-uy pise-to
Lee.president-NOM self-ACC overtrust-PAST-CONJ he-GEN secretary-also
kuleha-yess-ta.
so.do-PAST-DECL

‘President Lee overtrusted himself, and his secretary did so, too.’

a. ‘..., and his secretary overtrusted himself, too.’ [sloppy identity]

b. ‘..., and his secretary overtrusted President Lee, too.’ [strict identity]

The above observations suggest that, in principle, the VP anaphora sentences involving *caki* ‘self’ can allow strict readings as well as sloppy readings. This being so, the sloppy−strict asymmetry in (58) may be taken merely as an indication that the strict reading is not preferred over the sloppy reading, therefore not actually posing any problem to the pro-form analysis of Korean VP anaphora.

Chapter 4

The syntax of null objects in Korean

4.1 Introduction

One of the defining grammatical properties of East Asian languages such as Korean, Japanese, and Chinese is that they freely allow the omission of object arguments (as well as subject arguments).[1] This object drop phenomenon can be attested in the so-called null object construction, as exemplified by the Korean sentences in (1) and (2), where a transitive verb with no overtly expressed object (marked with [e] as a theory-neutral notation) appears in the second conjunct of each coordinate structure.

(1) Sengkyeng-ey po-myen, Hawa-ka mence senakkwa yelmay-lul mek-ko,
Bible-at see-if Hawa-NOM first good.evil.fruit fruit-ACC eat-CONJ
ku hwu-ey Adam-to [e] mek-supni-ta.
that after-at Adam-also eat-HON-DECL
(lit.) 'According to the Bible, Hawa(=Eve) first eats the fruit of knowledge of good and evil, and then Adam eats, too.'
(https://www.leesangku.org/ns/?mid=board_iKrY97&page=26&document)

(2) Appa-nun sayenni-lul coaha-yss-ciman, emma-nun [e] sileha-yss-ta.
dad-TOP new.sister-ACC like-PAST-CONJ mom-TOP dislike-PAST-DECL
(lit.) 'Dad liked older brother's wife, but mom disliked.'
(https://torantoran.postype.com/post/763142)

In the second conjunct in (1), the object of *mek* 'eat' (as a transitive verb) is missing, but it is readily understood as corresponding to the phonologically overt object in the first conjunct, *senakkwa yelmay* ‘the fruit of knowledge of good and evil’. Likewise, in the second conjunct in (2), the null object of *sileha* ‘dislike’ is immediately taken to denote the same referent as the audible counterpart in the first conjunct, *sayenni* ‘older brother’s wife’. This is in contrast to the English coordinate structure in (3) (the literal translation of (1)), which demonstrates that object omission is not grammatical in English.[2]

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[1] Earlier versions of this chapter were presented at the 29th Annual CUNY Conference on Human Sentence Processing held at the University of Florida, Gainesville, in April 2016, the Workshop on Experimental Approaches to East Asian Languages held at the University of Hawai'i at Mānoa, in May 2016, and the 24th Japanese/Korean Linguistics Conference at NINJAL, Japan, in October 2016.

(3) * Hawa first eats the fruit of knowledge of good and evil, and then Adam eats [**e**], too.

Note that the second conjunct in (3) can be made felicitous by either constructing a VP ellipsis instead, as in (4a), or replacing [**e**] with a full nominal expression or a pronoun *it*, as in (4b).

(4) a. ..., and then Adam does [$_{\text{VP}}$ ~~eat the fruit of knowledge of good and evil~~], too.
b. ..., and then Adam eats {the fruit of knowledge of good and evil/it}, too.

The precise characterization of the syntactic status of null complement objects has been one of the extensively debated issues in the literature of East Asian languages over the past three decades or so. As suggested by Ahn and Cho (2011a), Funakoshi (2016), and Sato and Karimi (2016), the existing proposals can be grouped into at least three camps: (i) the null pronominal analysis; (ii) the argument ellipsis analysis; and (iii) the verb-stranding VP ellipsis analysis.[3]

---

[2] As attested in Wilder’s (1997: 74) example in (i), along with (3) above, it has generally been assumed that English is a non-null object (and non-null subject) language (e.g., Roberts & Holmberg 2010). Note, however, that English might employ object dropping in certain limited written contexts, such as recipes (Massam & Roberge 1989, Massam 1992), as in (ii), and diary-style texts (Haegeman 1990, Haegeman & Ihsane 1999), as in (iii).

(i) * John bought the book, and Mary read [**e**]. (Wilder 1997: 74, ex.(52))

(ii) Take the cake mix, 1 cup of water, and 3 eggs. Mix [**e**] well and beat [**e**] for 5 minutes. Pour [**e**] into a well-greased cake pan and bake [**e**] for 20 minutes. Remove [**e**] from oven and cool [**e**]. (Massam & Roberge 1989: 135, ex.(2))

(iii) Search for hairbrush. Locate [**e**] in handbag. (Haegeman & Ihsane 1999: 100, ex.(2))

See Massam and Roberge (1989: 138) for an argument that the English null objects might be analyzed as either a variable bound by a null topic (see Footnote 3 below) or “a sort of NP-trace (a trace bound by an element in an A-position)”.

[3] An alternative account for null objects is the null topic variable analysis, which was proposed in Huang (1982, 1984a, 1984b) and Hasegawa (1984/85). According to this analysis, languages like Chinese and Japanese can license a null topic in an internal argument position, which is subsequently A′-moved to the sentence-initial topic position. Consider first the examples of Chinese null objects and subjects below.

(i) [Zhangsan$_2$ xiwang [Lisi keyi kanjian [**e**]]].
Zhangsan hopes Lisi can see
(lit.) ‘Zhangsan$_2$ hopes Lisi can see [**e**](=him$_{1/*2}$).’
(compare: Zhangsan$_2$ xiwang Lisi keyi kanjian **ta**. ‘Zhangsan$_2$ hopes Lisi can see him$_{1/2}$.’

(ii) [Zhangsan$_2$ xiwang [[**e**] keyi kanjian Lisi]].
Zhangsan hopes can see Lisi

It has been advocated by a number of researchers that a phonologically null pronoun (*pro* in Chomsky's (1981, 1982) typology) is base-generated in the null object position [**e**] (e.g., Yoon 1985; Cole 1987; M. K. Park 1994, 1997; Hoji 1998, 2003; G. Li 1998; S. H. Kim 2010; Moon 2010; Ahn & Cho 2010, 2011a, 2011b; Bae & Kim 2012), as illustrated in (5), where irrelevant structural details are abstracted away and English translation is used for convenience.

(lit.) 'Zhangsan$_2$ hopes [**e**](=he$_{1/2}$) can see Lisi.'
(compare: Zhangsan$_2$ xiwang **ta** keyi kanjian Lisi. 'Zhangsan$_2$ hopes he$_{1/2}$ can see Lisi.'
(adapted from Huang 1984a: 538, ex.(22a) and (22b))

In (i), the null object can only correspond to an entity introduced in the preceding context, but not to a clause-internal argument, such as the matrix subject *Zhangsan*, while the null subject does not exhibit such restricted interpretive properties, as shown in (ii). Huang argues that the asymmetry is to be expected if the null object and subject have different syntactic statuses, as represented below.

(iii) [OP$_1$ Zhangsan$_2$ xiwang [Lisi keyi kanjian t_1]].
(iv) [Zhangsan$_2$ xiwang [*pro* keyi kanjian Lisi]].

In (iii), the null object is a trace that is locally A′-bound by the null topic operator and thus functions as a variable. It would be then subject to Principle C, just like an R-expression, thus obeying the Strong Crossover Constraint (Chomsky 1981, 1982). In (iv), on the other hand, the null subject position is occupied by an empty pronoun, *pro*, which would be subject to Principle B, not Principle C.

Under this view, then, the Korean null object construction in (1) would be represented as in (v), where the 'null variable object' is bound by the null topic, which in turn refers to the previously mentioned object, *senakkwa yelmay* 'the fruit of knowledge of good and evil'.

(v) Hawa-ka mence [DP senakkwa yelmay-lul] mek-ko, ku hwu-ey [OP$_1$ Adam-to t_1 mek-supni-ta].

As noted by Cole (1987: 602), however, null objects in Korean should not be treated as variables, since they *can* naturally be anaphoric to "matrix arguments in unmarked contexts", as illustrated in (vi)-(viii) below.

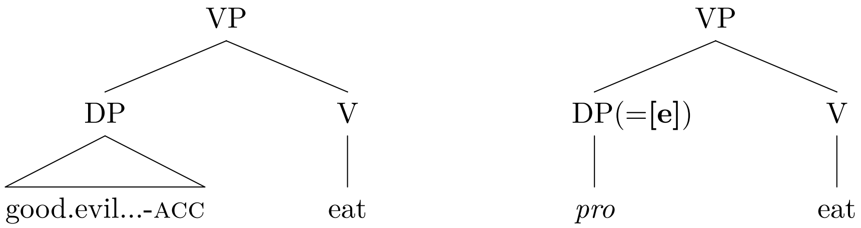
(vi) Ku yeca$_1$-ka [namphyen-i [**e**] phokhayngha-yess-ta-ko] kecitmalha-yess-ta.
that woman-NOM husband-NOM hit-PAST-DECL-COMP lie-PAST-DECL
(lit.) 'That woman$_1$ lied that her$_1$ husband hit [**e**](=her$_{1/2}$).' (Google)

(vii) Chelswu$_1$-ka [Yenghi-ka [**e**] hyeppakha-yess-ta-ko] cwucangha-yess-ta.
Chelswu-NOM Yenghi-NOM threaten-PAST-DECL-COMP claim-PAST-DECL
(lit.) 'Chelswu$_1$ claimed that Yenghi threatened [**e**](=him$_{1/2}$).'

(viii) John$_1$-un [Bill-i [**e**] cenhwaha-yess-ta]-nun sasil-ul acik moru-n-ta.
John-TOP Bili-NOM call-PAST-DECL-ADN fact-ACC yet not.know-PRES-DECL
(lit.) 'John$_1$ doesn't know the fact that Bill called [**e**](=him$_{1/2}$).'
(Cole 1987: 602, ex.(18a) and (18b), originally from Yoon 1985)

Given the above data, the null topic variable analysis does not seem to be empirically appropriate for Korean null objects, and thus is not considered as an analytic option in the current research.

(5) Null pronominal:



Similar to the behaviour of a regular overt pronoun such as *kukes* 'it', the empty pronominal might refer to the (most) contextually salient entity, e.g., the fruit of knowledge of good and evil in (1), which has been introduced into the discourse by the overt object in the first clause.[4]

An alternative view of the status of null objects is that they are the result of an ellipsis operation called argument ellipsis (or NP/DP ellipsis) (e.g., Oku 1998; S. W. Kim 1999; Saito 2003, 2007; Saito & An 2010; Takahashi 2007, 2008, 2010; Takita 2011; Um 2011; Cheng 2011, 2013; J. S. Kim 2012; M. K. Park 2013; Ohtaki 2011, 2014; Sakamoto 2015, 2016).[5] That is, a full-fledged DP constituent is normally constructed in the null object position **[e]**, but may subsequently become unpronounced under identity with an overt DP in the corresponding object position in a preceding clause, as illustrated in (6).[6]

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[4] In later sections, the term *null pronominal analysis* is used to indicate Hoji's (1998) 'indefinite *pro*' analysis (see Subsection 4.2.2 for further details).

[5] Argument ellipsis has also been argued to occur in South Asian languages such as Bangla, Hindi, and Malayalam (Simpson et al. 2013; cf. Takahashi 2013), and in other languages such as Colloquial Singapore English (Sato 2014, 2016), Mongolian (Takahashi 2007), Persian (Sato & Karimi 2016), and Turkish (Sener & Takahashi 2010).

[6] As pointed out by Takita (2011) and Takahashi (2013), the term *argument ellipsis* has been used, in part, to stress that adjuncts alone cannot be elided, as illustrated by the following Korean examples.

(i) A: Minswu-ka sinsokhi ku mwuncey-lul phwul-ess-ta.
Minswu-NOM quickly the problem-ACC solve-PAST-DECL
'Minswu solved the problem quickly.'

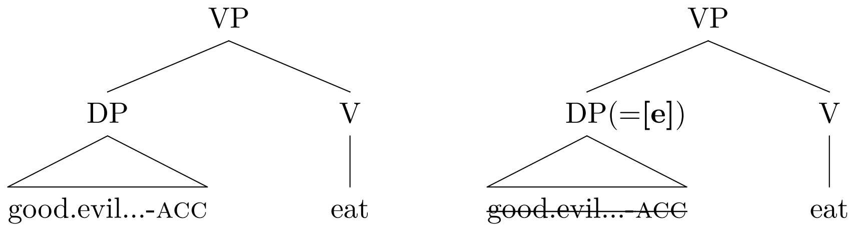
B: * Cinho-nun [e] ku mwuncey-lul an phwul-ess-ta.
Cinho-TOP the problem-ACC NEG solve-PAST-DECL
Intended: 'Cinho did not solve the problem quickly.'

B′: Cinho-nun sinsokhi ku mwuncey-lul an phwul-ess-ta.
Cinho-TOP quickly the problem-ACC NEG solve-PAST-DECL

(adapted from Takahashi 2013: 4, ex.(5)))

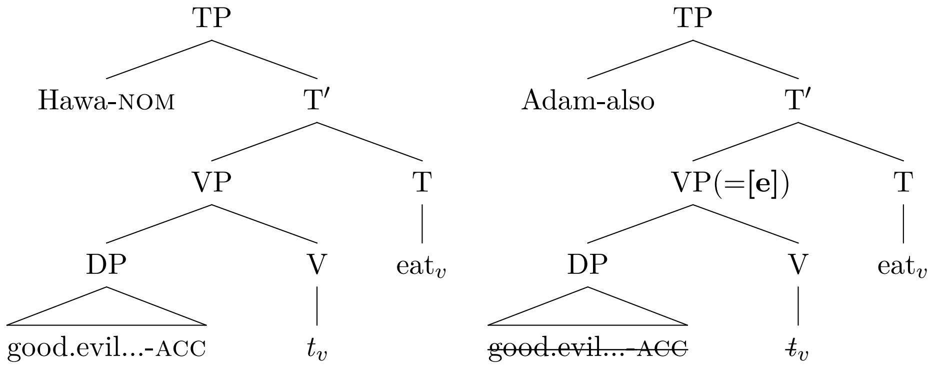
In (iB), the adverb *sinsokhi* 'quickly' is intended to have been elided under identity with the overt adverb in (iA). If 'adjunct ellipsis' indeed were a licit process, then the interpretation of (iB) should be 'Cinho solved the problem, but he did not do so quickly' just like that of (iB′), where the target adverb is explicitly expressed. However, (iB) is unanimously interpreted as 'Cinho did *not* solve the problem at all', thus suggesting that unlike arguments, adjuncts on their own cannot directly undergo ellipsis (see, however, Takahashi 2007, who argues that 'adjunct ellipsis' may be operative in Mongolian and Mandarin Chinese).

(6) Argument ellipsis:



Another analytic option for null objects involves VP ellipsis preceded by overt movement of the main verb out of the VP to Tense (Huang 1987, 1988, 1991; Otani & Whitman 1991; cf. Pan 2002; E. J. Lee 2005b; Funakoshi 2014, 2016; Fujiwara 2017; cf. W. S. Lee 2016). In (7), for instance, all the elements within the VP in the second conjunct (i.e., the DP object and the trace left behind by V-raising) undergo ellipsis, whereas the verb in Tense, *mek* 'eat', is stranded outside the elided VP and is thus overtly realized. Therefore, under this view, the null object site [e] is actually equivalent to an articulated VP constituent, although it does not appear to be so on the surface.[7]

(7) Verb-stranding VP ellipsis:



Given the above considerations, the three competing approaches might be distinguished from one another in their assumptions regarding the following two parameters: (i) whether null objects contain unpronounced internal structure; and (ii) whether null objects correspond to DPs or VPs, as illustrated in Table 4.1 below.

Source of null objects	(i) Internal structure?	(ii) [e] is DP or VP?
NULL PRONOMINAL	Absent	DP
ARGUMENT ELLIPSIS	Present	DP
VERB-STRANDING VP ELLIPSIS	Present	VP

Table 4.1: Syntactic status of null objects

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[7] The verb-stranding VP ellipsis analysis has also been proposed for Hebrew (Doron 1999; Goldberg 2005), Irish (McCloskey 1991), Persian (Shafiei 2015), and Russian (Gribanova 2013).

The primary purpose of this chapter is to present novel empirical data obtained from an experimental study (Experiment 5) to defend the position that some instances of Korean null objects should be analyzed as being derived via an ellipsis process. In Experiment 5, the (un)availability of sloppy identity readings for null objects was examined in order to diagnose the presence/absence of internal syntactic structure within them, in much the same way as in the investigation of the syntax of Korean VP anaphora in Experiment 3 in Chapter 3. I demonstrate that the results from Experiment 5 could only be obtained if the null object constructions tested are attributed to the ellipsis of a constituent with full-fledged structure, thus undermining the view that Korean null objects are all instances of empty pronominals, atomic elements that lack internal structure (e.g., Ahn & Cho 2010, 2011a, b). This chapter does not aim to determine the 'size' of ellipsis involved in Korean null objects, i.e., whether the element elided in the position of [**e**] is a DP object (Argument ellipsis) or a VP containing the DP object (Verb-stranding VP ellipsis). However, Section 4.4 discusses a possible direction for future research on this issue, along with a brief review of the relevant literature.

4.2 Theoretical background

4.2.1 Korean as a radical pro-drop language

As noted in Section 2.2 of Chapter 2, it has long been agreed in the theoretical literature that East Asian languages, such as Korean, Japanese, and Chinese, and Romance languages, such as Spanish and Italian, are all characterized as pro-drop languages (or null subject languages), given the common characteristic that they allow an understood pronominal subject of a tensed clause to be 'dropped'. Consider first the Spanish sentences in (8) and (9).

(8) a. José sabe [que (él) ha sido visto por Maria].
José know that he have.SUBJ.3SG been seen by Maria
'José$_1$ knows that he$_{1/2}$ has been seen by Maria.'

b. Jose sabe [que Maria *(lo) ha visto].
José know that Maria him have.SUBJ.3SG seen
'José$_1$ knows that Maria has seen him$_{1/2}$.'

(adapted from Huang 1984a: 533, ex.(5) and (6))

(9) A: El hombre golpeó la mujer?
the.MASC.SG man hit.SUBJ.3SG the.FEM.SG woman
'Did the man hit the woman?'

B: Sí, (él) *(la) golpeó.
yes he her hit.SUBJ.3SG
'Yes, he hit her.'

Note above that the third-person singular subject pronoun, *él* 'he', can be omitted in the finite embedded and matrix clauses, whereas the object (clitic) pronoun, *lo* 'him', must be overtly realized. Such subject-object asymmetry is not attested in non-pro-drop (or non-null subject) languages such as English, where neither the pronominal subjects nor the pronominal objects of tensed clauses can be unexpressed, as exemplified in (10) and (11).

(10) a. John promised Bill that [*(he) would see Mary].
b. John promised Bill that [Mary would see *(him)].
(adapted from Huang 1984a: 532, ex.(3a) and (3b))

(11) A: Did the man meet the woman?
B: Yes, *(he) met *(her).

In the standard theory, the above cross-linguistic variation and language-internal variation with respect to the (un)availability of pro-drop are attributed to the presence or absence of 'rich' (or 'uniform') agreement under T within individual languages (Perlmutter 1971; Taraldsen 1978; Chomsky 1981, 1982; Rizzi 1982, 1986; Jaeggli & Safir 1989; Koeneman 2000, among many others). The basic idea goes as follows: Spanish (and Italian)-type languages have 'rich' verbal inflectional morphology for subject-verb agreement (e.g., the subject *él* 'he' and the verb *golpeó* 'hit.SUBJ.3SG' in (9)), but none for object-verb agreement; thus, pro-drop may be licensed in a finite subject, but not object, position, since the content of an omitted pronoun could be readily 'recoverable' by means of the morpho-syntactic agreement. English-type languages, on the other hand, exhibit 'impoverished' subject-verb agreement morphology and no object-verb agreement morphology; thus, neither pronominal subjects nor pronominal objects may be omitted in these languages, since there would be no means to 'recover' the content of an otherwise missing pronoun.[8]

However, as already noticed by many researchers, including Chomsky (1981: 284) and Neeleman and Szendroi (2007: 647), the agreement-based theory of pro-drop, established mainly based on European languages, would be immediately challenged when considering East Asian languages such as Korean, Japanese, and Chinese. These languages typically do not have (overt) verbal agreement morphology at all, and thus would be predicted to exhibit total absence of pro-drop, which is not the case, however, as exemplified in (12)-(14) below.

---

[8] Agreement in English, for instance, is considered to be 'impoverished', given that it only displays one subject-verb agreement suffix *-(e)s*, which occurs with a third-person singular subject in present tense, as illustrated below.

(i) He/She likes/*like/liked playing soccer in the morning.

(ii) They/You/I *likes/like/liked playing soccer in the morning.

(12) Korean

Kiho-ka Yuli-eykey [(ku-ka) (kunye-lul) kongwon-eyse po-ass-ta-ko]
Kiho-NOM Yuli-to he-NOM she-ACC park-at see-PAST-DECL-COMP
malha-yess-ta.
say-PAST-DECL

'Kiho said to Yuli that he saw her at the park.'

(13) Japanese

Yusuke-ga Hanako-ni [(kare-ga) (kanozyo-o) koen-de mita-to] itta.
Yusuke-NOM Hanako-to he-NOM she-ACC park-at saw-COMP said

'Yusuke said to Hanako that he saw her at the park.'

(14) Chinese

Zhangsan dui Fei shuo [(ta) zai gongyuan kanjian (ta) le].
Zhangsan to Fei said he at park saw her LE

'Zhangsan said to Fei that he saw her at the park.'

As can be seen above, Korean, Japanese, and Chinese do not inflect verbs for agreement, but nevertheless allow free omission of subject pronouns. Additionally, as Neeleman and Szendroi (2007: 647) put it, "pro-drop in [these 'agreementless' languages] seems to be more widespread than in [rich-agreement languages]", since the pro-drop phenomenon takes place not only in the subject position, but also in all other argument positions, including direct/indirect object positions (see also Kuroda 1965, Huang 1982, 1984, Hoji 1985, Saito 1985).[9] Given this 'liberal' pattern of pro-drop, Korean, Japanese, and Chinese have frequently been referred to as 'radical pro-drop' languages in the literature. Also, note that these East Asian languages are generally assumed to depend primarily on discourse to 'recover' dropped pronouns, especially as demonstrated by the Korean examples in (15), where either subject pro-drop or object pro-drop arises in contexts without a linguistic antecedent.[10]

(15) a. (Cinswu's mother is pointing to a bruise on his forehead. Cinswu says to her:)

---

[9] As noted in Chapter 2, the Korean-type languages are also known to allow omission of pronouns in the possessor positions, as shown in the Korean example below.

(i) Minswu-nun [(ku-uy) tongsayng-ul] cengmal salangha-n-ta.
Minswu-TOP he-GEN younger.brother-ACC really love-PRES-DECL
'Minswu really loves his younger brother.'

See also, e.g., Neeleman and Szendroi (2007: 647), for Japanese and Chinese examples.

[10] The exact characterization of licensing conditions for radical pro-drop is still an issue of considerable discussion. See Tomioka (2003), Speas (2004), Saito (2007), and Neeleman and Szendroi (2007) for detailed discussion.

Minswu-ka (na(-lul)) ttayli-ess-e.
Minswu-NOM I-ACC hit-PAST-DECL

'Minswu hit me.'

b. (Cinswu's mother has found that there is only 50 cent in Minswu(=Cinswu's younger brother)'s wallet. Cinswu says to her:)

(kyay(-ka)) cemsim-ey haympeke sey-kay(-lul) sa mek-ess-e.
he-NOM lunch-at hamburger three-CL-ACC buy eat-PAST-DECL

'He bought and ate three hamburgers for lunch.'

c. (Cinswu has found Tongswu's garage empty where there used to be his truck. Minswu says to Cinswu:)

(kyay(-ka)) (kukes(-ul)) ecey phal-ass-e.
he-NOM it-ACC yesterday sell-PAST-DECL

'He sold it yesterday.'

(adapted from Lee & Kim 2010: 1033)

Crucially, within the framework of generative grammar, a standard syntactic assumption about the cross-linguistic pro-drop phenomenon has been that a phonologically empty (but syntactically and semantically active) pronoun, the little *pro*, is licensed in the position of a dropped pronominal argument. Under this view, the Korean sentence in (15a) would be represented as in (16), where the object position is occupied by a *pro*, whose referent would be deduced from discourse.

(16) (Cinswu's mother is pointing to a bruise on his forehead. Cinswu says to her:)

Minswu-ka *pro* ttayli-ess-e.
Minswu-NOM hit-PAST-DECL

'Minswu hit me.'

Since the work of Chomsky (1981, 1982), it has been customary to treat a *pro* as the null counterpart of a regular overt pronoun (e.g., *ku* 'he'), having the features [−anaphor, +pronominal].[11] Therefore, as discussed by, for example, Takahashi (2008: 308) and Funakoshi (2016:114), a supporting argument for the occurrence of *pro* within an individual

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[11] As has been observed in Chapter 2, however, within pro-drop languages, null and overt pronouns are not entirely in free variation. Recall that in Spanish and Italian, for example, null pronouns may be construed as bound variables while their overt counterparts may not.

(i) SPANISH

Nadie cree que {*pro*/*él} es inteligente.
nobody believe.PRES COMP he be.PRES intelligent

Intended: 'Nobody$_1$ believes that he$_1$ is intelligent.'

(ii) ITALIAN

Ogni studente crede che {*pro*/*lui} è intelligente.
every student think.PRES COMP he be.PRES intelligent

pro-drop language would be that it complies with Principle B of the binding theory on a par with an overt pronoun. This point is illustrated by the Korean examples in (17) and (18) below, which are all ungrammatical under the interpretation where the empty category represented by [e] and the overt pronoun *ku* 'he' are anaphorically connected to the subjects within the same clause.

(17) a. * Minho-ka simhakey **[e]** pinanha-yss-e.
Minho-NOM severely blame-PAST-DECL
Intended: 'Minho blamed himself severely.'

b. * Motun haksayng-i simhakey **[e]** pinanha-yss-e.
every student-NOM severely blame-PAST-DECL
Intended: 'Every student blamed himself severely.'

(18) a. * Minho-ka simhakey ku-lul pinanha-yss-e.
Minho-NOM severely he-ACC blame-PAST-DECL
Intended: 'Minho blamed himself severely.'

b. * Motun haksayng-i simhakey ku-lul pinanha-yss-e.
every student-NOM severely he-ACC blame-PAST-DECL
Intended: 'Every student blamed himself severely.'

(constructed on the basis of Takahashi's (2008: 308) Japanese examples)

The sentences in (18) are ruled out due to a violation of Principle B, since the pronoun *ku* 'he' is not free in its local binding domain (e.g., Hong 1985). The ungrammaticality of the sentences in (17) can also be straightforwardly accounted for in terms of Principle B, if the null element in the object position is a *pro*, "a pure pronominal like its overt counterpart" (Chomsky 1982: 81-82).[12]

In light of the above considerations, it seems quite reasonable to conclude that employing *pro* in an argument position is a grammatical option that is independently available in Korean and other East Asian languages.[13] Notably, however, there has been a considerable debate in the literature as to whether the *pro* strategy is the only way of deriving null arguments in these radical pro-drop languages. Some researchers have argued that there are cases of null objects that certainly do not involve *pro*, but must be the result of an ellipsis process (Huang 1987, 1988, 1991; Otani & Whitman 1991; Oku 1998; S. W. Kim 1999, among many others). However, this claim has been challenged by other researchers such as Hoji (1998, 2003), G. Li (1998), Ahn and Cho (2010, 2011a, 2011b), Moon (2010), and Bae and Kim (2012), who have proposed that the relevant null object examples can all

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Intended: 'Every student$_1$ thinks that he$_1$ is intelligent.'

[12] See, however, footnote 5 for Huang's (1982, 1984a, 1984b) argument that an object empty category cannot be a null pronominal.

[13] See Takahashi (2008: 308), Ohtaki (2011: 248), and Funakoshi (2016: 114) for a similar discussion for Japanese.

be accommodated in terms of *pro* (more precisely, an 'indefinite *pro*'). In the next section, we further delve into this ellipsis versus null pronominal debate.

4.2.2 Ellipsis versus null pronominal

The first and most frequently cited argument in defence of the ellipsis strategy for null objects in East Asian languages is that sloppy identity readings are available in some null object constructions, as illustrated in the Korean examples in (19) and (20) below.[14] Note that the antecedent sentences in (19A) and (20A) have a DP object containing the long-distance anaphor *caki* 'self' as a possessor.

(19) A: Minswu$_1$-ka caki$_1$-uy emma-lul piphanha-yess-ta.
Minswu-NOM self-GEN mom-ACC critisize-PAST-DECL
'Minswu$_1$ criticized his$_1$ mom.'

B: Cinswu-to **[e]** piphanha-yess-ta.
Cinswu-also critisize-PAST-DECL
(lit.) 'Cinswu criticized, too.'

a. 'Cinswu criticized his own mom, too.' [sloppy identity]

b. 'Cinswu criticized Minswu's mom, too.' [strict identity]

(adapted from Ahn & Cho 2011: 473, ex.(3))[15]

(20) A: John$_1$-i caki$_1$-uy khemphwute-lul pwuswu-ess-ta.
John-NOM self-GEN computer-ACC destroy-PAST-DECL
'John$_1$ destroyed his$_1$ computer.'

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[14] See also Japanese and Chinese examples from S. W. Kim (1999: 255) below.

(i) A: Bill$_1$-wa zibun$_1$-no tegami-o suteta.
Bill-TOP self-GEN letter-ACC discarded
'Bill$_1$ discarded his$_1$ letter.'

B: John-mo **[e]** suteta.
John-also discarded
(lit.) 'John discarded, too.'

a. 'John discarded his own letter, too.' [sloppy identity]

b. 'John discarded Bill's letter, too.' [strict identity]

(ii) A: Zhangsan$_1$ bu xihuan guanyü ziji$_1$-de yaoyan.
Zhangsan not like about self-GEN rumor
'Zhangsan doesn't like rumors about himself.'

B: Mali ye bu xihuan **[e]**.
Mary also not like
(lit.) 'Mary doesn't like, either.'

a. 'Mary doesn't like rumors about herself, either.' [sloppy identity]

b. 'Mary doesn't like rumors about Zhangsan, either.' [strict identity]

[15] Ahn and Cho's original example contains *casin* 'self', another Korean long-distance anaphor.

B: Peter-to **[e]** pwuswu-ess-ta.
Peter-also destroy-PAST-DECL
(lit.) 'Peter destroyed, too.'

a. 'Peter destroyed his own computer, too.' [sloppy identity]

b. 'Peter destroyed John's computer, too.' [strict identity]

(adapted from Saito & An 2010: 3, ex.(8))

As indicated above, the null object sentences in (19B) and (20B) allow a sloppy identity reading as well as a strict identity reading. This interpretive pattern would pose a non-trivial challenge to the "uniform *pro*-theory" (Sato & Karimi 2016: 2). Recall that *pro* is standardly considered to be the null analogue of an overt pronoun. Therefore, if the null object arguments in (19B) and (20B) were simply empty pronominals, the sentences, contrary to fact, should not be able to yield the sloppy identity readings, on a par with the sentences in (21B) and (22B) below, which contain *kunye* 'she' and *kukes* 'it' in the object positions. Here, these overt pronouns can only be interpreted referentially and, thus, only allow the strict identity readings.

(21) A: Minswu$_1$-ka [**caki**$_1$-uy emeni]$_2$-lul piphanha-yess-ta.
Minswu-NOM self-GEN mother-ACC critisize-PAST-DECL
'Minswu$_1$ criticized [his$_1$ mother]$_2$.'

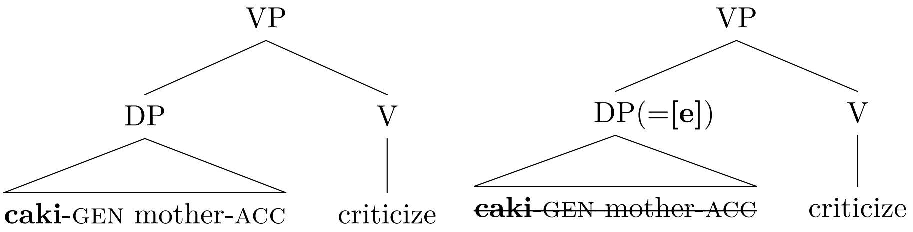
B: Cinswu-to **kunye**$_2$**-lul** piphanha-yess-ta.
Cinswu-also her-ACC criticize-PAST-DECL
'Cinswu criticized her$_2$, too.' [*sloppy identity, strict identity]

(22) A: John$_1$-i [**caki**$_1$-uy khemphwute]$_2$-lul pwuswu-ess-ta.
John-NOM self-GEN computer-ACC destroy-PAST-DECL
'John$_1$ destroyed [his$_1$ computer]$_2$.'

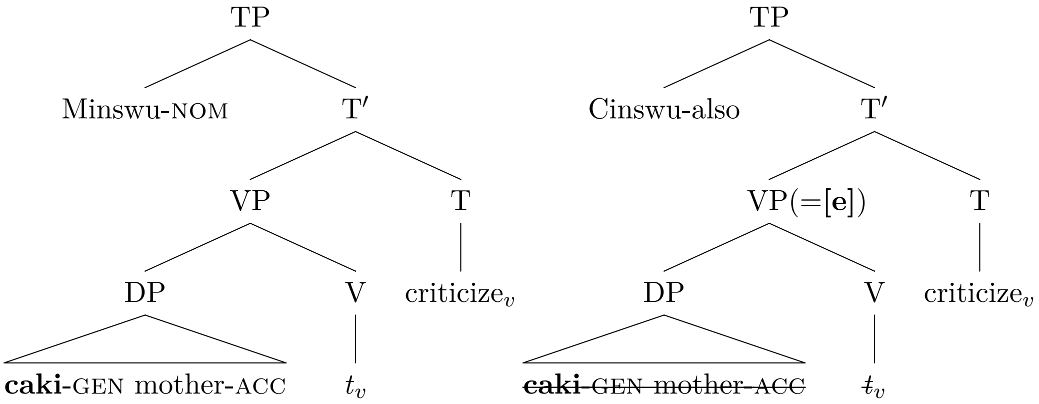
B: Peter-to **kukes**$_2$**-ul** pwuswu-ess-ta.
Peter-also it-ACC destroy-PAST-DECL
'Peter destroyed it$_2$, too.' [*sloppy identity, strict identity]

In order to accommodate the availability of sloppy interpretation in null object constructions like (19) and (20), a number of syntacticians have argued that the relevant null objects should be analyzed as resulting from some kind of ellipsis operation, which might be either argument ellipsis (e.g., Oku 1998; Kim 1999; Saito 2003, 2007; Takahashi 2007, 2008, 2010; Sakamoto 2015, 2017) or verb-stranding VP ellipsis (e.g., Huang 1987, 1991; Otani & Whitman 1991; E. J. Lee 2005; Funakoshi 2014, 2016), as previously introduced in Section 1. According to these ellipsis views, the null object construction in (19) may be represented in two ways, as illustrated in (23) and (24).

(23) Argument ellipsis:


VP
DP
V
caki-GEN mother-ACC
criticize
VP
DP(=[**e**])
V
~~**caki**-GEN mother-ACC~~
criticize

(24) Verb-stranding VP Ellipsis:


TP
Minswu-NOM
T′
VP
T
DP
V
criticize$_v$
caki-GEN mother-ACC
t_v
TP
Cinswu-also
T′
VP(=[**e**])
T
DP
V
criticize$_v$
~~**caki**-GEN mother-ACC~~
~~t_v~~

In (23) and (24), either of the structures for the null object sentence in (19B) has the object DP embedding the possessive anaphor *caki-uy* ‘self-GEN’, which is elided under identity with its overt antecedent. Therefore, the sloppy identity reading can be readily attributed to the elided anaphor being bound by the clause-mate subject, *Cinswu*.

Notably, this ellipsis analysis can be further supported by the English data below. The sentence in (25a) involves an elided (VP) structure hosting a possessive pronoun *his*, which is available to serve as a bound variable and can thus induce a sloppy identity reading; the sentence in (25b), on the other hand, includes a referential pronoun *her* in the object position, and thus allows only a strict identity reading, but not a sloppy identity reading.

(25) a. Minswu$_1$ criticized his$_1$ mother, and Cinswu did [~~criticize his mother~~], too. [sloppy identity, strict identity]

b. Minswu$_1$ criticized his$_1$ mother, and Cinswu criticized **her**, too. [*sloppy identity, strict identity]

Another representative argument made to substantiate the ellipsis analysis is based on the observation that some null objects yield the ‘quantificational readings’ (the term coined by Takahashi 2008a, 2008b). Consider the following Korean null object construction, in which the antecedent sentence in (26A) contains a nominal object modified by a numerical quantified expression *sey myeng*(*-uy*) ‘three CL(-GEN)’.[16]

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[16] See also Japanese and Chinese examples from Sener and Takahashi (2011: 81-82) and Cheng (2014: 2) below.

(26) A: Minswu-ka sey myeng-uy kaswu-lul coaha-n-ta.
Minswu-NOM three CL-GEN singer-ACC like-PRES-DECL
'Minswu likes three singers.'

B: Cinswu-to [e] coaha-n-ta.
Cinswu-also like-PRES-DECL
(lit.) 'Cinswu likes, too.'

a. 'Cinswu likes three singers, too.' [quantificational]

b. 'Cinswu also likes the same three singers who Minswu likes.' [E-type]

As indicated above, the null object sentence in (26B) may be interpreted in two different ways. One reading is the quantificational reading, in which the set of singers that Cinswu likes do not need to be identical to the ones that Minswu likes. The other reading is the so-called E-type reading (e.g., Evans 1980), in which the singers who Cinswu likes must be the same as the ones that Minswu likes. Now compare (26B) with (27B) below, where the object argument site is filled with an overt pronominal.

(27) A: Minswu-ka sey myeng-uy kaswu-lul coaha-n-ta.
Minswu-NOM three CL-GEN singer-ACC like-PRES-DECL
'Minswu likes three singers.'

B: Cinswu-to **kutul**-ul coaha-n-ta.
Cinswu-also they-ACC like-PRES-DECL
'Cinswu likes them, too.' [*quantificational, E-type]

The pronoun *kutul* 'they' in (27B) is and can only be anaphorically linked to the singers that Minswu likes. Thus, the sentence only yields the E-type reading. Given this, the fact

---

(i) A: Taro-wa sannin-no sensei-o sonkeisiteiru.
Taro-TOP three-GEN teacher-ACC respects
'Taro respects three teachers.'

B: Hanako-mo [**e**] sonkeisiteiru.
Hanako-also respects
(lit.) 'Hanako respects, too.'

a. 'Hanako respects three teachers, too.' [quantificational]
b. 'Hanako also respects the same three teachers who Taro respects.' [E-type]

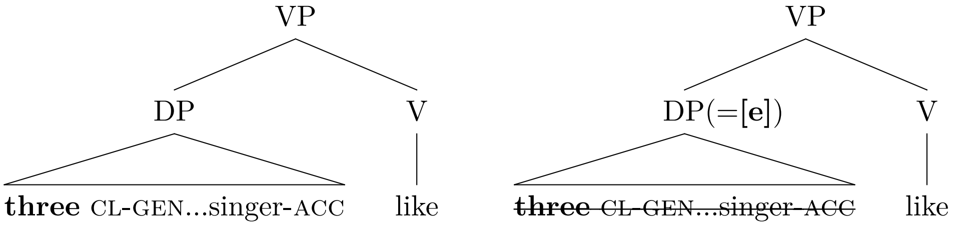
(ii) A: Akiu kanjian-le san-ge xuesheng.
Akiu see-ASP three-CL student
'Akiu saw three students.'

B: Lisi ye kanjian-le [**e**].
Lisi also see-ASP
(lit.) 'Lisi saw, too.'

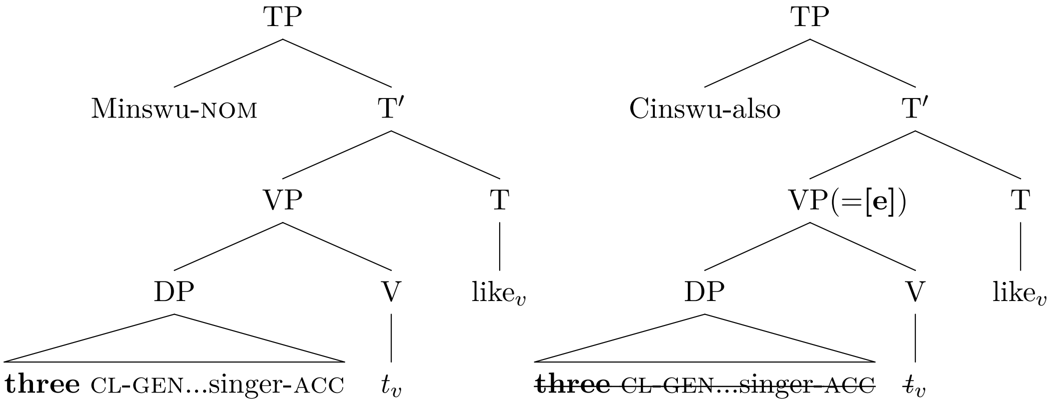
a. 'Lisi saw three students, too.' [quantificational]
b. 'Lisi also saw the same three students who Akiu saw.' [E-type]

that (26B) *does* allow the quantificational reading (as well as the E-type reading) remains mysterious if an empty pronoun, *pro*, indeed occupies the object argument position. On the other hand, the ellipsis analysis can easily capture the availability of the quantificational reading of the null object. Consider the two possible structural representations of (26) under the argument ellipsis analysis and the verb-stranding VP ellipsis analysis, respectively, as given in (28) and (29) below.

(28) Argument ellipsis:


VP
DP
V
three CL-GEN...singer-ACC
like
VP
DP(=[**e**])
V
~~**three** CL-GEN...singer-ACC~~
like

(29) Verb-stranding VP Ellipsis:


TP
Minswu-NOM
T′
VP
T
DP
V
like$_v$
three CL-GEN...singer-ACC
t_v
TP
Cinswu-also
T′
VP(=[**e**])
T
DP
V
like$_v$
~~**three** CL-GEN...singer-ACC~~
~~t_v~~

In (28) and (29), either of the structures for (26B) has an (indefinite) object DP containing *sey myeng*(*-uy*) 'three CL(-GEN)', which undergoes ellipsis under identity with its overt antecedent, and can thus readily induce the quantificational reading.

Similarly as in the case for the sloppy identity reading, the above ellipsis account of the quantificational reading can be further reinforced by the (VP) ellipsis-pronominal pair in English below. The sentence in (30a) involves the ellipsis of a full-fledged structure containing the numerically quantified object *three singers*. Thus, the quantificational reading can be naturally obtained; the sentence in (30b), on the other hand, has the pronoun *them* in the object position and, thus, does not allow such a quantificational reading.

(30) a. Minswu likes three singers, and Cinswu does [~~like three singers~~], too.
[quantificational, E-type]

b. Minswu likes three singers, and Cinswu likes **them**, too.
[*quantificational, E-type]

The ellipsis analyses discussed so far, however, have been rejected by Hoji (1998, 2003) and subsequent researchers (e.g., G. Li 1998; Ahn & Cho 2010, 2011a, b; Moon 2010; Bae & Kim 2012), who have argued that the relevant null object examples can be all accounted for in terms of empty pronominals, without postulating any ellipsis mechanism.[17] Consider first the Korean null object construction in (20), repeated in (31) below.

(31) A: John$_1$-i caki$_1$-uy khemphwute-lul pwuswu-ess-ta.
John-NOM self-GEN computer-ACC destroy-PAST-DECL
'John$_1$ destroyed his$_1$ computer.'

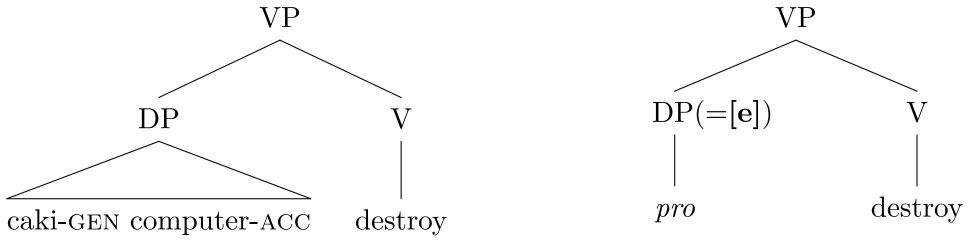
B: Peter-to **[e]** pwuswu-ess-ta.
Peter-also destroy-PAST-DECL
(lit.) 'Peter destroyed, too.'

a. 'Peter destroyed his own computer, too.' [sloppy identity]

b. 'Peter destroyed John's computer, too.' [strict identity]

Hoji (1998) argues that null pronominals in East Asian languages, including Korean, can be construed as indefinite as well as definite (cf. Jaeggli 1986; Rizzi 1986). According to Hoji, the null object position [e] in (31B) is occupied by a *pro*, as represented in (32), that can be anaphorically linked to an indefinite argument, *khemphwute* 'computer', which corresponds to the noun head of the full DP object in the antecedent sentence in (31A). Under this 'indefinite *pro*' analysis (or 'supplied N Head' analysis), then, the null object sentence in (31B) is taken to be semantically equivalent to the sentence in (33B) containing the lexically overt object, *khemphwute* 'computer'.[18]

(32)



(33) A: John$_1$-i caki$_1$-uy khemphwute-lul pwuswu-ess-ta.
John-NOM self-GEN computer-ACC destroy-PAST-DECL
'John$_1$ destroyed his$_1$ computer.'

---

[17] Hoji (1998) argues against the verb-stranding VP ellipsis analysis by demonstrating that unlike English VP ellipsis, some Japanese null object constructions (i) lack a sloppy identity reading, or (ii) do not show locality effects on a sloppy reading. See Hoji (1998: 130-138) for more details of his argument.

[18] As pointed out by Saito (2007: 207), the postulation of an indefinite *pro* could be considered to be "non-standard", since a *pro* is generally taken to be "a pronoun without phonetic content", as in Chomsky (1981, 1982), and thus it should be expected to have a definite (or referential) interpretation, i.e., to be a definite *pro*.

B: Peter-to khemphwute-lul pwuswu-ess-ta.
Peter-also computer-ACC destroy-PAST-DECL
'Peter destroyed a computer, too.'

As noted by Saito (2007: 206), the interpretation of the sentence in (33B) is not exactly identical to the sloppy identity reading given in (31), 'Pete destroyed his own computer, too'. Nevertheless, this sentence is (pragmatically) consistent with and can thus be truthfully uttered under the situation or the discourse context constituted by the above sloppy identity reading. Given this consideration, Hoji (1998) proposes that the availability of the sloppy identity reading (in his terms, the 'sloppy-like reading') for the null object sentence in (31B) can be analyzed in terms of *pro*, without recourse to an elided structure embedding the bound variable element *caki-uy* 'self-GEN'.[19]

Consider now the Korean null object construction with a quantificational reading in (26), repeated here in (34).

(34) A: Minswu-ka sey myeng-uy kaswu-lul coaha-n-ta.
Minswu-NOM three CL-GEN singer-ACC like-PRES-DECL
'Minswu likes three singers.'

B: Cinswu-to [e] coaha-n-ta.
Cinswu-also like-PRES-DECL

---

[19] Saito (2007: 207), however, argues that Hoji's (1998) argument is significantly undermined if the null object construction involves negation, as illustrated below.

(i) A: John$_1$-i caki$_1$-uy khemphwute-lul pwuswu-ess-ta.
John-NOM self-GEN computer-ACC destroy-PAST-DECL
'John$_1$ destroyed his$_1$ computer.'

B: Peter-nun [**e**] an pwuswu-ess-ta.
Peter-TOP NEG destroy-PAST-DECL
(lit.) 'Peter did not destroy.'

a. 'Peter did not destroy his own computer.' [sloppy identity]
b. 'Peter did not destroy John's computer.' [strict identity]

The negated null object sentence in (iB) can induce the sloppy identity reading, 'Peter did not destroy his own computer', which is compatible with the context where Peter destroyed a computer, but not his own computer. This observation, however, cannot be explained by the indefinite *pro* analysis, since the negated sentence in (iiB) below containing the indefinite object, *khemphwute* 'computer', only means that Peter did not destroy any computer at all, and thus is inappropriate under the situation/context described by the above sloppy identity reading.

(ii) A: John$_1$-i caki$_1$-uy khemphwute-lul pwuswu-ess-ta.
John-NOM self-GEN computer-ACC destroy-PAST-DECL
'John$_1$ destroyed his$_1$ computer.'

B: Peter-nun khemphwute-lul an pwuswu-ess-ta.
Peter-TOP computer-ACC NEG destroy-PAST-DECL
'Peter did not destroy a computer.'

Under the ellipsis analysis, however, the sloppy identity reading in (iB) is easily obtained by postulating an elided (VP or DP) structure containing *caki* 'self'.

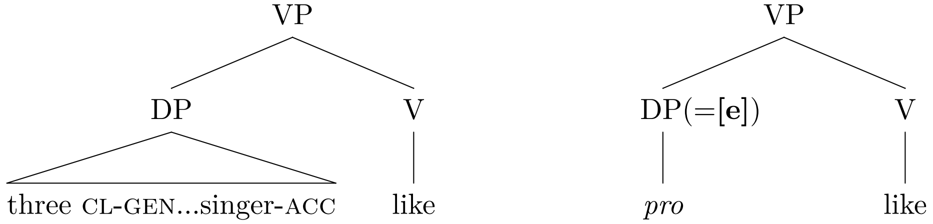
(lit.) ‘Cinswu likes, too.’

a. ‘Cinswu likes three singers, too.’ [quantificational]

b. ‘Cinswu also likes the same three singers who Minswu likes.’ [E-type]

Following the spirit of Hoji (1998), Ahn and Cho (2011a, 2011b) suggest that the null object sentence in (34B) involves an indefinite *pro*, as represented in (35), and thus is equivalent to the sentence in (36B) below, where the object position is filled with the indefinite nominal, *kaswu* ‘singer’.

(35)



(36) A: Minswu-ka sey myeng-uy kaswu-lul coaha-n-ta.
Minswu-NOM three CL-GEN singer-ACC like-PRES-DECL
‘Minswu likes three singers.’

B: Cinswu-to kaswu-lul coaha-n-ta.
Cinswu-also singer-ACC like-PRES-DECL
‘Cinswu likes a singer, too.’

According to Ahn and Cho (2011a, b), the quantificational reading in (34B) can be understood as an explicature of the sentence in (36B), which has been derived by three pragmatic adjustment processes, disambiguation, reference assignment, and enrichment (Sperber & Wilson 1986). This analysis is arguably strengthed by the fact that, since the explicature (or the quantificational) reading is pragmatically determined, it can be explicitly cancelled, as illustrated in (37).[20]

---

[20] According to Ahn and Cho (2011a, b), the ellipsis analysis would incorrectly predict that the relevant reading is not cancellable, as illustrated in (i), since the null object site [e] is assumed to have internal structure containing the quantifier nominal *sey myeng-uy* kaswu ‘three singers’.

(i) A: Minswu-ka sey myeng-uy kaswu-lul coaha-n-ta.
Minswu-NOM three CL-GEN singer-ACC like-PRES-DECL
‘Minswu likes three singers.’

B: # Cinswu-to ~~sey~~ ~~myeng-uy~~ ~~kaswu-lul~~ coaha-n-ta. Haciman, ney myeng-lul
Cinswu-also three CL-GEN singer-ACC like-PRES-DECL but four CL-ACC
coaha-n-ta.
like-PRES-DECL
‘Cinswu likes three singers, too, but he likes four singers.’

(37) A: Minswu-ka sey myeng-uy kaswu-lul coaha-n-ta.
Minswu-NOM three CL-GEN singer-ACC like-PRES-DECL
'Minswu likes three singers.'

B: Cinswu-to *pro* (=kaswu-lul) coaha-n-ta. Haciman ney myeng-ul
Cinswu-also (singer-ACC) like-PRES-DECL but four CL-ACC
coaha-n-ta.
like-PRES-DECL
(lit.) 'Cinswu likes, too, but he likes four singers.'

So far, we have seen that the ellipsis and null pronominal approaches are competitive in the precise characterization of the status of null objects in Korean (and other East Asian languages). As previously mentioned in the Introduction, the primary goal of this chapter is to contribute to this debate. In the next section, I present novel empirical data from Experiment 5 that supports the ellipsis analysis for Korean.

4.3 Experiment 5

4.3.1 Research question and predictions of the experiment

In Experiment 3 in Chapter 3, with the aid of the pronoun *ku* 'he', the (un)availability of a sloppy identity reading was used as a reliable diagnostic to identify whether Korean VP anaphora *kuleha* 'do so' has internal syntactic structure, and thus to ultimately determine whether it is derived by ellipsis or it is an instance of pro-form anaphora. Experiment 5 was carried out in much the same way as in Experiment 3, in order to investigate the syntactic nature of Korean null objects. To comprehend the fundamental logic of Experiment 5, we need to recall the interpretive properties of *ku* found from Experiments 1 to 3. First, there exists substantial inter-speaker variation in the bindability of *ku*. That is, with regard to the interpretation of quantificational sentences such as (38), some Korean speakers consistently allow a bound variable reading for *ku*, while other Korean speakers consistently do not.

(38) Motwu-ka **ku**-uy cim-ul nalu-ess-ta.
everyone-NOM he-GEN stuff-ACC move-PAST-DECL
'Everyone moved his stuff.'

a. 'Each person moved his own stuff.'

b. 'Everyone moved one particular person's stuff.'

Recall also that in sentences like (39), the pronoun *ku* can readily take as its antecedent a referential matrix subject (e.g., *Minswu* in (39)) as long as a relevant context is provided, although it strongly prefers to have a discourse antecedent.

(39) Minswu-ka **ku**-uy cim-ul nalu-ess-ta.
Minswu-NOM he-GEN stuff-ACC move-PAST-DECL

‘Minswu moved his stuff.’

a. ‘Minswu moved his own stuff.’

b. ‘Minswu moved one particular person’s stuff.’

Given these considerations, Experiment 5 was designed to address the following research question.

(40) RESEARCH QUESTION:
Does the distribution of sloppy reading for null objects follow from the distribution of the bound-variable pronoun in Korean?

To answer this research question, the availability of sloppy identity readings in null object constructions such as (41) was examined in comparison with the availability of bound variable readings in quantificational sentences such as (38).

(41) Minswu-ka **ku**-uy cim-ul nalu-ess-ko, Kiswu-to **[e]**
Minswu-NOM he-GEN stuff-ACC move-PAST-CONJ Kiswu-also
nalu-ess-ta.
move-PAST-DECL
(lit.) ‘Minswu moved his stuff, and Kiswu moved, too.’

a. ‘Minswu moved Minswu’s stuff, and Kiswu moved Kiswu’s stuff, too.’
[sloppy identity]

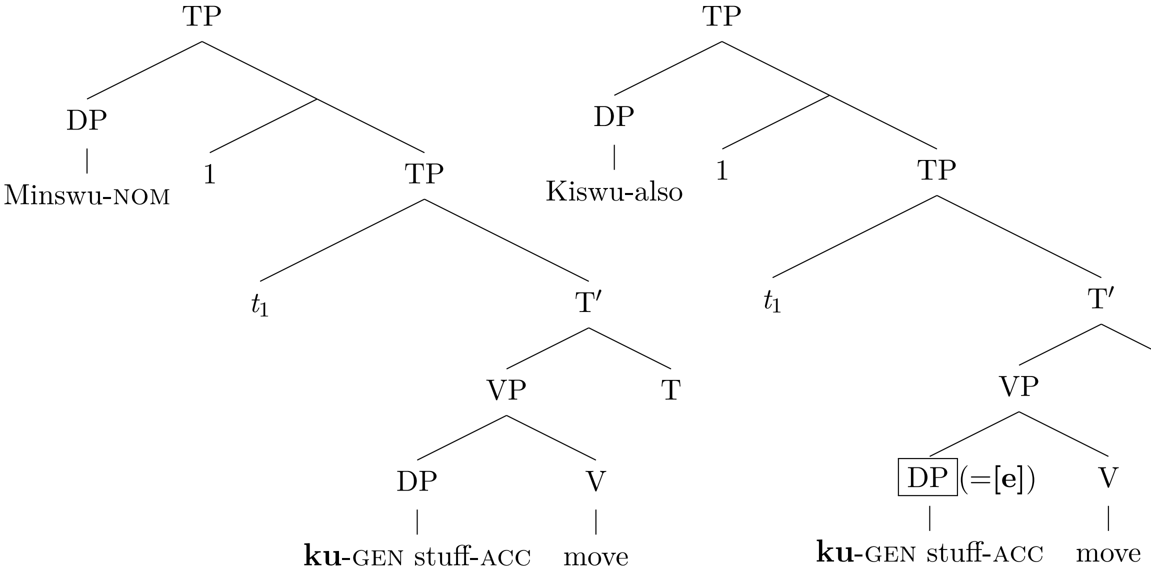
b. ‘Minswu moved Minswu’s stuff, and Kiswu moved Minswu’s stuff, too.’
[strict identity]

Given that the first conjunct in (41) is intended as ‘Minswu moved Minswu’s stuff’, the ellipsis and null pronominal analyses discussed in Section 4.2 make different predictions about the correlation between the distribution of the sloppy identity readings for the null object constructions and the distribution of the quantificational binding of *ku.* The details of the predictions are presented below.

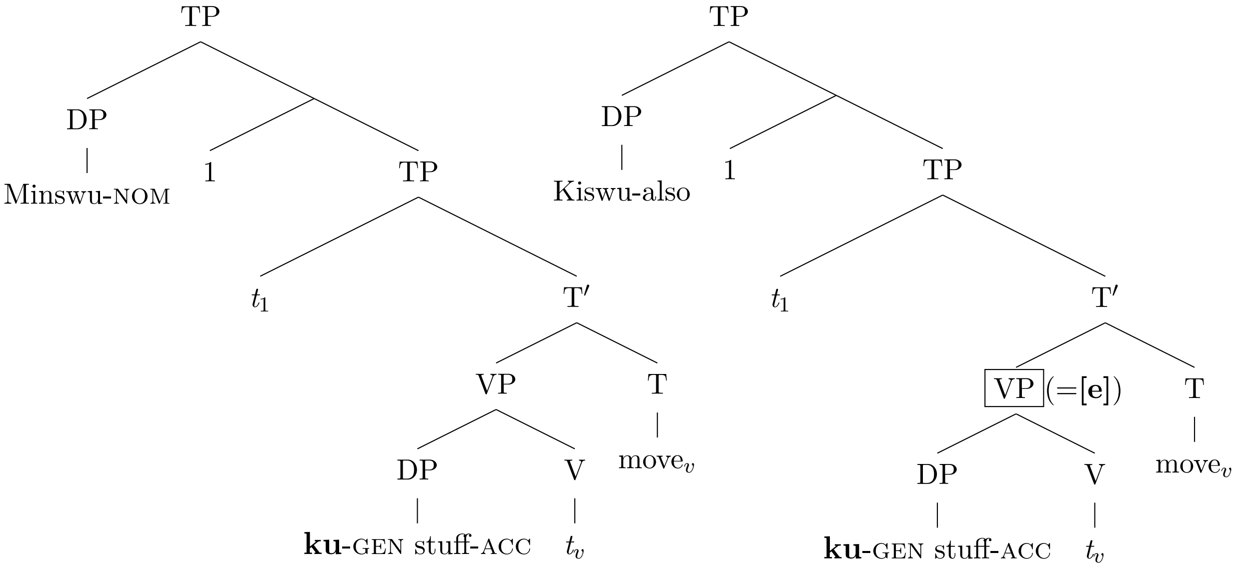
Predictions of the ellipsis analysis

If the Korean null objects are generated through ellipsis of a fully-fledged constituent (DP or VP), which is identical to its antecedent, then the pronoun *ku* must be existent in the null object site **[e]**, as represented in (42) and (43) below, and its bindability should exhibit inter-speaker variation.

(42) Argument ellipsis:


TP
DP
Minswu-NOM
1
TP
t_1
T′
VP
T
DP
V
ku-GEN stuff-ACC
move
TP
DP
Kiswu-also
1
TP
t_1
T′
VP
T
DP (=[**e**])
V
ku-GEN stuff-ACC
move

(43) Verb-stranding VP ellipsis:

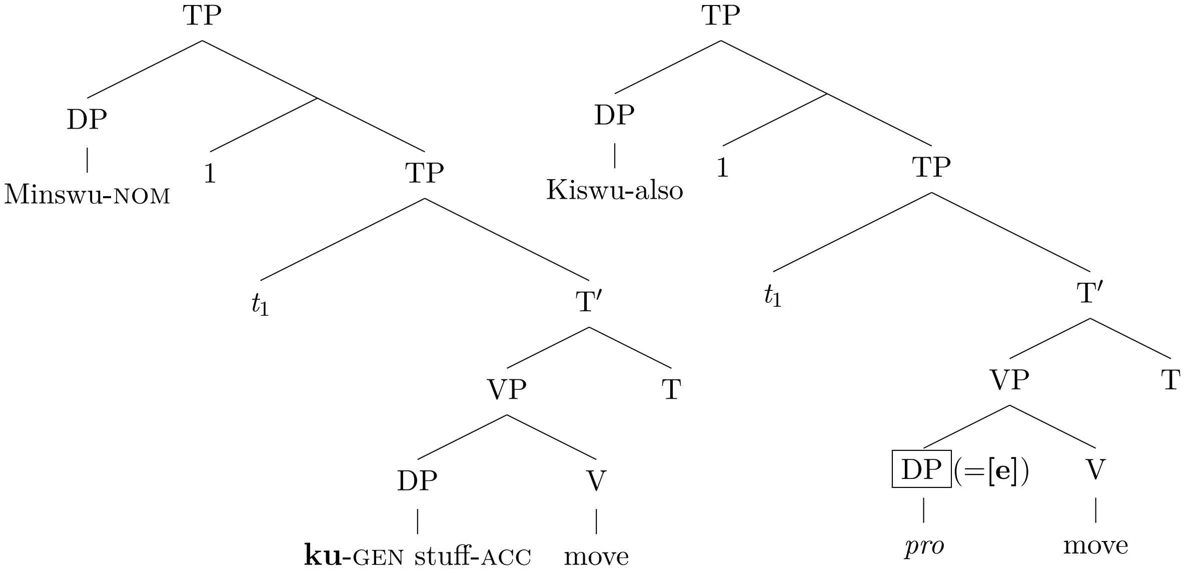

TP
DP
Minswu-NOM
1
TP
t_1
T′
VP
T
move$_v$
DP
V
ku-GEN stuff-ACC
t_v
TP
DP
Kiswu-also
1
TP
t_1
T′
VP (=[**e**])
T
move$_v$
DP
V
ku-GEN stuff-ACC
t_v

Recall the standard view that a sloppy identity reading under ellipsis arises from a pronoun in the ellipsis site being construed as a bound variable. We would thus expect to observe variation among Korean speakers in their acceptance of sloppy identity readings in null object constructions as in (41), as well as in their acceptance of bound variable readings in quantificational sentences as in (38). Additionally, we should be able to find a high correlation between the distribution of the two readings in question. This would indicate that an individual speaker's acceptance of the sloppy identity readings should be predictable from her acceptance of the quantificational binding of *ku*. For example, speakers who accept the bound variable reading in (38a) would be expected to allow the sloppy identity reading in (41a), while speakers who reject the bound variable reading would be expected to disallow the sloppy identity reading.[21]

Predictions of the null pronominal analysis

If the Korean null objects are base-generated as indefinite *pro*s, then they would not have an internal syntactic structure, and thus the pronoun *ku* would never be existent in the null object site [**e**], as represented in (44) below.

(44) Null pronominal:

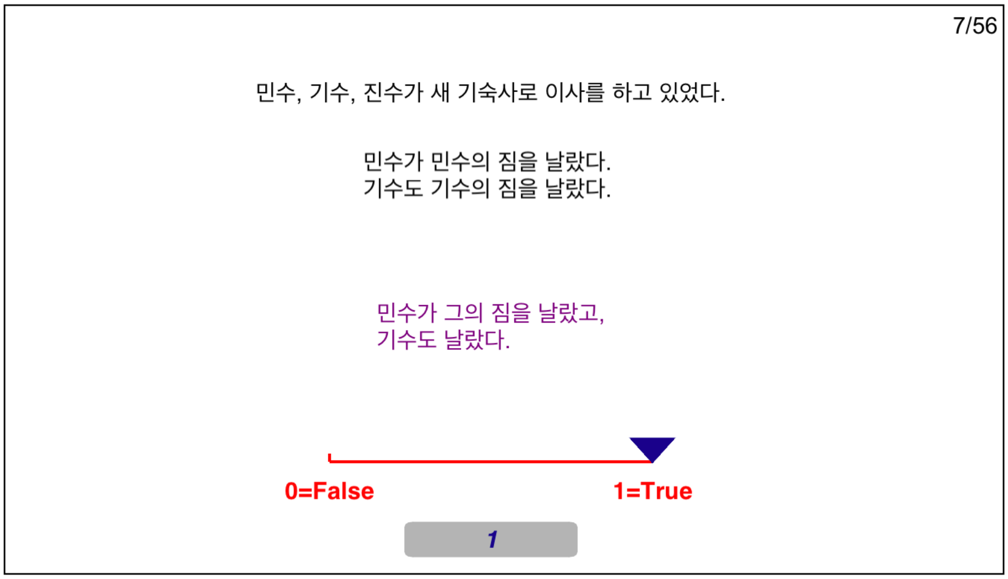


Accordingly, the availability of sloppy identity readings in null object constructions as in (41) would never be influenced by the (un)bindability of *ku*, and thus should not correlate with the availability of bound variable readings in quantificational sentences as in (38). Recall Hoji's (1998) claim that the null objects, as indefinite null pronominals, can license sloppy identity readings (which he calls 'sloppy-like readings') through pragmatic inferences. Under this view, then, the sloppy identity reading in (41a) should be expected to be unequivocally accepted by Korean speakers, once a relevant context is clearly provided in the discourse.[22]

---

[21] The strict identity reading in (41b) would be expected to be available to all Korean speakers, since *ku* in the null object site [e] would readily serve as a (co)referential pronoun, which has been standardly assumed to be the source of strict identity readings under ellipsis.

[22] For the same reason, we should also expect the strict identity reading in (41b) to be uniformly available to Korean speakers.



민수, 기수, 진수가 새 기숙사로 이사를 하고 있었다.

민수가 민수의 짐을 날랐다.
기수도 기수의 짐을 날랐다.

민수가 그의 짐을 날랐고,
기수도 날랐다.

Figure 4.1: Screenshot of a test trial in Experiment 5

4.3.2 Methodology

4.3.2.1 Participants

Forty native Korean adult speakers living in Vancouver, Canada, who did not participate in any of the previous experiments participated in Experiment 5. They all met the same requirements for eligibility for participation as in the previous experiments.[23]

4.3.2.2 Task

The same truth-value judgment task was employed as in the previous experiments. That is, the participants were presented with sentences describing a context on a computer screen, followed by a target sentence. They were then asked to judge whether the target sentence truthfully described the given context by clicking 1 for ‘True’ and 0 for ‘False’ (see Figure 4.1 above).

4.3.2.3 Design and Materials

The experimental design of Experiment 5 was similar to that of Experiment 3. Each target sentence was either a null object construction such as (41) or a quantificational sentence such as (38), and each context was biased towards either bound or free (referential) interpretation of *ku* in the target sentence. Thus, two factors were crossed to create four experimental conditions: SENTENCE TYPE (NullObject vs. Quantificational) × CONTEXT TYPE (Bound vs. Free). A sample set of test items are given in (45)-(48) below, where the target sentences are in boldface.[24]

---

[23] The participants were between the ages of 20 and 27 (the mean age was 23). Most of them were university students in Korea, but came to Canada to work part-time or study English at ESL institutions temporarily. Four participants were attending colleges in Vancouver at the time of participation.

(45) NullObject-Bound (sloppy identity reading) condition:

Minswu, Kiswu, Cinswu-ka say kiswuksa-lo isaha-ko iss-ess-ta.
Minswu Kiswu Cinswu-NOM new dormitory-to move-PROG PAST-DECL
Minswu-ka Minswu-uy cim-ul nalu-ess-ta. Kiswu-to Kiswu-uy
Minswu-NOM Minswu-GEN stuff-ACC move-PAST-DECL Kiswu-also Kiswu-GEN
cim-ul nalu-ess-ta.
stuff-ACC move-PAST-DECL

'Minswu, Kiswu, and Cinswu were moving to a new dormitory. Minswu moved Minswu's stuff. Kiswu also moved Kiswu's stuff.'

Minswu-ka ku-uy cim-ul nalu-ess-ko, **Kiswu-to** [e]
Minswu-NOM he-GEN stuff-ACC move-PAST-CONJ Kiswu-also
nalu-ess-ta.
move-PAST-DECL

'Minswu moved his stuff, and Kiswu moved, too.'

(46) NullObject-Free (strict identity reading) condition:

Minswu, Kiswu, Cinswu-ka say kiswuksa-lo isaha-ko iss-ess-ta.
Minswu Kiswu Cinswu-NOM new dormitory-to move-PROG PAST-DECL
Minswu-ka Minswu-uy cim-ul nalu-ess-ta. Kiswu-to Minswu-uy
Minswu-NOM Minswu-GEN stuff-ACC move-PAST-DECL Kiswu-also Minswu-GEN
cim-ul nalu-ess-ta.
stuff-ACC move-PAST-DECL

'Minswu, Kiswu, and Cinswu were moving to a new dormitory. Minswu moved Minswu's stuff. Kiswu also moved Minswu's stuff.'

Minswu-ka ku-uy cim-ul nalu-ess-ko, **Kiswu-to** [e]
Minswu-NOM he-GEN stuff-ACC move-PAST-CONJ Kiswu-also
nalu-ess-ta.
move-PAST-DECL

'Minswu moved his stuff, and Kiswu moved, too.'

(47) Quantificational-Bound condition:

Minswu, Kiswu, Cinswu-ka say kiswuksa-lo isaha-ko iss-ess-ta.
Minswu Kiswu Cinswu-NOM new dormitory-to move-PROG PAST-DECL
Minswu-ka Minswu-uy cim-ul nalu-ess-ta. Kiswu-to Kiswu-uy
Minswu-NOM Minswu-GEN stuff-ACC move-PAST-DECL Kiswu-also Kiswu-GEN

---

[24] A complete set of all test items can be found in Appendix F.

cim-ul nalu-ess-ta. Cinswu-to Cinswu-uy cim-ul
stuff-ACC move-PAST-DECL Cinswu-also Cinswu-GEN stuff-ACC
nalu-ess-ta.
move-PAST-DECL

'Minswu, Kiswu, and Cinswu were moving to a new dormitory. Minswu moved Minswu's stuff. Kiswu also moved Kiswu's stuff. Cinswu also moved Cinswu's stuff.'

Motwu-ka ku-uy cim-ul nalu-ess-ta.
everyone-NOM he-GEN stuff-ACC move-PAST-DECL

'Everyone moved his stuff.'

(48) QUANTIFICATIONAL-FREE condition:

Minswu, Kiswu, Cinswu-ka Thayswu-ka oki-lul kitalimye, say
Minswu Kiswu Cinswu-NOM Thayswu-NOM coming-ACC waiting new
kiswuksa-lo isaha-ko iss-ess-ta. Minswu-ka Thayswu-uy cim-ul
dormitory-to move-PROG PAST-DECL Minswu-NOM Thayswu-GEN stuff-ACC
nalu-ess-ta. Kiswu-to Thayswu-uy cim-ul nalu-ess-ta.
move-PAST-DECL Kiswu-also Thayswu-GEN stuff-ACC move-PAST-DECL
Cinswu-to Thayswu-uy cim-ul nalu-ess-ta.
Cinswu-also Thayswu-GEN stuff-ACC move-PAST-DECL

'Minswu, Kiswu, and Cinswu were moving to a new dormitory, waiting for Thayswu to come. Minswu moved Thayswu's stuff. Kiswu also moved Thayswu's stuff. Cinswu also moved Thayswu's stuff.'

Motwu-ka ku-uy cim-ul nalu-ess-ta.
everyone-NOM he-GEN stuff-ACC move-PAST-DECL

'Everyone moved his stuff.'

In (45), the context is consistent with the sloppy identity reading for the target null object construction, which would arise, according to the ellipsis analysis, from *ku* being a bound pronoun, while in (46), the context is consistent with the strict identity reading for the target null object construction, which would be attributed to *ku* serving as a free pronoun. In (47), the context is consistent with the bound variable reading for *ku* in the target quantificational sentence, while in (48), the context is consistent with the referential reading for *ku* in the target quantificational sentence.

Based on the sample set illustrated in (45)-(48), 16 sets of test items were constructed, thus resulting in 64 test items (16 items for each of the four experimental conditions). These items were then assigned to four presentation lists according to a Latin Square design, such that each list contained four items in each condition. The same 40 filler items were then added to each list, some of which are given in (49)-(51) below.[25]

(49) Referential condition:

Minswu, Kiswu, Cinswu-ka uwntong hwu swui-ko iss-ess-ta.
Minswu Kiswu Cinswu-NOM exercise after rest-PROG PAST-DECL
Minswu-ka Minswu-uy umlyoswu-lul masi-ess-ta.
Minswu-NOM Minswu-GEN beverage-ACC drink-PAST-DECL

'Minswu, Kiswu, and Cinswu were taking a rest after exercise. Minswu drank Minswu's beverage.'

Minswu-ka ku-uy umlyoswu-lul masi-ess-ta.
Minswu-NOM he-GEN beverage-ACC drink-PAST-DECL

'Minswu drank his beverage.'

(50) Nullobject-'Object-mismatch' condition:

Minswu, Kiswu, Cinswu-ka uwntong hwu swui-ko iss-ess-ta.
Minswu Kiswu Cinswu-NOM exercise after rest-PROG PAST-DECL
Minswu-ka umlyoswu-lul masi-ess-ta. Kiswu-nun mwul-lul
Minswu-NOM beverage-ACC drink-PAST-DECL Kiswu-TOP water-ACC
masi-ess-ta.
drink-PAST-DECL

'Minswu, Kiswu, and Cinswu were taking a rest after exercise. Minswu drank a beverage. Kiswu drank water.'

Minswu-ka umlyoswu-lul masi-ess-ko, **Kiswu-to** [e]
Minswu-NOM beverage-ACC drink-PAST-CONJ Kiswu-also
masi-ess-ta.
drink-PAST-DECL

'Minswu drank a beverage, and Kiswu drank, too.'

(constructed on the basis of J. S. Kim's (2012) examples)

(51) Nullobject-'Modifier-mismatch' condition:

Minswu, Kiswu, Cinswu-ka uwntong hwu swui-ko iss-ess-ta.
Minswu Kiswu Cinswu-NOM exercise after rest-PROG PAST-DECL
Minswu-ka chaka-wun umlyoswu-lul masi-ess-ta. Kiswu-nun ttattuthan
Minswu-NOM cold-ADN beverage-ACC drink-PAST-DECL Kiswu-TOP warm
umlyoswu-lul masi-ess-ta.
beverage-ACC drink-PAST-DECL

---

[25] In footnote 28, I briefly present and discuss the results obtained in the Nullobject-'Modifier-mismatch' filler condition (51), which suggests that the relevant null object constructions should be analyzed as being derived by ellipsis.

'Minswu, Kiswu, and Cinswu were taking a rest after exercise. Minswu drank a cold beverage. Kiswu drank a warm beverage.'

Minswu-ka chaka-wun umlyoswu-lul masi-ess-ko, Kiswu-to [e]
Minswu-NOM cold-ADN beverage-ACC drink-PAST-CONJ Kiswu-also
masi-ess-ta.
drink-PAST-DECL

'Minswu drank a cold beverage, and Kiswu drank, too.'
(constructed on the basis of J. S. Kim's (2012) examples)

4.3.2.4 Procedure

The experiment was administered using PsychoPy software. The procedure was the same as in Experiments 1 to 3. Sixteen test trials (four trials per condition) and 40 filler trials were presented to the participants in a uniquely generated random order. They were paid $10 each as compensation for participation.

4.3.3 Findings

Figure 4.2 summarizes mean rates of acceptance (i.e., assignment of 1 'True') by condition: 33% in the Quantificational-Bound condition, 31% in the NullObject-Bound (sloppy identity reading) condition, 82% in the Quantificational-Free condition, and 79% in the NullObject-Free (strict identity reading) condition. Data were fitted to generalized linear mixed-effects models using the 'lmer' function of the 'lme4' package in the R statistical software, to analyze the participants' responses as a function of SENTENCE TYPE and CONTEXT TYPE, with participants and items included as random effects. The analysis revealed a main effect of CONTEXT TYPE (coefficient estimate = 2.46, *s.e.* = .29, $z = 8.44$, $p < .001$): regardless of SENTENCE TYPE, speakers were significantly more likely to accept free reading than bound reading. However, the analysis revealed no main effect of SENTENCE TYPE, and no interaction between CONTEXT TYPE and SENTENCE TYPE: speakers were equally likely to accept bound readings for the quantificational sentences and the null object constructions; speakers were also equally likely to accept free readings for both sentence types.

As in Experiments 1 to 3, all participants (n=40) were assigned into three different groups on the basis of their mean individual acceptance rates in the Quantificational-Bound condition and the NullObject-Bound (sloppy identity reading) condition: ACCEPT (> 75% acceptance: assignment of 1 to three or four target sentences), AMBIVALENT (= 50% acceptance: assignment of 1 to two target sentences), and REJECT (< 25% acceptance: assignment of 1 to none or one target sentence). As a result, a bimodal distribution of the participants' responses was observed in each Bound condition, as illustrated in Figure 4.3 below: participants tended to either always accept or always reject the quantificational

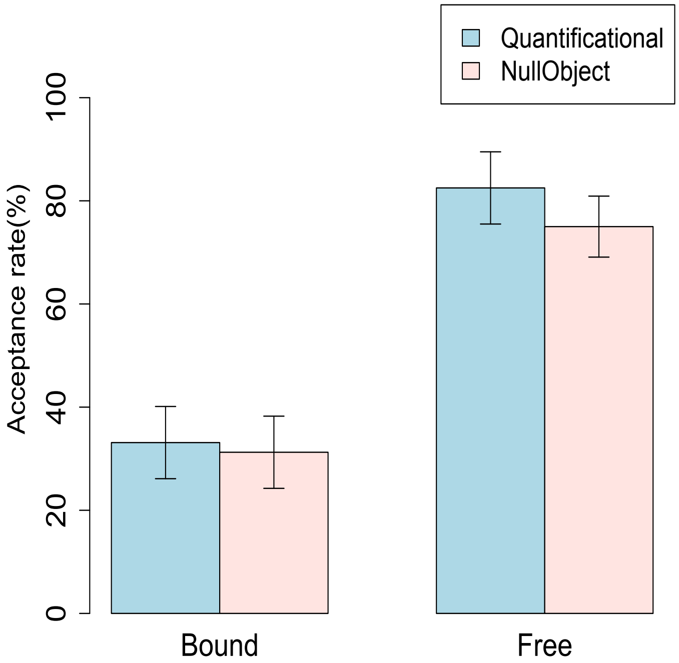


Figure 4.2: Mean rates of acceptance and standard errors in Experiment 5

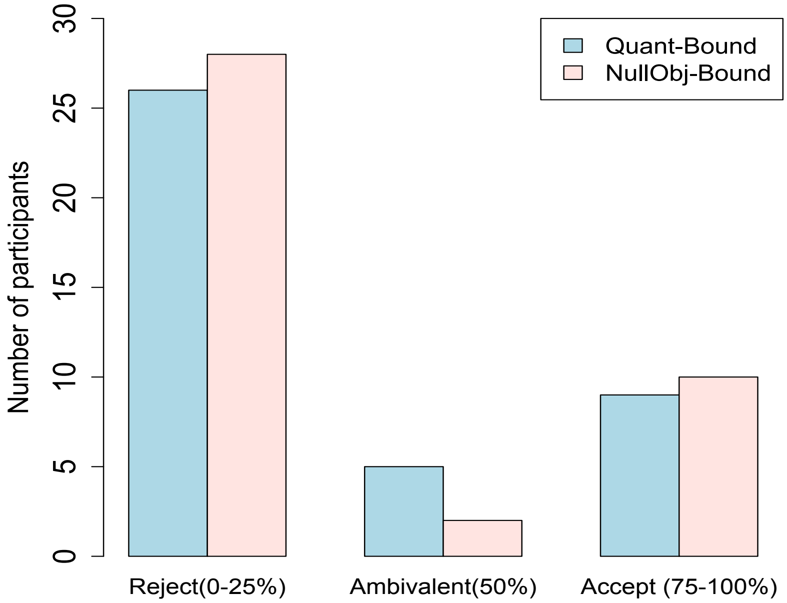


Figure 4.3: Distribution of responses in Quantificational-Bound and NullObject-Bound (sloppy identity reading) conditions in Experiment 5

binding interpretation for *ku*; participants also tended to either always accept or always reject the sloppy identity readings for the null object constructions.[26]

Given that inter-speaker variation was found in the Quantificational-Bound and Null Object-Bound (sloppy identity reading) conditions, a linear regression analysis was carried out to examine the correlation between the participants' mean acceptance rates in the two Bound conditions. The analysis revealed a strong correlation ($r = 0.79$, $t = 6.43$, $p < .001$), as illustrated in Figure 4.4 below. This result indicates that an individual speaker's acceptance of the sloppy identity readings for the null object constructions is predictable from her acceptance of the bound variable readings for the quantificational sentences (and vice versa). Therefore, it is highly likely that participants who allowed the quantificational binding of *ku* accepted the sloppy identity readings for the null object constructions, and those who did not allow the quantificational binding of *ku* rejected the sloppy identity readings.[27]

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[26] One might say that most of the participants did not accept the null object constructions under the sloppy identity reading contexts, as exemplified by (i) below (repeated from (45)), probably because they rarely allowed the pronoun *ku* in the first conjuncts to be anaphorically linked to the clause-mate subjects (e.g., *Minswu* in (i)).

(i) NullObject-Bound (sloppy identity reading) condition:
(context: Minswu, Kiswu, and Cinswu were moving to a new dormitory. Minswu moved Minswu's stuff. Kiswu also moved Kiswu's stuff.)

Minswu-ka	**ku-uy**	**cim-ul**	**nalu-ess-ko**,	**Kiswu-to**	[e]	**nalu-ess-ta**.
Minswu-NOM	he-GEN	stuff-ACC	move-PAST-CONJ	Kiswu-also		move-PAST-DECL

'Minswu moved his stuff, and Kiswu moved, too.'

Recall from footnote 28 in Chapter 2 that *ku* generally prefers a discourse antecedent to an intra-sentential antecedent. However, the results obtained from the filler trials for the Referential condition, as exemplified by (ii) below (repeated from (49)), revealed a high mean acceptance rate (86%), indicating that *ku* can readily take a clause-mate subject antecedent as long as an appropriate context is provided (see Experiment 1A in Chapter 2 for a similar result in the Referential-Overt condition).

(ii) Referential condition:
(context: Minswu, Kiswu, and Cinswu were taking a rest after exercise. Minswu drank Minswu's beverage.)

Minswu-ka	**ku-uy**	**umlyoswu-lul**	**masi-ess-ta**.
Minswu-NOM	he-GEN	beverage-ACC	drink-PAST-DECL

'Minswu drank his beverage.'

Given these experimental results, it is reasonable to conclude that those participants who rejected the target null object constructions in the NullObject-Bound condition did so because they considered the first conjuncts acceptable, but the second conjuncts (i.e., the null object sentences) unacceptable.

[27] As predicted in Subsection 4.3.1, the mean acceptance rates in the Quantificational-Free and NullObject-Free (strict identity reading) conditions are uniformly high, thus confirming the accuracy and reliability of the results obtained in the Quantificational-Bound and NullObject-Bound (sloppy identity reading) conditions, which are the key test conditions of the experiment.

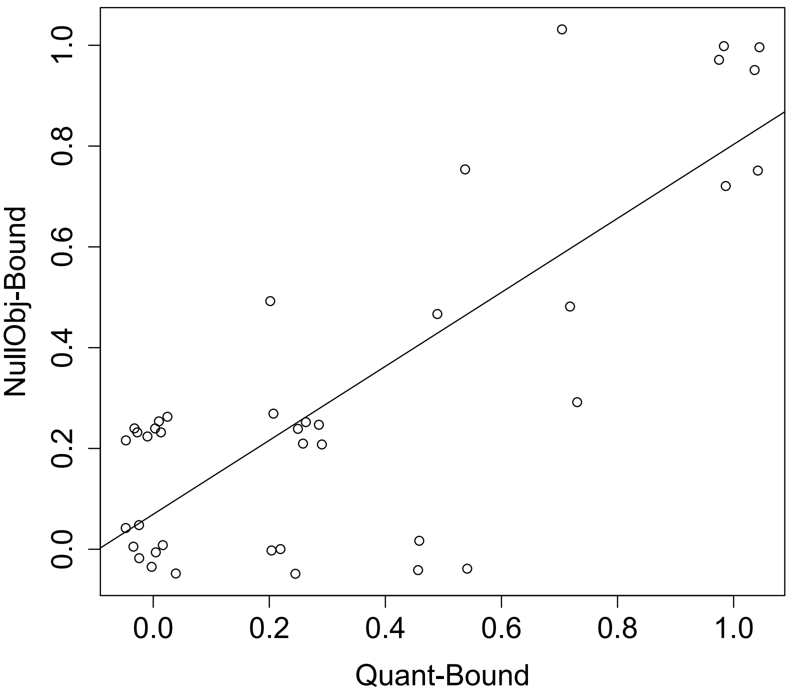

Figure 4.4: Correlation between mean acceptance rates in Quantificational-Bound and NullObject-Bound (sloppy identity reading) conditions in Experiment 5

4.3.3 Discussion of Experiment 5

The findings of Experiment 5 present empirical evidence that is inconsistent with the view that the examples of null objects in Korean (and other East Asian languages) are all instances of phonologically empty pronominals. As discussed in Subsection 4.3.1, if the Korean null objects in sentences such as (41), repeated in (52) below, were indeed base-generated as (indefinite) *pro*s, atomic elements which do not have internal structure (that can accommodate the pronoun *ku*), then the availability of the relevant sloppy identity readings would be expected to not correlate with the availability of the bound variable construal of *ku* in sentences such as (38), repeated in (53) below.

(52) Minswu-ka **ku**-uy cim-ul nalu-ess-ko, Kiswu-to **[e]**
Minswu-NOM he-GEN stuff-ACC move-PAST-CONJ Kiswu-also
nalu-ess-ta.
move-PAST-DECL
(lit.) ‘Minswu moved his stuff, and Kiswu moved, too.’

a. ‘Minswu moved Minswu’s stuff, and Kiswu moved Kiswu’s stuff, too.’
[sloppy identity]

b. ‘Minswu moved Minswu’s stuff, and Kiswu moved Minswu’s stuff, too.’
[strict identity]

(53) Motwu-ka **ku**-uy cim-ul nalu-ess-ta.
everyone-NOM he-GEN stuff-ACC move-PAST-DECL
'Everyone moved his stuff.'

a. 'Each person moved his own stuff.'

b. 'Everyone moved one particular person's stuff.'

Contrary to the prediction of the null pronominal analysis, however, Experiment 5 have found a strong correlation between the distribution of the sloppy identity readings and the quantificational binding of *ku*. Furthemore, it has been demonstrated that native speakers of Korean may be sorted into two distinct groups; a group of speakers who allow both the sloppy identity readings for null objects (as in (52a)) and the quantificational binding of *ku* (as in (53a)), and a group of speakers who do not allow either of them. These findings can be easily accounted for by postulating that the relevant null object constructions are derived by ellipsis (i.e., PF-deletion) of an argument DP or a VP with internal structure containing *ku*.[28,29]

---

[28] As briefly mentioned in footnote 25, the results obtained from the participants' responses in the Nullobject-'Modifier-mismatch' filler condition further support the view that some cases of Korean null objects should be analyzed as involving ellipsis, not *pro*. Let us consider (51) again, repeated below in (i).

(i) NullObject-'Modifier-mismatch' condition:
(context: Minswu, Kiswu, and Cinswu were taking a rest after exercise. Minswu drank a cold beverage. Kiswu drank a warm beverage.)

Minswu-ka chakawun umlyoswu-lul masi-ess-ko, **Kiswu-to [e] masi-ess-ta.**
Minswu-NOM cold beverage-ACC drink-PAST-CONJ Kiswu-also drink-PAST-DECL

'Minswu drank a cold beverage, and Kiswu drank, too.'

As noted by J. S. Kim (2012: 42-43), the ellipsis and null pronominal analyses yield different predictions regarding the truth-value of the target sentence in (i). Under the argument ellipsis analysis or verb-stranding VP ellipsis analysis, the null object site [e] in the second conjunct involves a full-fledged structure containing *chakawun umlyoswu* 'cold beverage', which is elided under identity with its antecedent in the first conjunct. Therefore, the whole target sentence should be judged false, since it is not compatible with the given context where Minswu drank a cold beverage, but Kiswu drank a warm beverage. According to the null pronominal analysis, on the other hand, the null object site [e] corresponds to the head noun of the full DP object in the first conjunct, *umlyoswu* 'beverage'. Thus, the whole target sentence should be taken to truthfully describe the given context, since it is true that both Minswu and Kiswu drank a beverage, although the beverages consumed were of different temperatures. The results revealed that the participants rejected the target null object constructions in the 'modifier-mismatch' condition 93% of the time, indicating that they interpreted the null object site [e] as involving the same full DP objects as in the first conjuncts, and thus supporting the ellipsis analysis. See J. S. Kim's (2012) TVJT experiment for similar results.

[29] In a similar way as discussed in footnote 29 of Chapter 2, one might maintain that the split among the Korean speakers with regard to the sloppy identity readings for the null objects could have been due to the speakers' initial access to one of the two possible interpretations (i.e., a sloppy identity reading and a strict identity reading). Even if that were the case, the current conclusion on the syntax of Korean null objects would be still maintained. That is, it was found in Experiment 5 that an individual speaker's acceptance of the sloppy identity readings for the null objects with antecedents containing *ku* was strongly correlated with her acceptance of quantifier-bound *ku*, and this could be attributed to each speaker's "initial access bias" to the interpretation of an elided *ku* in the null objects, which would be expected to be the same as her "initial access bias" to the interpretation of the overt *ku*.

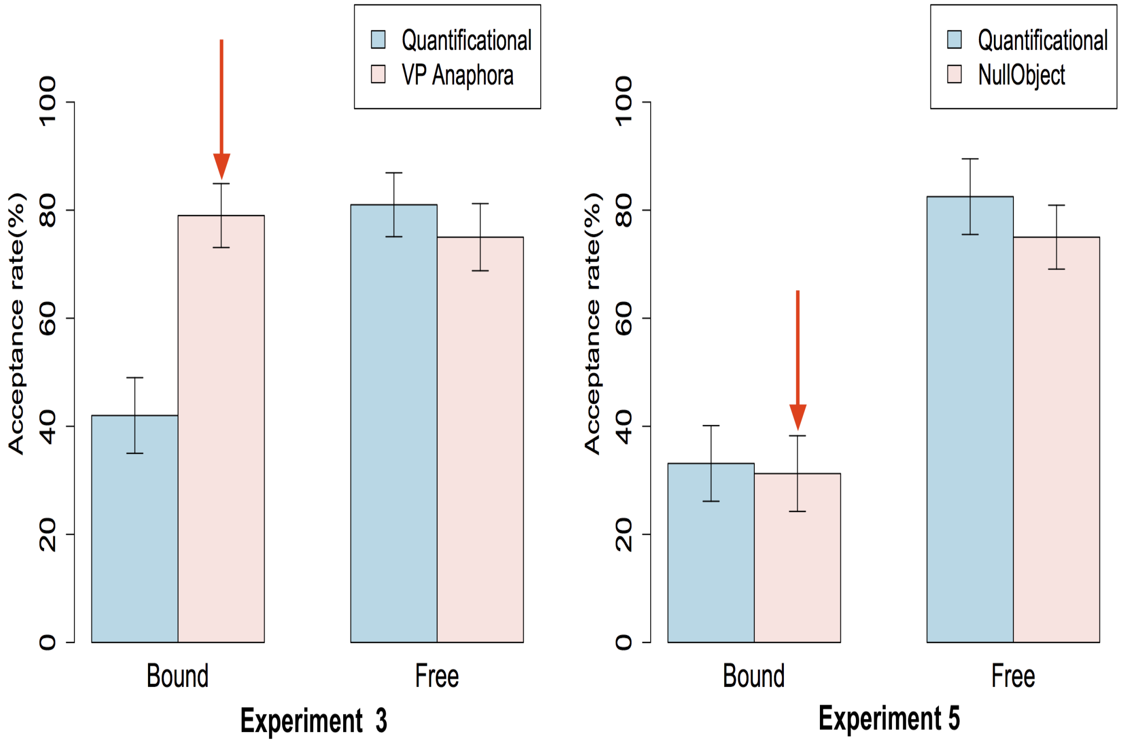

Figure 4.5: Mean rates of acceptance and standard errors in Experiment 3 and Experiment 5

At this point, one might possibly maintain that the inter-speaker variation found with the sloppy identity readings for the Korean null objects could have been due to some aspects of the task or method employed in the experiment, or due to general characteristics of Korean anaphora. However, this line of argument cannot be sustained if we review the findings of Experiment 3 in Chapter 3, which investigated the syntactic status of Korean VP anaphora *kuleha* 'do so'. Consider first Figure 4.5 above, where the mean acceptances rates and standard errors in Experiment 5 can be compared to those in Experiment 3. Let us then recall that in Experiment 3, the availability of the sloppy identity reading in VP anaphora constructions such as (54) was inspected in comparison with the availability of the quantificational binding interpretation for *ku*, in much the same way as in Experiment 5.

(54) Minswu-ka **ku**-uy cim-ul nalu-ess-ko, Kiswu-to kuleha-yess-ta.
Minswu-NOM he-GEN stuff-ACC move-PAST-CONJ Kiswu-also so.do-PAST-DECL
(lit.) 'Minswu moved his stuff, and Kiswu did so, too.'

a. 'Minswu moved Minswu's stuff, and Kiswu moved Kiswu's stuff, too.'
[sloppy identity]

b. ‘Minswu moved Minswu’s stuff, and Kiswu moved Minswu’s stuff, too.’
[strict identity]

The findings of Experiment 3 have demonstrated that while there existed considerable inter-speaker variation in the acceptance of the quantificational binding of *ku*, just as in Experiment 5, (nearly) all participants unequivocally accepted the sloppy identity readings for the VP anaphors. We have concluded from these findings that the Korean VP anaphors are base-generated verbal pro-forms, atomic elements that lack internal structure in the syntax. Given these considerations, if the relevant null objects were indeed instances of empty pronouns, then uniform and high acceptance of the sloppy identity readings for the null object constructions would have been expected, just as in the VP Anaphora-Bound (sloppy identity reading) condition in Experiment 3. However, this expectation has not been confirmed by the results of Experiment 5, which revealed 31% acceptance rate in the NullObject-Bound (sloppy identity reading) condition, that was derived from about one-third of the participants who consistently accepted the target null object constructions in this condition. This strongly suggests, I argue, that the null object constructions tested in Experiment 5 should be analyzed as involving ellipsis, not *pro*.

4.4 General discussions

To summarize, in this chapter I have provided novel empirical evidence that supports the position that some cases of null objects in Korean, a radical pro-drop language, should be attributed to the ellipsis of a constituent with full-fledged structure. However, a crucial question remains unanswered as to whether the elided element in question is a DP object (Argument ellipsis) or a VP containing the DP object (Verb-stranding VP ellipsis), as illustrated in Table 4.2 below.

Source of null objects	(i) Internal structure?	(ii) [e] is DP or VP?
~~NULL PRONOMINAL~~	~~Absent~~	~~DP~~
ARGUMENT ELLIPSIS	Present	DP
VERB-STRANDING VP ELLIPSIS	Present	VP

Table 4.2: Syntactic status of null objects

One of the well-known diagnostics to identify the ‘size’ of ellipsis is the (un)availability of the so-called ‘null adjunct reading’ (a term coined by Funakoshi 2016) for null object constructions such as (55) below, where the antecedent sentence in (55A) contains an adverb and the null object sentence in (55B) is negated.

(55) A: Minho-ka ppali mwul-ul masi-ess-ta.
Minho-NOM quickly water-ACC drink-PAST-DECL
'Minho drank water quickly.'

B: Kiho-nun [e] masici-an-ass-ta.
Kiho-TOP drink-NEG-PAST-DECL
(lit.) 'Kiho did not drink.'

(constructed on the basis of Oku's (1998: 172) Japanese examples)

Crucially, the verb-stranding VP ellipsis analysis and the argument ellipsis analysis make different predictions about the 'recovery' of an adjunct in the Korean null object construction above. Under the verb-stranding VP ellipsis analysis, the null object sentence in (55B) should mean that Kiho did not drink water quickly (thus implying that Kiho drank water, but he did not do so quickly). This is so since the elided element in [e] would correspond to a VP structure, which contains the manner adverb *ppali* 'quickly' as well as the DP object *mwul* 'water', as roughly represented in the following structure.[30]

(56) Kiho-TOP [~~VP quickly~~ [~~DP water-ACC~~] ~~t_v~~](=[e]) drink$_v$-NEG-PAST

According to the argument ellipsis analysis, on the other hand, such a null adjunct reading should not be available, because only the DP object *mwul* 'water', but not the adverb *ppali* 'quickly', would undergo ellipsis in [e], as illustrated in (57), and thus the whole null object sentence in (55B) should receive the 'object only reading' that Kiho did not drink water at all.

(57) Kiho-TOP quickly [~~DP water-ACC~~](=[e]) drink-NEG-PAST

To the best of my knowledge, the dominant view in the literature of East Asian languages has been that null object sentences such as (55B) are acceptable only under the interpretation in which the DP object alone is semantically 'recovered' in [e] (e.g., Park 1997; Oku 1998; cf. Takahashi 2008; Cheng 2011; J. S. Kim 2012), thus supporting the argument ellipsis analysis.[31,32]

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[30] As discussed in Oku (1998: 173), the verb-stranding VP ellipsis analysis assumes that ('low') adverbs are adjoined to VP (cf. Ko 2007; Lasnik 2003).

[31] The null adjunct reading for (55B) was not available to any of the native Korean speakers (including myself) that I informally consulted. However, the object only reading was readily available to all of them.

[32] See Japanese and Chinese examples below, which have been cited by Oku (1998: 172) and Cheng (2011: 233) as evidence for the argument ellipsis analysis.

(i) A: Bill-wa kuruma-o teineini aratta.
Bill-TOP car-ACC carefully washed
'Bill washed the car carefully.'

B: John-wa [e] arawa-nakat-ta.
John-TOP wash-NEG-PAST
(lit.) 'John did not wash.'

a. 'John did not wash the car carefully.' [*null adjunct]

However, the verb-stranding VP ellipsis analysis has recently been revitalized by Funakoshi (2016: 5), who argues that “the null adjunct reading becomes much easier to get” if the antecedent clause and the null object clause are combined by a disjunction connective, as illustrated in the following Japanese example.

(58) Taroo-wa teineini kuruma-o arat-ta **kedo**, John-wa **[e]** araw-anak-atta.
Taroo-TOP carefully car-ACC wash-PAST **but**, John-TOP wash-NEG-PAST
(lit.) ‘Bill washed the car carefully, **but** John did not wash.’
(adapted from Funakoshi 2016: 5, ex.(16))

According to Funakoshi, the null object clause in (58) has the meaning, ‘John washed the car, but not in a careful manner’, which can be derived if the adverb *teineini* ‘carefully’ as well as the object *kuruma* ‘car’ is recovered in [e]. Funakoshi also proposes that the null adjunct reading is available “even without the disjunction connective, if a context makes the null adjunct reading appropriate”. He provides the following Japanese example to illustrate this point.

(59) Context: Taroo and Hanako washed their parents’ cars to get allowance. Taroo was thorough in his work while Hanako was not.

A: Taroo-wa teineini kuruma-o arat-ta.
Bill-TOP carefully car-ACC wash-PAST
‘Bill washed the car carefully.’

B: Hanako-wa **[e]** araw-anak-atta. Hanako-ga arat-ta ato-no
Hanako-TOP wash-NEG-PAST Hanako-NOM wash-PAST after-GEN
kuruma-wa kitanak-atta.
car-TOP dirty-PAST
(lit.) ‘Hanako did not wash. The car that Hanako washed was dirty.’
(Funakoshi 2016: 7, ex.(17))

Funakoshi claims that the null object sentence in (59B) can readily mean that Hanako did not wash the car carefully, with the aid of the context and the follow-up sentence “designed to favor the null adjunct reading”. Building upon his insights and arguments, an

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b. ‘John did not wash the car at all.’ [object only]

(ii) A: Zhangsan henkuaide chi-wan-le fan.
Zhangsan quickly eat-finish-ASP rice
‘Zhangsan finished the rice quickly.’

B: Lisi ye chi-wan-le **[e]**.
Lisi also eat-finish-ASP
(lit.) ‘Lisi also finished.’

a. ‘Lisi also finished the rice quickly.’ [*null adjunct]

b. ‘Lisi also finished the rice.’ [object only] experimental study can be constructed in order to investigate the size of ellipsis involved in Korean null object constructions, but I will leave this for future work.

Chapter 5

Conclusion

In this dissertation, using an experimental methodology, I have investigated the syntactic and interpretative characteristics of three Korean anaphoric devices, third-person pronouns (Chapter 2), VP anaphora (Chapter 3), and null objects (Chapter 4). In the following sections, I provide a summary of the novel empirical findings and contributions of the present study and conclude with suggestion for future work.

5.1 Summary of the major findings

In Chapter 2, the bound variable status of the third-person pronoun *ku* 'he' has been explored. I have presented three experiments designed to inspect the possibility of inter-speaker variation in the availability of bound variable construal for *ku*. In Experiment 1A, I tested the availability of quantificational binding of *ku*. It was found that some speakers of Korean consistently accepted the quantificational binding of *ku*, while other speakers of Korean consistently rejected it. This suggests an existence of variation across Korean speakers in the bound variable construal for *ku*. In Experiment 1B, I examined the availability of quantificational binding of *ku* in a single clause and across clauses. It was found that an individual speaker's acceptance of quantificational binding in a single clause is highly predictable from her acceptance of quantificational binding across a clause boundary. This suggests that clause type does not affect the bound variable construal for *ku*. In Experiment 2, the availability of quantificational binding of *ku* was examined in two different test sessions, which took place one month apart. I found a strong correlation between a speaker's acceptance of quantificational binding of *ku* in the two sessions. This suggests that Korean speakers exhibit the same judgment over time on the bound variable construal of *ku*. Based on all these findings, I have come to the conclusion that there is indeed variation across Korean speakers regarding the availability of bound variable construal for *ku*.

I have also attempted to provide a principled account for why and how the phenomenon of inter-speaker variation arises and exists in Korean and how it can be captured in binding-theoretic terms. Taking into consideration the historical background of *ku* and its present status, I have concluded that child learners of Korean may not receive sufficient evidence regarding *ku* from the primary language input data. Given this, adopting Han et al.'s (2007) *two-grammar hypothesis* and Déchaine and Wiltschko's (2002) pronominal typology, I have proposed that some speakers of Korean randomly acquire ϕP *ku*, which complies with the "pronominal grammar", while other speakers of Korean acquire DP *ku*, which complies with the "demonstrative grammar".

Chapter 3 has investigated the syntactic nature of VP anaphora in Korean. I have presented two experiments designed to inspect the presence/absence of internal structure within Korean VP anaphora. In Experiment 3, building upon the finding that there is inter-speaker variation in the quantificational binding of *ku* (i.e., the bound variable construal for *ku*), I examined the availability of sloppy readings for VP anaphors with antecedents containing *ku*. Given the standard view that the sloppy reading in ellipsis is due to a pronoun in the ellipsis site being bound, if VP anaphors have elided structure that hosts *ku*, the distribution of sloppy readings for them should correlate with that of quantificational binding of *ku*. Such a correlation, however, is not expected if they are pro-forms, which do not host elided material (and thus not *ku*). This correlation was not found in Experiment 3. In Experiment 4, I examined the acceptability of extraction out of VP anaphora in the short distance and long distance scrambling contexts. If VP anaphors are instances of ellipsis, then object scrambling should be possible in both the short distance and long distance contexts, since they contain internal syntactic structure that can host a trace of movement. If VP anaphors are base-generated pro-forms, then object scrambling should not be possible in either the short distance or long distance contexts, since they do not have internal structure to host a trace of movement. It was found that sentences involving either short or long distance scrambling out of VP anaphora are significantly likely to be judged less acceptable than their corresponding non-scrambled sentences, thus suggesting that extraction out of VP anaphora is hardly available in Korean. Based on all these findings, I have claimed that Korean VP anaphors are verbal pro-forms.

Chapter 4 has investigated the syntactic nature of null objects in Korean. I presented an experiment designed to inspect the presence/absence of internal structure within null objects in Korean. In a similar way as in Experiment 3, in Experiment 5, I examined the availability of sloppy readings for null objects with antecedents containing *ku*. If null objects have elided structure that hosts *ku*, an individual speaker's acceptance of sloppy readings for null objects is highly predictable from her acceptance of quantificational binding of *ku*. Such a correlation is not expected if they are null pronouns that do not host elided material (and thus not *ku*). This correlation was found in Experiment 5. If null objects were null pro-forms, high acceptance of sloppy readings for them would have been expected, just as in the VP Anaphora-Bound (sloppy identity reading) condition in Experiment 3, where VP anaphors have been found to be overt pro-forms. However, this expectation was not confirmed by the results of Experiment 5. Based on all these findings, I have claimed that null objects in Korean are instances of ellipsis.

5.2 Contributions

The present study has provided novel empirical evidence that there exists inter-speaker variation regarding the availability of bound variable construal for Korean third-person pronoun *ku*, as a synchronically active linguistic phenomenon. As mentioned in Chapter 2, in previous studies on bound variable anaphora in Korean, much less attention has been paid to *ku* than the long-distance anaphor *caki* 'self'. Moreover, the lack of scholarly consensus regarding the bound variable status of *ku* has been highly indicative of a possibility of the existence of the inter-speaker variation phenomenon, but no attempt has been made to verify this possibility experimentally. Therefore, one significant contribution of the present study is that it has established a solid and extensive empirical base for obtaining a more precise and complete picture of the interpretative status of Korean (third-person) pronouns.

Another crucial contribution of the present study is that it has demonstrated that the inter-speaker variation in the availability of bound variable construal for *ku* can play a crucial role in investigating the syntax of Korean anaphora. As mentioned in Chapter 3, in previous studies on anaphora, the availability of sloppy readings has been taken as a problematic diagnostics for the presence/absence of internal structure of an anaphoric item (e.g., Merchant 2013a, 2013b). However, the present study has shown that the same does not hold true for Korean anaphora. In Experiment 3 and Experiment 5, based on the assumption that *ku* in the elided structure should pattern with the overt *ku* in terms of bindablity, the availability of sloppy readings has been used as a reliable tool to determine the syntactic identity of Korean VP anaphors and null objects. In light of this, I hope that the present study will serve as a useful starting point for any future research on the syntax of other Korean anaphoric items.

5.3 Suggestion for future work

According to Déchaine and Wiltschko's (2002) theory, DPs (including pro-DPs) are demonstrably definite and have the binding-theoretic status of R-expressions, so they are never expected to have bound variable interpretations, because of Principle C of the binding theory. Indeed, English definite descriptions, as full DPs, cannot generally be bound, as illustrated in (1).

(1) a. * Every boy$_1$ thinks the/that/this boy$_1$ is smart.

b. * Every boy$_1$ loves the/that/this boy$_1$'s girlfriend.

However, sentences such as (2) have been used in the literature to argue that English definite descriptions can be construed as bound variables.[1]

(2) a. Every logician$_1$ was walking with a boy near that logician$_1$'s house. (Evans 1977: 491)

b. John criticized every senator$_1$ in private while praising the bastard$_1$ in public. (Hornstein & Weinberg 1988: 149)

Taking the hypothesis that binding applies only to functional items, Noguchi (1997) argues that D-pronouns (e.g., English *he*) can be construed as bound variables, which are claimed to occupy the functional node D. He also claims that the definite articles and demonstratives, as functional items, can be bound and thus the definite descriptions headed by them can be bound, too. However, he points out that not all definite descriptions can be bound, as illustrated by the contrast in (3), since they are sensitive to certain factors or conditions regarding bindability that are yet to be discovered.

(3) a. Every boy$_1$ dates a girl who adores that boy$_1$.

b. * Every boy$_1$ dates a girl who adores this boy$_1$. (Noguchi 1997: 785)

The crucial point Noguchi makes is that though not a sufficient condition, being a functional item is a necessary condition for an item to be bound. This is in stark contrast with D&W's theory in which the DP projection itself is not expected to be bound at all. Moreover, he argues that it is no surprise that the Korean personal pronoun *ku* is claimed to be capable of functioning as a bound variable, since it is a member of the paradigm of Korean demonstrative determiners. This obviously contradicts the proposed pro-DP analysis of *ku*, in which the DP *ku* complies with the "demonstrative grammar" and thus cannot be construed as a bound variable.

Given the conflict regarding the availability of bound variable construal for definite descriptions (or DPs), I propose to conduct an experiment to investigate how Korean speakers judge the definite descriptions headed by the demonstrative determiner *ku* in the bound variable reading contexts. Unfortunately, there are no studies, to my knowledge, in the literature that provide Korean data regarding the issue in question. At this point, it is worth noting Hoji's (1990) claim that the Japanese demonstrative *so* corresponds to the Korean demonstrative *ku*, as illustrated in the following comparison between the demonstrative paradigms in Japanese and Korean (*-no* is a genitive marker in Japanese).

(4) **Japanese** **Korean**

a. kono hon i chayk 'this book' (close to both speaker and hearer)

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[1] Hornstein and Weinberg (1988) explain that in (2b), *the bastard* is bound by *every senator* at LF and is construed as a bound variable.

b. sono hon ku chayk 'that book' (far from speaker and close to hearer)
c. ano hon ce chayk 'that book' (far from both speaker and hearer)

Additionally, Nishigauchi (1990), Hoji (1990), and Noguchi (1997) argue that the Japanese *sono*+N can be construed as a bound variable, as illustrated in (5).

(5) a. [Dono daigaku]$_1$-mo [sono daigaku]$_1$-no gengogakusya-o tairyooni
every university-also that university-GEN linguist-ACC many
kubinisita.
fired
'Every university$_1$ fired that university's$_1$ linguists by a large number.'
(Hoji 1990: 10)

b. [Dono kaisya]$_1$-mo [sono kaisya]$_1$-ga itiban-da to omotte-iru.
every company-also that company-NOM best-COP COMP think-PRES
'Every company$_1$ thinks that that company$_1$ is the best.'
(Noguchi 1997: 786)

Thus, the test sentences for the experiment can be adapted from the Japanese sentences with *sono*+N with bound variable interpretations, as exemplified in (6).

(6) a. [Motun tayhakkyo]-ka [ku tayhakkyo]-uy enehakca-lul taylyangulo
every university-NOM that university-GEN linguist-ACC many
haykoha-yess-ta.
fire-PAST-DECL
'Every university fired that university's linguists by a large number.'

b. [Motun hoysa]-ka [ku hoysa]-ka choyko-lako sayngkakha-n-ta.
every company-NOM that company-NOM best-COMP think-PRES-DECL
'Every company thinks that that company is the best.'

The experiment will employ a similar TVJ task as in the earlier experiments and include the test trials for the *quantificational-overt* condition used in Experiment 1. Thus, the experiment will be able to examine (i) whether there exists inter-speaker variation regarding the bound variable construal for the pronoun *ku* and, if so, (ii) how the two groups of speakers judge the bound variable construal for the definite descriptions headed by the demonstrative *ku*. Note that unlike personal pronoun *ku*, child learners of Korean are provided with sufficient input regarding demonstrative *ku*, and thus it can be hypothesized that they may acquire a uniform demonstrative *ku*. Assuming that the demonstrative *ku* is the head of DP (Kang 2001; Chang 2009, among others), the current proposed analysis based on Déchaine and Wiltschko's (2002) theory predicts that all Korean speakers should disallow the definite descriptions to have a bound variable interpretation, regardless of whether they allow a bound variable construal of the pronoun *ku* (or whether they have pro-DP *ku* or pro-ϕP *ku*). If this prediction is not borne out, the proposed theoretical account on the variable status of the Korean third-person pronoun will have to be reconsidered.

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Appendix A

Test sentences from Experiment 1A

A.1 Condition 1: Quantificational-Overt

(1) Hanswu, Cinswu, Minswu-ka nongkwucang-eyse nongkwu-lul ha-ko
Hanswu, Cinswu, Minswu-NOM basketball.court-at basketball-ACC do-PROG
iss-ess-ta. Hanswu-ka caki-ka nongkwu-lul cal ha-n-tako
PAST-DECL Hanswu-NOM self-NOM basketball-ACC well do-PRES-COMP
malha-yess-ta. Cinswu-to caki-ka nongkwu-lul cal ha-n-tako
say-PAST-DECL Cinswu-also self-NOM basketball-ACC well do-PRES-COMP
malha-yess-ta. Minswu-to caki-ka nongkwu-lul cal ha-n-tako
say-PAST-DECL Minswu-also self-NOM basketball-ACC well do-PRES-COMP
malha-yess-ta.
say-PAST-DECL

'Hanswu, Cinswu, and Minswu were playing basketball at a basketball court. Hanswu said that he plays basketball well. Cinswu also said that he plays basketball well. Minswu also said that he plays basketball well.'

Motwu-ka nongkwucang-eyse ku-ka nongkwu-lul cal
everyone-NOM basketball.court-at he-NOM basketball-ACC well
ha-n-tako malha-yess-ta.
do-PRES-COMP say-PAST-DECL

'Everyone said at a basketball court that he plays basketball well.'

(2) Wonmwu, Kiswu, Sengswu-ka mywucikkkaphey-eyse tayhwua-lul
Wonmwu, Kiswu, Sengswu-NOM music.café-at conversation-ACC
nanwu-ko iss-ess-ta. Wonmwu-ka caki-ka maikhulcayksun-ul cengmal
share-PROG PAST-DECL Wonmwu-NOM self-NOM Michael.Jackson-ACC really
coaha-n-tako malha-yess-ta. Kiswu-to caki-ka maikhulcayksun-ul
like-PRES-COMP say-PAST-DECL Kiswu-also self-NOM Michael.Jackson-ACC

cengmal coaha-n-tako malha-yess-ta. Sengswu-to caki-ka
really like-PRES-COMP say-PAST-DECL Sengswu-also self-NOM
maikhulcayksun-ul cengmal coaha-n-tako malha-yess-ta.
Michael.Jackson-ACC really like-PRES-COMP say-PAST-DECL
'Wonmwu, Kiswu, and Sengswu were having a conversation at a music café. Wonmwu said that he really likes Michael Jackson. Kiswu also said that he really likes Michael Jackson. Sengswu also said that he really likes Michael Jackson.'

Motwu-ka mywucikkkaphey-eyse ku-ka maikhulcayksun-ul
everyone-NOM music.café-at he-NOM Michael.Jackson-ACC
cengmal coaha-n-tako malha-yess-ta.
really like-PRES-COMP say-PAST-DECL

'Everyone said at a music café that he really likes Michael Jackson.'

(3) Hwanswu, Thayswu, Twusik-ika nolaypang-eyse nol-ko iss-ess-ta.
Hwanswu, Thayswu, Twusik-NOM singing.room-at hang.out-PROG PAST-DECL
Hwanswu-ka caki-ka pillicin-ul cal pwulu-n-tako malha-yess-ta.
Hwanswu-NOM self-NOM Billie.Jean-ACC well sing-PRES-COMP say-PAST-DECL
Thayswu-to caki-ka pillicin-ul cal pwulu-n-tako malha-yess-ta.
Thayswu-also self-NOM Billie.Jean-ACC well sing-PRES-COMP say-PAST-DECL
Twusik-ito caki-ka pillicin-ul cal pwulu-n-tako malha-yess-ta.
Twusik-also self-NOM Billie.Jean-ACC well sing-PRES-COMP say-PAST-DECL
'Hwanswu, Thayswu, and Twusik were hanging out at a singing room. Hwanswu said that he sings Billie Jean well. Thayswu also said that he sings Billie Jean well. Twusik also said that he sings Billie Jean well.'

Motwu-ka nolaypang-eyse ku-ka pillicin-ul cal pwulu-n-tako
everyone-NOM singing.room-at he-NOM Billie.Jean-ACC well sing-PRES-COMP
malha-yess-ta.
say-PAST-DECL

'Everyone said at a singing room that he sings Billie Jean well.'

(4) Cinkwu, Minkwu, Sinswu-ka tosekwuan-eyse sihemkongpwu-lul ha-ko
Cinkwu, Minkwu, Sinswu-NOM library-in exam.studying-ACC do-PROG
iss-ess-ta. Cinkwu-ka caki-ka swuhak-ul cal ha-n-tako
PAST-DECL Cinkwu-NOM self-NOM math-ACC well do-PRES-COMP
malha-yess-ta. Minkwu-to caki-ka swuhak-ul cal ha-n-tako
say-PAST-DECL Minkwu-also self-NOM math-ACC well do-PRES-COMP
malha-yess-ta. Sinswu-to caki-ka swuhak-ul cal ha-n-tako
say-PAST-DECL Sinswu-also self-NOM math-ACC well do-PRES-COMP
malha-yess-ta.
say-PAST-DECL
'Cinkwu, Minkwu, and Sinswu were studying for the exam in a library. Cinkwu said that he is good at math. Minkwu also said that he is good at math. Sinswu also said that he is good at math.'

Motwu-ka tosekwuan-eyse ku-ka swuhak-ul cal ha-n-tako
everyone-NOM library-in he-NOM math-ACC well do-PRES-COMP
malha-yess-ta.
say-PAST-DECL

‘Everyone said in a library that he is good at math.’

A.2 Condition 2: Quantificational-Null

(1) Hanswu, Cinswu, Minswu-ka nongkwucang-eyse nongkwu-lul ha-ko
Hanswu, Cinswu, Minswu-NOM basketball.court-at basketball-ACC do-PROG
iss-ess-ta. Hanswu-ka caki-ka nongkwu-lul cal ha-n-tako
PAST-DECL Hanswu-NOM self-NOM basketball-ACC well do-PRES-COMP
malha-yess-ta. Cinswu-to caki-ka nongkwu-lul cal ha-n-tako
say-PAST-DECL Cinswu-also self-NOM basketball-ACC well do-PRES-COMP
malha-yess-ta. Minswu-to caki-ka nongkwu-lul cal ha-n-tako
say-PAST-DECL Minswu-also self-NOM basketball-ACC well do-PRES-COMP
malha-yess-ta.
say-PAST-DECL

‘Hanswu, Cinswu, and Minswu were playing basketball at a basketball court. Hanswu said that he plays basketball well. Cinswu also said that he plays basketball well. Minswu also said that he plays basketball well.’

Motwu-ka nongkwucang-eyse *pro* **nongkwu-lul cal**
everyone-NOM basketball.court-at basketball-ACC well
ha-n-tako malha-yess-ta.
do-PRES-COMP say-PAST-DECL

‘Everyone said at a basketball court that he plays basketball well.’

(2) Wonmwu, Kiswu, Sengswu-ka mywucikkkaphey-eyse tayhwua-lul
Wonmwu, Kiswu, Sengswu-NOM music.café-at conversation-ACC
nanwu-ko iss-ess-ta. Wonmwu-ka caki-ka maikhulcayksun-ul cengmal
share-PROG PAST-DECL Wonmwu-NOM self-NOM Michael.Jackson-ACC really
coaha-n-tako malha-yess-ta. Kiswu-to caki-ka maikhulcayksun-ul
like-PRES-COMP say-PAST-DECL Kiswu-also self-NOM Michael.Jackson-ACC
cengmal coaha-n-tako malha-yess-ta. Sengswu-to caki-ka
really like-PRES-COMP say-PAST-DECL Sengswu-also self-NOM
maikhulcayksun-ul cengmal coaha-n-tako malha-yess-ta.
Michael.Jackson-ACC really like-PRES-COMP say-PAST-DECL

‘Wonmwu, Kiswu, and Sengswu were having a conversation at a music café. Wonmwu said that he really likes Michael Jackson. Kiswu also said that he really likes Michael Jackson. Sengswu also said that he really likes Michael Jackson.’

Motwu-ka mywucikkkaphey-eyse *pro* **maikhulcayksun-ul**
everyone-NOM music.café-at Michael.Jackson-ACC
cengmal coaha-n-tako malha-yess-ta.
really like-PRES-COMP say-PAST-DECL

‘Everyone said at a music café that he really likes Michael Jackson.’

(3) Hwanswu, Thayswu, Twusik-ika nolaypang-eyse nol-ko iss-ess-ta.
Hwanswu, Thayswu, Twusik-NOM singing.room-at hang.out-PROG PAST-DECL
Hwanswu-ka caki-ka pillicin-ul cal pwulu-n-tako malha-yess-ta.
Hwanswu-NOM self-NOM Billie.Jean-ACC well sing-PRES-COMP say-PAST-DECL
Thayswu-to caki-ka pillicin-ul cal pwulu-n-tako malha-yess-ta.
Thayswu-also self-NOM Billie.Jean-ACC well sing-PRES-COMP say-PAST-DECL
Twusik-ito caki-ka pillicin-ul cal pwulu-n-tako malha-yess-ta.
Twusik-also self-NOM Billie.Jean-ACC well sing-PRES-COMP say-PAST-DECL

‘Hwanswu, Thayswu, and Twusik were hanging out at a singing room. Hwanswu said that he sings Billie Jean well. Thayswu also said that he sings Billie Jean well. Twusik also said that he sings Billie Jean well.’

Motwu-ka nolaypang-eyse *pro* **pillicin-ul cal pwulu-n-tako**
everyone-NOM singing.room-at Billie.Jean-ACC well sing-PRES-COMP
malha-yess-ta.
say-PAST-DECL

‘Everyone said at a singing room that he sings Billie Jean well.’

(4) Cinkwu, Minkwu, Sinswu-ka tosekwuan-eyse sihemkongpwu-lul ha-ko
Cinkwu, Minkwu, Sinswu-NOM library-in exam.studying-ACC do-PROG
iss-ess-ta. Cinkwu-ka caki-ka swuhak-ul cal ha-n-tako
PAST-DECL Cinkwu-NOM self-NOM math-ACC well do-PRES-COMP
malha-yess-ta. Minkwu-to caki-ka swuhak-ul cal ha-n-tako
say-PAST-DECL Minkwu-also self-NOM math-ACC well do-PRES-COMP
malha-yess-ta. Sinswu-to caki-ka swuhak-ul cal ha-n-tako
say-PAST-DECL Sinswu-also self-NOM math-ACC well do-PRES-COMP
malha-yess-ta.
say-PAST-DECL

‘Cinkwu, Minkwu, and Sinswu were studying for the exam in a library. Cinkwu said that he is good at math. Minkwu also said that he is good at math. Sinswu also said that he is good at math.’

Motwu-ka tosekwuan-eyse *pro* **swuhak-ul cal ha-n-tako**
everyone-NOM library-in math-ACC well do-PRES-COMP
malha-yess-ta.
say-PAST-DECL

‘Everyone said in a library that he is good at math.’

A.3 Condition 3: Referential-Overt

(1) Hanswu, Cinswu, Minswu-ka nongkwucang-eyse nongkwu-lul ha-ko
Hanswu, Cinswu, Minswu-NOM basketball.court-at basketball-ACC do-PROG
iss-ess-ta. Hanswu-ka caki-ka nongkwu-lul cal ha-n-tako
PAST-DECL Hanswu-NOM self-NOM basketball-ACC well do-PRES-COMP
malha-yess-ta.
say-PAST-DECL
'Hanswu, Cinswu, and Minswu were playing basketball at a basketball court. Hanswu said that he plays basketball well.'

Hanswu-ka nongkwucang-eyse ku-ka nongkwu-lul cal ha-n-tako
Hanswu-NOM basketball.court-at he-NOM basketball-ACC well do-PRES-COMP
malha-yess-ta.
say-PAST-DECL

'Hanswu said at a basketball court that he plays basketball well.'

(2) Wonmwu, Kiswu, Sengswu-ka mywucikkkaphey-eyse tayhwua-lul
Wonmwu, Kiswu, Sengswu-NOM music.café-at conversation-ACC
nanwu-ko iss-ess-ta. Wonmwu-ka caki-ka maikhulcayksun-ul cengmal
share-PROG PAST-DECL Wonmwu-NOM self-NOM Michael.Jackson-ACC really
coaha-n-tako malha-yess-ta.
like-PRES-COMP say-PAST-DECL
'Wonmwu, Kiswu, and Sengswu were having a conversation at a music café. Wonmwu said that he really likes Michael Jackson.'

Wonmwu-ka mywucikkkaphey-eyse ku-ka maikhulcayksun-ul
Wonmwu-NOM music.café-at he-NOM Michael.Jackson-ACC
cengmal coaha-n-tako malha-yess-ta.
really like-PRES-COMP say-PAST-DECL

'Wonmwu said at a music café that he really likes Michael Jackson.'

(3) Hwanswu, Thayswu, Twusik-ika nolaypang-eyse nol-ko iss-ess-ta.
Hwanswu, Thayswu, Twusik-NOM singing.room-at hang.out-PROG PAST-DECL
Hwanswu-ka caki-ka pillicin-ul cal pwulu-n-tako malha-yess-ta.
Hwanswu-NOM self-NOM Billie.Jean-ACC well sing-PRES-COMP say-PAST-DECL
'Hwanswu, Thayswu, and Twusik were hanging out at a singing room. Hwanswu said that he sings Billie Jean well.'

Hwanswu-ka nolaypang-eyse ku-ka pillicin-ul cal pwulu-n-tako
Hwanswu-NOM singing.room-at he-NOM Billie.Jean-ACC well sing-PRES-COMP
malha-yess-ta.
say-PAST-DECL

'Hwanswu said at a singing room that he sings Billie Jean well.'

(4) Cinkwu, Minkwu, Sinswu-ka tosekwuan-eyse sihemkongpwu-lul ha-ko
Cinkwu, Minkwu, Sinswu-NOM library-in exam.studying-ACC do-PROG
iss-ess-ta. Cinkwu-ka caki-ka swuhak-ul cal ha-n-tako
PAST-DECL Cinkwu-NOM self-NOM math-ACC well do-PRES-COMP
malha-yess-ta.
say-PAST-DECL
'Cinkwu, Minkwu, and Sinswu were studying for the exam in a library. Cinkwu said that he is good at math.'

Cinkwu-ka tosekwuan-eyse ku-ka swuhak-ul cal ha-n-tako
Cinkwu-NOM library-in he-NOM math-ACC well do-PRES-COMP
malha-yess-ta.
say-PAST-DECL

'Cinkwu said in a library that he is good at math.'

A.4 Condition 4: Referential-Null

(1) Hanswu, Cinswu, Minswu-ka nongkwucang-eyse nongkwu-lul ha-ko
Hanswu, Cinswu, Minswu-NOM basketball.court-at basketball-ACC do-PROG
iss-ess-ta. Hanswu-ka caki-ka nongkwu-lul cal ha-n-tako
PAST-DECL Hanswu-NOM self-NOM basketball-ACC well do-PRES-COMP
malha-yess-ta.
say-PAST-DECL
'Hanswu, Cinswu, and Minswu were playing basketball at a basketball court. Hanswu said that he plays basketball well.'

Hanswu-ka nongkwucang-eyse *pro* **nongkwu-lul cal ha-n-tako**
Hanswu-NOM basketball.court-at basketball-ACC well do-PRES-COMP
malha-yess-ta.
say-PAST-DECL

'Hanswu said at a basketball court that he plays basketball well.'

(2) Wonmwu, Kiswu, Sengswu-ka mywucikkkaphey-eyse tayhwua-lul
Wonmwu, Kiswu, Sengswu-NOM music.café-at conversation-ACC
nanwu-ko iss-ess-ta. Wonmwu-ka caki-ka maikhulcayksun-ul cengmal
share-PROG PAST-DECL Wonmwu-NOM self-NOM Michael.Jackson-ACC really
coaha-n-tako malha-yess-ta.
like-PRES-COMP say-PAST-DECL
'Wonmwu, Kiswu, and Sengswu were having a conversation at a music café. Wonmwu said that he really likes Michael Jackson.'

Wonmwu-ka mywucikkkaphey-eyse *pro* **maikhulcayksun-ul**
Wonmwu-NOM music.café-at Michael.Jackson-ACC
cengmal coaha-n-tako malha-yess-ta.
really like-PRES-COMP say-PAST-DECL

‘Wonmwu said at a music café that he really likes Michael Jackson.’

(3) Hwanswu, Thayswu, Twusik-ika nolaypang-eyse nol-ko iss-ess-ta.
Hwanswu, Thayswu, Twusik-NOM singing.room-at hang.out-PROG PAST-DECL
Hwanswu-ka caki-ka pillicin-ul cal pwulu-n-tako malha-yess-ta.
Hwanswu-NOM self-NOM Billie.Jean-ACC well sing-PRES-COMP say-PAST-DECL
‘Hwanswu, Thayswu, and Twusik were hanging out at a singing room. Hwanswu said that he sings Billie Jean well.’

Hwanswu-ka nolaypang-eyse *pro* **pillicin-ul cal pwulu-n-tako**
Hwanswu-NOM singing.room-at Billie.Jean-ACC well sing-PRES-COMP
malha-yess-ta.
say-PAST-DECL

‘Hwanswu said at a singing room that he sings Billie Jean well.’

(4) Cinkwu, Minkwu, Sinswu-ka tosekwuan-eyse sihemkongpwu-lul ha-ko
Cinkwu, Minkwu, Sinswu-NOM library-in exam.studying-ACC do-PROG
iss-ess-ta. Cinkwu-ka caki-ka swuhak-ul cal ha-n-tako
PAST-DECL Cinkwu-NOM self-NOM math-ACC well do-PRES-COMP
malha-yess-ta.
say-PAST-DECL
‘Cinkwu, Minkwu, and Sinswu were studying for the exam in a library. Cinkwu said that he is good at math.’

Cinkwu-ka tosekwuan-eyse *pro* **swuhak-ul cal ha-n-tako**
Cinkwu-NOM library-in math-ACC well do-PRES-COMP
malha-yess-ta.
say-PAST-DECL

‘Cinkwu said in a library that he is good at math.’

Appendix B

Test sentences from Experiment 1B

B.1 Condition 1: Simple

(1) Hanswu, Cinswu, Minswu-ka nongkwucang-eyse nongkwu-lul ha-ko
Hanswu, Cinswu, Minswu-NOM basketball.court-at basketball-ACC do-PROG
iss-ess-ta. Hanswu-ka caki-uy umlyoswu-lul masi-ess-ta. Cinswu-to
-PAST-DECL Hanswu-NOM self-GEN beverage-ACC drink-PAST-DECL Cinswu-also
caki-uy umlyoswu-lul masi-ess-ta. Minswu-to caki-uy umlyoswu-lul
self-GEN beverage-ACC drink-PAST-DECL Minswu-also self-GEN beverage-ACC
masi-ess-ta.
drink-PAST-DECL

'Hanswu, Cinswu, and Minswu were playing basketball at a basketball court. Hanswu drank his own beverage. Cinswu also drank his own beverage. Minswu also drank his own beverage.'

Motwu-ka nongkwucang-eyse ku-uy umlyoswu-lul masi-ess-ta.
everyone-NOM basketball.court-at he-GEN beverage-ACC drink-PAST-DECL

'Everyone drank his beverage at a basketball court.'

(2) Yonghi, Kenhi, Myengho-ka wuntongcang-eyse yakwu-lul ha-ko
Yonghi Kenhi Myengho-NOM play.ground-in baseball-ACC do-PROG
iss-ess-ta. Yonghi-ka caki-uy kong-ul tenci-ess-ta. Kenhi-to
PAST-DECL Yonghi-NOM self-GEN ball-ACC throw-PAST-DECL Kenhi-also
caki-uy kong-ul tenci-ess-ta. Myengho-to caki-uy kong-ul
self-GEN ball-ACC throw-PAST-DECL Myengho-also self-GEN ball-ACC
tenci-ess-ta.
throw-PAST-DECL

'Yonghi, Kenhi, and Myengho were playing basketball in a playground. Yonghi threw his own ball. Kenhi also threw his own ball. Myengho also threw his own ball.'

Motwu-ka wuntongcang-eyse ku-uy kong-ul tenci-ess-ta.
everyone-NOM play.ground-in he-GEN ball-ACC throw-PAST-DECL

‘Everyone throw his ball in a playground.’

(3) Kwangho, Changho, Yengho-ka siktang-eyse cenyek-ul mek-ko
Kwangho Changho Yengho-NOM restaurant-at dinner-ACC eat-PROG
iss-ess-ta. Kwangho-ka caki-uy suphakeythi-lul mek-ess-ta.
PAST-DECL Kwangho-NOM self-GEN spaghetti-ACC eat-PAST-DECL
Changho-to caki-uy suphakeythi-lul mek-ess-ta. Yengho-to caki-uy
Changho-also self-GEN spaghetti-ACC eat-PAST-DECL Yengho-also self-GEN
suphakeythi-lul mek-ess-ta.
spaghetti-ACC eat-PAST-DECL

‘Kwangho, Changho, and Yengho were having dinner at a restaurant. Kwangho ate his own spaghetti. Changho also ate his own spaghetti. Yengho also ate his own spaghetti.’

Motwu-ka siktang-eyse ku-uy suphakeythi-lul mek-ess-ta.
everyone-NOM restaurant-at he-GEN spaghetti-ACC eat-PAST-DECL

‘Everyone ate his spaghetti at a restaurant.’

(4) Chiswu, Pyengswu, Hanswu-ka chatcip-eyse tayhwua-lul nanwu-ko
Chiswu Pyengswu Hanswu-NOM tea.house-at conversation-ACC share-PROG
iss-ess-ta. Chiswu-ka caki-uy hyeng-ul helttut-ess-ta.
PAST-DECL Chiswu-NOM self-GEN older.brother-ACC speak.ill.of-PAST-DECL
Pyengswu-to caki-uy hyeng-ul helttut-ess-ta. Hanswu-to
Pyengswu-also self-GEN older.brother-ACC speak.ill.of-PAST-DECL Hanswu-also
caki-uy hyeng-ul helttut-ess-ta.
self-GEN older.brother-ACC speak.ill.of-PAST-DECL

‘Chiswu, Pyengswu, and Hanswu were having a conversation at a tea house. Chiswu spoke ill of his own older brother. Pyengswu also spoke ill of his own older brother. Hanswu also spoke ill of his own older brother.’

Motwu-ka chatcip-eyse ku-uy hyeng-ul helttut-ess-ta.
everyone-NOM tea.house-at he-GEN older.brother-ACC speak.ill.of-PAST-DECL

‘Everyone spoke ill of his own older brother at a tea house.’

B.2 Condition 2: Complex

The test items for the COMPLEX condition are the same as those for the QUANTIFICATIONAL-OVERT condition in Experiment 1A.

Appendix C

Test sentences from Experiment 2

C.1 Condition 1: Bound-August

The test items for the BOUND-AUGUST condition are the same as those for the SIMPLE condition in Experiment 1B.

C.2 Condition 2: Bound-September

(1) Chiswu, Pyengswu, Hanswu-ka kkaphey-eyse tayhwua-lul nanwu-ko
Chiswu Pyengswu Hanswu-NOM café-at conversation-ACC share-PROG
iss-ess-ta. Chiswu-ka Chiswu-uy cen yecachinkwu-lul
PAST-DECL Chiswu-NOM Chiswu-GEN previous girlfriend-ACC
helttut-ess-ta. Pyengswu-to Pyengswu-uy cen yecachinkwu-lul
speak.ill.of-PAST-DECL Pyengswu-also Pyengswu-GEN previous girlfriend-ACC
helttut-ess-ta. Hanswu-to Hanswu-uy cen yecachinkwu-lul
speak.ill.of-PAST-DECL Hanswu-also Hanswu-GEN previous girlfriend-ACC
helttut-ess-ta.
speak.ill.of-PAST-DECL

‘Chiswu, Pyengswu, and Hanswu were having a conversation at a café. Chiswu spoke ill of Chiswu’s ex-girlfriend. Pyengswu also spoke ill of Pyengswu’s ex-girlfriend. Hanswu also spoke ill of Hanswu’s ex-girlfriend.’

Motwu-ka ku-uy cen yecachinkwu-lul helttut-ess-ta.
everyone-NOM he-GEN previous girlfriend-ACC speak.ill.of-PAST-DECL

‘Everyone spoke ill of his ex-girlfriend.’

(2) Congswu, Hwuanswu, Tongswu-ka kongwuen-eyse nol-ko
Congswu Hwuanswu Tongswu-NOM park-at hang.out-PROG
iss-ess-ta. Congswu-ka Congswu-uy kay-lul kancilephi-ess-ta.
PAST-DECL Congswu-NOM Congswu-GEN dog-ACC tickle-PAST-DECL

Hwuanswu-to Hwuanswu-uy kay-lul kancilephi-ess-ta. Tongswu-to
Hwuanswu-also Hwuanswu-GEN dog-ACC tickle-PAST-DECL Tongswu-also
Tongswu-uy kay-lul kancilephi-ess-ta.
Tongswu-GEN dog-ACC tickle-PAST-DECL
‘Congswu, Hwuanswu, and Tongswu were hanging out at a park. Congswu tickled Congswu’s dog. Hwuanswu also tickled Hwuanswu’s dog. Tongswu also tickled Tongswu’s dog.’

Motwu-ka ku-uy kay-lul kancilephi-ess-ta.
everyone-NOM he-GEN dog-ACC tickle-PAST-DECL

‘Everyone tickled his dog.’

(3) Tongwu, Cinwu, Thaywu-ka Sinswu-uy cip-eyse nol-ko
Tongwu Cinwu Thaywu-NOM Sinswu-GEN house-at hang.out-PROG
iss-ess-ta. Tongwu-ka Tongwu-uy yetongsayng-ul ttayli-ess-ta.
PAST-DECL Tongwu-NOM Tongwu-GEN younger.sister-ACC hit-PAST-DECL
Cinwu-to Cinwu-uy yetongsayng-ul ttayli-ess-ta. Thaywu-to
Cinwu-also Cinwu-GEN younger.sister-ACC hit-PAST-DECL Thaywu-also
Thaywu-uy yetongsayng-ul ttayli-ess-ta.
Thaywu-GEN younger.sister-ACC hit-PAST-DECL
‘Tongwu, Cinwu, and Thaywu were hanging out at Sinswu’s house. Tongwu hit Tongwu’s younger sister. Cinwu also hit Cinwu’s younger sister. Thaywu also hit Thaywu’s younger sister.’

Motwu-ka ku-uy yetongsayng-ul ttayli-ess-ta.
everyone-NOM he-GEN younger.sister-ACC hit-PAST-DECL

‘Everyone hit his younger sister.’

(4) Wonmwu, Kiswu, Sengswu-ka chatcip-eyse tayhwua-lul nanwu-ko
Wonmwu Kiswu Sengswu-NOM tea.house-at conversation-ACC share-PROG
iss-ess-ta. Wonmwu-ka Wonmwu-uy nwuna-lul
PAST-DECL Wonmwu-NOM Wonmwu-GEN older.sister-ACC
chingchanha-yss-ta. Kiswu-to Kiswu-uy nwuna-lul
compliment-PAST-DECL Kiswu-also Kiswu-GEN older.sister-ACC
chingchanha-yss-ta. Sengswu-to Sengswu-uy nwuna-lul
compliment-PAST-DECL Sengswu-also Sengswu-GEN older.sister-ACC
chingchanha-yss-ta.
compliment-PAST-DECL
‘Wonmwu, Kiswu, and Sengswu were having a conversation at a tea house. Wonmwu complimented Wonmwu’s older sister. Kiswu also complimented Kiswu’s older sister. Sengswu also complimented Sengswu’s older sister.’

Motwu-ka ku-uy nwuna-lul chingchanha-yss-ta.
everyone-NOM he-GEN older.sister-ACC compliment-PAST-DECL

‘Everyone complimented his older sister.’

C.3 Condition 3: Free-August

(1) Pyengmin, Cengmin, Tongmin-ika wuntongcang-eyse, Cengki-ka
Pyengmin Cengmin Tongmin-NOM play.ground-in Cengki-NOM
oki-lul kitalimye, chwukkwu-lul ha-ko iss-ess-ta. Pyengmin-ika
coming-ACC waiting soccer-ACC do-PROG PAST-DECL Pyengmin-NOM
Cengki-uy kong-ul cha-ss-ta. Cengmin-ito Cengki-uy kong-ul
Cengki-GEN ball-ACC kick-PAST-DECL Cengmin-also Cengki-GEN ball-ACC
cha-ss-ta. Tongmin-ito Cengki-uy kong-ul cha-ss-ta.
kick-PAST-DECL Tongmin-also Cengki-GEN ball-ACC kick-PAST-DECL

'Pyengmin, Cengmin, and Tongmin were playing soccer in a playground, waiting for Cengki to come. Pyengmin kicked Cengki's ball. Cengmin also kicked Cengki's ball. Tongmin also kicked Cengki's ball.'

Motwu-ka ku-uy kong-ul cha-ss-ta.
everyone-NOM he-GEN ball-ACC kick-PAST-DECL

'Everyone kicked his ball.'

(2) Cinswu, Sungswu, Pyengswu-ka seythaksil-eyse, Cinho-ka oki-lul
Cinswu Sungswu Pyengswu-NOM laundry.room-at Cinho-NOM coming-ACC
kitalimye, seythak-ul ha-ko iss-ess-ta. Cinswu-ka Cinho-uy
waiting laundry-ACC do-PROG PAST-DECL Cinswu-NOM Cinho-GEN
seycey-lul sayongha-yss-ta. Sungswu-to Cinho-uy seycey-lul
detergent-ACC use-PAST-DECL Sungswu-also Cinho-GEN detergent-ACC
sayongha-yss-ta. Pyengswu-to Cinho-uy seycey-lul sayongha-yss-ta.
use-PAST-DECL Pyengswu-also Cinho-GEN detergent-ACC use-PAST-DECL

'Cinswu, Sungswu, and Pyengswu were doing laundry at a laundry room, waiting for Cinho to come. Cinswu used Cinho's detergent. Sungswu also used Cinho's detergent. Pyengswu also used Cinho's detergent.'

Motwu-ka ku-uy seycey-lul sayongha-yss-ta.
everyone-NOM he-GEN detergent-ACC use-PAST-DECL

'Everyone used his detergent.'

(3) Kimkenmo, Kimcanghwun, Sinsunghwun-i nolaypang-eyse, Imwunsey-ka
Kimkenmo Kimcanghwun Sinsunghwun-NOM singing.room-at Imwunsey-NOM
oki-lul kitalimye, nol-ko iss-ess-ta. Kimkenmo-ka
coming-ACC waiting hang.out-PROG PAST-DECL Kimkenmo-NOM
Imwunsey-uy hithukok-ul pwulu-ess-ta. Kimcanghwun-to
Imwunsey-GEN hit.song-ACC sing-PAST-DECL Kimcanghwun-also
Imwunsey-uy hithukok-ul pwulu-ess-ta. Sinsunghwun-to Imwunsey-uy
Imwunsey-GEN hit.song-ACC sing-PAST-DECL Sinsunghwun-also Imwunsey-GEN
hithukok-ul pwulu-ess-ta.
hit.song-ACC sing-PAST-DECL

'Kimkenmo, Kimcanghwun, and Sinsunghwun were hanging out in a singing room, waiting for Imwunsey to come. Kimkenmo sang Imwunsey's hit song. Kimcanghwun also sang Imwunsey's hit song. Sinsunghwun also sang Imwunsey's hit song.'[1]

Motwu-ka ku-uy hithukok-ul pwulu-ess-ta.
everyone-NOM he-GEN hit.song-ACC sing-PAST-DECL

'Everyone sang his hit song.'

(4) Pongswu, Thaykang, Thayho-ka pwuek-eyse, Sungki-ka oki-lul
Pongswu Thaykang Thayho-NOM kitchen-at Sungki-NOM coming-ACC
kitalimye, selkeci-lul ha-ko iss-ess-ta. Pongswu-ka Sungki-uy
waiting dish.washing-ACC do-PROG PAST-DECL Pongswu-NOM Sungki-GEN
khep-ul sis-ess-ta. Thaykang-ito Sungki-uy khep-ul
cup-ACC wash-PAST-DECL Thaykang-also Sungki-GEN cup-ACC
sis-ess-ta. Thayho-to Sungki-uy khep-ul sis-ess-ta.
wash-PAST-DECL Thayho-also Sungki-GEN cup-ACC wash-PAST-DECL

'Pongswu, Thaykang, and Thayho were doing the dishes at a kitchen, waiting for Sungki to come. Pongswu washed Sungki's cup. Thaykang also washed Sungki's cup. Thayho also washed Sungki's cup.'

Motwu-ka ku-uy khep-ul sis-ess-ta.
everyone-NOM he-GEN cup-ACC wash-PAST-DECL

'Everyone washed his cup.'

C.4 Condition 4: Free-September

(1) Chiswu, Pyengswu, Hanswu-ka kkaphey-eyse, Cengki-ka oki-lul
Chiswu Pyengswu Hanswu-NOM café-at Cengki-NOM coming-ACC
kitalimye, tayhwua-lul nanwu-ko iss-ess-ta. Chiswu-ka Cengki-uy
waiting conversation-ACC share-PROG PAST-DECL Chiswu-NOM Cengki-GEN
cen yecachinkwu-lul helttut-ess-ta. Pyengswu-to Cengki-uy
previous girlfriend-ACC speak.ill.of-PAST-DECL Pyengswu-also Cengki-GEN
cen yecachinkwu-lul helttut-ess-ta. Hanswu-to Cengki-uy
previous girlfriend-ACC speak.ill.of-PAST-DECL Hanswu-also Cengki-GEN
cen yecachinkwu-lul helttut-ess-ta.
previous girlfriend-ACC speak.ill.of-PAST-DECL

'Chiswu, Pyengswu, and Hanswu were having a conversation at a café, waiting for Cengki to come. Chiswu spoke ill of Cengki's ex-girlfriend. Pyengswu also spoke ill of Cengki's ex-girlfriend. Hanswu also spoke ill of Cengki's ex-girlfriend.'

Motwu-ka ku-uy cen yecachinkwu-lul helttut-ess-ta.
everyone-NOM he-GEN previous girlfriend-ACC speak.ill.of-PAST-DECL

'Everyone spoke ill of his ex-girlfriend.'

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[1] Kimkenmo, Kimcanghwun, Sinsunghwun, and Imwunsey are famous Korean male singers.

(2) Congswu, Hwuanswu, Tongswu-ka kongwuen-eyse, Cinkwu-ka oki-lul
Congswu Hwuanswu Tongswu-NOM park-at Cinkwu-NOM coming-ACC
kitalimye, nol-ko iss-ess-ta. Congswu-ka Cinkwu-uy kay-lul
waiting hang.out-PROG PAST-DECL Congswu-NOM Cinkwu-GEN dog-ACC
kancilephi-ess-ta. Hwuanswu-to Cinkwu-uy kay-lul kancilephi-ess-ta.
tickle-PAST-DECL Hwuanswu-also Cinkwu-GEN dog-ACC tickle-PAST-DECL
Tongswu-to Cinkwu-uy kay-lul kancilephi-ess-ta.
Tongswu-also Cinkwu-GEN dog-ACC tickle-PAST-DECL

‘Congswu, Hwuanswu, and Tongswu were hanging out at a park, waiting for Cinkwu to come. Congswu tickled Cinkwu’s dog. Hwuanswu also tickled Cinkwu’s dog. Tongswu also tickled Cinkwu’s dog.’

Motwu-ka ku-uy kay-lul kancilephi-ess-ta.
everyone-NOM he-GEN dog-ACC tickle-PAST-DECL

‘Everyone tickled his dog.’

(3) Tongwu, Cinwu, Thaywu-ka Sinswu-uy cip-eyse, Sinswu-ka oki-lul
Tongwu Cinwu Thaywu-NOM Sinswu-GEN house-at Sinswu-NOM coming-ACC
kitalimye, nol-ko iss-ess-ta. Tongwu-ka Sinswu-uy
waiting hang.out-PROG PAST-DECL Tongwu-NOM Sinswu-GEN
yetongsayng-ul ttayli-ess-ta. Cinwu-to Sinswu-uy yetongsayng-ul
younger.sister-ACC hit-PAST-DECL Cinwu-also Sinswu-GEN younger.sister-ACC
ttayli-ess-ta. Thaywu-to Sinswu-uy yetongsayng-ul ttayli-ess-ta.
hit-PAST-DECL Thaywu-also Sinswu-GEN younger.sister-ACC hit-PAST-DECL

‘Tongwu, Cinwu, and Thaywu were hanging out at Sinswu’s house, waiting for Sinswu to come. Tongwu hit Sinswu’s younger sister. Cinwu also hit Sinswu’s younger sister. Thaywu also hit Sinswu’s younger sister.’

Motwu-ka ku-uy yetongsayng-ul ttayli-ess-ta.
everyone-NOM he-GEN younger.sister-ACC hit-PAST-DECL

‘Everyone hit his younger sister.’

(4) Wonmwu, Kiswu, Sengswu-ka chatcip-eyse, Tongwu-ka oki-lul
Wonmwu Kiswu Sengswu-NOM tea.house-at Tongwu-NOM coming-ACC
kitalimye, tayhwua-lul nanwu-ko iss-ess-ta. Wonmwu-ka
waiting conversation-ACC share-PROG PAST-DECL Wonmwu-NOM
Tongwu-uy nwuna-lul chingchanha-yss-ta. Kiswu-to Tongwu-uy
Tongwu-GEN older.sister-ACC compliment-PAST-DECL Kiswu-also Tongwu-GEN
nwuna-lul chingchanha-yss-ta. Sengswu-to Tongwu-uy
older.sister-ACC compliment-PAST-DECL Sengswu-also Tongwu-GEN
nwuna-lul chingchanha-yss-ta.
older.sister-ACC compliment-PAST-DECL

‘Wonmwu, Kiswu, and Sengswu were having a conversation at a tea house, waiting for Tongwu to come. Wonmwu complimented Tongwu’s older sister. Kiswu also complimented Tongwu’s older sister. Sengswu also complimented Tongwu’s older sister.’

Motwu-ka	**ku-uy**	**nwuna-lul**	**chingchanha-yss-ta**.
everyone-NOM	he-GEN	older.sister-ACC	compliment-PAST-DECL

‘Everyone complimented his older sister.’

Appendix D

Test sentences from Experiment 3

D.1 Condition 1: VPA-Bound (sloppy identity reading)

(1) Minswu, Kiswu, Cinswu-ka say kiswuksa-lo isaha-ko iss-ess-ta.
Minswu Kiswu Cinswu-NOM new dormitory-to move-PROG PAST-DECL
Minswu-ka Minswu-uy cim-ul nalu-ess-ta. Kiswu-to Kiswu-uy
Minswu-NOM Minswu-GEN stuff-ACC move-PAST-DECL Kiswu-also Kiswu-GEN
cim-ul nalu-ess-ta.
stuff-ACC move-PAST-DECL

‘Minswu, Kiswu, and Cinswu were moving to a new dormitory. Minswu moved Minswu’s stuff. Kiswu also moved Kiswu’s stuff.’

Minswu-ka ku-uy cim-ul nalu-ess-ko, **Kiswu-to kuleha-yess-ta**.
Minswu-NOM he-GEN stuff-ACC move-PAST-CONJ Kiswu-also so.do-PAST-DECL

‘Minswu moved his stuff, and Kiswu did so, too.’

(2) Yonghi, Kenhi, Myengho-ka wuntongcang-eyse yakwu-lul ha-ko
Yonghi Kenhi Myengho-NOM play.ground-in baseball-ACC do-PROG
iss-ess-ta. Yonghi-ka Yonghi-uy kong-ul tenci-ess-ta. Kenhi-to
PAST-DECL Yonghi-NOM Yonghi-GEN ball-ACC throw-PAST-DECL Kenhi-also
Kenhi-uy kong-ul tenci-ess-ta.
Kenhi-GEN ball-ACC throw-PAST-DECL

‘Yonghi, Kenhi, and Myengho were playing basketball in a playground. Yonghi threw Yonghi’s ball. Kenhi also threw Kenhi’s ball.’

Yonghi-ka ku-uy kong-ul tenci-ess-ko, **Kenhi-to kuleha-yess-ta**.
Yonghi-NOM he-GEN ball-ACC throw-PAST-CONJ Kenhi-also so.do-PAST-DECL

‘Yonghi threw his ball, and Kenhi did so, too.’

(3) Thayswu, Kiswu, Cengswu-ka pa-eyse wuain-ul masi-ko iss-ess-ta.
Thayswu Kiswu Cengswu-NOM bar-at wuain-ACC drink-PROG PAST-DECL
Thayswu-ka Thayswu-uy wuaincan-ul kkaythuli-ess-ta. Kiswu-to
Thayswu-NOM Thayswu-GEN wine.glass-ACC break-PAST-DECL Kiswu-also
Kiswu-uy wuaincan-ul kkaythuli-ess-ta.
Kiswu-GEN wine.glass-ACC break-PAST-DECL

'Thayswu, Kiswu, and Cengswu were drinking wine at a bar. Thayswu broke Thayswu's wine glass. Kiswu also broke Kiswu's wine glass.'

Thayswu-ka ku-uy wuaincan-ul kkaythuli-ess-ko, **Kiswu-to**
Thayswu-NOM he-GEN wine.glass-ACC break-PAST-CONJ Kiswu-also
kuleha-yess-ta.
so.do-PAST-DECL

'Thayswu broke his wine glass, and Kiswu did so, too.'

(4) Myengswu, Hyenswu, Cwunswu-ka wuntong hwu swui-ko iss-ess-ta.
Myengswu Hyenswu Cwunswu-NOM exercise after rest-PROG PAST-DECL
Myengswu-ka Myengswu-uy umlyoswu-lul masi-ess-ta. Hyenswu-to
Myengswu-NOM Myengswu-GEN beverage-ACC drink-PAST-DECL Hyenswu-also
Hyenswu-uy umlyoswu-lul masi-ess-ta.
Hyenswu-GEN beverage-ACC drink-PAST-DECL

'Myengswu, Hyenswu, and Cwunswu were taking a rest after exercise. Myengswu drank Myengswu's beverage. Hyenswu also drank Hyenswu's beverage.'

Myengswu-ka ku-uy umlyoswu-lul masi-ess-ko, **Hyenswu-to**
Myengswu-NOM he-GEN beverage-ACC drink-PAST-CONJ Hyenswu-also
kuleha-yess-ta.
so.do-PAST-DECL

'Myengswu drank his beverage, and Hyenswu did so, too.'

(5) Pyengswu, Mwunswu, Cwunswu-ka cip-ul chengsoha-ko iss-ess-ta.
Pyengswu Mwunswu Cwunswu-NOM house-ACC clean-PROG PAST-DECL
Pyengswu-ka Pyengswu-uy pang-ul ssul-ess-ta. Mwunswu-to
Pyengswu-NOM Pyengswu-GEN room-ACC sweep-PAST-DECL Mwunswu-also
Mwunswu-uy pang-ul ssul-ess-ta.
Mwunswu-GEN room-ACC sweep-PAST-DECL

'Pyengswu, Mwunswu, and Cwunswu were cleaning their house. Pyengswu swept Pyengswu's room. Mwunswu also swept Mwunswu's room.'

Pyengswu-ka ku-uy pang-ul ssul-ess-ko, **Mwunswu-to**
Pyengswu-NOM he-GEN room-ACC sweep-PAST-CONJ Mwunswu-also
kuleha-yess-ta.
so.do-PAST-DECL

'Pyengswu swept his room, and Mwunswu did so, too.'

(6) Chelswu, Yengswu, Cengswu-ka tosekwuan-eyse kongpwuha-ko iss-ess-ta.
Chelswu Yengswu Cengswu-NOM library-in study-PROG PAST-DECL
Chelswu-ka Chelswu-uy pheyn-ul ttelethuli-ess-ta. Yengswu-to
Chelswu-NOM Chelswu-GEN pen-ACC drop-PAST-DECL Yengswu-also
Yengswu-uy pheyn-ul ttelethuli-ess-ta.
Yengswu-GEN pen-ACC drop-PAST-DECL
'Chelswu, Yengswu, and Cengswu were studying in a library. Chelswu dropped Chelswu's pen. Yengswu also dropped Yengswu's pen.'

Chelswu-ka ku-uy pheyn-ul ttelethuli-ess-ko, **Yengswu-to**
Chelswu-NOM he-GEN pen-ACC drop-PAST-CONJ Chelswu-also
kuleha-yess-ta.
SO.DO-PAST-DECL

'Chelswu dropped his pen, and Yengswu did so, too.'

(7) Chelho, Phengho, Swuho-ka kakca phyenci-lul ssu-ko iss-ess-ta.
Chelho Phengho Swuho-NOM each letter-ACC write-PROG PAST-DECL
Chelho-ka Chelho-uy phyenci-lul ilk-ess-ta. Phengho-to
Chelho-NOM Chelho-GEN letter-ACC read-PAST-DECL Phengho-also
Phengho-uy phyenci-lul ilk-ess-ta.
Phengho-GEN letter-ACC read-PAST-DECL
'Chelho, Phengho, and Swuho were each writing a letter. Chelho read Chelho's letter. Phengho also read Phengho's letter.'

Chelho-ka ku-uy phyenci-lul ilk-ess-ko, **Phengho-to**
Chelho-NOM he-GEN letter-ACC read-PAST-CONJ Phengho-also
kuleha-yess-ta.
SO.DO-PAST-DECL

'Chelho read his letter, and Phengho did so, too.'

(8) Kwangho, Changho, Yengho-ka ilsiktang-eyse cemsim-ul mek-ko
Kwangho Changho Yengho-NOM Japanese.restaurant-at lunch-ACC eat-PROG
iss-ess-ta. Kwangho-ka Kwangho-uy utong-ul mek-ess-ta.
PAST-DECL Kwangho-NOM Kwangho-GEN Udon-ACC eat-PAST-DECL
Changho-to Changho-uy utong-ul mek-ess-ta.
Changho-also Changho-GEN Udon-ACC eat-PAST-DECL
'Kwangho, Changho, and Yengho were having lunch at a Japanese restaurant. Kwangho ate Kwangho's Udon. Changho also ate Changho's Udon.'

Kwangho-ka ku-uy utong-ul mek-ess-ko, **Changho-to**
Kwangho-NOM he-GEN Udon-ACC eat-PAST-CONJ Changho-also
kuleha-yess-ta.
SO.DO-PAST-DECL

'Kwangho ate his Udon, and Changho did so, too.'

(9) Pyengmin, Cengmin, Tongmin-ika wuntongcang-eyse chwukkwu-lul ha-ko
Pyengmin Cengmin Tongmin-NOM play.ground-in soccer-ACC do-PROG
iss-ess-ta. Pyengmin-ika Pyengmin-iuy kong-ul cha-ss-ta.
PAST-DECL Pyengmin-NOM Pyengmin-GEN ball-ACC kick-PAST-DECL
Cengmin-ito Cengmin-iuy kong-ul cha-ss-ta.
Cengmin-also Cengmin-GEN ball-ACC kick-PAST-DECL
'Pyengmin, Cengmin, and Tongmin were playing soccer in a playground. Pyengmin kicked Pyengmin's ball. Cengmin also kicked Cengmin's ball.'

Pyengmin-ika ku-uy kong-ul cha-ss-ko, **Cengmin-ito**
Pyengmin-NOM he-GEN ball-ACC kick-PAST-CONJ Cengmin-also
kuleha-yess-ta.
SO.DO-PAST-DECL

'Pyengmin kicked his ball, and Cengmin did so, too.'

(10) Cinswu, Sungswu, Pyengswu-ka seythaksil-eyse seythak-ul ha-ko
Cinswu Sungswu Pyengswu-NOM laundry.room-at laundry-ACC do-PROG
iss-ess-ta. Cinswu-ka Cinswu-uy seycey-lul sayongha-yss-ta.
PAST-DECL Cinswu-NOM Cinswu-GEN detergent-ACC use-PAST-DECL
Sungswu-to Sungswu-uy seycey-lul sayongha-yss-ta.
Sungswu-also Sungswu-GEN detergent-ACC use-PAST-DECL
'Cinswu, Sungswu, and Pyengswu were doing laundry at a laundry room. Cinswu used Cinswu's detergent. Sungswu also used Sungswu's detergent.'

Cinswu-ka ku-uy seycey-lul sayongha-yss-ko, **Sungswu-to**
Cinswu-NOM he-GEN detergent-ACC use-PAST-CONJ Sungswu-also
kuleha-yess-ta.
SO.DO-PAST-DECL

'Cinswu used his detergent, and Sungswu did so, too.'

(11) Kimkenmo, Kimcanghwun, Sinsunghwun-i nolaypang-eyse nol-ko
Kimkenmo Kimcanghwun Sinsunghwun-NOM singing.room-at hang.out-PROG
iss-ess-ta. Kimkenmo-ka Kimkenmo-uy hithukok-ul pwulu-ess-ta.
PAST-DECL Kimkenmo-NOM Kimkenmo-GEN hit.song-ACC sing-PAST-DECL
Kimcanghwun-to Kimcanghwun-uy hithukok-ul pwulu-ess-ta.
Kimcanghwun-also Kimcanghwun-GEN hit.song-ACC sing-PAST-DECL
'Kimkenmo, Kimcanghwun, and Sinsunghwun were hanging out in a singing room. Kimkenmo sang Kimkenmo's hit song. Kimcanghwun also sang Kimcanghwun's hit song.'

Kimkenmo-ka ku-uy hithukok-ul pwulu-ess-ko, **Kimcanghwun-to**
Kimkenmo-NOM he-GEN hit.song-ACC sing-PAST-CONJ Kimcanghwun-also
kuleha-yess-ta.
SO.DO-PAST-DECL

'Kimkenmo sang his hit song, and Kimcanghwun did so, too.'

(12) Pongswu, Thaykang, Thayho-ka pwuek-eyse selkeci-lul ha-ko
Pongswu Thaykang Thayho-NOM kitchen-at dish.washing-ACC do-PROG
iss-ess-ta. Pongswu-ka Pongswu-uy khep-ul sis-ess-ta.
PAST-DECL Pongswu-NOM Pongswu-GEN cup-ACC wash-PAST-DECL
Thaykang-ito Thaykang-iuy khep-ul sis-ess-ta.
Thaykang-also Thaykang-GEN cup-ACC wash-PAST-DECL

'Pongswu, Thaykang, and Thayho were doing the dishes at a kitchen. Pongswu washed Pongswu's cup. Thaykang also washed Thaykang's cup.'

Pongswu-ka ku-uy khep-ul sis-ess-ko, **Thaykang-ito**
Pongswu-NOM he-GEN cup-ACC wash-PAST-CONJ Thaykang-also
kuleha-yess-ta.
so.do-PAST-DECL

'Pongswu washed his cup, and Thaykang did so, too.'

(13) Chiswu, Pyengswu, Hanswu-ka kkaphey-eyse tayhwua-lul nanwu-ko
Chiswu Pyengswu Hanswu-NOM café-at conversation-ACC share-PROG
iss-ess-ta. Chiswu-ka Chiswu-uy cen yecachinkwu-lul
PAST-DECL Chiswu-NOM Chiswu-GEN previous girlfriend-ACC
helttut-ess-ta. Pyengswu-to Pyengswu-uy cen yecachinkwu-lul
speak.ill.of-PAST-DECL Pyengswu-also Pyengswu-GEN previous girlfriend-ACC
helttut-ess-ta.
speak.ill.of-PAST-DECL

'Chiswu, Pyengswu, and Hanswu were having a conversation at a café. Chiswu spoke ill of Chiswu's ex-girlfriend. Pyengswu also spoke ill of Pyengswu's ex-girlfriend.'

Chiswu-ka ku-uy cen yecachinkwu-lul helttut-ess-ko,
Chiswu-NOM he-GEN previous girlfriend-ACC speak.ill.of-PAST-CONJ
Pyengswu-to kuleha-yess-ta.
Pyengswu-also so.do-PAST-DECL

'Chiswu spoke ill of his ex-girlfriend, and Pyengswu did so, too.'

(14) Congswu, Hwuanswu, Tongswu-ka kongwuen-eyse nol-ko
Congswu Hwuanswu Tongswu-NOM park-at hang.out-PROG
iss-ess-ta. Congswu-ka Congswu-uy kay-lul kancilephi-ess-ta.
PAST-DECL Congswu-NOM Congswu-GEN dog-ACC tickle-PAST-DECL
Hwuanswu-to Hwuanswu-uy kay-lul kancilephi-ess-ta.
Hwuanswu-also Hwuanswu-GEN dog-ACC tickle-PAST-DECL

'Congswu, Hwuanswu, and Tongswu were hanging out at a park. Congswu tickled Congswu's dog. Hwuanswu also tickled Hwuanswu's dog.'

Congswu-ka ku-uy kay-lul kancilephi-ess-ko, **Hwuanswu-to**
Congswu-NOM he-GEN dog-ACC tickle-PAST-CONJ Hwuanswu-also
kuleha-yess-ta.
so.do-PAST-DECL

‘Congswu tickled his dog, and Hwuanswu did so, too.’

(15) Tongwu, Cinwu, Thaywu-ka Sinswu-uy cip-eyse nol-ko
Tongwu Cinwu Thaywu-NOM Sinswu-GEN house-at hang.out-PROG
iss-ess-ta. Tongwu-ka Tongwu-uy yetongsayng-ul ttayli-ess-ta.
PAST-DECL Tongwu-NOM Tongwu-GEN younger.sister-ACC hit-PAST-DECL
Cinwu-to Cinwu-uy yetongsayng-ul ttayli-ess-ta.
Cinwu-also Cinwu-GEN younger.sister-ACC hit-PAST-DECL

‘Tongwu, Cinwu, and Thaywu were hanging out at Sinswu’s house. Tongwu hit Tongwu’s younger sister. Cinwu also hit Cinwu’s younger sister.’

Tongwu-ka ku-uy yetongsayng-ul ttayli-ess-ko, **Cinwu-to**
Tongwu-NOM he-GEN younger.sister-ACC hit-PAST-CONJ Cinwu-also
kuleha-yess-ta.
so.do-PAST-DECL

‘Tongwu hit his younger sister, and Cinwu did so, too.’

(16) Wonmwu, Kiswu, Sengswu-ka chatcip-eyse tayhwua-lul nanwu-ko
Wonmwu Kiswu Sengswu-NOM tea.house-at conversation-ACC share-PROG
iss-ess-ta. Wonmwu-ka Wonmwu-uy nwuna-lul
PAST-DECL Wonmwu-NOM Wonmwu-GEN older.sister-ACC
chingchanha-yss-ta. Kiswu-to Kiswu-uy nwuna-lul
compliment-PAST-DECL Kiswu-also Kiswu-GEN older.sister-ACC
chingchanha-yss-ta.
compliment-PAST-DECL

‘Wonmwu, Kiswu, and Sengswu were having a conversation at a tea house. Wonmwu complimented Wonmwu’s older sister. Kiswu also complimented Kiswu’s older sister.’

Wonmwu-ka ku-uy nwuna-lul chingchanha-yss-ko, **Kiswu-to**
Wonmwu-NOM he-GEN older.sister-ACC compliment-PAST-CONJ Kiswu-also
kuleha-yess-ta.
so.do-PAST-DECL

‘Wonmwu complimented his older sister, and Kiswu did so, too.’

D.2 Condition 2: VPA-Free (strict identity reading)

(1) Minswu, Kiswu, Cinswu-ka say kiswuksa-lo isaha-ko iss-ess-ta.
Minswu Kiswu Cinswu-NOM new dormitory-to move-PROG PAST-DECL
Minswu-ka Minswu-uy cim-ul nalu-ess-ta. Kiswu-to Minswu-uy
Minswu-NOM Minswu-GEN stuff-ACC move-PAST-DECL Kiswu-also Minswu-GEN
cim-ul nalu-ess-ta.
stuff-ACC move-PAST-DECL

‘Minswu, Kiswu, and Cinswu were moving to a new dormitory. Minswu moved Minswu’s stuff. Kiswu also moved Minswu’s stuff.’

Minswu-ka ku-uy cim-ul nalu-ess-ko, **Kiswu-to kuleha-yess-ta**.
Minswu-NOM he-GEN stuff-ACC move-PAST-CONJ Kiswu-also so.do-PAST-DECL

‘Minswu moved his stuff, and Kiswu did so, too.’

(2) Yonghi, Kenhi, Myengho-ka wuntongcang-eyse yakwu-lul ha-ko
Yonghi Kenhi Myengho-NOM play.ground-in baseball-ACC do-PROG
iss-ess-ta. Yonghi-ka Yonghi-uy kong-ul tenci-ess-ta. Kenhi-to
PAST-DECL Yonghi-NOM Yonghi-GEN ball-ACC throw-PAST-DECL Kenhi-also
Yonghi-uy kong-ul tenci-ess-ta.
Yonghi-GEN ball-ACC throw-PAST-DECL

‘Yonghi, Kenhi, and Myengho were playing basketball in a playground. Yonghi threw Yonghi’s ball. Kenhi also threw Yonghi’s ball.’

Yonghi-ka ku-uy kong-ul tenci-ess-ko, **Kenhi-to kuleha-yess-ta**.
Yonghi-NOM he-GEN ball-ACC throw-PAST-CONJ Kenhi-also so.do-PAST-DECL

‘Yonghi threw his ball, and Kenhi did so, too.’

(3) Thayswu, Kiswu, Cengswu-ka pa-eyse wuain-ul masi-ko iss-ess-ta.
Thayswu Kiswu Cengswu-NOM bar-at wuain-ACC drink-PROG PAST-DECL
Thayswu-ka Thayswu-uy wuaincan-ul kkaythuli-ess-ta. Kiswu-to
Thayswu-NOM Thayswu-GEN wine.glass-ACC break-PAST-DECL Kiswu-also
Thayswu-uy wuaincan-ul kkaythuli-ess-ta.
Thayswu-GEN wine.glass-ACC break-PAST-DECL

‘Thayswu, Kiswu, and Cengswu were drinking wine at a bar. Thayswu broke Thayswu’s wine glass. Kiswu also broke Thayswu’s wine glass.’

Thayswu-ka ku-uy wuaincan-ul kkaythuli-ess-ko, **Kiswu-to**
Thayswu-NOM he-GEN wine.glass-ACC break-PAST-CONJ Kiswu-also
kuleha-yess-ta.
so.do-PAST-DECL

‘Thayswu broke his wine glass, and Kiswu did so, too.’

(4) Myengswu, Hyenswu, Cwunswu-ka wuntong hwu swui-ko iss-ess-ta.
Myengswu Hyenswu Cwunswu-NOM exercise after rest-PROG PAST-DECL
Myengswu-ka Myengswu-uy umlyoswu-lul masi-ess-ta. Hyenswu-to
Myengswu-NOM Myengswu-GEN beverage-ACC drink-PAST-DECL Hyenswu-also
Myengswu-uy umlyoswu-lul masi-ess-ta.
Myengswu-GEN beverage-ACC drink-PAST-DECL

‘Myengswu, Hyenswu, and Cwunswu were taking a rest after exercise. Myengswu drank Myengswu’s beverage. Hyenswu also drank Myengswu’s beverage.’

Myengswu-ka ku-uy umlyoswu-lul masi-ess-ko, **Hyenswu-to**
Myengswu-NOM he-GEN beverage-ACC drink-PAST-CONJ Hyenswu-also
kuleha-yess-ta.
so.do-PAST-DECL

‘Myengswu drank his beverage, and Hyenswu did so, too.’

(5) Pyengswu, Mwunswu, Cwunswu-ka cip-ul chengsoha-ko iss-ess-ta.
Pyengswu Mwunswu Cwunswu-NOM house-ACC clean-PROG PAST-DECL
Pyengswu-ka Pyengswu-uy pang-ul ssul-ess-ta. Mwunswu-to
Pyengswu-NOM Pyengswu-GEN room-ACC sweep-PAST-DECL Mwunswu-also
Pyengswu-uy pang-ul ssul-ess-ta.
Pyengswu-GEN room-ACC sweep-PAST-DECL
‘Pyengswu, Mwunswu, and Cwunswu were cleaning their house. Pyengswu swept Pyengswu’s room. Mwunswu also swept Pyengswu’s room.’

Pyengswu-ka ku-uy pang-ul ssul-ess-ko, **Mwunswu-to**
Pyengswu-NOM he-GEN room-ACC sweep-PAST-CONJ Mwunswu-also
kuleha-yess-ta.
so.do-PAST-DECL

‘Pyengswu swept his room, and Mwunswu did so, too.’

(6) Chelswu, Yengswu, Cengswu-ka tosekwuan-eyse kongpwuha-ko iss-ess-ta.
Chelswu Yengswu Cengswu-NOM library-in study-PROG PAST-DECL
Chelswu-ka Chelswu-uy pheyn-ul ttelethuli-ess-ta. Yengswu-to
Chelswu-NOM Chelswu-GEN pen-ACC drop-PAST-DECL Yengswu-also
Chelswu-uy pheyn-ul ttelethuli-ess-ta.
Chelswu-GEN pen-ACC drop-PAST-DECL
‘Chelswu, Yengswu, and Cengswu were studying in a library. Chelswu dropped Chelswu’s pen. Yengswu also dropped Chelswu’s pen.’

Chelswu-ka ku-uy pheyn-ul ttelethuli-ess-ko, **Yengswu-to**
Chelswu-NOM he-GEN pen-ACC drop-PAST-CONJ Chelswu-also
kuleha-yess-ta.
so.do-PAST-DECL

‘Chelswu dropped his pen, and Yengswu did so, too.’

(7) Chelho, Phengho, Swuho-ka kakca phyenci-lul ssu-ko iss-ess-ta.
Chelho Phengho Swuho-NOM each letter-ACC write-PROG PAST-DECL
Chelho-ka Chelho-uy phyenci-lul ilk-ess-ta. Phengho-to
Chelho-NOM Chelho-GEN letter-ACC read-PAST-DECL Phengho-also
Chelho-uy phyenci-lul ilk-ess-ta.
Chelho-GEN letter-ACC read-PAST-DECL
‘Chelho, Phengho, and Swuho were each writing a letter. Chelho read Chelho’s letter. Phengho also read Chelho’s letter.’

Chelho-ka ku-uy phyenci-lul ilk-ess-ko, **Phengho-to**
Chelho-NOM he-GEN letter-ACC read-PAST-CONJ Phengho-also
kuleha-yess-ta.
so.do-PAST-DECL

‘Chelho read his letter, and Phengho did so, too.’

(8) Kwangho, Changho, Yengho-ka ilsiktang-eyse cemsim-ul mek-ko
Kwangho Changho Yengho-NOM Japanese.restaurant-at lunch-ACC eat-PROG
iss-ess-ta. Kwangho-ka Kwangho-uy utong-ul mek-ess-ta.
PAST-DECL Kwangho-NOM Kwangho-GEN Udon-ACC eat-PAST-DECL
Changho-to Kwangho-uy utong-ul mek-ess-ta.
Changho-also Kwangho-GEN Udon-ACC eat-PAST-DECL

‘Kwangho, Changho, and Yengho were having lunch at a Japanese restaurant. Kwangho ate Kwangho’s Udon. Changho also ate Kwangho’s Udon.’

Kwangho-ka ku-uy utong-ul mek-ess-ko, **Changho-to**
Kwangho-NOM he-GEN Udon-ACC eat-PAST-CONJ Changho-also
kuleha-yess-ta.
SO.do-PAST-DECL

‘Kwangho ate his Udon, and Changho did so, too.’

(9) Pyengmin, Cengmin, Tongmin-ika wuntongcang-eyse chwukkwu-lul ha-ko
Pyengmin Cengmin Tongmin-NOM play.ground-in soccer-ACC do-PROG
iss-ess-ta. Pyengmin-ika Pyengmin-iuy kong-ul cha-ss-ta.
PAST-DECL Pyengmin-NOM Pyengmin-GEN ball-ACC kick-PAST-DECL
Cengmin-ito Pyengmin-iuy kong-ul cha-ss-ta.
Cengmin-also Pyengmin-GEN ball-ACC kick-PAST-DECL

‘Pyengmin, Cengmin, and Tongmin were playing soccer in a playground. Pyengmin kicked Pyengmin’s ball. Cengmin also kicked Pyengmin’s ball.’

Pyengmin-ika ku-uy kong-ul cha-ss-ko, **Cengmin-ito**
Pyengmin-NOM he-GEN ball-ACC kick-PAST-CONJ Cengmin-also
kuleha-yess-ta.
SO.do-PAST-DECL

‘Pyengmin kicked his ball, and Cengmin did so, too.’

(10) Cinswu, Sungswu, Pyengswu-ka seythaksil-eyse seythak-ul ha-ko
Cinswu Sungswu Pyengswu-NOM laundry.room-at laundry-ACC do-PROG
iss-ess-ta. Cinswu-ka Cinswu-uy seycey-lul sayongha-yss-ta.
PAST-DECL Cinswu-NOM Cinswu-GEN detergent-ACC use-PAST-DECL
Sungswu-to Cinswu-uy seycey-lul sayongha-yss-ta.
Sungswu-also Cinswu-GEN detergent-ACC use-PAST-DECL

‘Cinswu, Sungswu, and Pyengswu were doing laundry at a laundry room. Cinswu used Cinswu’s detergent. Sungswu also used Cinswu’s detergent.’

Cinswu-ka ku-uy seycey-lul sayongha-yss-ko, **Sungswu-to**
Cinswu-NOM he-GEN detergent-ACC use-PAST-CONJ Sungswu-also
kuleha-yess-ta.
SO.do-PAST-DECL

‘Cinswu used his detergent, and Sungswu did so, too.’

(11) Kimkenmo, Kimcanghwun, Sinsunghwun-i nolaypang-eyse nol-ko
Kimkenmo Kimcanghwun Sinsunghwun-NOM singing.room-at hang.out-PROG
iss-ess-ta. Kimkenmo-ka Kimkenmo-uy hithukok-ul pwulu-ess-ta.
PAST-DECL Kimkenmo-NOM Kimkenmo-GEN hit.song-ACC sing-PAST-DECL
Kimcanghwun-to Kimkenmo-uy hithukok-ul pwulu-ess-ta.
Kimcanghwun-also Kimkenmo-GEN hit.song-ACC sing-PAST-DECL

‘Kimkenmo, Kimcanghwun, and Sinsunghwun were hanging out in a singing room. Kimkenmo sang Kimkenmo’s hit song. Kimcanghwun also sang Kimkenmo’s hit song.’

Kimkenmo-ka ku-uy hithukok-ul pwulu-ess-ko, **Kimcanghwun-to**
Kimkenmo-NOM he-GEN hit.song-ACC sing-PAST-CONJ Kimcanghwun-also
kuleha-yess-ta.
so.do-PAST-DECL

‘Kimkenmo sang his hit song, and Kimcanghwun did so, too.’

(12) Pongswu, Thaykang, Thayho-ka pwuek-eyse selkeci-lul ha-ko
Pongswu Thaykang Thayho-NOM kitchen-at dish.washing-ACC do-PROG
iss-ess-ta. Pongswu-ka Pongswu-uy khep-ul sis-ess-ta.
PAST-DECL Pongswu-NOM Pongswu-GEN cup-ACC wash-PAST-DECL
Thaykang-ito Pongswu-uy khep-ul sis-ess-ta.
Thaykang-also Pongswu-GEN cup-ACC wash-PAST-DECL

‘Pongswu, Thaykang, and Thayho were doing the dishes at a kitchen. Pongswu washed Pongswu’s cup. Thaykang also washed Pongswu’s cup.’

Pongswu-ka ku-uy khep-ul sis-ess-ko, **Thaykang-ito**
Pongswu-NOM he-GEN cup-ACC wash-PAST-CONJ Thaykang-also
kuleha-yess-ta.
so.do-PAST-DECL

‘Pongswu washed his cup, and Thaykang did so, too.’

(13) Chiswu, Pyengswu, Hanswu-ka kkaphey-eyse tayhwua-lul nanwu-ko
Chiswu Pyengswu Hanswu-NOM café-at conversation-ACC share-PROG
iss-ess-ta. Chiswu-ka Chiswu-uy cen yecachinkwu-lul
PAST-DECL Chiswu-NOM Chiswu-GEN previous girlfriend-ACC
helttut-ess-ta. Pyengswu-to Chiswu-uy cen yecachinkwu-lul
speak.ill.of-PAST-DECL Pyengswu-also Chiswu-GEN previous girlfriend-ACC
helttut-ess-ta.
speak.ill.of-PAST-DECL

‘Chiswu, Pyengswu, and Hanswu were having a conversation at a café. Chiswu spoke ill of Chiswu’s ex-girlfriend. Pyengswu also spoke ill of Chiswu’s ex-girlfriend.’

Chiswu-ka ku-uy cen yecachinkwu-lul helttut-ess-ko,
Chiswu-NOM he-GEN previous girlfriend-ACC speak.ill.of-PAST-CONJ
Pyengswu-to kuleha-yess-ta.
Pyengswu-also so.do-PAST-DECL

'Chiswu spoke ill of his ex-girlfriend, and Pyengswu did so, too.'

(14) Congswu, Hwuanswu, Tongswu-ka kongwuen-eyse nol-ko
Congswu Hwuanswu Tongswu-NOM park-at hang.out-PROG
iss-ess-ta. Congswu-ka Congswu-uy kay-lul kancilephi-ess-ta.
PAST-DECL Congswu-NOM Congswu-GEN dog-ACC tickle-PAST-DECL
Hwuanswu-to Congswu-uy kay-lul kancilephi-ess-ta.
Hwuanswu-also Congswu-GEN dog-ACC tickle-PAST-DECL

'Congswu, Hwuanswu, and Tongswu were hanging out at a park. Congswu tickled Congswu's dog. Hwuanswu also tickled Congswu's dog.'

Congswu-ka ku-uy kay-lul kancilephi-ess-ko, **Hwuanswu-to**
Congswu-NOM he-GEN dog-ACC tickle-PAST-CONJ Hwuanswu-also
kuleha-yess-ta.
so.do-PAST-DECL

'Congswu tickled his dog, and Hwuanswu did so, too.'

(15) Tongwu, Cinwu, Thaywu-ka Sinswu-uy cip-eyse nol-ko
Tongwu Cinwu Thaywu-NOM Sinswu-GEN house-at hang.out-PROG
iss-ess-ta. Tongwu-ka Tongwu-uy yetongsayng-ul ttayli-ess-ta.
PAST-DECL Tongwu-NOM Tongwu-GEN younger.sister-ACC hit-PAST-DECL
Cinwu-to Tongwu-uy yetongsayng-ul ttayli-ess-ta.
Cinwu-also Tongwu-GEN younger.sister-ACC hit-PAST-DECL

'Tongwu, Cinwu, and Thaywu were hanging out at Sinswu's house. Tongwu hit Tongwu's younger sister. Cinwu also hit Tongwu's younger sister.'

Tongwu-ka ku-uy yetongsayng-ul ttayli-ess-ko, **Cinwu-to**
Tongwu-NOM he-GEN younger.sister-ACC hit-PAST-CONJ Cinwu-also
kuleha-yess-ta.
so.do-PAST-DECL

'Tongwu hit his younger sister, and Cinwu did so, too.'

(16) Wonmwu, Kiswu, Sengswu-ka chatcip-eyse tayhwua-lul nanwu-ko
Wonmwu Kiswu Sengswu-NOM tea.house-at conversation-ACC share-PROG
iss-ess-ta. Wonmwu-ka Wonmwu-uy nwuna-lul
PAST-DECL Wonmwu-NOM Wonmwu-GEN older.sister-ACC
chingchanha-yss-ta. Kiswu-to Wonmwu-uy nwuna-lul
compliment-PAST-DECL Kiswu-also Wonmwu-GEN older.sister-ACC
chingchanha-yss-ta.
compliment-PAST-DECL

‘Wonmwu, Kiswu, and Sengswu were having a conversation at a tea house. Wonmwu complimented Wonmwu’s older sister. Kiswu also complimented Wonmwu’s older sister.’

Wonmwu-ka ku-uy nwuna-lul chingchanha-yss-ko, **Kiswu-to**
Wonmwu-NOM he-GEN older.sister-ACC compliment-PAST-CONJ Kiswu-also
kuleha-yess-ta.
so.do-PAST-DECL

‘Wonmwu complimented his older sister, and Kiswu did so, too.’

D.3 Condition 3: Quantificational-Bound

(1) Minswu, Kiswu, Cinswu-ka say kiswuksa-lo isaha-ko iss-ess-ta.
Minswu Kiswu Cinswu-NOM new dormitory-to move-PROG PAST-DECL
Minswu-ka Minswu-uy cim-ul nalu-ess-ta. Kiswu-to Kiswu-uy
Minswu-NOM Minswu-GEN stuff-ACC move-PAST-DECL Kiswu-also Kiswu-GEN
cim-ul nalu-ess-ta. Cinswu-to Cinswu-uy cim-ul
stuff-ACC move-PAST-DECL Cinswu-also Cinswu-GEN stuff-ACC
nalu-ess-ta.
move-PAST-DECL

‘Minswu, Kiswu, and Cinswu were moving to a new dormitory. Minswu moved Minswu’s stuff. Kiswu also moved Kiswu’s stuff. Cinswu also moved Cinswu’s stuff.’

Motwu-ka ku-uy cim-ul nalu-ess-ta.
everyone-NOM he-GEN stuff-ACC move-PAST-DECL

‘Everyone moved his stuff.’

(2) Yonghi, Kenhi, Myengho-ka wuntongcang-eyse yakwu-lul ha-ko
Yonghi Kenhi Myengho-NOM play.ground-in baseball-ACC do-PROG
iss-ess-ta. Yonghi-ka Yonghi-uy kong-ul tenci-ess-ta. Kenhi-to
PAST-DECL Yonghi-NOM Yonghi-GEN ball-ACC throw-PAST-DECL Kenhi-also
Kenhi-uy kong-ul tenci-ess-ta. Myengho-to Myengho-uy kong-ul
Kenhi-GEN ball-ACC throw-PAST-DECL Myengho-also Myengho-GEN ball-ACC
tenci-ess-ta.
throw-PAST-DECL

‘Yonghi, Kenhi, and Myengho were playing basketball in a playground. Yonghi threw Yonghi’s ball. Kenhi also threw Kenhi’s ball. Myengho also threw Myengho’s ball.’

Motwu-ka ku-uy kong-ul tenci-ess-ta.
everyone-NOM he-GEN ball-ACC throw-PAST-DECL

‘Everyone threw his ball.’

(3) Thayswu, Kiswu, Cengswu-ka pa-eyse wuain-ul masi-ko iss-ess-ta.
Thayswu Kiswu Cengswu-NOM bar-at wuain-ACC drink-PROG PAST-DECL
Thayswu-ka Thayswu-uy wuaincan-ul kkaythuli-ess-ta. Kiswu-to
Thayswu-NOM Thayswu-GEN wine.glass-ACC break-PAST-DECL Kiswu-also
Kiswu-uy wuaincan-ul kkaythuli-ess-ta. Cengswu-to Cengswu-uy
Kiswu-GEN wine.glass-ACC break-PAST-DECL Cengswu-also Cengswu-GEN
wuaincan-ul kkaythuli-ess-ta.
wine.glass-ACC break-PAST-DECL

'Thayswu, Kiswu, and Cengswu were drinking wine at a bar. Thayswu broke Thayswu's wine glass. Kiswu also broke Kiswu's wine glass. Cengswu also broke Cengswu's wine glass.'

Motwu-ka ku-uy wuaincan-ul kkaythuli-ess-ta.
everyone-NOM he-GEN wine.glass-ACC break-PAST-DECL

'Everyone broke his wine glass.'

(4) Myengswu, Hyenswu, Cwunswu-ka wuntong hwu swui-ko iss-ess-ta.
Myengswu Hyenswu Cwunswu-NOM exercise after rest-PROG PAST-DECL
Myengswu-ka Myengswu-uy umlyoswu-lul masi-ess-ta. Hyenswu-to
Myengswu-NOM Myengswu-GEN beverage-ACC drink-PAST-DECL Hyenswu-also
Hyenswu-uy umlyoswu-lul masi-ess-ta. Cwunswu-to Cwunswu-uy
Hyenswu-GEN beverage-ACC drink-PAST-DECL Cwunswu-also Cwunswu-GEN
umlyoswu-lul masi-ess-ta.
beverage-ACC drink-PAST-DECL

'Myengswu, Hyenswu, and Cwunswu were taking a rest after exercise. Myengswu drank Myengswu's beverage. Hyenswu also drank Hyenswu's beverage. Cwunswu also drank Cwunswu's beverage.'

Motwu-ka ku-uy umlyoswu-lul masi-ess-ta.
everyone-NOM he-GEN beverage-ACC drink-PAST-DECL

'Everyone drank his beverage.'

(5) Pyengswu, Mwunswu, Cwunswu-ka cip-ul chengsoha-ko iss-ess-ta.
Pyengswu Mwunswu Cwunswu-NOM house-ACC clean-PROG PAST-DECL
Pyengswu-ka Pyengswu-uy pang-ul ssul-ess-ta. Mwunswu-to
Pyengswu-NOM Pyengswu-GEN room-ACC sweep-PAST-DECL Mwunswu-also
Mwunswu-uy pang-ul ssul-ess-ta. Cwunswu-to Cwunswu-uy
Mwunswu-GEN room-ACC sweep-PAST-DECL Cwunswu-also Cwunswu-GEN
pang-ul ssul-ess-ta.
room-ACC sweep-PAST-DECL

'Pyengswu, Mwunswu, and Cwunswu were cleaning their house. Pyengswu swept Pyengswu's room. Mwunswu also swept Mwunswu's room. Cwunswu also swept Cwunswu's room.'

Motwu-ka ku-uy pang-ul ssul-ess-ta.
everyone-NOM he-GEN room-ACC sweep-PAST-DECL

'Everyone swept his room.'

(6) Chelswu, Yengswu, Cengswu-ka tosekwuan-eyse kongpwuha-ko iss-ess-ta.
Chelswu Yengswu Cengswu-NOM library-in study-PROG PAST-DECL
Chelswu-ka Chelswu-uy pheyn-ul ttelethuli-ess-ta. Yengswu-to
Chelswu-NOM Chelswu-GEN pen-ACC drop-PAST-DECL Yengswu-also
Yengswu-uy pheyn-ul ttelethuli-ess-ta. Cengswu-to Cengswu-uy pheyn-ul
Yengswu-GEN pen-ACC drop-PAST-DECL Cengswu-also Cengswu-GEN pen-ACC
ttelethuli-ess-ta.
drop-PAST-DECL

'Chelswu, Yengswu, and Cengswu were studying in a library. Chelswu dropped Chelswu's pen. Yengswu also dropped Yengswu's pen. Cengswu also dropped Cengswu's pen.'

Motwu-ka ku-uy pheyn-ul ttelethuli-ess-ta.
everyone-NOM he-GEN pen-ACC drop-PAST-DECL

'Everyone dropped his pen.'

(7) Chelho, Phengho, Swuho-ka kakca phyenci-lul ssu-ko iss-ess-ta.
Chelho Phengho Swuho-NOM each letter-ACC write-PROG PAST-DECL
Chelho-ka Chelho-uy phyenci-lul ilk-ess-ta. Phengho-to
Chelho-NOM Chelho-GEN letter-ACC read-PAST-DECL Phengho-also
Phengho-uy phyenci-lul ilk-ess-ta. Swuho-to Swuho-uy phyenci-lul
Phengho-GEN letter-ACC read-PAST-DECL Swuho-also Swuho-GEN letter-ACC
ilk-ess-ta.
read-PAST-DECL

'Chelho, Phengho, and Swuho were each writing a letter. Chelho read Chelho's letter. Phengho also read Phengho's letter. Swuho also read Swuho's letter.'

Motwu-ka ku-uy phyenci-lul ilk-ess-ta.
everyone-NOM he-GEN letter-ACC read-PAST-DECL

'Everyone read his letter.'

(8) Kwangho, Changho, Yengho-ka ilsiktang-eyse cemsim-ul mek-ko
Kwangho Changho Yengho-NOM Japanese.restaurant-at lunch-ACC eat-PROG
iss-ess-ta. Kwangho-ka Kwangho-uy utong-ul mek-ess-ta.
PAST-DECL Kwangho-NOM Kwangho-GEN Udon-ACC eat-PAST-DECL
Changho-to Changho-uy utong-ul mek-ess-ta. Yengho-to
Changho-also Changho-GEN Udon-ACC eat-PAST-DECL Yengho-also
Yengho-uy utong-ul mek-ess-ta.
Yengho-GEN Udon-ACC eat-PAST-DECL

'Kwangho, Changho, and Yengho were having lunch at a Japanese restaurant. Kwangho ate Kwangho's Udon. Changho also ate Changho's Udon. Yengho also ate Yengho's Udon.'

Motwu-ka ku-uy utong-ul mek-ess-ta.
everyone-NOM he-GEN Udon-ACC eat-PAST-DECL

‘Everyone ate his Udon.’

(9) Pyengmin, Cengmin, Tongmin-ika wuntongcang-eyse chwukkwu-lul ha-ko
Pyengmin Cengmin Tongmin-NOM play.ground-in soccer-ACC do-PROG
iss-ess-ta. Pyengmin-ika Pyengmin-iuy kong-ul cha-ss-ta.
PAST-DECL Pyengmin-NOM Pyengmin-GEN ball-ACC kick-PAST-DECL
Cengmin-ito Cengmin-iuy kong-ul cha-ss-ta. Tongmin-ito
Cengmin-also Cengmin-GEN ball-ACC kick-PAST-DECL Tongmin-also
Tongmin-iuy kong-ul cha-ss-ta.
Tongmin-GEN ball-ACC kick-PAST-DECL

‘Pyengmin, Cengmin, and Tongmin were playing soccer in a playground. Pyengmin kicked Pyengmin’s ball. Cengmin also kicked Cengmin’s ball. Tongmin also kicked Tongmin’s ball.’

Motwu-ka ku-uy kong-ul cha-ss-ta.
everyone-NOM he-GEN ball-ACC kick-PAST-DECL

‘Everyone kicked his ball.’

(10) Cinswu, Sungswu, Pyengswu-ka seythaksil-eyse seythak-ul ha-ko
Cinswu Sungswu Pyengswu-NOM laundry.room-at laundry-ACC do-PROG
iss-ess-ta. Cinswu-ka Cinswu-uy seycey-lul sayongha-yss-ta.
PAST-DECL Cinswu-NOM Cinswu-GEN detergent-ACC use-PAST-DECL
Sungswu-to Sungswu-uy seycey-lul sayongha-yss-ta. Pyengswu-to
Sungswu-also Sungswu-GEN detergent-ACC use-PAST-DECL Pyengswu-also
Pyengswu-uy seycey-lul sayongha-yss-ta.
Pyengswu-GEN detergent-ACC use-PAST-DECL

‘Cinswu, Sungswu, and Pyengswu were doing laundry at a laundry room. Cinswu used Cinswu’s detergent. Sungswu also used Sungswu’s detergent. Pyengswu also used Pyengswu’s detergent.’

Motwu-ka ku-uy seycey-lul sayongha-yss-ta.
everyone-NOM he-GEN detergent-ACC use-PAST-DECL

‘Everyone used his detergent.’

(11) Kimkenmo, Kimcanghwun, Sinsunghwun-i nolaypang-eyse nol-ko
Kimkenmo Kimcanghwun Sinsunghwun-NOM singing.room-at hang.out-PROG
iss-ess-ta. Kimkenmo-ka Kimkenmo-uy hithukok-ul pwulu-ess-ta.
PAST-DECL Kimkenmo-NOM Kimkenmo-GEN hit.song-ACC sing-PAST-DECL
Kimcanghwun-to Kimcanghwun-uy hithukok-ul pwulu-ess-ta.
Kimcanghwun-also Kimcanghwun-GEN hit.song-ACC sing-PAST-DECL
Sinsunghwun-to Sinsunghwun-uy hithukok-ul pwulu-ess-ta.
Sinsunghwun-also Sinsunghwun-GEN hit.song-ACC sing-PAST-DECL

‘Kimkenmo, Kimcanghwun, and Sinsunghwun were hanging out in a singing room. Kimkenmo sang Kimkenmo’s hit song. Kimcanghwun also sang Kimcanghwun’s hit song. Sinsunghwun also sang Sinsunghwun’s hit song.’

Motwu-ka ku-uy hithukok-ul pwulu-ess-ta.
everyone-NOM he-GEN hit.song-ACC sing-PAST-DECL

'Everyone sang his hit song.'

(12) Pongswu, Thaykang, Thayho-ka pwuek-eyse selkeci-lul ha-ko
Pongswu Thaykang Thayho-NOM kitchen-at dish.washing-ACC do-PROG
iss-ess-ta. Pongswu-ka Pongswu-uy khep-ul sis-ess-ta.
PAST-DECL Pongswu-NOM Pongswu-GEN cup-ACC wash-PAST-DECL
Thaykang-ito Thaykang-iuy khep-ul sis-ess-ta. Thayho-to
Thaykang-also Thaykang-GEN cup-ACC wash-PAST-DECL Thayho-also
Thayho-uy khep-ul sis-ess-ta.
Thayho-GEN cup-ACC wash-PAST-DECL

'Pongswu, Thaykang, and Thayho were doing the dishes at a kitchen. Pongswu washed Pongswu's cup. Thaykang also washed Thaykang's cup. Thayho also washed Thayho's cup.'

Motwu-ka ku-uy khep-ul sis-ess-ta.
everyone-NOM he-GEN cup-ACC wash-PAST-DECL

'Everyone washed his cup.'

The four test items that are not given here are the same as those for the BOUND-SEPTEMBER condition in Experiment 2.

D.4 Condition 4: Quantificational-Free

(1) Minswu, Kiswu, Cinswu-ka Thayswu-ka oki-lul kitalimye, say
Minswu Kiswu Cinswu-NOM Thayswu-NOM coming-ACC waiting new
kiswuksa-lo isaha-ko iss-ess-ta. Minswu-ka Thayswu-uy cim-ul
dormitory-to move-PROG PAST-DECL Minswu-NOM Thayswu-GEN stuff-ACC
nalu-ess-ta. Kiswu-to Thayswu-uy cim-ul nalu-ess-ta.
move-PAST-DECL Kiswu-also Thayswu-GEN stuff-ACC move-PAST-DECL
Cinswu-to Thayswu-uy cim-ul nalu-ess-ta.
Cinswu-also Thayswu-GEN stuff-ACC move-PAST-DECL

'Minswu, Kiswu, and Cinswu were moving to a new dormitory, waiting for Thayswu to come. Minswu moved Thayswu's stuff. Kiswu also moved Thayswu's stuff. Cinswu also moved Thayswu's stuff.'

Motwu-ka ku-uy cim-ul nalu-ess-ta.
everyone-NOM he-GEN stuff-ACC move-PAST-DECL

'Everyone moved his stuff.'

(2) Yonghi, Kenhi, Myengho-ka wuntongcang-eyse, Cinswu-ka oki-lul
Yonghi Kenhi Myengho-NOM play.ground-in Cinswu-NOM coming-ACC
kitalimye, yakwu-lul ha-ko iss-ess-ta. Yonghi-ka Cinswu-uy
waiting baseball-ACC do-PROG PAST-DECL Yonghi-NOM Cinswu-GEN

kong-ul tenci-ess-ta. Kenhi-to Cinswu-uy kong-ul tenci-ess-ta.
ball-ACC throw-PAST-DECL Kenhi-also Cinswu-GEN ball-ACC throw-PAST-DECL
Myengho-to Cinswu-uy kong-ul tenci-ess-ta.
Myengho-also Cinswu-GEN ball-ACC throw-PAST-DECL
‘Yonghi, Kenhi, and Myengho were playing basketball in a playground, waiting for Cinswu to come. Yonghi threw Cinswu’s ball. Kenhi also threw Cinswu’s ball. Myengho also threw Cinswu’s ball.’

Motwu-ka ku-uy kong-ul tenci-ess-ta.
everyone-NOM he-GEN ball-ACC throw-PAST-DECL

‘Everyone threw his ball.’

(3) Thayswu, Kiswu, Cengswu-ka pa-eyse, Yonghi-ka oki-lul kitalimye,
Thayswu Kiswu Cengswu-NOM bar-at Yonghi-NOM coming-ACC waiting
wuain-ul masi-ko iss-ess-ta. Thayswu-ka Yonghi-uy wuaincan-ul
wuain-ACC drink-PROG PAST-DECL Thayswu-NOM Yonghi-GEN wine.glass-ACC
kkaythuli-ess-ta. Kiswu-to Yonghi-uy wuaincan-ul kkaythuli-ess-ta.
break-PAST-DECL Kiswu-also Yonghi-GEN wine.glass-ACC break-PAST-DECL
Cengswu-to Yonghi-uy wuaincan-ul kkaythuli-ess-ta.
Cengswu-also Yonghi-GEN wine.glass-ACC break-PAST-DECL
‘Thayswu, Kiswu, and Cengswu were drinking wine at a bar, waiting for Yonghi to come. Thayswu broke Yonghi’s wine glass. Kiswu also broke Yonghi’s wine glass. Cengswu also broke Yonghi’s wine glass.’

Motwu-ka ku-uy wuaincan-ul kkaythuli-ess-ta.
everyone-NOM he-GEN wine.glass-ACC break-PAST-DECL

‘Everyone broke his wine glass.’

(4) Myengswu, Hyenswu, Cwunswu-ka wuntong hwu, Kiswu-ka oki-lul
Myengswu Hyenswu Cwunswu-NOM exercise after Kiswu-NOM coming-ACC
kitalimye, swui-ko iss-ess-ta. Myengswu-ka Kiswu-uy umlyoswu-lul
waiting rest-PROG PAST-DECL Myengswu-NOM Kiswu-GEN beverage-ACC
masi-ess-ta. Hyenswu-to Kiswu-uy umlyoswu-lul masi-ess-ta.
drink-PAST-DECL Hyenswu-also Kiswu-GEN beverage-ACC drink-PAST-DECL
Cwunswu-to Kiswu-uy umlyoswu-lul masi-ess-ta.
Cwunswu-also Kiswu-GEN beverage-ACC drink-PAST-DECL
‘Myengswu, Hyenswu, and Cwunswu were taking a rest after exercise, waiting for Kiswu to come. Myengswu drank Kiswu’s beverage. Hyenswu also drank Kiswu’s beverage. Cwunswu also drank Kiswu’s beverage.’

Motwu-ka ku-uy umlyoswu-lul masi-ess-ta.
everyone-NOM he-GEN beverage-ACC drink-PAST-DECL

‘Everyone drank his beverage.’

(5) Pyengswu, Mwunswu, Cwunswu-ka, Sengswu-ka oki-lul kitalimye,
Pyengswu Mwunswu Cwunswu-NOM Sengswu-NOM coming-ACC waiting
cip-ul chengsoha-ko iss-ess-ta. Pyengswu-ka Sengswu-uy pang-ul
house-ACC clean-PROG PAST-DECL Pyengswu-NOM Sengswu-GEN room-ACC
ssul-ess-ta. Mwunswu-to Sengswu-uy pang-ul ssul-ess-ta.
sweep-PAST-DECL Mwunswu-also Sengswu-GEN room-ACC sweep-PAST-DECL
Cwunswu-to Sengswu-uy pang-ul ssul-ess-ta.
Cwunswu-also Sengswu-GEN room-ACC sweep-PAST-DECL

‘Pyengswu, Mwunswu, and Cwunswu were cleaning the house, waiting for Sengswu to come. Pyengswu swept Sengswu’s room. Mwunswu also swept Sengswu’s room. Cwunswu also swept Sengswu’s room.’

Motwu-ka ku-uy pang-ul ssul-ess-ta.
everyone-NOM he-GEN room-ACC sweep-PAST-DECL

‘Everyone swept his room.’

(6) Chelswu, Yengswu, Cengswu-ka tosekwuan-eyse, Pemswu-ka oki-lul
Chelswu Yengswu Cengswu-NOM library-in Pemswu-NOM coming-ACC
kitalimye, kongpwuha-ko iss-ess-ta. Chelswu-ka Pemswu-uy pheyn-ul
waiting study-PROG PAST-DECL Chelswu-NOM Pemswu-GEN pen-ACC
ttelethuli-ess-ta. Yengswu-to Pemswu-uy pheyn-ul ttelethuli-ess-ta.
drop-PAST-DECL Yengswu-also Pemswu-GEN pen-ACC drop-PAST-DECL
Cengswu-to Pemswu-uy pheyn-ul ttelethuli-ess-ta.
Cengswu-also Pemswu-GEN pen-ACC drop-PAST-DECL

‘Chelswu, Yengswu, and Cengswu were studying in a library, waiting for Pemswu to come. Chelswu dropped Pemswu’s pen. Yengswu also dropped Pemswu’s pen. Cengswu also dropped Pemswu’s pen.’

Motwu-ka ku-uy pheyn-ul ttelethuli-ess-ta.
everyone-NOM he-GEN pen-ACC drop-PAST-DECL

‘Everyone dropped his pen.’

(7) Chelho, Phengho, Swuho-ka, Cengswu-ka oki-lul kitalimye, kakca
Chelho Phengho Swuho-NOM Cengswu-NOM coming-ACC waiting each
phyenci-lul ssu-ko iss-ess-ta. Chelho-ka Cengswu-uy phyenci-lul
letter-ACC write-PROG PAST-DECL Chelho-NOM Cengswu-GEN letter-ACC
ilk-ess-ta. Phengho-to Cengswu-uy phyenci-lul ilk-ess-ta.
read-PAST-DECL Phengho-also Cengswu-GEN letter-ACC read-PAST-DECL
Swuho-to Cengswu-uy phyenci-lul ilk-ess-ta.
Swuho-also Cengswu-GEN letter-ACC read-PAST-DECL

‘Chelho, Phengho, and Swuho were each writing a letter, waiting for Cengswu to come. Chelho read Cengswu’s letter. Phengho also read Cengswu’s letter. Swuho also read Cengswu’s letter.’

Motwu-ka ku-uy phyenci-lul ilk-ess-ta.
everyone-NOM he-GEN letter-ACC read-PAST-DECL

‘Everyone read his letter.’

(8) Kwangho, Changho, Yengho-ka ilsiktang-eyse, Sangki-ka
Kwangho Changho Yengho-NOM Japanese.restaurant-at Sangki-NOM
oki-lul kitalimye, cemsim-ul mek-ko iss-ess-ta. Kwangho-ka
coming-ACC waiting lunch-ACC eat-PROG PAST-DECL Kwangho-NOM
Sangki-uy utong-ul mek-ess-ta. Changho-to Sangki-uy utong-ul
Sangki-GEN Udon-ACC eat-PAST-DECL Changho-also Sangki-GEN Udon-ACC
mek-ess-ta. Yengho-to Sangki-uy utong-ul mek-ess-ta.
eat-PAST-DECL Yengho-also Sangki-GEN Udon-ACC eat-PAST-DECL

‘Kwangho, Changho, and Yengho were having lunch at a Japanese restaurant, waiting for Sangki to come. Kwangho ate Sangki’s Udon. Changho also ate Sangki’s Udon. Yengho also ate Sangki’s Udon.’

Motwu-ka ku-uy utong-ul mek-ess-ta.
everyone-NOM he-GEN Udon-ACC eat-PAST-DECL

‘Everyone ate his Udon.’

The eight test items that are not given here are the same as those for the Free-August and Free-September conditions in Experiment 2.

Appendix E

Test sentences from Experiment 4

E.1 Condition 1: Simple-Extraction (short distance scrambling)

(1) Minswu-wa Hanswu-ka kakca etten kwamok-ul yelsimhi
Minswu-and Hanswu-NOM each which subject-ACC hard
kongpwuha-yess-nunci malha-ko iss-ess-ta.
study-PAST-COMP talk-PROG PAST-DECL
'Minswu and Hanswu were talking about which subject they each studied hard.'

M: Swuhak-ul$_1$ na-nun [$_{\text{VP}}$ yelsimhi t_1 kongpwuha]-yss-e. Ne-nun?
math-ACC I-TOP hard study-PAST-DECL you-TOP

'I studied math hard. How about you?'

H: **Swuhak-ul na-to kulay-ss-e.**
math-ACC I-also so.do-PAST-DECL

Intended: 'I studied math hard, too.'

(2) Pongswu-wa Hyentong-ika kakca etten kkoch-ul yelsimhi
Pongswu-and Hyentong-NOM each which flower-ACC diligently
sim-ess-nunci malha-ko iss-ess-ta.
plant-PAST-COMP talk-PROG PAST-DECL
'Pongswu and Hyentong were talking about which flowers they each planted diligently.'

P: Haypalaki-lul$_1$ na-nun [$_{\text{VP}}$ yelsimhi t_1 sim]-ess-e. Ne-nun?
sunflower-ACC I-TOP diligently plant-PAST-DECL you-TOP

'I planted sunflowers diligently. How about you?'

H: **Haypalaki-lul na-to kulay-ss-e.**
sunflower-ACC I-also so.do-PAST-DECL

Intended: 'I planted sunflowers diligently, too.'

(3) Sungho-wa Changcin-ika kakca etten cencaceyphwum-ul olay
Sungho-and Changcin-NOM each which electronic.goods-ACC long
sayongha-yess-nunci malha-ko iss-ess-ta.
use-PAST-COMP talk-PROG PAST-DECL
'Sungho and Changcin were talking about which electronic goods they each used for a long period of time.'

S: Nothupwuk-ul$_1$ na-nun [$_{\text{VP}}$ olay t_1 sayongha]-yss-e. Ne-nun?
laptop-ACC I-TOP long use-PAST-DECL you-TOP

'I used a laptop for a long period of time. How about you?'

C: **Nothupwuk-ul na-to kulay-ss-e.**
laptop-ACC I-also so.do-PAST-DECL

Intended: 'I used a laptop for a long period of time, too.'

(4) Kyuho-wa Sangchel-ika kakca etten mwuswul-ul olay
Kyuho-and Sangchel-NOM each which martial.arts-ACC long
swulyenha-yess-nunci malha-ko iss-ess-ta.
practice-PAST-COMP talk-PROG PAST-DECL
'Kyuho and Sangchel were talking about which martial arts they each practiced for a long period of time.'

K: Thaykwuento-lul$_1$ na-nun [$_{\text{VP}}$ olay t_1 swulyenha]-yss-e. Ne-nun?
Taekwondo-ACC I-TOP long practice-PAST-DECL you-TOP

'I practiced Taekwondo for a long period of time. How about you?'

S: **Thaykwuento-lul na-to kulay-ss-e.**
Taekwondo-ACC I-also so.do-PAST-DECL

Intended: 'I practiced Taekwondo for a long period of time, too.'

(5) Kyengphyo-wa Caychel-ika kakca etten sociphwum-ul cacwu
Kyengphyo-and Caychel-NOM each which belongings-ACC frequently
ilepeli-ess-nunci malha-ko iss-ess-ta.
lose-PAST-COMP talk-PROG PAST-DECL
'Kyengphyo and Caychel were talking about which belongings they each lost frequently.'

K: Cikap-ul$_1$ na-nun [$_{\text{VP}}$ cacwu t_1 ilepeli]-ess-e. Ne-nun?
wallet-ACC I-TOP frequently lose-PAST-DECL you-TOP

'I lost a wallet freqeuntly. How about you?'

C: **Cikap-ul na-to kulay-ss-e.**
wallet-ACC I-also so.do-PAST-DECL

Intended: 'I lost a wallet frequently, too.'

(6) Congswu-wa Saypem-ika kakca etten cha-ul cengmal coaha-yess-nunci
Congswu-and Saypem-NOM each which car-ACC really like-PAST-COMP
malha-ko iss-ess-ta.
talk-PROG PAST-DECL
'Congswu and Saypem were talking about which car they each really liked.'

C: Nywupithul-ul$_1$ na-nun [$_{VP}$ cengmal t_1 coaha]-yss-e. Ne-nun?
New.Beetle-ACC I-TOP really like-PAST-DECL you-TOP

'I really liked New Beetle. How about you?'

S: **Nywupithul-ul na-to kulay-ss-e.**
New.Beetle-ACC I-also so.do-PAST-DECL

Intended: 'I really liked New Beetle, too.'

(7) Swuho-wa Cayhak-ika kakca etten panchan-ul cengmal
Swuho-and Cayhak-NOM each which side.dish-ACC really
sileha-yess-nunci malha-ko iss-ess-ta.
dislike-PAST-COMP talk-PROG PAST-DECL
'Swuho and Cayhak were talking about which side dish they each really disliked.'

S: Kimchi-lul$_1$ na-nun [$_{VP}$ cengmal t_1 sileha]-yss-e. Ne-nun?
Kimchi-ACC I-TOP really dislike-PAST-DECL you-TOP

'I really disliked Kimchi. How about you?'

C: **Kimchi-lul na-to kulay-ss-e.**
Kimchi-ACC I-also so.do-PAST-DECL

Intended: 'I really disliked Kimchi, too.'

(8) Congwu-wa Taykwan-ika kakca etten homsyophing sangphwum-ul
Congwu-and Taykwan-NOM each which home.shopping goods-ACC
cacwu cwumwunha-yess-nunci malha-ko iss-ess-ta.
frequently order-PAST-COMP talk-PROG PAST-DECL
'Congwu and Taykwan were talking about which home shopping goods they each ordered frequently.'

C: Kimchi-lul$_1$ na-nun [$_{VP}$ cacwu t_1 cwumwunha]-yss-e. Ne-nun?
Kimchi-ACC I-TOP frequently order-PAST-DECL you-TOP

'I ordered Kimchi frequently. How about you?'

T: **Kimchi-lul na-to kulay-ss-e.**
Kimchi-ACC I-also so.do-PAST-DECL

Intended: 'I ordered Kimchi frequently, too.'

(9) Bemswu-wa Twusik-ika kakca etten thipiphulo-lul cacwu
Bemswu-and Twusik-NOM each which television.program-ACC frequently
sichengha-yess-nunci malha-ko iss-ess-ta.
watch-PAST-COMP talk-PROG PAST-DECL
'Bemswu and Twusik were talking about which TV show they each watched frequently.'

B: Mwuhantocen-ul$_1$ na-nun [$_{\text{VP}}$ cacwu t_1 sichengha]-yss-e.
Infinite.Challenge-ACC I-TOP frequently watch-PAST-DECL
Ne-nun?
you-TOP

'I watched Infinite Challenge frequently. How about you?'

T: **Mwuhantocen-ul na-to kulay-ss-e.**
Infinite.Challenge-ACC I-also so.do-PAST-DECL

Intended: 'I watched Infinite Challenge frequently, too.'

(10) Chelswu-wa Heechel-ika kakca etten maykcwu-lul cacwu
Chelswu-and Heechel-NOM each which beer-ACC frequently
masi-ess-nunci malha-ko iss-ess-ta.
drink-PAST-COMP talk-PROG PAST-DECL
'Chelswu and Heechel were talking about which beer they each drank frequently.'

C: Chasu-lul$_1$ na-nun [$_{\text{VP}}$ cacwu t_1 masi]-ess-e. Ne-nun?
Cass-ACC I-TOP frequently drink-PAST-DECL you-TOP

'I drank Cass frequently. How about you?'

H: **Chasu-lul na-to kulay-ss-e.**
Cass-ACC I-also so.do-PAST-DECL

Intended: 'I drank Cass frequently, too.'

(11) Minswu-wa Yengmin-ika kakca etten ilponumsik-ul cacwu
Minswu-and Yengmin-NOM each which Japanese.food-ACC frequently
mek-ess-nunci malha-ko iss-ess-ta.
eat-PAST-COMP talk-PROG PAST-DECL
'Minswu and Yengmin were talking about which Japanese food they each ate frequently.'

M: Udong-ul$_1$ na-nun [$_{\text{VP}}$ cacwu t_1 mek]-ess-e. Ne-nun?
Udon-ACC I-TOP frequently eat-PAST-DECL you-TOP

'I ate Udon frequently. How about you?'

Y: **Udong-ul na-to kulay-ss-e.**
Udon-ACC I-also so.do-PAST-DECL

Intended: 'I ate Udon frequently, too.'

(12) Sengmo-wa Cinchel-ika kakca etten sinmwun-ul olay
Sengmo-and Cinchel-NOM each which newspaper-ACC long
kwutokha-yess-nunci malha-ko iss-ess-ta.
subscribe-PAST-COMP talk-PROG PAST-DECL

'Sengmo and Cinchel were talking about which newspaper they each subscribed to for a long period of time.'

S: Tongailpo-lul$_1$ na-nun [$_{VP}$ olay t_1 kwutokha]-yss-e. Ne-nun?
Dong-A.Ilbo-ACC I-TOP long subscribe-PAST-DECL you-TOP

'I subscribed to Dong-A Ilbo for a long period of time. How about you?'

C: **Tongailpo-lul na-to kulay-ss-e.**
DongA.Ilbo-ACC I-also SO.DO-PAST-DECL

Intended: 'I subscribed to Dong-A Ilbo for a long period of time, too.'

(13) Hyenho-wa Tayhwun-ika kakca etten yenghwa-lul cacwu
Hyenho-and Tayhwun-NOM each which movie-ACC frequently
poa-ss-nunci malha-ko iss-ess-ta.
watch-PAST-COMP talk-PROG PAST-DECL

'Hyenho and Tayhwun were talking about which movie they each watched frequently.'

H: Phulocun-ul$_1$ na-nun [$_{VP}$ cacwu t_1 poa]-ss-e. Ne-nun?
Frozen-ACC I-TOP frequently watch-PAST-DECL you-TOP

'I watched Frozen frequently. How about you?'

T: **Phulocun-ul na-to kulay-ss-e.**
Frozen-ACC I-also SO.DO-PAST-DECL

Intended: 'I watched Frozen frequently, too.'

(14) Thayswu-wa Myenghwun-ika kakca etten akki-lul olay
Thayswu-and Myenghwun-NOM each which music.instrument-ACC long
yencwuha-yess-nunci malha-ko iss-ess-ta.
play-PAST-COMP talk-PROG PAST-DECL

'Thayswu and Myenghwun were talking about which music instrument they each played for a long period of time.'

T: Phiano-lul$_1$ na-nun [$_{VP}$ olay t_1 yencwuha]-yss-e. Ne-nun?
piano-ACC I-TOP long play-PAST-DECL you-TOP

'I played the piano for a long period of time. How about you?'

M: **Phiano-lul na-to kulay-ss-e.**
piano-ACC I-also SO.DO-PAST-DECL

Intended: 'I played the piano for a long period of time, too.'

(15) Hungswu-wa Minhyen-ika kakca etten hankwukumsik-ul cacwu
Hungswu-and Minhyen-NOM each which Korean.food-ACC frequently
yoliha-yess-nunci malha-ko iss-ess-ta.
cook-PAST-COMP talk-PROG PAST-DECL
'Hungswu and Minhyen were talking about which Korean food they each cooked frequently.'

H: Kimchi-lul$_1$ na-nun [$_{\text{VP}}$ cacwu t_1 yoliha]-yss-e. Ne-nun?
Kimchi-ACC I-TOP frequently cook-PAST-DECL you-TOP

'I cooked Kimchi frequently. How about you?'

M: **Kimchi-lul na-to kulay-ss-e.**
Kimchi-ACC I-also so.do-PAST-DECL

Intended: 'I cooked Kimchi frequently, too.'

(16) Unphyo-wa Congsin-ika kakca etten nolay-lul cacwu pwulu-ess-nunci
Unphyo-and Congsin-NOM each which song-ACC frequently sing-PAST-COMP
malha-ko iss-ess-ta.
talk-PROG PAST-DECL
'Unphyo and Congsin were talking about which song they each sang frequently.'

U: Mannam-ul$_1$ na-nun [$_{\text{VP}}$ cacwu t_1 pwulu]-ess-e. Ne-nun?
Mannam-ACC I-TOP frequently sing-PAST-DECL you-TOP

'I sang Mannam frequently. How about you?'

C: **Mannam-ul na-to kulay-ss-e.**
Mannam-ACC I-also so.do-PAST-DECL

Intended: 'I sang Mannam frequently, too.'

(17) Kithay-wa Cenghwun-ika kakca etten nolay-lul cacwu
Kithay-and Cenghwun-NOM each which song-ACC frequently
tul-ess-nunci malha-ko iss-ess-ta.
listen-PAST-COMP talk-PROG PAST-DECL
'Kithay and Cenghwun were talking about which song they each listened to frequently.'

K: Mannam-ul$_1$ na-nun [$_{\text{VP}}$ cacwu t_1 tul]-ess-e. Ne-nun?
Mannam-ACC I-TOP frequently listen-PAST-DECL you-TOP

'I listened to Mannam frequently. How about you?'

C: **Mannam-ul na-to kulay-ss-e.**
Mannam-ACC I-also so.do-PAST-DECL

Intended: 'I listened to Mannam frequently, too.'

(18) Kyengho-wa Hakpem-ika kakca etten kwail-ul cacwu sa-ss-nunci
Kyengho-and Hakpem-NOM each which fruit-ACC frequently buy-PAST-COMP
malha-ko iss-ess-ta.
talk-PROG PAST-DECL
'Kyengho and Hakpem were talking about which fruit they each bought frequently.'

K: Sakwa-lul$_1$ na-nun [$_{\text{VP}}$ cacwu t_1 sa]-ss-e. Ne-nun?
apple-ACC I-TOP frequently buy-PAST-DECL you-TOP

'I bought apples frequently. How about you?'

H: **Sakwa-lul na-to kulay-ss-e.**
apple-ACC I-also so.do-PAST-DECL

Intended: 'I bought apples frequently, too.'

(19) Hyenwu-wa Tonghwun-ika kakca etten chwum-ul mayil
Hyenwu-and Tonghwun-NOM each which dance-ACC every.day
chwu-ess-nunci malha-ko iss-ess-ta.
dance-PAST-COMP talk-PROG PAST-DECL
'Hyenwu and Tonghwun were talking about which dance they each danced everyday.'

H: Thayngko-lul$_1$ na-nun [$_{\text{VP}}$ mayil t_1 chwu]-ess-e. Ne-nun?
Tango-ACC I-TOP every.day dance-PAST-DECL you-TOP

'I danced Tango everyday. How about you?'

T: **Thayngko-lul na-to kulay-ss-e.**
Tango-ACC I-also so.do-PAST-DECL

Intended: 'I danced Tango everyday, too.'

(20) Ciseng-iwa Mincong-ika kakca etten aywantongmwul-ul olay
Ciseng-and Mincong-NOM each which pet-ACC long
khiwu-ess-nunci malha-ko iss-ess-ta.
raise-PAST-COMP talk-PROG PAST-DECL
'Ciseng and Mincong were talking about which pet they each kept for a long period of time.'

C: Kay-lul$_1$ na-nun [$_{\text{VP}}$ olay t_1 khiwu]-ess-e. Ne-nun?
dog-ACC I-TOP long raise-PAST-DECL you-TOP

'I kept a dog for a long period of time. How about you?'

M: **Kay-lul na-to kulay-ss-e.**
dog-ACC I-also so.do-PAST-DECL

Intended: 'I kept a dog for a long period of time, too.'

(21) Henswu-wa Canghwun-ika kakca etten mwulken-ul olay mo-ass-nunci
Henswu-and Canghwun-NOM each which item-ACC long collect-PAST-COMP
malha-ko iss-ess-ta.
talk-PROG PAST-DECL

'Henswu and Canghwun were talking about which item they each collected for a long period of time.'

H: Wuphyo-lul$_1$ na-nun [$_{VP}$ olay t_1 mo]-ass-e. Ne-nun?
stamp-ACC I-TOP long collect-PAST-DECL you-TOP

'I collected stamps for a long period of time. How about you?'

C: **Wuphyo-lul na-to kulay-ss-e.**
stamp-ACC I-also so.do-PAST-DECL

Intended: 'I collected stamps for a long period of time, too.'

(22) Changho-wa Minhyen-ika kakca etten wuekuke-lul olay
Changho-and Minhyen-NOM each which foreign.language-ACC long
paywu-ess-nunci malha-ko iss-ess-ta.
learn-PAST-COMP talk-PROG PAST-DECL

'Changho and Minhyen were talking about which foreign language they each learned for a long period of time.'

C: Pwule-lul$_1$ na-nun [$_{VP}$ olay t_1 paywu]-ess-e. Ne-nun?
French-ACC I-TOP long learn-PAST-DECL you-TOP

'I learned French for a long period of time. How about you?'

M: **Pwule-lul na-to kulay-ss-e.**
French-ACC I-also so.do-PAST-DECL

Intended: 'I learned French for a long period of time, too.'

(23) Cengho-wa Senghyen-ika kakca etten ppang-ul cacwu
Cengho-and Senghyen-NOM each which bread-ACC frequently
kwu-ess-nunci malha-ko iss-ess-ta.
bake-PAST-COMP talk-PROG PAST-DECL

'Cengho and Senghyen were talking about which bread they each baked frequently.'

C: Manulppang-ul$_1$ na-nun [$_{VP}$ cacwu t_1 kwu]-ess-e. Ne-nun?
garlic.bread-ACC I-TOP frequently bake-PAST-DECL you-TOP

'I baked garlic bread frequently. How about you?'

S: **Manulppang-ul na-to kulay-ss-e.**
garlic.bread-ACC I-also so.do-PAST-DECL

Intended: 'I baked garlic bread frequently, too.'

(24) Tonghay-wa Siwan-ika kakca etten chayk-ul cacwu ilk-ess-nunci
Tonghay-and Siwan-NOM each which book-ACC frequently read-PAST-COMP
malha-ko iss-ess-ta.
talk-PROG PAST-DECL
'Tonghay and Siwan were talking about which book they each read frequently.'

T: Hayliphothe-lul$_1$ na-nun [$_{\text{VP}}$ cacwu t_1 ilk]-ess-e. Ne-nun?
Harry.Potter-ACC I-TOP frequently read-PAST-DECL you-TOP

'I read Harry Potter frequently. How about you?'

S: **Hayliphothe-lul na-to kulay-ss-e.**
Harry.Potter-ACC I-also so.do-PAST-DECL

Intended: 'I read Harry Potter frequently, too.'

E.2 Condition 2: Simple-NoExtraction

(1) Minswu-wa Hanswu-ka kakca etten kwamok-ul yelsimhi
Minswu-and Hanswu-NOM each which subject-ACC hard
kongpwuha-yess-nunci malha-ko iss-ess-ta.
study-PAST-COMP talk-PROG PAST-DECL
'Minswu and Hanswu were talking about which subject they each studied hard.'

M: Na-nun [$_{\text{VP}}$ yelsimhi swuhak-ul kongpwuha]-yss-e. Ne-nun?
I-TOP hard math-ACC study-PAST-DECL you-TOP

'I studied math hard. How about you?'

H: **Na-to kulay-ss-e.**
I-also do.SO-PAST-DECL

Intended: 'I studied math hard, too.'

(2) Pongswu-wa Hyentong-ika kakca etten kkoch-ul yelsimhi
Pongswu-and Hyentong-NOM each which flower-ACC diligently
sim-ess-nunci malha-ko iss-ess-ta.
plant-PAST-COMP talk-PROG PAST-DECL
'Pongswu and Hyentong were talking about which flowers they each planted diligently.'

P: Na-nun [$_{\text{VP}}$ yelsimhi haypalaki-lul sim]-ess-e. Ne-nun?
I-TOP diligently sunflower-ACC plant-PAST-DECL you-TOP

'I planted sunflowers diligently. How about you?'

H: **Na-to kulay-ss-e.**
I-also so.do-PAST-DECL

Intended: 'I planted sunflowers diligently, too.'

(3) Sungho-wa Changcin-ika kakca etten cencaceyphwum-ul olay
Sungho-and Changcin-NOM each which electronic.goods-ACC long
sayongha-yess-nunci malha-ko iss-ess-ta.
use-PAST-COMP talk-PROG PAST-DECL
'Sungho and Changcin were talking about which electronic goods they each used for a long period of time.'

S: Na-nun [VP olay nothupwuk-ul sayongha]-yss-e. Ne-nun?
I-TOP long laptop-ACC use-PAST-DECL you-TOP

'I used a laptop for a long period of time. How about you?'

C: **Na-to kulay-ss-e.**
I-also SO.do-PAST-DECL

Intended: 'I used a laptop for a long period of time, too.'

(4) Kyuho-wa Sangchel-ika kakca etten mwuswul-ul olay
Kyuho-and Sangchel-NOM each which martial.arts-ACC long
swulyenha-yess-nunci malha-ko iss-ess-ta.
practice-PAST-COMP talk-PROG PAST-DECL
'Kyuho and Sangchel were talking about which martial arts they each practiced for a long period of time.'

K: Na-nun [VP olay thaykwuento-lul swulyenha]-yss-e. Ne-nun?
I-TOP long Taekwondo-ACC practice-PAST-DECL you-TOP

'I practiced Taekwondo for a long period of time. How about you?'

S: **Na-to kulay-ss-e.**
I-also SO.do-PAST-DECL

Intended: 'I practiced Taekwondo for a long period of time, too.'

(5) Kyengphyo-wa Caychel-ika kakca etten sociphwum-ul cacwu
Kyengphyo-and Caychel-NOM each which belongings-ACC frequently
ilepeli-ess-nunci malha-ko iss-ess-ta.
lose-PAST-COMP talk-PROG PAST-DECL
'Kyengphyo and Caychel were talking about which belongings they each lost frequently.'

K: Na-nun [VP cacwu cikap-ul ilepeli]-ess-e. Ne-nun?
I-TOP frequently wallet-ACC lose-PAST-DECL you-TOP

'I lost a wallet freqeuntly. How about you?'

C: **Na-to kulay-ss-e.**
I-also SO.do-PAST-DECL

Intended: 'I lost a wallet frequently, too.'

(6) Congswu-wa Saypem-ika kakca etten cha-ul cengmal coaha-yess-nunci
Congswu-and Saypem-NOM each which car-ACC really like-PAST-COMP
malha-ko iss-ess-ta.
talk-PROG PAST-DECL
'Congswu and Saypem were talking about which car they each really liked.'

C: Na-nun [VP cengmal nywupithul-ul coaha]-yss-e. Ne-nun?
I-TOP really New.Beetle-ACC like-PAST-DECL you-TOP

'I really liked New Beetle. How about you?'

S: **Na-to kulay-ss-e.**
I-also SO.DO-PAST-DECL

Intended: 'I really liked New Beetle, too.'

(7) Swuho-wa Cayhak-ika kakca etten panchan-ul cengmal
Swuho-and Cayhak-NOM each which side.dish-ACC really
sileha-yess-nunci malha-ko iss-ess-ta.
dislike-PAST-COMP talk-PROG PAST-DECL
'Swuho and Cayhak were talking about which side dish they each really disliked.'

S: Na-nun [VP cengmal kimchi-lul sileha]-yss-e. Ne-nun?
I-TOP really Kimchi-ACC dislike-PAST-DECL you-TOP

'I really disliked Kimchi. How about you?'

C: **Na-to kulay-ss-e.**
I-also SO.DO-PAST-DECL

Intended: 'I really disliked Kimchi, too.'

(8) Congwu-wa Taykwan-ika kakca etten homsyophing sangphwum-ul
Congwu-and Taykwan-NOM each which home.shopping goods-ACC
cacwu cwumwunha-yess-nunci malha-ko iss-ess-ta.
frequently order-PAST-COMP talk-PROG PAST-DECL
'Congwu and Taykwan were talking about which home shopping goods they each ordered frequently.'

C: Na-nun [VP cacwu kimchi-lul cwumwunha]-yss-e. Ne-nun?
I-TOP frequently Kimchi-ACC order-PAST-DECL you-TOP

'I ordered Kimchi frequently. How about you?'

T: **Na-to kulay-ss-e.**
I-also SO.DO-PAST-DECL

Intended: 'I ordered Kimchi frequently, too.'

(9) Bemswu-wa Twusik-ika kakca etten thipiphulo-lul cacwu
Bemswu-and Twusik-NOM each which television.program-ACC frequently
sichengha-yess-nunci malha-ko iss-ess-ta.
watch-PAST-COMP talk-PROG PAST-DECL
'Bemswu and Twusik were talking about which TV show they each watched frequently.'

B: Na-nun [$_{VP}$ cacwu mwuhantocen-ul sichengha]-yss-e.
I-TOP frequently Infinite.Challenge-ACC watch-PAST-DECL
Ne-nun?
you-TOP

'I watched Infinite Challenge frequently. How about you?'

T: **Na-to kulay-ss-e.**
I-also so.do-PAST-DECL

Intended: 'I watched Infinite Challenge frequently, too.'

(10) Chelswu-wa Heechel-ika kakca etten maykcwu-lul cacwu
Chelswu-and Heechel-NOM each which beer-ACC frequently
masi-ess-nunci malha-ko iss-ess-ta.
drink-PAST-COMP talk-PROG PAST-DECL
'Chelswu and Heechel were talking about which beer they each drank frequently.'

C: Na-nun [$_{VP}$ cacwu chasu-lul masi]-ess-e. Ne-nun?
I-TOP frequently Cass-ACC drink-PAST-DECL you-TOP

'I drank Cass frequently. How about you?'

H: **Na-to kulay-ss-e.**
I-also so.do-PAST-DECL

Intended: 'I drank Cass frequently, too.'

(11) Minswu-wa Yengmin-ika kakca etten ilponumsik-ul cacwu
Minswu-and Yengmin-NOM each which Japanese.food-ACC frequently
mek-ess-nunci malha-ko iss-ess-ta.
eat-PAST-COMP talk-PROG PAST-DECL
'Minswu and Yengmin were talking about which Japanese food they each ate frequently.'

M: Na-nun [$_{VP}$ cacwu udong-ul mek]-ess-e. Ne-nun?
I-TOP frequently Udon-ACC eat-PAST-DECL you-TOP

'I ate Udon frequently. How about you?'

Y: **Na-to kulay-ss-e.**
I-also so.do-PAST-DECL

Intended: 'I ate Udon frequently, too.'

(12) Sengmo-wa Cinchel-ika kakca etten sinmwun-ul olay
Sengmo-and Cinchel-NOM each which newspaper-ACC long
kwutokha-yess-nunci malha-ko iss-ess-ta.
subscribe-PAST-COMP talk-PROG PAST-DECL
'Sengmo and Cinchel were talking about which newspaper they each subscribed to for a long period of time.'

S: Na-nun [VP olay tongailpo-lul kwutokha]-yss-e. Ne-nun?
I-TOP long Dong-A.Ilbo-ACC subscribe-PAST-DECL you-TOP

'I subscribed to Dong-A Ilbo for a long period of time. How about you?'

C: **Na-to kulay-ss-e.**
I-also SO.DO-PAST-DECL

Intended: 'I subscribed to Dong-A Ilbo for a long period of time, too.'

(13) Hyenho-wa Tayhwun-ika kakca etten yenghwa-lul cacwu
Hyenho-and Tayhwun-NOM each which movie-ACC frequently
poa-ss-nunci malha-ko iss-ess-ta.
watch-PAST-COMP talk-PROG PAST-DECL
'Hyenho and Tayhwun were talking about which movie they each watched frequently.'

H: Na-nun [VP cacwu phulocun-ul poa]-ss-e. Ne-nun?
I-TOP frequently Frozen-ACC watch-PAST-DECL you-TOP

'I watched Frozen frequently. How about you?'

T: **Na-to kulay-ss-e.**
I-also SO.DO-PAST-DECL

Intended: 'I watched Frozen frequently, too.'

(14) Thayswu-wa Myenghwun-ika kakca etten akki-lul olay
Thayswu-and Myenghwun-NOM each which music.instrument-ACC long
yencwuha-yess-nunci malha-ko iss-ess-ta.
play-PAST-COMP talk-PROG PAST-DECL
'Thayswu and Myenghwun were talking about which music instrument they each played for a long period of time.'

T: Na-nun [VP olay phiano-lul yencwuha]-yss-e. Ne-nun?
I-TOP long piano-ACC play-PAST-DECL you-TOP

'I played the piano for a long period of time. How about you?'

M: **Na-to kulay-ss-e.**
I-also SO.DO-PAST-DECL

Intended: 'I played the piano for a long period of time, too.'

(15) Hungswu-wa Minhyen-ika kakca etten hankwukumsik-ul cacwu
Hungswu-and Minhyen-NOM each which Korean.food-ACC frequently
yoliha-yess-nunci malha-ko iss-ess-ta.
cook-PAST-COMP talk-PROG PAST-DECL
'Hungswu and Minhyen were talking about which Korean food they each cooked frequently.'

H: Na-nun $[_{VP}$ cacwu kimchi-lul yoliha]-yss-e. Ne-nun?
I-TOP frequently Kimchi-ACC cook-PAST-DECL you-TOP

'I cooked Kimchi frequently. How about you?'

M: **Na-to kulay-ss-e.**
I-also SO.DO-PAST-DECL

Intended: 'I cooked Kimchi frequently, too.'

(16) Unphyo-wa Congsin-ika kakca etten nolay-lul cacwu pwulu-ess-nunci
Unphyo-and Congsin-NOM each which song-ACC frequently sing-PAST-COMP
malha-ko iss-ess-ta.
talk-PROG PAST-DECL
'Unphyo and Congsin were talking about which song they each sang frequently.'

U: Na-nun $[_{VP}$ cacwu mannam-ul pwulu]-ess-e. Ne-nun?
I-TOP frequently Mannam-ACC sing-PAST-DECL you-TOP

'I sang Mannam frequently. How about you?'

C: **Na-to kulay-ss-e.**
I-also SO.DO-PAST-DECL

Intended: 'I sang Mannam frequently, too.'

(17) Kithay-wa Cenghwun-ika kakca etten nolay-lul cacwu
Kithay-and Cenghwun-NOM each which song-ACC frequently
tul-ess-nunci malha-ko iss-ess-ta.
listen-PAST-COMP talk-PROG PAST-DECL
'Kithay and Cenghwun were talking about which song they each listened to frequently.'

K: Na-nun $[_{VP}$ cacwu mannam-ul tul]-ess-e. Ne-nun?
I-TOP frequently Mannam-ACC listen-PAST-DECL you-TOP

'I listened to Mannam frequently. How about you?'

C: **Na-to kulay-ss-e.**
I-also SO.DO-PAST-DECL

Intended: 'I listened to Mannam frequently, too.'

(18) Kyengho-wa Hakpem-ika kakca etten kwail-ul cacwu sa-ss-nunci
Kyengho-and Hakpem-NOM each which fruit-ACC frequently buy-PAST-COMP
malha-ko iss-ess-ta.
talk-PROG PAST-DECL

'Kyengho and Hakpem were talking about which fruit they each bought frequently.'

K: Na-nun [VP cacwu sakwa-lul sa]-ss-e. Ne-nun?
I-TOP frequently apple-ACC buy-PAST-DECL you-TOP

'I bought apples frequently. How about you?'

H: **Na-to kulay-ss-e.**
I-also SO.DO-PAST-DECL

Intended: 'I bought apples frequently, too.'

(19) Hyenwu-wa Tonghwun-ika kakca etten chwum-ul mayil
Hyenwu-and Tonghwun-NOM each which dance-ACC every.day
chwu-ess-nunci malha-ko iss-ess-ta.
dance-PAST-COMP talk-PROG PAST-DECL

'Hyenwu and Tonghwun were talking about which dance they each danced everyday.'

H: Na-nun [VP mayil thayngko-lul chwu]-ess-e. Ne-nun?
I-TOP every.day Tango-ACC dance-PAST-DECL you-TOP

'I danced Tango everyday. How about you?'

T: **Na-to kulay-ss-e.**
I-also SO.DO-PAST-DECL

Intended: 'I danced Tango everyday, too.'

(20) Ciseng-iwa Mincong-ika kakca etten aywantongmwul-ul olay
Ciseng-and Mincong-NOM each which pet-ACC long
khiwu-ess-nunci malha-ko iss-ess-ta.
raise-PAST-COMP talk-PROG PAST-DECL

'Ciseng and Mincong were talking about which pet they each kept for a long period of time.'

C: Na-nun [VP olay kay-lul khiwu]-ess-e. Ne-nun?
I-TOP long dog-ACC raise-PAST-DECL you-TOP

'I kept a dog for a long period of time. How about you?'

M: **Na-to kulay-ss-e.**
I-also SO.DO-PAST-DECL

Intended: 'I kept a dog for a long period of time, too.'

(21) Henswu-wa Canghwun-ika kakca etten mwulken-ul olay mo-ass-nunci
Henswu-and Canghwun-NOM each which item-ACC long collect-PAST-COMP
malha-ko iss-ess-ta.
talk-PROG PAST-DECL

‘Henswu and Canghwun were talking about which item they each collected for a long period of time.’

H: Na-nun [VP olay wuphyo-lul mo]-ass-e. Ne-nun?
I-TOP long stamp-ACC collect-PAST-DECL you-TOP

‘I collected stamps for a long period of time. How about you?’

C: **Na-to kulay-ss-e.**
I-also so.do-PAST-DECL

Intended: ‘I collected stamps for a long period of time, too.’

(22) Changho-wa Minhyen-ika kakca etten wuekuke-lul olay
Changho-and Minhyen-NOM each which foreign.language-ACC long
paywu-ess-nunci malha-ko iss-ess-ta.
learn-PAST-COMP talk-PROG PAST-DECL

‘Changho and Minhyen were talking about which foreign language they each learned for a long period of time.’

C: Na-nun [VP olay pwule-lul paywu]-ess-e. Ne-nun?
I-TOP long French-ACC learn-PAST-DECL you-TOP

‘I learned French for a long period of time. How about you?’

M: **Na-to kulay-ss-e.**
I-also so.do-PAST-DECL

Intended: ‘I learned French for a long period of time, too.’

(23) Cengho-wa Senghyen-ika kakca etten ppang-ul cacwu
Cengho-and Senghyen-NOM each which bread-ACC frequently
kwu-ess-nunci malha-ko iss-ess-ta.
bake-PAST-COMP talk-PROG PAST-DECL

‘Cengho and Senghyen were talking about which bread they each baked frequently.’

C: Na-nun [VP cacwu manulppang-ul kwu]-ess-e. Ne-nun?
I-TOP frequently garlic.bread-ACC bake-PAST-DECL you-TOP

‘I baked garlic bread frequently. How about you?’

S: **Na-to kulay-ss-e.**
I-also so.do-PAST-DECL

Intended: ‘I baked garlic bread frequently, too.’

(24) Tonghay-wa Siwan-ika kakca etten chayk-ul cacwu ilk-ess-nunci
Tonghay-and Siwan-NOM each which book-ACC frequently read-PAST-COMP
malha-ko iss-ess-ta.
talk-PROG PAST-DECL
‘Tonghay and Siwan were talking about which book they each read frequently.’

T: Na-nun [$_{VP}$ cacwu hayliphothe-lul ilk]-ess-e. Ne-nun?
I-TOP frequently Harry.Potter-ACC read-PAST-DECL you-TOP

‘I read Harry Potter frequently. How about you?’

S: **Na-to kulay-ss-e.**
I-also so.do-PAST-DECL

Intended: ‘I read Harry Potter frequently, too.’

E.3 Condition 3: Complex-Extraction (long distance scrambling)

(1) Minswu-wa Hanswu-ka kakca etten kwamok-ul Yuli-ka yelsimhi
Minswu-and Hanswu-NOM each which subject-ACC Yuli-NOM hard
kongpwuha-yss-tako tul-ess-nunci malha-ko iss-ess-ta.
study-PAST-COMP hear-PAST-COMP talk-PROG PAST-DECL
‘Minswu and Hanswu were talking about which subject they each heard that Yuli studied hard.’

M: Swuhak-ul$_1$ na-nun [$_{VP}$[$_{CP}$ Yuli-ka yelsimhi t_1 kongpwuha-yss-tako]
math-ACC I-TOP Yuli-NOM hard study-PAST-COMP
tul]-ess-e. Ne-nun?
hear-PAST-DECL you-TOP

‘I heard that Yuli studied math hard. How about you?’

H: **Swuhak-ul na-to kulay-ss-e.**
math-ACC I-also do.so-PAST-DECL

Intended: ‘I also heard that Yuli studied math hard.’

(2) Pongswu-wa Hyentong-ika kakca etten kkoch-ul Yuli-ka yelsimhi
Pongswu-and Hyentong-NOM each which flower-ACC Yuli-NOM diligently
sim-ess-tako tul-ess-nunci malha-ko iss-ess-ta.
plant-PAST-COMP hear-PAST-COMP talk-PROG PAST-DECL
‘Pongswu and Hyentong were talking about which flowers they each heard that Yuli planted diligently.’

P: Haypalaki-lul$_1$ na-nun [$_{VP}$[$_{CP}$ Yuli-ka yelsimhi t_1 sim-ess-tako]
sunflower-ACC I-TOP Yuli-NOM diligently plant-PAST-COMP
tul]-ess-e. Ne-nun?
hear-PAST-DECL you-TOP

‘I heard that Yuli planted sunflowers diligently. How about you?’

H: **Haypalaki-lul na-to kulay-ss-e.**
sunflower-ACC I-also so.do-PAST-DECL

Intended: ‘I also heard that Yuli planted sunflowers diligently.’

(3) Sungho-wa Changcin-ika kakca etten cencaceyphwum-ul Yuli-ka olay
Sungho-and Changcin-NOM each which electronic.goods-ACC Yuli-NOM long
sayongha-yss-tako tul-ess-nunci malha-ko iss-ess-ta.
use-PAST-COMP hear-PAST-COMP talk-PROG PAST-DECL
‘Sungho and Changcin were talking about which electronic goods they each heard that Yuli used for a long period of time.’

S: Nothupwuk-ul$_1$ na-nun [VP[CP Yuli-ka olay t_1 sayongha-yss-tako]
laptop-ACC I-TOP Yuli-NOM long use-PAST-COMP
tul]-ess-e. Ne-nun?
hear-PAST-DECL you-TOP

‘I heard that Yuli used a laptop for a long period of time. How about you?’

C: **Nothupwuk-ul na-to kulay-ss-e.**
laptop-ACC I-also so.do-PAST-DECL

Intended: ‘I also heard that Yuli used a laptop for a long period of time.’

(4) Kyuho-wa Sangchel-ika kakca etten mwuswul-ul Yuli-ka olay
Kyuho-and Sangchel-NOM each which martial.arts-ACC Yuli-NOM long
swulyenha-yss-tako tul-ess-nunci malha-ko iss-ess-ta.
practice-PAST-COMP hear-PAST-COMP talk-PROG PAST-DECL
‘Kyuho and Sangchel were talking about which martial arts they each heard that Yuli practiced for a long period of time.’

K: Thaykwuento-lul$_1$ na-nun [VP[CP Yuli-ka olay t_1 swulyenha-yss-tako]
Taekwondo-ACC I-TOP Yuli-NOM long practice-PAST-COMP
tul]-ess-e. Ne-nun?
hear-PAST-DECL you-TOP

‘I heard that Yuli practiced Taekwondo for a long period of time. How about you?’

S: **Thaykwuento-lul na-to kulay-ss-e.**
Taekwondo-ACC I-also so.do-PAST-DECL

Intended: ‘I also heard that Yuli practiced Taekwondo for a long period of time.’

(5) Kyengphyo-wa Caychel-ika kakca etten sociphwum-ul Yuli-ka cacwu
Kyengphyo-and Caychel-NOM each which belongings-ACC Yuli-NOM frequently
ilepeli-ess-tako tul-ess-nunci malha-ko iss-ess-ta.
lose-PAST-COMP hear-PAST-COMP talk-PROG PAST-DECL

‘Kyengphyo and Caychel were talking about which belongings they each heard that Yuli lost frequently.’

K: Cikap-ul$_1$ na-nun [$_{\text{VP}}$[$_{\text{CP}}$ Yuli-ka cacwu t_1 ilepeli-ess-tako]
wallet-ACC I-TOP Yuli-NOM frequently lose-PAST-COMP
tul]-ess-e. Ne-nun?
hear-PAST-DECL you-TOP

‘I heard that Yuli lost a wallet freqeuntly. How about you?’

C: **Cikap-ul na-to kulay-ss-e.**
wallet-ACC I-also so.do-PAST-DECL

Intended: ‘I also heard that Yuli lost a wallet frequently.’

(6) Congswu-wa Saypem-ika kakca etten cha-ul Yuli-ka cengmal
Congswu-and Saypem-NOM each which car-ACC Yuli-NOM really
coaha-yss-tako tul-ess-nunci malha-ko iss-ess-ta.
like-PAST-COMP hear-PAST-COMP talk-PROG PAST-DECL
‘Congswu and Saypem were talking about which car they each heard that Yuli really liked.’

C: Nywupithul-ul$_1$ na-nun [$_{\text{VP}}$[$_{\text{CP}}$ Yuli-ka cengmal t_1 coaha-yss-tako]
New.Beetle-ACC I-TOP Yuli-NOM really like-PAST-COMP
tul]-ess-e. Ne-nun?
hear-PAST-DECL you-TOP

‘I heard that Yuli really liked New Beetle. How about you?’

S: **Nywupithul-ul na-to kulay-ss-e.**
New.Beetle-ACC I-also so.do-PAST-DECL

Intended: ‘I also heard that Yuli really liked New Beetle.’

(7) Swuho-wa Cayhak-ika kakca etten panchan-ul Yuli-ka cengmal
Swuho-and Cayhak-NOM each which side.dish-ACC Yuli-NOM really
sileha-yss-tako tul-ess-nunci malha-ko iss-ess-ta.
dislike-PAST-COMP hear-PAST-COMP talk-PROG PAST-DECL
‘Swuho and Cayhak were talking about which side dish they each heard that Yuli really disliked.’

S: Kimchi-lul$_1$ na-nun [$_{\text{VP}}$[$_{\text{CP}}$ Yuli-ka cengmal t_1 sileha-yss-tako]
Kimchi-ACC I-TOP Yuli-NOM really dislike-PAST-COMP
tul]-ess-e. Ne-nun?
hear-PAST-DECL you-TOP

‘I heard that Yuli really disliked Kimchi. How about you?’

C: **Kimchi-lul na-to kulay-ss-e.**
Kimchi-ACC I-also so.do-PAST-DECL

Intended: 'I also heard that Yuli really disliked Kimchi.'

(8) Congwu-wa Taykwan-ika kakca etten homsyophing sangphwum-ul
Congwu-and Taykwan-NOM each which home.shopping goods-ACC
Yuli-ka cacwu cwumwunha-yss-tako tul-ess-nunci malha-ko
Yuli-NOM frequently order-PAST-COMP hear-PAST-COMP talk-PROG
iss-ess-ta.
PAST-DECL

'Congwu and Taykwan were talking about which home shopping goods they each heard that Yuli ordered frequently.'

C: Kimchi-lul$_1$ na-nun [$_{VP}$[$_{CP}$ Yuli-ka cacwu t_1 cwumwunha-yss-tako]
Kimchi-ACC I-TOP Yuli-NOM frequently order-PAST-COMP
tul]-ess-e. Ne-nun?
hear-PAST-DECL you-TOP

'I heard that Yuli ordered Kimchi frequently. How about you?'

T: **Kimchi-lul na-to kulay-ss-e.**
Kimchi-ACC I-also so.do-PAST-DECL

Intended: 'I also heard that Yuli ordered Kimchi frequently.'

(9) Bemswu-wa Twusik-ika kakca etten thipiphulo-lul Yuli-ka
Bemswu-and Twusik-NOM each which television.program-ACC Yuli-NOM
cacwu sichengha-yss-tako tul-ess-nunci malha-ko iss-ess-ta.
frequently watch-PAST-COMP hear-PAST-COMP talk-PROG PAST-DECL

'Bemswu and Twusik were talking about which TV show they each heard that Yuli watched frequently.'

B: Mwuhantocen-ul$_1$ na-nun [$_{VP}$[$_{CP}$ Yuli-ka cacwu t_1
Infinite.Challenge-ACC I-TOP Yuli-NOM frequently
sichengha-yss-tako] tul]-ess-e. Ne-nun?
watch-PAST-COMP hear-PAST-DECL you-TOP

'I heard that Yuli watched Infinite Challenge frequently. How about you?'

T: **Mwuhantocen-ul na-to kulay-ss-e.**
Infinite.Challenge-ACC I-also so.do-PAST-DECL

Intended: 'I also heard that Yuli watched Infinite Challenge frequently.'

(10) Chelswu-wa Heechel-ika kakca etten maykcwu-lul Yuli-ka cacwu
Chelswu-and Heechel-NOM each which beer-ACC Yuli-NOM frequently
masi-ess-tako tul-ess-nunci malha-ko iss-ess-ta.
drink-PAST-COMP hear-PAST-COMP talk-PROG PAST-DECL

'Chelswu and Heechel were talking about which beer they each heard that Yuli drank frequently.'

C: Chasu-lul$_1$ na-nun [$_{VP}$[$_{CP}$ Yuli-ka cacwu t_1 masi-ess-tako]
Cass-ACC I-TOP Yuli-NOM frequently drink-PAST-COMP
tul]-ess-e. Ne-nun?
hear-PAST-DECL you-TOP

'I heard that Yuli drank Cass frequently. How about you?'

H: **Chasu-lul na-to kulay-ss-e.**
Cass-ACC I-also so.do-PAST-DECL

Intended: 'I also heard that Yuli drank Cass frequently.'

(11) Minswu-wa Yengmin-ika kakca etten ilponumsik-ul Yuli-ka
Minswu-and Yengmin-NOM each which Japanese.food-ACC Yuli-NOM
cacwu mek-ess-tako tul-ess-nunci malha-ko iss-ess-ta.
frequently eat-PAST-COMP hear-PAST-COMP talk-PROG PAST-DECL
'Minswu and Yengmin were talking about which Japanese food they each heard that Yuli ate frequently.'

M: Udong-ul$_1$ na-nun [$_{VP}$[$_{CP}$ Yuli-ka cacwu t_1 mek-ess-tako]
Udon-ACC I-TOP Yuli-NOM frequently eat-PAST-COMP
tul]-ess-e. Ne-nun?
hear-PAST-DECL you-TOP

'I heard that Yuli ate Udon frequently. How about you?'

Y: **Udong-ul na-to kulay-ss-e.**
Udon-ACC I-also so.do-PAST-DECL

Intended: 'I also heard that Yuli ate Udon frequently.'

(12) Sengmo-wa Cinchel-ika kakca etten sinmwun-ul Yuli-ka olay
Sengmo-and Cinchel-NOM each which newspaper-ACC Yuli-NOM long
kwutokha-yss-tako tul-ess-nunci malha-ko iss-ess-ta.
subscribe-PAST-COMP hear-PAST-COMP talk-PROG PAST-DECL
'Sengmo and Cinchel were talking about which newspaper they each heard that Yuli subscribed to for a long period of time.'

S: Tongailpo-lul$_1$ na-nun [$_{VP}$[$_{CP}$ Yuli-ka olay t_1 kwutokha-yss-tako]
Dong-A.Ilbo-ACC I-TOP Yuli-NOM long subscribe-PAST-COMP
tul]-ess-e. Ne-nun?
hear-PAST-DECL you-TOP

'I heard that Yuli subscribed to Dong-A Ilbo for a long period of time. How about you?'

C: **Tongailpo-lul na-to kulay-ss-e.**
DongA.Ilbo-ACC I-also so.do-PAST-DECL

Intended: 'I also heard that Yuli subscribed to Dong-A Ilbo for a long period of time.'

(13) Hyenho-wa Tayhwun-ika kakca etten yenghwa-lul Yuli-ka cacwu
Hyenho-and Tayhwun-NOM each which movie-ACC Yuli-NOM frequently
poa-ss-tako tul-ess-nunci malha-ko iss-ess-ta.
watch-PAST-COMP hear-PAST-COMP talk-PROG PAST-DECL
'Hyenho and Tayhwun were talking about which movie they each heard that Yuli watched frequently.'

H: Phulocun-ul$_1$ na-nun [$_{VP}$[$_{CP}$ Yuli-ka cacwu t_1 poa-ss-tako]
Frozen-ACC I-TOP Yuli-NOM frequently watch-PAST-COMP
tul]-ess-e. Ne-nun?
hear-PAST-DECL you-TOP

'I heard that Yuli watched Frozen frequently. How about you?'

T: **Phulocun-ul na-to kulay-ss-e.**
Frozen-ACC I-also so.do-PAST-DECL

Intended: 'I also heard that Yuli watched Frozen frequently.'

(14) Thayswu-wa Myenghwun-ika kakca etten akki-lul Yuli-ka
Thayswu-and Myenghwun-NOM each which music.instrument-ACC Yuli-NOM
olay yencwuha-yss-tako tul-ess-nunci malha-ko iss-ess-ta.
long play-PAST-COMP hear-PAST-COMP talk-PROG PAST-DECL
'Thayswu and Myenghwun were talking about which music instrument they each heard that Yuli played for a long period of time.'

T: Phiano-lul$_1$ na-nun [$_{VP}$[$_{CP}$ Yuli-ka olay t_1 yencwuha-yss-tako]
piano-ACC I-TOP Yuli-NOM long play-PAST-COMP
tul]-ess-e. Ne-nun?
hear-PAST-DECL you-TOP

'I heard that Yuli played the piano for a long period of time. How about you?'

M: **Phiano-lul na-to kulay-ss-e.**
piano-ACC I-also so.do-PAST-DECL

Intended: 'I also heard that Yuli played the piano for a long period of time.'

(15) Hungswu-wa Minhyen-ika kakca etten hankwukumsik-ul Yuli-ka
Hungswu-and Minhyen-NOM each which Korean.food-ACC Yuli-NOM
cacwu yoliha-yss-tako tul-ess-nunci malha-ko iss-ess-ta.
frequently cook-PAST-COMP hear-PAST-COMP talk-PROG PAST-DECL
'Hungswu and Minhyen were talking about which Korean food they each heard that Yuli cooked frequently.'

H: Kimchi-lul$_1$ na-nun [$_{VP}$[$_{CP}$ Yuli-ka cacwu t_1 yoliha-yss-tako]
Kimchi-ACC I-TOP Yuli-NOM frequently cook-PAST-COMP
tul]-ess-e. Ne-nun?
hear-PAST-DECL you-TOP

‘I heard that Yuli cooked Kimchi frequently. How about you?’

M: **Kimchi-lul na-to kulay-ss-e.**
Kimchi-ACC I-also so.do-PAST-DECL

Intended: ‘I also heard that Yuli cooked Kimchi frequently.’

(16) Unphyo-wa Congsin-ika kakca etten nolay-lul Yuli-ka cacwu
Unphyo-and Congsin-NOM each which song-ACC Yuli-NOM frequently
pwulu-ess-tako tul-ess-nunci malha-ko iss-ess-ta.
sing-PAST-COMP hear-PAST-COMP talk-PROG PAST-DECL
‘Unphyo and Congsin were talking about which song they each heard that Yuli sang frequently.’

U: Mannam-ul$_1$ na-nun [$_{VP}$[$_{CP}$ Yuli-ka cacwu t_1 pwulu-ess-tako]
Mannam-ACC I-TOP Yuli-NOM frequently sing-PAST-COMP
tul]-ess-e. Ne-nun?
hear-PAST-DECL you-TOP

‘I heard that Yuli sang Mannam frequently. How about you?’

C: **Mannam-ul na-to kulay-ss-e.**
Mannam-ACC I-also so.do-PAST-DECL

Intended: ‘I also heard that Yuli sang Mannam frequently.’

(17) Kithay-wa Cenghwun-ika kakca etten nolay-lul Yuli-ka cacwu
Kithay-and Cenghwun-NOM each which song-ACC Yuli-NOM frequently
tul-ess-tako tul-ess-nunci malha-ko iss-ess-ta.
listen-PAST-COMP hear-PAST-COMP talk-PROG PAST-DECL
‘Kithay and Cenghwun were talking about which song they each heard that Yuli listened to frequently.’

K: Mannam-ul$_1$ na-nun [$_{VP}$[$_{CP}$ Yuli-ka cacwu t_1 tul-ess-tako]
Mannam-ACC I-TOP Yuli-NOM frequently listen-PAST-COMP
tul]-ess-e. Ne-nun?
hear-PAST-DECL you-TOP

‘I heard that Yuli listened to Mannam frequently. How about you?’

C: **Mannam-ul na-to kulay-ss-e.**
Mannam-ACC I-also so.do-PAST-DECL

Intended: ‘I also heard that Yuli listened to Mannam frequently.’

(18) Kyengho-wa Hakpem-ika kakca etten kwail-ul Yuli-ka cacwu
Kyengho-and Hakpem-NOM each which fruit-ACC Yuli-NOM frequently
sa-ss-tako tul-ess-nunci malha-ko iss-ess-ta.
buy-PAST-COMP hear-PAST-COMP talk-PROG PAST-DECL
‘Kyengho and Hakpem were talking about which fruit they each heard that Yuli bought frequently.’

K: Sakwa-lul$_1$ na-nun [$_{VP}$[$_{CP}$ Yuli-ka cacwu t_1 sa-ss-tako]
apple-ACC I-TOP Yuli-NOM frequently buy-PAST-COMP
tul]-ess-e. Ne-nun?
hear-PAST-DECL you-TOP

‘I heard that Yuli bought apples frequently. How about you?’

H: **Sakwa-lul na-to kulay-ss-e.**
apple-ACC I-also so.do-PAST-DECL

Intended: ‘I also heard that Yuli bought apples frequently.’

(19) Hyenwu-wa Tonghwun-ika kakca etten chwum-ul Yuli-ka mayil
Hyenwu-and Tonghwun-NOM each which dance-ACC Yuli-NOM every.day
chwu-ess-tako tul-ess-nunci malha-ko iss-ess-ta.
dance-PAST-COMP hear-PAST-COMP talk-PROG PAST-DECL
‘Hyenwu and Tonghwun were talking about which dance they each heard that Yuli danced everyday.’

H: Thayngko-lul$_1$ na-nun [$_{VP}$[$_{CP}$ Yuli-ka mayil t_1 chwu-ess-tako]
Tango-ACC I-TOP Yuli-NOM every.day dance-PAST-COMP
tul]-ess-e. Ne-nun?
hear-PAST-DECL you-TOP

‘I heard that Yuli danced Tango everyday. How about you?’

T: **Thayngko-lul na-to kulay-ss-e.**
Tango-ACC I-also so.do-PAST-DECL

Intended: ‘I also heard that Yuli danced Tango everyday.’

(20) Ciseng-iwa Mincong-ika kakca etten aywantongmwul-ul Yuli-ka olay
Ciseng-and Mincong-NOM each which pet-ACC Yuli-NOM long
khiwu-ess-tako tul-ess-nunci malha-ko iss-ess-ta.
raise-PAST-COMP hear-PAST-COMP talk-PROG PAST-DECL
‘Ciseng and Mincong were talking about which pet they each heard that Yuli kept for a long period of time.’

C: Kay-lul$_1$ na-nun [$_{VP}$[$_{CP}$ Yuli-ka olay t_1 khiwu-ess-tako]
dog-ACC I-TOP Yuli-NOM long raise-PAST-COMP
tul]-ess-e. Ne-nun?
hear-PAST-DECL you-TOP

‘I heard that Yuli kept a dog for a long period of time. How about you?’

M: **Kay-lul na-to kulay-ss-e.**
dog-ACC I-also so.do-PAST-DECL

Intended: ‘I also heard that Yuli kept a dog for a long period of time.’

(21) Henswu-wa Canghwun-ika kakca etten mwulken-ul Yuli-ka olay
Henswu-and Canghwun-NOM each which item-ACC Yuli-NOM long
mo-ass-tako tul-ess-nunci malha-ko iss-ess-ta.
collect-PAST-COMP hear-PAST-COMP talk-PROG PAST-DECL
'Henswu and Canghwun were talking about which item they each heard that Yuli collected for a long period of time.'

H: Wuphyo-lul$_1$ na-nun [$_{\text{VP}}$[$_{\text{CP}}$ Yuli-ka olay t_1 mo-ass-tako]
stamp-ACC I-TOP Yuli-NOM long collect-PAST-COMP
tul]-ess-e. Ne-nun?
hear-PAST-DECL you-TOP

'I heard that Yuli collected stamps for a long period of time. How about you?'

C: **Wuphyo-lul na-to kulay-ss-e.**
stamp-ACC I-also so.do-PAST-DECL

Intended: 'I also heard that Yuli collected stamps for a long period of time.'

(22) Changho-wa Minhyen-ika kakca etten wuekuke-lul Yuli-ka olay
Changho-and Minhyen-NOM each which foreign.language-ACC Yuli-NOM long
paywu-ess-tako tul-ess-nunci malha-ko iss-ess-ta.
learn-PAST-COMP hear-PAST-COMP talk-PROG PAST-DECL
'Changho and Minhyen were talking about which foreign language they each heard that Yuli learned for a long period of time.'

C: Pwule-lul$_1$ na-nun [$_{\text{VP}}$[$_{\text{CP}}$ Yuli-ka olay t_1 paywu-ess-tako]
French-ACC I-TOP Yuli-NOM long learn-PAST-COMP
tul]-ess-e. Ne-nun?
hear-PAST-DECL you-TOP

'I heard that Yuli learned French for a long period of time. How about you?'

M: **Pwule-lul na-to kulay-ss-e.**
French-ACC I-also so.do-PAST-DECL

Intended: 'I also heard that Yuli learned French for a long period of time.'

(23) Cengho-wa Senghyen-ika kakca etten ppang-ul Yuli-ka cacwu
Cengho-and Senghyen-NOM each which bread-ACC Yuli-NOM frequently
kwu-ess-tako tul-ess-nunci malha-ko iss-ess-ta.
bake-PAST-COMP hear-PAST-COMP talk-PROG PAST-DECL
'Cengho and Senghyen were talking about which bread they each heard that Yuli baked frequently.'

C: Manulppang-ul$_1$ na-nun [$_{\text{VP}}$[$_{\text{CP}}$ Yuli-ka cacwu t_1 kwu-ess-tako]
garlic.bread-ACC I-TOP Yuli-NOM frequently bake-PAST-COMP
tul]-ess-e. Ne-nun?
hear-PAST-DECL you-TOP

'I heard that Yuli baked garlic bread frequently. How about you?'

S: **Manulppang-ul na-to kulay-ss-e.**
garlic.bread-ACC I-also so.do-PAST-DECL

Intended: 'I also heard that Yuli baked garlic bread frequently, too.'

(24) Tonghay-wa Siwan-ika kakca etten chayk-ul Yuli-ka cacwu
Tonghay-and Siwan-NOM each which book-ACC Yuli-NOM frequently
ilk-ess-tako tul-ess-nunci malha-ko iss-ess-ta.
read-PAST-COMP hear-PAST-COMP talk-PROG PAST-DECL
'Tonghay and Siwan were talking about which book they each heard that Yuli read frequently.'

T: Hayliphothe-lul$_1$ na-nun [$_{\text{VP}}$[$_{\text{CP}}$ Yuli-ka cacwu t_1 ilk-ess-tako]
Harry.Potter-ACC I-TOP Yuli-NOM frequently read-PAST-COMP
tul]-ess-e. Ne-nun?
hear-PAST-DECL you-TOP

'I heard that Yuli read Harry Potter frequently. How about you?'

S: **Hayliphothe-lul na-to kulay-ss-e.**
Harry.Potter-ACC I-also so.do-PAST-DECL

Intended: 'I also heard that Yuli read Harry Potter frequently.'

E.4 Condition 4: Complex-NoExtraction

(1) Minswu-wa Hanswu-ka kakca etten kwamok-ul Yuli-ka yelsimhi
Minswu-and Hanswu-NOM each which subject-ACC Yuli-NOM hard
kongpwuha-yess-tako sayngkakha-yess-nunci malha-ko iss-ess-ta.
study-PAST-COMP think-PAST-COMP talk-PROG PAST-DECL
'Minswu and Hanswu were talking about which subject they each thought that Yuli studied hard.'

M: Na-nun [$_{\text{VP}}$[$_{\text{CP}}$ Yuli-ka yelsimhi swuhak-ul kongpwuha-yss-tako]
I-TOP Yuli-NOM hard math-ACC study-PAST-COMP
sayngkakha]-yss-e. Ne-nun?
think-PAST-DECL you-TOP

'I thought that Yuli studied math hard. How about you?'

H: **Na-to kulay-ss-e.**
I-also do.SO-PAST-DECL

Intended: 'I also thought that Yuli studied math hard.'

(2) Pongswu-wa Hyentong-ika kakca etten kkoch-ul Yuli-ka yelsimhi
Pongswu-and Hyentong-NOM each which flower-ACC Yuli-NOM diligently
sim-ess-tako tul-ess-nunci malha-ko iss-ess-ta.
plant-PAST-COMP hear-PAST-COMP talk-PROG PAST-DECL

‘Pongswu and Hyentong were talking about which flowers they each heard that Yuli planted diligently.’

P: Na-nun $[_{\text{VP}}[_{\text{CP}}$ Yuli-ka yelsimhi haypalaki-lul sim-ess-tako]
I-TOP Yuli-NOM diligently sunflower-ACC plant-PAST-COMP
tul]-ess-e. Ne-nun?
hear-PAST-DECL you-TOP

‘I heard that Yuli planted sunflowers diligently. How about you?’

H: **Na-to kulay-ss-e.**
I-also SO.DO-PAST-DECL

Intended: ‘I also heard that Yuli planted sunflowers diligently.’

(3) Sungho-wa Changcin-ika kakca etten cencaceyphwum-ul Yuli-ka olay
Sungho-and Changcin-NOM each which electronic.goods-ACC Yuli-NOM long
sayongha-yss-tako tul-ess-nunci malha-ko iss-ess-ta.
use-PAST-COMP hear-PAST-COMP talk-PROG PAST-DECL

‘Sungho and Changcin were talking about which electronic goods they each heard that Yuli used for a long period of time.’

S: Na-nun $[_{\text{VP}}[_{\text{CP}}$ Yuli-ka olay nothupwuk-ul sayongha-yss-tako]
I-TOP Yuli-NOM long laptop-ACC use-PAST-COMP
tul]-ess-e. Ne-nun?
hear-PAST-DECL you-TOP

‘I heard that Yuli used a laptop for a long period of time. How about you?’

C: **Na-to kulay-ss-e.**
I-also SO.DO-PAST-DECL

Intended: ‘I also heard that Yuli used a laptop for a long period of time.’

(4) Kyuho-wa Sangchel-ika kakca etten mwuswul-ul Yuli-ka olay
Kyuho-and Sangchel-NOM each which martial.arts-ACC Yuli-NOM long
swulyenha-yss-tako tul-ess-nunci malha-ko iss-ess-ta.
practice-PAST-COMP hear-PAST-COMP talk-PROG PAST-DECL

‘Kyuho and Sangchel were talking about which martial arts they each heard that Yuli practiced for a long period of time.’

K: Na-nun $[_{\text{VP}}[_{\text{CP}}$ Yuli-ka olay thaykwuento-lul swulyenha-yss-tako]
I-TOP Yuli-NOM long Taekwondo-ACC practice-PAST-COMP
tul]-ess-e. Ne-nun?
hear-PAST-DECL you-TOP

‘I heard that Yuli practiced Taekwondo for a long period of time. How about you?’

S: **Na-to kulay-ss-e.**
I-also SO.DO-PAST-DECL

Intended: ‘I also heard that Yuli practiced Taekwondo for a long period of time.’

(5) Kyengphyo-wa Caychel-ika kakca etten sociphwum-ul Yuli-ka cacwu
Kyengphyo-and Caychel-NOM each which belongings-ACC Yuli-NOM frequently
ilepeli-ess-tako tul-ess-nunci malha-ko iss-ess-ta.
lose-PAST-COMP hear-PAST-COMP talk-PROG PAST-DECL

‘Kyengphyo and Caychel were talking about which belongings they each heard that Yuli lost frequently.’

K: Na-nun [$_{\text{VP}}$[$_{\text{CP}}$ Yuli-ka cacwu cikap-ul ilepeli-ess-tako]
I-TOP Yuli-NOM frequently wallet-ACC lose-PAST-COMP
tul]-ess-e. Ne-nun?
hear-PAST-DECL you-TOP

‘I heard that Yuli lost a wallet freqeuntly. How about you?’

C: **Na-to kulay-ss-e.**
I-also SO.DO-PAST-DECL

Intended: ‘I also heard that Yuli lost a wallet frequently.’

(6) Congswu-wa Saypem-ika kakca etten cha-ul Yuli-ka cengmal
Congswu-and Saypem-NOM each which car-ACC Yuli-NOM really
coaha-yss-tako tul-ess-nunci malha-ko iss-ess-ta.
like-PAST-COMP hear-PAST-COMP talk-PROG PAST-DECL

‘Congswu and Saypem were talking about which car they each heard that Yuli really liked.’

C: Na-nun [$_{\text{VP}}$[$_{\text{CP}}$ Yuli-ka cengmal nywupithul-ul coaha-yss-tako]
I-TOP Yuli-NOM really New.Beetle-ACC like-PAST-COMP
tul]-ess-e. Ne-nun?
hear-PAST-DECL you-TOP

‘I heard that Yuli really liked New Beetle. How about you?’

S: **Na-to kulay-ss-e.**
I-also SO.DO-PAST-DECL

Intended: ‘I also heard that Yuli really liked New Beetle.’

(7) Swuho-wa Cayhak-ika kakca etten panchan-ul Yuli-ka cengmal
Swuho-and Cayhak-NOM each which side.dish-ACC Yuli-NOM really
sileha-yss-tako tul-ess-nunci malha-ko iss-ess-ta.
dislike-PAST-COMP hear-PAST-COMP talk-PROG PAST-DECL

‘Swuho and Cayhak were talking about which side dish they each heard that Yuli really disliked.’

S: Na-nun [VP[CP Yuli-ka cengmal kimchi-lul sileha-yss-tako]
I-TOP Yuli-NOM really Kimchi-ACC dislike-PAST-COMP
tul]-ess-e. Ne-nun?
hear-PAST-DECL you-TOP

'I heard that Yuli really disliked Kimchi. How about you?'

C: **Na-to kulay-ss-e.**
I-also SO.DO-PAST-DECL

Intended: 'I also heard that Yuli really disliked Kimchi.'

(8) Congwu-wa Taykwan-ika kakca etten homsyophing sangphwum-ul
Congwu-and Taykwan-NOM each which home.shopping goods-ACC
Yuli-ka cacwu cwumwunha-yss-tako tul-ess-nunci malha-ko
Yuli-NOM frequently order-PAST-COMP hear-PAST-COMP talk-PROG
iss-ess-ta.
PAST-DECL

'Congwu and Taykwan were talking about which home shopping goods they each heard that Yuli ordered frequently.'

C: Na-nun [VP[CP Yuli-ka cacwu kimchi-lul cwumwunha-yss-tako]
I-TOP Yuli-NOM frequently Kimchi-ACC order-PAST-COMP
tul]-ess-e. Ne-nun?
hear-PAST-DECL you-TOP

'I heard that Yuli ordered Kimchi frequently. How about you?'

T: **Na-to kulay-ss-e.**
I-also SO.DO-PAST-DECL

Intended: 'I also heard that Yuli ordered Kimchi frequently.'

(9) Bemswu-wa Twusik-ika kakca etten thipiphulo-lul Yuli-ka
Bemswu-and Twusik-NOM each which television.program-ACC Yuli-NOM
cacwu sichengha-yss-tako tul-ess-nunci malha-ko iss-ess-ta.
frequently watch-PAST-COMP hear-PAST-COMP talk-PROG PAST-DECL

'Bemswu and Twusik were talking about which TV show they each heard that Yuli watched frequently.'

B: Na-nun [VP[CP Yuli-ka cacwu mwuhantocen-ul
I-TOP Yuli-NOM frequently Infinite.Challenge-ACC
sichengha-yss-tako] tul]-ess-e. Ne-nun?
watch-PAST-COMP hear-PAST-DECL you-TOP

'I heard that Yuli watched Infinite Challenge frequently. How about you?'

T: **Na-to kulay-ss-e.**
I-also SO.DO-PAST-DECL

Intended: 'I also heard that Yuli watched Infinite Challenge frequently.'

(10) Chelswu-wa Heechel-ika kakca etten maykcwu-lul Yuli-ka cacwu
Chelswu-and Heechel-NOM each which beer-ACC Yuli-NOM frequently
masi-ess-tako tul-ess-nunci malha-ko iss-ess-ta.
drink-PAST-COMP hear-PAST-COMP talk-PROG PAST-DECL

'Chelswu and Heechel were talking about which beer they each heard that Yuli drank frequently.'

C: Na-nun [VP[CP Yuli-ka cacwu chasu-lul masi-ess-tako]
I-TOP Yuli-NOM frequently Cass-ACC drink-PAST-COMP
tul]-ess-e. Ne-nun?
hear-PAST-DECL you-TOP

'I heard that Yuli drank Cass frequently. How about you?'

H: **Na-to kulay-ss-e.**
I-also so.do-PAST-DECL

Intended: 'I also heard that Yuli drank Cass frequently.'

(11) Minswu-wa Yengmin-ika kakca etten ilponumsik-ul Yuli-ka
Minswu-and Yengmin-NOM each which Japanese.food-ACC Yuli-NOM
cacwu mek-ess-tako tul-ess-nunci malha-ko iss-ess-ta.
frequently eat-PAST-COMP hear-PAST-COMP talk-PROG PAST-DECL

'Minswu and Yengmin were talking about which Japanese food they each heard that Yuli ate frequently.'

M: Na-nun [VP[CP Yuli-ka cacwu udong-ul mek-ess-tako]
I-TOP Yuli-NOM frequently Udon-ACC eat-PAST-COMP
tul]-ess-e. Ne-nun?
hear-PAST-DECL you-TOP

'I heard that Yuli ate Udon frequently. How about you?'

Y: **Na-to kulay-ss-e.**
I-also so.do-PAST-DECL

Intended: 'I also heard that Yuli ate Udon frequently.'

(12) Sengmo-wa Cinchel-ika kakca etten sinmwun-ul Yuli-ka olay
Sengmo-and Cinchel-NOM each which newspaper-ACC Yuli-NOM long
kwutokha-yss-tako tul-ess-nunci malha-ko iss-ess-ta.
subscribe-PAST-COMP hear-PAST-COMP talk-PROG PAST-DECL

'Sengmo and Cinchel were talking about which newspaper they each heard that Yuli subscribed to for a long period of time.'

S: Na-nun [VP[CP Yuli-ka olay tongailpo-lul kwutokha-yss-tako]
I-TOP Yuli-NOM long Dong-A.Ilbo-ACC subscribe-PAST-COMP
tul]-ess-e. Ne-nun?
hear-PAST-DECL you-TOP

‘I heard that Yuli subscribed to Dong-A Ilbo for a long period of time. How about you?’

C: **Na-to kulay-ss-e.**
I-also so.do-PAST-DECL

Intended: ‘I also heard that Yuli subscribed to Dong-A Ilbo for a long period of time.’

(13) Hyenho-wa Tayhwun-ika kakca etten yenghwa-lul Yuli-ka cacwu
Hyenho-and Tayhwun-NOM each which movie-ACC Yuli-NOM frequently
poa-ss-tako tul-ess-nunci malha-ko iss-ess-ta.
watch-PAST-COMP hear-PAST-COMP talk-PROG PAST-DECL
‘Hyenho and Tayhwun were talking about which movie they each heard that Yuli watched frequently.’

H: Na-nun [$_{VP}$[$_{CP}$ Yuli-ka cacwu phulocun-ul poa-ss-tako]
I-TOP Yuli-NOM frequently Frozen-ACC watch-PAST-COMP
tul]-ess-e. Ne-nun?
hear-PAST-DECL you-TOP

‘I heard that Yuli watched Frozen frequently. How about you?’

T: **Na-to kulay-ss-e.**
I-also so.do-PAST-DECL

Intended: ‘I also heard that Yuli watched Frozen frequently.’

(14) Thayswu-wa Myenghwun-ika kakca etten akki-lul Yuli-ka
Thayswu-and Myenghwun-NOM each which music.instrument-ACC Yuli-NOM
olay yencwuha-yss-tako tul-ess-nunci malha-ko iss-ess-ta.
long play-PAST-COMP hear-PAST-COMP talk-PROG PAST-DECL
‘Thayswu and Myenghwun were talking about which music instrument they each heard that Yuli played for a long period of time.’

T: Na-nun [$_{VP}$[$_{CP}$ Yuli-ka olay phiano-lul yencwuha-yss-tako]
I-TOP Yuli-NOM long piano-ACC play-PAST-COMP
tul]-ess-e. Ne-nun?
hear-PAST-DECL you-TOP

‘I heard that Yuli played the piano for a long period of time. How about you?’

M: **Na-to kulay-ss-e.**
I-also so.do-PAST-DECL

Intended: ‘I also heard that Yuli played the piano for a long period of time.’

(15) Hungswu-wa Minhyen-ika kakca etten hankwukumsik-ul Yuli-ka
Hungswu-and Minhyen-NOM each which Korean.food-ACC Yuli-NOM
cacwu yoliha-yss-tako tul-ess-nunci malha-ko iss-ess-ta.
frequently cook-PAST-COMP hear-PAST-COMP talk-PROG PAST-DECL

‘Hungswu and Minhyen were talking about which Korean food they each heard that Yuli cooked frequently.’

H: Na-nun [$_{VP}$[$_{CP}$ Yuli-ka cacwu kimchi-lul yoliha-yss-tako]
I-TOP Yuli-NOM frequently Kimchi-ACC cook-PAST-COMP
tul]-ess-e. Ne-nun?
hear-PAST-DECL you-TOP

‘I heard that Yuli cooked Kimchi frequently. How about you?’

M: **Na-to kulay-ss-e.**
I-also so.do-PAST-DECL

Intended: ‘I also heard that Yuli cooked Kimchi frequently.’

(16) Unphyo-wa Congsin-ika kakca etten nolay-lul Yuli-ka cacwu
Unphyo-and Congsin-NOM each which song-ACC Yuli-NOM frequently
pwulu-ess-tako tul-ess-nunci malha-ko iss-ess-ta.
sing-PAST-COMP hear-PAST-COMP talk-PROG PAST-DECL

‘Unphyo and Congsin were talking about which song they each heard that Yuli sang frequently.’

U: Na-nun [$_{VP}$[$_{CP}$ Yuli-ka cacwu mannam-ul pwulu-ess-tako]
I-TOP Yuli-NOM frequently Mannam-ACC sing-PAST-COMP
tul]-ess-e. Ne-nun?
hear-PAST-DECL you-TOP

‘I heard that Yuli sang Mannam frequently. How about you?’

C: **Na-to kulay-ss-e.**
I-also so.do-PAST-DECL

Intended: ‘I also heard that Yuli sang Mannam frequently.’

(17) Kithay-wa Cenghwun-ika kakca etten nolay-lul Yuli-ka cacwu
Kithay-and Cenghwun-NOM each which song-ACC Yuli-NOM frequently
tul-ess-tako tul-ess-nunci malha-ko iss-ess-ta.
listen-PAST-COMP hear-PAST-COMP talk-PROG PAST-DECL

‘Kithay and Cenghwun were talking about which song they each heard that Yuli listened to frequently.’

K: Na-nun [$_{VP}$[$_{CP}$ Yuli-ka cacwu mannam-ul tul-ess-tako]
I-TOP Yuli-NOM frequently Mannam-ACC listen-PAST-COMP
tul]-ess-e. Ne-nun?
hear-PAST-DECL you-TOP

‘I heard that Yuli listened to Mannam frequently. How about you?’

C: **Na-to kulay-ss-e.**
I-also so.do-PAST-DECL

Intended: ‘I also heard that Yuli listened to Mannam frequently.’

(18) Kyengho-wa Hakpem-ika kakca etten kwail-ul Yuli-ka cacwu
Kyengho-and Hakpem-NOM each which fruit-ACC Yuli-NOM frequently
sa-ss-tako tul-ess-nunci malha-ko iss-ess-ta.
buy-PAST-COMP hear-PAST-COMP talk-PROG PAST-DECL
‘Kyengho and Hakpem were talking about which fruit they each heard that Yuli bought frequently.’

K: Na-nun [$_{VP}$[$_{CP}$ Yuli-ka cacwu sakwa-lul sa-ss-tako]
I-TOP Yuli-NOM frequently apple-ACC buy-PAST-COMP
tul]-ess-e. Ne-nun?
hear-PAST-DECL you-TOP

‘I heard that Yuli bought apples frequently. How about you?’

H: **Na-to kulay-ss-e.**
I-also SO.DO-PAST-DECL

Intended: ‘I also heard that Yuli bought apples frequently.’

(19) Hyenwu-wa Tonghwun-ika kakca etten chwum-ul Yuli-ka mayil
Hyenwu-and Tonghwun-NOM each which dance-ACC Yuli-NOM every.day
chwu-ess-tako tul-ess-nunci malha-ko iss-ess-ta.
dance-PAST-COMP hear-PAST-COMP talk-PROG PAST-DECL
‘Hyenwu and Tonghwun were talking about which dance they each heard that Yuli danced everyday.’

H: Na-nun [$_{VP}$[$_{CP}$ Yuli-ka mayil thayngko-lul chwu-ess-tako]
I-TOP Yuli-NOM every.day Tango-ACC dance-PAST-COMP
tul]-ess-e. Ne-nun?
hear-PAST-DECL you-TOP

‘I heard that Yuli danced Tango everyday. How about you?’

T: **Na-to kulay-ss-e.**
I-also SO.DO-PAST-DECL

Intended: ‘I also heard that Yuli danced Tango everyday.’

(20) Ciseng-iwa Mincong-ika kakca etten aywantongmwul-ul Yuli-ka olay
Ciseng-and Mincong-NOM each which pet-ACC Yuli-NOM long
khiwu-ess-tako tul-ess-nunci malha-ko iss-ess-ta.
raise-PAST-COMP hear-PAST-COMP talk-PROG PAST-DECL
‘Ciseng and Mincong were talking about which pet they each heard that Yuli kept for a long period of time.’

C: Na-nun [$_{VP}$[$_{CP}$ Yuli-ka olay kay-lul khiwu-ess-tako]
I-TOP Yuli-NOM long dog-ACC raise-PAST-COMP
tul]-ess-e. Ne-nun?
hear-PAST-DECL you-TOP

‘I heard that Yuli kept a dog for a long period of time. How about you?’

M: **Na-to kulay-ss-e.**
I-also SO.DO-PAST-DECL

Intended: ‘I also heard that Yuli kept a dog for a long period of time.’

(21) Henswu-wa Canghwun-ika kakca etten mwulken-ul Yuli-ka olay
Henswu-and Canghwun-NOM each which item-ACC Yuli-NOM long
mo-ass-tako tul-ess-nunci malha-ko iss-ess-ta.
collect-PAST-COMP hear-PAST-COMP talk-PROG PAST-DECL
‘Henswu and Canghwun were talking about which item they each heard that Yuli collected for a long period of time.’

H: Na-nun [$_{VP}$[$_{CP}$ Yuli-ka olay wuphyo-lul mo-ass-tako]
I-TOP Yuli-NOM long stamp-ACC collect-PAST-COMP
tul]-ess-e. Ne-nun?
hear-PAST-DECL you-TOP

‘I heard that Yuli collected stamps for a long period of time. How about you?’

C: **Na-to kulay-ss-e.**
I-also SO.DO-PAST-DECL

Intended: ‘I also heard that Yuli collected stamps for a long period of time.’

(22) Changho-wa Minhyen-ika kakca etten wuekuke-lul Yuli-ka olay
Changho-and Minhyen-NOM each which foreign.language-ACC Yuli-NOM long
paywu-ess-tako tul-ess-nunci malha-ko iss-ess-ta.
learn-PAST-COMP hear-PAST-COMP talk-PROG PAST-DECL
‘Changho and Minhyen were talking about which foreign language they each heard that Yuli learned for a long period of time.’

C: Na-nun [$_{VP}$[$_{CP}$ Yuli-ka olay pwule-lul paywu-ess-tako]
I-TOP Yuli-NOM long French-ACC learn-PAST-COMP
tul]-ess-e. Ne-nun?
hear-PAST-DECL you-TOP

‘I heard that Yuli learned French for a long period of time. How about you?’

M: **Na-to kulay-ss-e.**
I-also SO.DO-PAST-DECL

Intended: ‘I also heard that Yuli learned French for a long period of time.’

(23) Cengho-wa Senghyen-ika kakca etten ppang-ul Yuli-ka cacwu
Cengho-and Senghyen-NOM each which bread-ACC Yuli-NOM frequently
kwu-ess-tako tul-ess-nunci malha-ko iss-ess-ta.
bake-PAST-COMP hear-PAST-COMP talk-PROG PAST-DECL
‘Cengho and Senghyen were talking about which bread they each heard that Yuli baked frequently.’

C: Na-nun [VP[CP Yuli-ka cacwu manulppang-ul kwu-ess-tako]
I-TOP Yuli-NOM frequently garlic.bread-ACC bake-PAST-COMP
tul]-ess-e. Ne-nun?
hear-PAST-DECL you-TOP

‘I heard that Yuli baked garlic bread frequently. How about you?’

S: **Manulppang-ul na-to kulay-ss-e.**
garlic.bread-ACC I-also so.do-PAST-DECL

Intended: ‘I also heard that Yuli baked garlic bread frequently, too.’

(24) Tonghay-wa Siwan-ika kakca etten chayk-ul Yuli-ka cacwu
Tonghay-and Siwan-NOM each which book-ACC Yuli-NOM frequently
ilk-ess-tako tul-ess-nunci malha-ko iss-ess-ta.
read-PAST-COMP hear-PAST-COMP talk-PROG PAST-DECL

‘Tonghay and Siwan were talking about which book they each heard that Yuli read frequently.’

T: Na-nun [VP[CP Yuli-ka cacwu hayliphothe-lul ilk-ess-tako]
I-TOP Yuli-NOM frequently Harry.Potter-ACC read-PAST-COMP
tul]-ess-e. Ne-nun?
hear-PAST-DECL you-TOP

‘I heard that Yuli read Harry Potter frequently. How about you?’

S: **Na-to kulay-ss-e.**
I-also so.do-PAST-DECL

Intended: ‘I also heard that Yuli read Harry Potter frequently.’

Appendix F

Test sentences from Experiment 5

F.1 Condition 1: NullObject-Bound (sloppy identity reading)

(1) Minswu, Kiswu, Cinswu-ka say kiswuksa-lo isaha-ko iss-ess-ta.
Minswu Kiswu Cinswu-NOM new dormitory-to move-PROG PAST-DECL
Minswu-ka Minswu-uy cim-ul nalu-ess-ta. Kiswu-to Kiswu-uy
Minswu-NOM Minswu-GEN stuff-ACC move-PAST-DECL Kiswu-also Kiswu-GEN
cim-ul nalu-ess-ta.
stuff-ACC move-PAST-DECL

'Minswu, Kiswu, and Cinswu were moving to a new dormitory. Minswu moved Minswu's stuff. Kiswu also moved Kiswu's stuff.'

Minswu-ka ku-uy cim-ul nalu-ess-ko, **Kiswu-to** [e]
Minswu-NOM he-GEN stuff-ACC move-PAST-CONJ Kiswu-also
nalu-ess-ta.
move-PAST-DECL

'Minswu moved his stuff, and Kiswu moved, too.'

(2) Yonghi, Kenhi, Myengho-ka wuntongcang-eyse yakwu-lul ha-ko
Yonghi Kenhi Myengho-NOM play.ground-in baseball-ACC do-PROG
iss-ess-ta. Yonghi-ka Yonghi-uy kong-ul tenci-ess-ta. Kenhi-to
PAST-DECL Yonghi-NOM Yonghi-GEN ball-ACC throw-PAST-DECL Kenhi-also
Kenhi-uy kong-ul tenci-ess-ta.
Kenhi-GEN ball-ACC throw-PAST-DECL

'Yonghi, Kenhi, and Myengho were playing basketball in a playground. Yonghi threw Yonghi's ball. Kenhi also threw Kenhi's ball.'

Yonghi-ka ku-uy kong-ul tenci-ess-ko, **Kenhi-to** [e]
Yonghi-NOM he-GEN ball-ACC throw-PAST-CONJ Kenhi-also
tenci-ess-ta.
throw-PAST-DECL

‘Yonghi threw his ball, and Kenhi threw, too.’

(3) Thayswu, Kiswu, Cengswu-ka pa-eyse wuain-ul masi-ko iss-ess-ta.
Thayswu Kiswu Cengswu-NOM bar-at wuain-ACC drink-PROG PAST-DECL
Thayswu-ka Thayswu-uy wuaincan-ul kkaythuli-ess-ta. Kiswu-to
Thayswu-NOM Thayswu-GEN wine.glass-ACC break-PAST-DECL Kiswu-also
Kiswu-uy wuaincan-ul kkaythuli-ess-ta.
Kiswu-GEN wine.glass-ACC break-PAST-DECL

‘Thayswu, Kiswu, and Cengswu were drinking wine at a bar. Thayswu broke Thayswu’s wine glass. Kiswu also broke Kiswu’s wine glass.’

Thayswu-ka ku-uy wuaincan-ul kkaythuli-ess-ko, **Kiswu-to** [e]
Thayswu-NOM he-GEN wine.glass-ACC break-PAST-CONJ Kiswu-also
kkaythuli-ess-ta.
break-PAST-DECL

‘Thayswu broke his wine glass, and Kiswu broke, too.’

(4) Myengswu, Hyenswu, Cwunswu-ka wuntong hwu swui-ko iss-ess-ta.
Myengswu Hyenswu Cwunswu-NOM exercise after rest-PROG PAST-DECL
Myengswu-ka Myengswu-uy umlyoswu-lul masi-ess-ta. Hyenswu-to
Myengswu-NOM Myengswu-GEN beverage-ACC drink-PAST-DECL Hyenswu-also
Hyenswu-uy umlyoswu-lul masi-ess-ta.
Hyenswu-GEN beverage-ACC drink-PAST-DECL

‘Myengswu, Hyenswu, and Cwunswu were taking a rest after exercise. Myengswu drank Myengswu’s beverage. Hyenswu also drank Hyenswu’s beverage.’

Myengswu-ka ku-uy umlyoswu-lul masi-ess-ko, **Hyenswu-to** [e]
Myengswu-NOM he-GEN beverage-ACC drink-PAST-CONJ Hyenswu-also
masi-ess-ta.
drink-PAST-DECL

‘Myengswu drank his beverage, and Hyenswu drank, too.’

(5) Pyengswu, Mwunswu, Cwunswu-ka cip-ul chengsoha-ko iss-ess-ta.
Pyengswu Mwunswu Cwunswu-NOM house-ACC clean-PROG PAST-DECL
Pyengswu-ka Pyengswu-uy pang-ul ssul-ess-ta. Mwunswu-to
Pyengswu-NOM Pyengswu-GEN room-ACC sweep-PAST-DECL Mwunswu-also
Mwunswu-uy pang-ul ssul-ess-ta.
Mwunswu-GEN room-ACC sweep-PAST-DECL

‘Pyengswu, Mwunswu, and Cwunswu were cleaning their house. Pyengswu swept Pyengswu’s room. Mwunswu also swept Mwunswu’s room.’

Pyengswu-ka ku-uy pang-ul ssul-ess-ko, **Mwunswu-to** [e]
Pyengswu-NOM he-GEN room-ACC sweep-PAST-CONJ Mwunswu-also
ssul-ess-ta.
sweep-PAST-DECL

‘Pyengswu swept his room, and Mwunswu swept, too.’

(6) Chelswu, Yengswu, Cengswu-ka tosekwuan-eyse kongpwuha-ko iss-ess-ta.
Chelswu Yengswu Cengswu-NOM library-in study-PROG PAST-DECL
Chelswu-ka Chelswu-uy pheyn-ul ttelethuli-ess-ta. Yengswu-to
Chelswu-NOM Chelswu-GEN pen-ACC drop-PAST-DECL Yengswu-also
Yengswu-uy pheyn-ul ttelethuli-ess-ta.
Yengswu-GEN pen-ACC drop-PAST-DECL
‘Chelswu, Yengswu, and Cengswu were studying in a library. Chelswu dropped Chelswu’s pen. Yengswu also dropped Yengswu’s pen.’

Chelswu-ka ku-uy pheyn-ul ttelethuli-ess-ko, **Yengswu-to** [**e**]
Chelswu-NOM he-GEN pen-ACC drop-PAST-CONJ Chelswu-also
ttelethuli-ess-ta.
drop-PAST-DECL

‘Chelswu dropped his pen, and Yengswu dropped, too.’

(7) Chelho, Phengho, Swuho-ka kakca phyenci-lul ssu-ko iss-ess-ta.
Chelho Phengho Swuho-NOM each letter-ACC write-PROG PAST-DECL
Chelho-ka Chelho-uy phyenci-lul ilk-ess-ta. Phengho-to
Chelho-NOM Chelho-GEN letter-ACC read-PAST-DECL Phengho-also
Phengho-uy phyenci-lul ilk-ess-ta.
Phengho-GEN letter-ACC read-PAST-DECL
‘Chelho, Phengho, and Swuho were each writing a letter. Chelho read Chelho’s letter. Phengho also read Phengho’s letter.’

Chelho-ka ku-uy phyenci-lul ilk-ess-ko, **Phengho-to** [**e**]
Chelho-NOM he-GEN letter-ACC read-PAST-CONJ Phengho-also
ilk-ess-ta.
read-PAST-DECL

‘Chelho read his letter, and Phengho read, too.’

(8) Kwangho, Changho, Yengho-ka ilsiktang-eyse cemsim-ul mek-ko
Kwangho Changho Yengho-NOM Japanese.restaurant-at lunch-ACC eat-PROG
iss-ess-ta. Kwangho-ka Kwangho-uy utong-ul mek-ess-ta.
PAST-DECL Kwangho-NOM Kwangho-GEN Udon-ACC eat-PAST-DECL
Changho-to Changho-uy utong-ul mek-ess-ta.
Changho-also Changho-GEN Udon-ACC eat-PAST-DECL
‘Kwangho, Changho, and Yengho were having lunch at a Japanese restaurant. Kwangho ate Kwangho’s Udon. Changho also ate Changho’s Udon.’

Kwangho-ka ku-uy utong-ul mek-ess-ko, **Changho-to** [**e**]
Kwangho-NOM he-GEN Udon-ACC eat-PAST-CONJ Changho-also
mek-ess-ta.
eat-PAST-DECL

‘Kwangho ate his Udon, and Changho ate, too.’

(9) Pyengmin, Cengmin, Tongmin-ika wuntongcang-eyse chwukkwu-lul ha-ko
Pyengmin Cengmin Tongmin-NOM play.ground-in soccer-ACC do-PROG
iss-ess-ta. Pyengmin-ika Pyengmin-iuy kong-ul cha-ss-ta.
PAST-DECL Pyengmin-NOM Pyengmin-GEN ball-ACC kick-PAST-DECL
Cengmin-ito Cengmin-iuy kong-ul cha-ss-ta.
Cengmin-also Cengmin-GEN ball-ACC kick-PAST-DECL
‘Pyengmin, Cengmin, and Tongmin were playing soccer in a playground. Pyengmin kicked Pyengmin’s ball. Cengmin also kicked Cengmin’s ball.’

Pyengmin-ika ku-uy kong-ul cha-ss-ko, **Cengmin-ito** [e]
Pyengmin-NOM he-GEN ball-ACC kick-PAST-CONJ Cengmin-also
cha-ss-ta.
kick-PAST-DECL

‘Pyengmin kicked his ball, and Cengmin kicked, too.’

(10) Cinswu, Sungswu, Pyengswu-ka seythaksil-eyse seythak-ul ha-ko
Cinswu Sungswu Pyengswu-NOM laundry.room-at laundry-ACC do-PROG
iss-ess-ta. Cinswu-ka Cinswu-uy seycey-lul sayongha-yss-ta.
PAST-DECL Cinswu-NOM Cinswu-GEN detergent-ACC use-PAST-DECL
Sungswu-to Sungswu-uy seycey-lul sayongha-yss-ta.
Sungswu-also Sungswu-GEN detergent-ACC use-PAST-DECL
‘Cinswu, Sungswu, and Pyengswu were doing laundry at a laundry room. Cinswu used Cinswu’s detergent. Sungswu also used Sungswu’s detergent.’

Cinswu-ka ku-uy seycey-lul sayongha-yss-ko, **Sungswu-to** [e]
Cinswu-NOM he-GEN detergent-ACC use-PAST-CONJ Sungswu-also
sayongha-yss-ta.
use-PAST-DECL

‘Cinswu used his detergent, and Sungswu used, too.’

(11) Kimkenmo, Kimcanghwun, Sinsunghwun-i nolaypang-eyse nol-ko
Kimkenmo Kimcanghwun Sinsunghwun-NOM singing.room-at hang.out-PROG
iss-ess-ta. Kimkenmo-ka Kimkenmo-uy hithukok-ul pwulu-ess-ta.
PAST-DECL Kimkenmo-NOM Kimkenmo-GEN hit.song-ACC sing-PAST-DECL
Kimcanghwun-to Kimcanghwun-uy hithukok-ul pwulu-ess-ta.
Kimcanghwun-also Kimcanghwun-GEN hit.song-ACC sing-PAST-DECL
‘Kimkenmo, Kimcanghwun, and Sinsunghwun were hanging out in a singing room. Kimkenmo sang Kimkenmo’s hit song. Kimcanghwun also sang Kimcanghwun’s hit song.’

Kimkenmo-ka ku-uy hithukok-ul pwulu-ess-ko, **Kimcanghwun-to** [e]
Kimkenmo-NOM he-GEN hit.song-ACC sing-PAST-CONJ Kimcanghwun-also
pwulu-ess-ta.
sing-PAST-DECL

‘Kimkenmo sang his hit song, and Kimcanghwun sang, too.’

(12) Pongswu, Thaykang, Thayho-ka pwuek-eyse selkeci-lul ha-ko
Pongswu Thaykang Thayho-NOM kitchen-at dish.washing-ACC do-PROG
iss-ess-ta. Pongswu-ka Pongswu-uy khep-ul sis-ess-ta.
PAST-DECL Pongswu-NOM Pongswu-GEN cup-ACC wash-PAST-DECL
Thaykang-ito Thaykang-iuy khep-ul sis-ess-ta.
Thaykang-also Thaykang-GEN cup-ACC wash-PAST-DECL
‘Pongswu, Thaykang, and Thayho were doing the dishes at a kitchen. Pongswu washed Pongswu’s cup. Thaykang also washed Thaykang’s cup.’

Pongswu-ka ku-uy khep-ul sis-ess-ko, **Thaykang-ito** [e]
Pongswu-NOM he-GEN cup-ACC wash-PAST-CONJ Thaykang-also
sis-ess-ta.
wash-PAST-DECL

‘Pongswu washed his cup, and Thaykang washed, too.’

(13) Chiswu, Pyengswu, Hanswu-ka kkaphey-eyse tayhwua-lul nanwu-ko
Chiswu Pyengswu Hanswu-NOM café-at conversation-ACC share-PROG
iss-ess-ta. Chiswu-ka Chiswu-uy cen yecachinkwu-lul
PAST-DECL Chiswu-NOM Chiswu-GEN previous girlfriend-ACC
helttut-ess-ta. Pyengswu-to Pyengswu-uy cen yecachinkwu-lul
speak.ill.of-PAST-DECL Pyengswu-also Pyengswu-GEN previous girlfriend-ACC
helttut-ess-ta.
speak.ill.of-PAST-DECL
‘Chiswu, Pyengswu, and Hanswu were having a conversation at a café. Chiswu spoke ill of Chiswu’s ex-girlfriend. Pyengswu also spoke ill of Pyengswu’s ex-girlfriend.’

Chiswu-ka ku-uy cen yecachinkwu-lul helttut-ess-ko,
Chiswu-NOM he-GEN previous girlfriend-ACC speak.ill.of-PAST-CONJ
Pyengswu-to [e] **helttut-ess-ta**.
Pyengswu-also speak.ill.of-PAST-DECL

‘Chiswu spoke ill of his ex-girlfriend, and Pyengswu spoke ill of, too.’

(14) Congswu, Hwuanswu, Tongswu-ka kongwuen-eyse nol-ko
Congswu Hwuanswu Tongswu-NOM park-at hang.out-PROG
iss-ess-ta. Congswu-ka Congswu-uy kay-lul kancilephi-ess-ta.
PAST-DECL Congswu-NOM Congswu-GEN dog-ACC tickle-PAST-DECL
Hwuanswu-to Hwuanswu-uy kay-lul kancilephi-ess-ta.
Hwuanswu-also Hwuanswu-GEN dog-ACC tickle-PAST-DECL
‘Congswu, Hwuanswu, and Tongswu were hanging out at a park. Congswu tickled Congswu’s dog. Hwuanswu also tickled Hwuanswu’s dog.’

Congswu-ka ku-uy kay-lul kancilephi-ess-ko, **Hwuanswu-to** [e]
Congswu-NOM he-GEN dog-ACC tickle-PAST-CONJ Hwuanswu-also
kancilephi-ess-ta.
tickle-PAST-DECL

'Congswu tickled his dog, and Hwuanswu tickled, too.'

(15) Tongwu, Cinwu, Thaywu-ka Sinswu-uy cip-eyse nol-ko
Tongwu Cinwu Thaywu-NOM Sinswu-GEN house-at hang.out-PROG
iss-ess-ta. Tongwu-ka Tongwu-uy yetongsayng-ul ttayli-ess-ta.
PAST-DECL Tongwu-NOM Tongwu-GEN younger.sister-ACC hit-PAST-DECL
Cinwu-to Cinwu-uy yetongsayng-ul ttayli-ess-ta.
Cinwu-also Cinwu-GEN younger.sister-ACC hit-PAST-DECL
'Tongwu, Cinwu, and Thaywu were hanging out at Sinswu's house. Tongwu hit Tongwu's younger sister. Cinwu also hit Cinwu's younger sister.'

Tongwu-ka ku-uy yetongsayng-ul ttayli-ess-ko, **Cinwu-to** [e]
Tongwu-NOM he-GEN younger.sister-ACC hit-PAST-CONJ Cinwu-also
ttayli-ess-ta.
hit-PAST-DECL

'Tongwu hit his younger sister, and Cinwu hit, too.'

(16) Wonmwu, Kiswu, Sengswu-ka chatcip-eyse tayhwua-lul nanwu-ko
Wonmwu Kiswu Sengswu-NOM tea.house-at conversation-ACC share-PROG
iss-ess-ta. Wonmwu-ka Wonmwu-uy nwuna-lul
PAST-DECL Wonmwu-NOM Wonmwu-GEN older.sister-ACC
chingchanha-yss-ta. Kiswu-to Kiswu-uy nwuna-lul
compliment-PAST-DECL Kiswu-also Kiswu-GEN older.sister-ACC
chingchanha-yss-ta.
compliment-PAST-DECL
'Wonmwu, Kiswu, and Sengswu were having a conversation at a tea house. Wonmwu complimented Wonmwu's older sister. Kiswu also complimented Kiswu's older sister.'

Wonmwu-ka ku-uy nwuna-lul chingchanha-yss-ko, **Kiswu-to** [e]
Wonmwu-NOM he-GEN older.sister-ACC compliment-PAST-CONJ Kiswu-also
chingchanha-yss-ta.
compliment-PAST-DECL

'Wonmwu complimented his older sister, and Kiswu complimented, too.'

F.2 Condition 2: NullObject-Free (strict identity reading)

(1) Minswu, Kiswu, Cinswu-ka say kiswuksa-lo isaha-ko iss-ess-ta.
Minswu Kiswu Cinswu-NOM new dormitory-to move-PROG PAST-DECL
Minswu-ka Minswu-uy cim-ul nalu-ess-ta. Kiswu-to Minswu-uy
Minswu-NOM Minswu-GEN stuff-ACC move-PAST-DECL Kiswu-also Minswu-GEN
cim-ul nalu-ess-ta.
stuff-ACC move-PAST-DECL

'Minswu, Kiswu, and Cinswu were moving to a new dormitory. Minswu moved Minswu's stuff. Kiswu also moved Minswu's stuff.'

Minswu-ka ku-uy cim-ul nalu-ess-ko, **Kiswu-to** [e]
Minswu-NOM he-GEN stuff-ACC move-PAST-CONJ Kiswu-also
nalu-ess-ta.
move-PAST-DECL

'Minswu moved his stuff, and Kiswu moved, too.'

(2) Yonghi, Kenhi, Myengho-ka wuntongcang-eyse yakwu-lul ha-ko
Yonghi Kenhi Myengho-NOM play.ground-in baseball-ACC do-PROG
iss-ess-ta. Yonghi-ka Yonghi-uy kong-ul tenci-ess-ta. Kenhi-to
PAST-DECL Yonghi-NOM Yonghi-GEN ball-ACC throw-PAST-DECL Kenhi-also
Yonghi-uy kong-ul tenci-ess-ta.
Yonghi-GEN ball-ACC throw-PAST-DECL

'Yonghi, Kenhi, and Myengho were playing basketball in a playground. Yonghi threw Yonghi's ball. Kenhi also threw Yonghi's ball.'

Yonghi-ka ku-uy kong-ul tenci-ess-ko, **Kenhi-to** [e]
Yonghi-NOM he-GEN ball-ACC throw-PAST-CONJ Kenhi-also
tenci-ess-ta.
throw-PAST-DECL

'Yonghi threw his ball, and Kenhi threw, too.'

(3) Thayswu, Kiswu, Cengswu-ka pa-eyse wuain-ul masi-ko iss-ess-ta.
Thayswu Kiswu Cengswu-NOM bar-at wuain-ACC drink-PROG PAST-DECL
Thayswu-ka Thayswu-uy wuaincan-ul kkaythuli-ess-ta. Kiswu-to
Thayswu-NOM Thayswu-GEN wine.glass-ACC break-PAST-DECL Kiswu-also
Thayswu-uy wuaincan-ul kkaythuli-ess-ta.
Thayswu-GEN wine.glass-ACC break-PAST-DECL

'Thayswu, Kiswu, and Cengswu were drinking wine at a bar. Thayswu broke Thayswu's wine glass. Kiswu also broke Thayswu's wine glass.'

Thayswu-ka ku-uy wuaincan-ul kkaythuli-ess-ko, **Kiswu-to** [e]
Thayswu-NOM he-GEN wine.glass-ACC break-PAST-CONJ Kiswu-also
kkaythuli-ess-ta.
break-PAST-DECL

'Thayswu broke his wine glass, and Kiswu broke, too.'

(4) Myengswu, Hyenswu, Cwunswu-ka wuntong hwu swui-ko iss-ess-ta.
Myengswu Hyenswu Cwunswu-NOM exercise after rest-PROG PAST-DECL
Myengswu-ka Myengswu-uy umlyoswu-lul masi-ess-ta. Hyenswu-to
Myengswu-NOM Myengswu-GEN beverage-ACC drink-PAST-DECL Hyenswu-also
Myengswu-uy umlyoswu-lul masi-ess-ta.
Myengswu-GEN beverage-ACC drink-PAST-DECL

'Myengswu, Hyenswu, and Cwunswu were taking a rest after exercise. Myengswu drank Myengswu's beverage. Hyenswu also drank Myengswu's beverage.'

Myengswu-ka ku-uy umlyoswu-lul masi-ess-ko, **Hyenswu-to** [e]
Myengswu-NOM he-GEN beverage-ACC drink-PAST-CONJ Hyenswu-also
masi-ess-ta.
drink-PAST-DECL

'Myengswu drank his beverage, and Hyenswu drank, too.'

(5) Pyengswu, Mwunswu, Cwunswu-ka cip-ul chengsoha-ko iss-ess-ta.
Pyengswu Mwunswu Cwunswu-NOM house-ACC clean-PROG PAST-DECL
Pyengswu-ka Pyengswu-uy pang-ul ssul-ess-ta. Mwunswu-to
Pyengswu-NOM Pyengswu-GEN room-ACC sweep-PAST-DECL Mwunswu-also
Pyengswu-uy pang-ul ssul-ess-ta.
Pyengswu-GEN room-ACC sweep-PAST-DECL

'Pyengswu, Mwunswu, and Cwunswu were cleaning their house. Pyengswu swept Pyengswu's room. Mwunswu also swept Pyengswu's room.'

Pyengswu-ka ku-uy pang-ul ssul-ess-ko, **Mwunswu-to** [e]
Pyengswu-NOM he-GEN room-ACC sweep-PAST-CONJ Mwunswu-also
ssul-ess-ta.
sweep-PAST-DECL

'Pyengswu swept his room, and Mwunswu swept, too.'

(6) Chelswu, Yengswu, Cengswu-ka tosekwuan-eyse kongpwuha-ko iss-ess-ta.
Chelswu Yengswu Cengswu-NOM library-in study-PROG PAST-DECL
Chelswu-ka Chelswu-uy pheyn-ul ttelethuli-ess-ta. Yengswu-to
Chelswu-NOM Chelswu-GEN pen-ACC drop-PAST-DECL Yengswu-also
Chelswu-uy pheyn-ul ttelethuli-ess-ta.
Chelswu-GEN pen-ACC drop-PAST-DECL

'Chelswu, Yengswu, and Cengswu were studying in a library. Chelswu dropped Chelswu's pen. Yengswu also dropped Chelswu's pen.'

Chelswu-ka ku-uy pheyn-ul ttelethuli-ess-ko, **Yengswu-to** [e]
Chelswu-NOM he-GEN pen-ACC drop-PAST-CONJ Chelswu-also
ttelethuli-ess-ta.
drop-PAST-DECL

'Chelswu dropped his pen, and Yengswu dropped, too.'

(7) Chelho, Phengho, Swuho-ka kakca phyenci-lul ssu-ko iss-ess-ta.
Chelho Phengho Swuho-NOM each letter-ACC write-PROG PAST-DECL
Chelho-ka Chelho-uy phyenci-lul ilk-ess-ta. Phengho-to
Chelho-NOM Chelho-GEN letter-ACC read-PAST-DECL Phengho-also
Chelho-uy phyenci-lul ilk-ess-ta.
Chelho-GEN letter-ACC read-PAST-DECL
'Chelho, Phengho, and Swuho were each writing a letter. Chelho read Chelho's letter. Phengho also read Chelho's letter.'

Chelho-ka ku-uy phyenci-lul ilk-ess-ko, **Phengho-to** [e]
Chelho-NOM he-GEN letter-ACC read-PAST-CONJ Phengho-also
ilk-ess-ta.
read-PAST-DECL

'Chelho read his letter, and Phengho read, too.'

(8) Kwangho, Changho, Yengho-ka ilsiktang-eyse cemsim-ul mek-ko
Kwangho Changho Yengho-NOM Japanese.restaurant-at lunch-ACC eat-PROG
iss-ess-ta. Kwangho-ka Kwangho-uy utong-ul mek-ess-ta.
PAST-DECL Kwangho-NOM Kwangho-GEN Udon-ACC eat-PAST-DECL
Changho-to Kwangho-uy utong-ul mek-ess-ta.
Changho-also Kwangho-GEN Udon-ACC eat-PAST-DECL
'Kwangho, Changho, and Yengho were having lunch at a Japanese restaurant. Kwangho ate Kwangho's Udon. Changho also ate Kwangho's Udon.'

Kwangho-ka ku-uy utong-ul mek-ess-ko, **Changho-to** [e]
Kwangho-NOM he-GEN Udon-ACC eat-PAST-CONJ Changho-also
mek-ess-ta.
eat-PAST-DECL

'Kwangho ate his Udon, and Changho ate, too.'

(9) Pyengmin, Cengmin, Tongmin-ika wuntongcang-eyse chwukkwu-lul ha-ko
Pyengmin Cengmin Tongmin-NOM play.ground-in soccer-ACC do-PROG
iss-ess-ta. Pyengmin-ika Pyengmin-iuy kong-ul cha-ss-ta.
PAST-DECL Pyengmin-NOM Pyengmin-GEN ball-ACC kick-PAST-DECL
Cengmin-ito Pyengmin-iuy kong-ul cha-ss-ta.
Cengmin-also Pyengmin-GEN ball-ACC kick-PAST-DECL
'Pyengmin, Cengmin, and Tongmin were playing soccer in a playground. Pyengmin kicked Pyengmin's ball. Cengmin also kicked Pyengmin's ball.'

Pyengmin-ika ku-uy kong-ul cha-ss-ko, **Cengmin-ito** [e]
Pyengmin-NOM he-GEN ball-ACC kick-PAST-CONJ Cengmin-also
cha-ss-ta.
kick-PAST-DECL

'Pyengmin kicked his ball, and Cengmin kicked, too.'

(10) Cinswu, Sungswu, Pyengswu-ka seythaksil-eyse seythak-ul ha-ko
Cinswu Sungswu Pyengswu-NOM laundry.room-at laundry-ACC do-PROG
iss-ess-ta. Cinswu-ka Cinswu-uy seycey-lul sayongha-yss-ta.
PAST-DECL Cinswu-NOM Cinswu-GEN detergent-ACC use-PAST-DECL
Sungswu-to Cinswu-uy seycey-lul sayongha-yss-ta.
Sungswu-also Cinswu-GEN detergent-ACC use-PAST-DECL
'Cinswu, Sungswu, and Pyengswu were doing laundry at a laundry room. Cinswu used Cinswu's detergent. Sungswu also used Cinswu's detergent.'

Cinswu-ka ku-uy seycey-lul sayongha-yss-ko, **Sungswu-to** [e]
Cinswu-NOM he-GEN detergent-ACC use-PAST-CONJ Sungswu-also
sayongha-yss-ta.
use-PAST-DECL

'Cinswu used his detergent, and Sungswu used, too.'

(11) Kimkenmo, Kimcanghwun, Sinsunghwun-i nolaypang-eyse nol-ko
Kimkenmo Kimcanghwun Sinsunghwun-NOM singing.room-at hang.out-PROG
iss-ess-ta. Kimkenmo-ka Kimkenmo-uy hithukok-ul pwulu-ess-ta.
PAST-DECL Kimkenmo-NOM Kimkenmo-GEN hit.song-ACC sing-PAST-DECL
Kimcanghwun-to Kimkenmo-uy hithukok-ul pwulu-ess-ta.
Kimcanghwun-also Kimkenmo-GEN hit.song-ACC sing-PAST-DECL
'Kimkenmo, Kimcanghwun, and Sinsunghwun were hanging out in a singing room. Kimkenmo sang Kimkenmo's hit song. Kimcanghwun also sang Kimkenmo's hit song.'

Kimkenmo-ka ku-uy hithukok-ul pwulu-ess-ko, **Kimcanghwun-to** [e]
Kimkenmo-NOM he-GEN hit.song-ACC sing-PAST-CONJ Kimcanghwun-also
pwulu-ess-ta.
sing-PAST-DECL

'Kimkenmo sang his hit song, and Kimcanghwun sang, too.'

(12) Pongswu, Thaykang, Thayho-ka pwuek-eyse selkeci-lul ha-ko
Pongswu Thaykang Thayho-NOM kitchen-at dish.washing-ACC do-PROG
iss-ess-ta. Pongswu-ka Pongswu-uy khep-ul sis-ess-ta.
PAST-DECL Pongswu-NOM Pongswu-GEN cup-ACC wash-PAST-DECL
Thaykang-ito Pongswu-uy khep-ul sis-ess-ta.
Thaykang-also Pongswu-GEN cup-ACC wash-PAST-DECL
'Pongswu, Thaykang, and Thayho were doing the dishes at a kitchen. Pongswu washed Pongswu's cup. Thaykang also washed Pongswu's cup.'

Pongswu-ka ku-uy khep-ul sis-ess-ko, **Thaykang-ito** [e]
Pongswu-NOM he-GEN cup-ACC wash-PAST-CONJ Thaykang-also
sis-ess-ta.
wash-PAST-DECL

'Pongswu washed his cup, and Thaykang washed, too.'

(13) Chiswu, Pyengswu, Hanswu-ka kkaphey-eyse tayhwua-lul nanwu-ko
Chiswu Pyengswu Hanswu-NOM café-at conversation-ACC share-PROG
iss-ess-ta. Chiswu-ka Chiswu-uy cen yecachinkwu-lul
PAST-DECL Chiswu-NOM Chiswu-GEN previous girlfriend-ACC
helttut-ess-ta. Pyengswu-to Chiswu-uy cen yecachinkwu-lul
speak.ill.of-PAST-DECL Pyengswu-also Chiswu-GEN previous girlfriend-ACC
helttut-ess-ta.
speak.ill.of-PAST-DECL

'Chiswu, Pyengswu, and Hanswu were having a conversation at a café. Chiswu spoke ill of Chiswu's ex-girlfriend. Pyengswu also spoke ill of Chiswu's ex-girlfriend.'

Chiswu-ka ku-uy cen yecachinkwu-lul helttut-ess-ko,
Chiswu-NOM he-GEN previous girlfriend-ACC speak.ill.of-PAST-CONJ
Pyengswu-to [e] **helttut-ess-ta**.
Pyengswu-also speak.ill.of-PAST-DECL

'Chiswu spoke ill of his ex-girlfriend, and Pyengswu spoke ill of, too.'

(14) Congswu, Hwuanswu, Tongswu-ka kongwuen-eyse nol-ko
Congswu Hwuanswu Tongswu-NOM park-at hang.out-PROG
iss-ess-ta. Congswu-ka Congswu-uy kay-lul kancilephi-ess-ta.
PAST-DECL Congswu-NOM Congswu-GEN dog-ACC tickle-PAST-DECL
Hwuanswu-to Congswu-uy kay-lul kancilephi-ess-ta.
Hwuanswu-also Congswu-GEN dog-ACC tickle-PAST-DECL

'Congswu, Hwuanswu, and Tongswu were hanging out at a park. Congswu tickled Congswu's dog. Hwuanswu also tickled Congswu's dog.'

Congswu-ka ku-uy kay-lul kancilephi-ess-ko, **Hwuanswu-to** [e]
Congswu-NOM he-GEN dog-ACC tickle-PAST-CONJ Hwuanswu-also
kancilephi-ess-ta.
tickle-PAST-DECL

'Congswu tickled his dog, and Hwuanswu tickled, too.'

(15) Tongwu, Cinwu, Thaywu-ka Sinswu-uy cip-eyse nol-ko
Tongwu Cinwu Thaywu-NOM Sinswu-GEN house-at hang.out-PROG
iss-ess-ta. Tongwu-ka Tongwu-uy yetongsayng-ul ttayli-ess-ta.
PAST-DECL Tongwu-NOM Tongwu-GEN younger.sister-ACC hit-PAST-DECL
Cinwu-to Tongwu-uy yetongsayng-ul ttayli-ess-ta.
Cinwu-also Tongwu-GEN younger.sister-ACC hit-PAST-DECL

'Tongwu, Cinwu, and Thaywu were hanging out at Sinswu's house. Tongwu hit Tongwu's younger sister. Cinwu also hit Tongwu's younger sister.'

Tongwu-ka ku-uy yetongsayng-ul ttayli-ess-ko, **Cinwu-to** [e]
Tongwu-NOM he-GEN younger.sister-ACC hit-PAST-CONJ Cinwu-also
ttayli-ess-ta.
hit-PAST-DECL

‘Tongwu hit his younger sister, and Cinwu hit, too.’

(16) Wonmwu, Kiswu, Sengswu-ka chatcip-eyse tayhwua-lul nanwu-ko
Wonmwu Kiswu Sengswu-NOM tea.house-at conversation-ACC share-PROG
iss-ess-ta. Wonmwu-ka Wonmwu-uy nwuna-lul
PAST-DECL Wonmwu-NOM Wonmwu-GEN older.sister-ACC
chingchanha-yss-ta. Kiswu-to Wonmwu-uy nwuna-lul
compliment-PAST-DECL Kiswu-also Wonmwu-GEN older.sister-ACC
chingchanha-yss-ta.
compliment-PAST-DECL

‘Wonmwu, Kiswu, and Sengswu were having a conversation at a tea house. Wonmwu complimented Wonmwu’s older sister. Kiswu also complimented Wonmwu’s older sister.’

Wonmwu-ka ku-uy nwuna-lul chingchanha-yss-ko, **Kiswu-to** [e]
Wonmwu-NOM he-GEN older.sister-ACC compliment-PAST-CONJ Kiswu-also
chingchanha-yss-ta.
compliment-PAST-DECL

‘Wonmwu complimented his older sister, and Kiswu complimented, too.’

F.3 Condition 3: Quantificational-Bound

The test items for the Quantificational-Bound condition are the same as those for the Quantificational-Bound condition condition in Experiment 3.

F.4 Condition 4: Quantificational-Free

The test items for the Quantificational-Free condition are the same as those for the Quantificational-Free condition condition in Experiment 3.