A trace analysis of Korean UDCs

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Keywords: 8211; in the traditional HPSG analysis of UDCs following Pollard and Sag (1994). It is because in HPSG traces are not all required to have the same feature, unlike in other movement-based approaches including the minimalist program and GB theory. In addition, we argue that the three kinds of Korean UDC elements appearing in gap positions do not form separate categories from their corresponding forms appearing in non-UDCs based on the same semantic and pragmatic properties such as logophoricity and contrastiveness. We also investigate some controversial issues of island constraints and strong crossover with respect to filler-gap linkage in Korean UDCs.

Abstract

In this paper, we claim that the filler-gap linkage in Korean UDCs needs to be handled at the level of syntax and that unbounded dependencies represented by traces, resumptive pronouns, and resumptive reflexives in Korean can be simply captured - without posing any extra mechanisms - in the traditional HPSG analysis of UDCs following Pollard and Sag (1994). It is because in HPSG traces are not all required to have the same feature, unlike in other movement-based approaches including the minimalist program and GB theory. In addition, we argue that the three kinds of Korean UDC elements appearing in gap positions do not form separate categories from their corresponding forms appearing in non-UDCs based on the same semantic and pragmatic properties such as logophoricity and contrastiveness. We also investigate some controversial issues of island constraints and strong crossover with respect to filler-gap linkage in Korean UDCs.

1   Introduction

In Korean, there are various grammatical constructions that involve a long-distance dependency between a gap and some constituent that is coreferential with that gap. The dependency is in principle unbounded and can be captured by a feature percolation mechanism within HPSG. However, certain properties of gaps in Korean unbounded dependency constructions (hereafter UDCs) raise questions as to whether a syntactic approach to this long-distance dependency is appropriate. In fact, some previous researchers, including Kang (1986) and Yoon [1993] have argued that this dependency needs to be handled at the level of semantics, not syntax. In such a semantic approach, UDC gaps are treated as null resumptive pronouns (so-called *pro*s in GB terms), and syntactic binding between a gap and its antecedent is not required. However, UDC gaps and *pro*s in Korean show different properties with respect to Strong Crossover and Coordination facts. Furthermore, we examine putative resumptive pronouns (RPs), and the resumptive reflexive (RR) *caki* that appear in the same positions of UDC gaps, and argue that these resumptive elements are audible traces. This argument is compatible with resumptive pronoun analyses of Georgopoulos (1991) in Palauan and Vaillette (2001) in Hebrew. In this paper, we claim that the filler-gap linkage in Korean UDCs needs to be handled at the level of syntax and that unbounded dependencies in Korean can be captured by a feature percolation mechanism within HPSG. We also investigate some controversial issues of island constraints and strong crossover with respect to filler-gap linkage in Korean UDCs.

This paper shows that unbounded dependencies represented by traces, RPs, and the RR *caki* can be simply captured - without posing any extra mechanisms - in the traditional HPSG analysis of UDCs following Pollard and Sag (1994). It is

because in HPSG traces are not all required to have the same feature, unlike in other movement-based approaches including the minimalist program and GB theory. In addition, we conclude that the three kinds of Korean UDC elements appearing in gap positions do not form separate categories from their corresponding forms appearing in non-UDCs based on the same semantic and pragmatic properties such as logophoricity and contrastiveness.

2　A Null Pronominal Analysis and Its Problems

Korean has been standardly considered to be a *pro*-drop language. This is a language where a contextually identifiable element or some element introduced in the preceding context can be dropped. Huang (1984) argues that "cool" languages, including Chinese and Korean, are different from "hot" languages, like English, in that cool languages license a zero topic that binds a null element. While Huang argues that the phonologically null element *pro* appears only in the subject position in cool languages, it has been argued that there is no subject-object asymmetry in Korean(Cole (1987)). Since Korean is classified as a *pro*-drop language, it is possible to argue that gaps in UDCs are null resumptive pronouns or *pro*s, and that correspondingly, the long-distance dependencies are not syntactic relations but rather semantic binding relations. The following examples show that a gap can be replaced by an overt pronoun or the long-distance reflexive *caki*, which appears to support the semantic binding analysis.

(1)　a.　ku namca$_i$-nun [sacang-i　　eps-umyeon, e_i motun il-ul
　　　　that man-TOP　president-NOM absent-if　　every work-ACC
　　　　ttemath-aya hayssta].
　　　　took care　had to

　　　　'As for that man$_i$, if the president were absent, (he$_i$) had to take care of everything.'

　　b.　ku namca$_i$-nun [sacang-i　　eps-umyeon, ku$_i$/caki$_i$-ka motun
　　　　that man-TOP　president-NOM absent-if　　he/self　　all
　　　　il-ul　　ttmath-aya hayssta].
　　　　work-ACC took care　did

　　　　'As for that man$_i$, if the president were absent, he$_i$ had to take care of everything.'

As for English Cinque [1990] and Postal (1994) propose transformational analyses with null pronominals for English *tough* gaps and parasitic gaps. In Korean, Chae (1998) and Kang (1986) assumed that *tough* constructions, topicalization, and relativization in Korean license *pro*s, which are phonologically null elements in the gap position. However, in this study we treat those pronouns and the long-distance (LD) *caki* as audible traces and argue that the filler-gap linkages in Korean UDCs need to be captured by a syntactic mechanism of binding and not just by semantic coreference. Three different kinds of traces show the same phenomenon

with respect to Strong Crossover and Coordination. This suggests that they belong to the same category of trace.

3   Properties of Korean UDC Gaps

A UDC gap needs to have a coreferential element within the given sentence. While the syntactic and semantic connectivity between a gap and its antecedent in Korean UDCs is similar to the corresponding English sentences, Korean UDC gaps are known to be less sensitive to island constraints. The following properties have been pointed out by general properties of Korean UDC gaps.

[1] Syntactic Connectivity

There are two natural classes of Korean UDCs: strong UDCs and weak UDCs. In the case of strong UDCs, the filler is accompanied by the morphosyntactic case marker that originated from the gapped position, thus the filler shows a strong syntactic association with its gap. Strong UDCs in Korean include the following topic sentence.

(2) a.   Mary-ka   *John-eykey* senmwul-ul cwuessta.
          Mary-NOM John-to   present-ACC gave

          'Mary gave a present to John.'

     b.   *John$_i$-eykey*-nun [Mary-ka e_i senmwul-ul cwuessta].
          John-to-TOP   Mary-NOM   present-ACC gave

          'As for John$_i$, Mary gave a present (to him$_i$)

The case markers of the topic element in (2) show that it is syntactically connected to the gap; the dative case *eykey* (to) is required by the verb *cwuta* (give).

[2] Sentence-Internal Binding

A UDC gap must have a coreferential element within the same sentence. This property distinguishes UDC gaps from *pro*s, which are licensed by various syntactic, semantic, and pragmatic factors. For example, discourse factors allow a repeated or already-known element to be dropped from a sentence in languages like Korean. When this happens, the missing element can be retrieved from the context. However, a UDC gap requires its coreferential element to be present in the given sentence; it cannot be licensed only by context.

[3] Island Constraints

With respect to Korean UDCs, it has been argued that some examples of topicalization and relativization are subject to three island constraints: the Complex NP constraint (CNPC), the Sentential Subject constraint, and the Adjunct constraint. This

evidence has been used to support the claim that topicalization and relativization involve NP movement out of gap positions in Korean. In contrast, it has been also pointed out that topic and relative clauses in Korean frequently do violate island constraints (Kang (1986)). Inconsistency of data with respect to island constraints suggests that unlike most previous analyses in GB theory, island constraints cannot be used as a crucial test for determining whether a particular construction is a UDC or not.

However, some crosslinguistic studies have pointed out that sensitivity to island constraints cannot be used as evidence for the existence of a filler-gap linkage. When dealing with English adjunct extractions, Hukari and Levine (1995) argued that island effects are substantially irrelevant to the issue of whether or not adjunct extraction represents a genuine syntactic filler-gap construction. Instead, they argued that adjunct extraction belongs to the same category of UDCs as argument extraction. They based their conclusion on parallel patterns of crossover effects and on cross-linguistic evidence of syntactic binding domain effects. Szabolcsi and den Dikken (1999) also argued that some island constraint effects are relevant to the semantic scope that an expression takes over certain operators.

Considering that island constraint violations are driven by semantic and pragmatic factors but not by a syntactic operation like movement, inconsistency of island constraints in Korean UDCs cannot be supporting evidence for semantic binding approaches to Korean. In addition to syntactic connectivity, semantic binding relations between a UDC gap and a constituent are tighter than other binding relations between a pronoun and its antecedent. In the next section, we will examine strong crossover and coordination facts that distinguish the filler-gap linkage of Korean UDC gaps from semantic binding. Then, later in this paper we will provide a syntactic representation of unbounded dependencies with a simple syntactic tool, which avoids all the problems of island constraint violations that the movement approaches have confronted.

4 Characterizing Properties of Korean UDC Gaps

4.1 Strong Crossover

The Strong Crossover (SCO) Constraint does not apply to *pro*s in general, as we see in (3).

(3) [John$_i$-un [e_i [Mary-ka   ku$_i$-eykey [*pro$_i$* kayahanta-ko]
     John-TOP   Mary-NOM he-to   must go-COMP
     malhayssta-ko] kiekhanta].
     told-COMP   remember

     'As for John$_i$, (he$_i$) remembers that Mary$_j$ told him$_i$ that (e$_i$) must go.'

In(3), e_i represents a gap directly linked to its antecedent in the position of topic. It contrast with a *pro* that appears in the most deeply embedded clause. In general,

*pro*s in Korean occur when their coreferential elements (antecedents) are introduced in the previous context or when their coreferential elements syntactically precede. The pro_i takes the preceding pronoun ku_i as its antecedent and refers to *John* in (3). This violates the SCO constraint. In contrast with *pro*s, UDC gaps observe the SCO constraint, as in the following example.

(4) * ku ai_i-nun   Mary-ka   ku $papo_i$-eykey [e_i/ku_i/$caki_i$-lul cal
     that child-TOP Mary-NOM that idiot-to   /he-/selfACC   well
     tolpokessta-ko] yaksokhayssta.
     take care-COMP promised

     'As for the child$_i$, Mary promised that idiot$_i$ to take care of him$_i$ well.'

The example (4) shows that SCO is observed for UDCs. Instead of a pronoun an epithet has been used in (4). It is because the use of pronoun *ku* may allow a resumptive pronoun analysis of the intervening pronoun, which follows Vaillette (2001). In order to examine the applicability of crossover to Hebrew RPs, Vaillette (2001) replaces the upper pronoun by an epithet. The epithet has the same index value as the antecedent, while it retains an independent lexical meaning. Although (what looks like) pronouns and reflexives can be audible (SLASH-bearing) traces, epithets cannot be. Thus, the same strategy can be applied to Korean.

A notable point is that resumptive pronominal elements in Korean UDCs observe the SCO constraint as do inaudible traces. This fact is problematic because previous literature has assumed that SCO violations are triggered by the status of UDC gaps; in general UDC gaps are nonpronominal elements or R(eferring)-expressions. However, RPs in Korean UDCs show the same SCO effects as nonpronominal gaps in spite of their pronominal status. Within Chomskyan approaches, the SCO effects are accounted for by Principle C that requires so-called R-expressions to be unbound. Similarly, within the framework of HPSG, the SCO phenomenon has been explained by the binding condition C that specifies that a nonpronoun must be o-free. However, Postal (2004) argues that the SCO phenomenon in English cannot be accounted for by Chomsky's Principle C, and based on his arguemnts it is hard to argue that SCO effects are attributed to the status of UDC gaps as nonpronominal elements.[1] The SCO effects in Korean UDCs are not associated with Principle C (or condition C in HPSG). This argument is supported by the following examples.

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[1]Postal (2004) points out that the SCO effect cannot be reduced to Chomsky's Principle C that bars anaphoric linkage between pronoun and the nonpronominal trace based on (i) existence of SCO effects in non-NP extraction, (ii) the secondary strong effect, (iii) the Asymmetry Property and (iv) failure of the c-command condition required for Principle C. He claims that even though the Principle C account of the SCO effect is often considered to be supporting evidence of traces as nonpromoninal R-expressions,there is no empirical evidence for any trace-like objects connected with extraction.

(5) a. ku ai$_i$-nun wuli-ka [$_{ADVP}$ John$_k$-ul thonghay-se] [$_S$ e$_i$ iphak
    the kid-TOP we-NOM   John-ACC mediate-by   entrance
    sihem-ey hapkyekhayss-um-ul] alkey toyessta.
    exam-at pass-NML-ACC   know became

    (lit.)'As for the kid$_i$, we got to know via John that (he$_i$) passed the entrance exam.'

b. * ku ai$_i$-nun wuli-ka   [$_{ADVP}$ ku papo$_i$-lul thonghay-se] [$_S$ e$_i$
    the kid-TOP wuli-NOM   that idiot-ACC mediate-by
    iphak   sihem-ey hapkyekhayss-um-ul] alkey toyessta.
    entrance exam-at pass-NML-ACC   know became

    (lit.)'As for the kid$_i$, we got to know via that idiot$_i$ that (he$_i$) passed the university exam.'

c. * ku ai$_i$-nun   wuli-ka [$_{ADVP}$ ku papo$_i$-lul thonghay-se] [$_S$
    that child-TOP we-NOM   that idiot-ACC mediate-by
    ku$_i$-ka   iphak   sihem-ey hapkyekhayss-um-ul] alkey toyessta.
    he-NOM entrance exam-at pass-NML-ACC   know became

    (lit.) 'As for the kid$_i$, we got to know via that idiot$_i$ that he$_i$ passed the entrance exam.'

In the given examples, the intervening epithets are located in adjunct phrases that do not c-command (or o-command) the gaps in the embedded phrases. Although no violation of Principle C (or condition C) can be induced in (5), anaphoric linkage between a filler and a gap is as impossible as in (5b) and (5c). Moreover, when a gap appears in an adverbial phrase of the embedded clause, the SCO effects still appear in spite of the failure of c-command between a pronoun or an epithet and its anaphoric gap. In (6b), topicalization is licensed and there is no c-commanding relation between between the gap and its antecedent. However, the antecedent in an adjunct cannot be topicalized as in (6c) and (6d) when there is an intervening pronoun or an epithet. This contrasts with (6b).

(6) a. ?* Nay-ka ku/ku papo$_j$-eykey [[John$_j$-i   pwucilenhay-se] cip-ey
      I-NOM he/that idiot-to   John-NOM diligent-because home-at
      menci-to hana epsta-ko]   cenhaysse.
      dirt-also single not exist-COMP told

      'I told him$_j$/that idiot$_j$ that there is no dirt at home because (he$_j$) is diligent.'

b. John$_j$-un nay$_j$-ka saramtul$_k$-eykey [[e$_j$ pwucilenhay-se] cip-ey
    I-NOM   he/that idiot-to   diligent-because home-at
    menci-to hana epsta-ko]   cenhaysse.
    dirt-also single not exist-COMP told

    'As for John$_j$, I told people$_k$ that there is no dirt because (he$_j$)is diligent.'

c. ?* John$_j$-un nay-ka ku/ku papo$_j$-eykey [[e_j pwucilenhay-se] cip-ey
   John-TOP I-NOM he/that idiot-to   diligent-because home-at

menci-to hana epsta-ko]   cenhaysse.
dirt-also single not exist-COMP told

'As for John$_j$, I$_i$ told him$_j$/that idiot$_j$ that there is no dirt at home because
(he$_j$)is diligent.'

d. ?* John$_j$-un nay$_i$-ka ku/ku papo$_j$-eykey [[ku$_j$-ka pwucilenhay-se]
   John-TOP I-NOM he/that idiot-to   he-NOM diligent-because

cip-ey menci-to hana epsta-ko]   cenhaysse.
home-at dirt-also single not exist-COMP told

'As for John$_j$, I$_i$ told him$_j$/that idiot$_j$ that there is no dirt at home after he$_j$ is
diligent.'

Based on the fact that a pronoun and its anaphoric element do not hold a c-command (or o-command) relation, we conclude that SCO effects in Korean UDCs cannot be reduced to Principle C in GB theory or condition C in HPSG. Thus, there is no factual support for the status of traces as nonpronominal elements, which is why the SCO constraint is observed by both RPs and inaudible traces in Korean UDCs. This accords with SCO effects in English as shown in Postal (2004). An RP can be represented in HPSG via the propagation of a non-local feature. In addition to an RP, the long distance reflexive *caki* 'self' can also appear in the position of the trace.

4.2 Coordination

In general, it has been argued that the Coordinate Structure Constraint (CSC) is observed in Korean coordinate structures. The constraint disallows asymmetric extraction out of one conjunct. For example, (7b) and (7c) are ungrammatical because only one conjunct has a missing element. However, (7a) is grammatical because the topicalized element is connected to the missing elements in both conjuncts.

(7) a. i chayk$_j$-un [aitul-i e_j cohaha-ko eluntul-to e_j chohahay].
   this book-TOP kids-NOM   like-CONJ adults-also   like

'As for this book$_j$, kids like (it$_j$) and adults also like (it$_j$).'

b. * i   chayk$_j$-un [aitul-i e_j cohaha-ko eluntul-i   manhwachayk-ul
   this book-TOP kids-NOM   like-CONJ adults-NOM comic book-ACC

silehay].
like

'As for this book$_j$, kids like (it$_j$) and adults dislikes comic books.'

c. * i   chayk$_j$-un [aitul-i   manhwachayk-ul cohaha-ko elun-i
   this book-TOP kids-NOM comic books-ACC like-CONJ adults-NOM

e_j cohahay].
   like

'As for this book$_j$, kids like comic books and adults dislike (it$_j$).'

Another fact related to coordination is that a gap in a conjunct is allowed when there is a gap in the other conjunct, or a pronoun, as in (8a) and (8b).

(8) a. i   chayk$_j$-un [aitul-i   kukes$_j$-ul acwu cohaha-ko nointul-to
this book-NOM kids-NOM it-ACC   very like-CONJ old people-also
e$_j$ congcong chassnunta]
  often   ask for

'As for this book$_j$, kids like it$_j$ very much and old people also buy (it$_j$) often.'

b. i   chayk$_j$-un [aitul-i   e$_i$ acwu cohaha-ko nointul-to
this book-NOM kids-NOM   very like-CONJ old people-also
kukes$_j$-ul congcong chassnunta]
it-ACC   often   ask for

'As for this book$_j$, kids like (it$_j$) very much and old people also ask for (it$_j$).'

In particular, the example (8b) shows that the gap in the first conjunct is a trace but not a *pro*. It is supported by the general fact that in Korean a *pro* is not allowed to appear in the first conjunct of coordinated structures.

Given that the CSC operates in Korean UDCs to require a gap in each conjunct and given that the pronominal *kukes* in a conjunct does not cause a violation of the CSC, as in (8a) and (8b), we can argue that those pronouns are RPs and that they behave in the same way as traces. Thus, this favors the UDC approach to RPs.

In summary, we argue that the pronouns appearing in the gap positions are not *pro*s. Instead, we argue that RPs in the gap position work as audible traces. According to the trace approach, RPs and gaps arise from a single mechanism. This argument is crosslinguistically compatible with Georgopoulos (1991) and Vaillette (2001) with respect to Palauan and Hebrew. The terms for UDC gaps and non-UDC correspondents in Korean are summarized in the following chart. The UDC elements in the left-hand column all triggers a nonzero SLASH feature while the right-hand column cannot.

(9)

	UDCs	non-UDCs
zero	trace	*pro*
overt	resumptive prn	(ordinary) prn
caki	resumptive refl	(ordinary) refl

5   The Analysis of RPs and RR *caki*

Korean UDCs always involve the presence of one of three elements that give rise to a nonlocal SLASH feature: trace, resumptive pronoun, and resumptive reflexive. These three elements have certain properties with respect to the SCO constraint and coordination. Each of them shares certain information with a filler that appears in a possibly distant higher node. Furthermore, they share certain properties in common

with their corresponding forms in non-UDCs. The occurrences of the reflexive *caki* are associated with semantic and pragmatic properties of logophoricity and constrastiveness, in contrast with neutral occurrences of pronouns. This suggests that resumptive elements in UDCs are the same entities as those in non-UDCs except that the LOCAL feature of the former is the value of the SLASH feature percolating into higher structure. Based on common properties of logophoricity and contrastiveness, we claim that RPs and the RR *caki* in UDCs are respectively the same elements of pronouns and the LD reflexive *caki* in non-UDCs. In other words, resumptive elements in UDCs belong to the same sort hierarchy as non-UDC correspondents.

5.0.1 Logophoricity

The role of logophoricity in the interpretation of nonsyntactic reflexives has been widely discussed in the previous literature (e.g. Sells (1987), Pollard and Xue (2001), etc.). According to Sells (1987), logophoricity refers to subject of consciousness (SELF), the source of reported speech (SOURCE), and deictic perspective (PIVOT). Based on Sell's notion of logophricity, the antecedent of the LD reflexive *caki* is logophoric in the following examples.

(10) a. Mira$_i$-ka [Yumi-ka caki$_i$/kunye$_i$-lul chotayhayse] kipputa.
Mira-NOM Yumi-NOM self$_i$/her$_i$-ACC invite-because be glad

'Mira$_i$ is glad because her$_i$ son entered a university.'

   b. Mira$_i$-ka [Yumi-ka *caki$_j$/kunye$_j$-lul chotayhayse] Jisu$_j$-ul
Mira-NOM Yumi-NOM self$_j$/her$_j$-ACC invite-because Jisu-ACC
pwulewehanta.
envied

'Mira$_i$ envies Jisu$_j$ because Yumi$_k$ invited her$_j$'

In (10a), both reflexive *caki* and pronoun *kunye* are bound by the long-distance antecedent *Mira* that is the subject of consciousness. However, in (10b) it cannot be bound by the object *Yumi* because *Yumi* is not the subject. While *caki* takes the center of consciousness as its antecedent, the pronoun binding is not related to logophoricity. Instead, the pronoun use in (10) implies that the speaker takes an objective or 3rd-person point of view in describing the proposition. Using the reflexive *caki* implies that the viewpoint of the sentence is based on the subject of consciousness, and Sells (1987) names this notion as SELF.

The same kind of logophoric properties can be found in UDCs.

(11) a. [caki$_i$-ka silswu ha-n] namca$_i$-ka ohilye hwa-lul
self-NOM mistake make-REL man-NOM ironically anger-ACC
nayssta.
expressed

'The man$_i$ who he$_i$ made a mistake got angry ironically.'

    b. * nay-ka [caki$_i$-ka   silswu   ha-n]   namca$_i$-lul yatanchyessta.
        I-NOM   self-NOM mistake make-REL man-ACC   scolded

        'I scolded the man$_i$ who he$_i$ made a mistake.'

In (11a), the antecedent *namca* works as SELF and binds *caki* in the gapped position. In (11b), it is not SELF and does not bind *caki*.

    Logophoricity is related to certain predicates such as verbs of communication, psych-predicates, etc. In particular, a psych-predicate experiencer is logophoric because the predicate reports the state of consciousness of the experiencer. Consider the following examples.

(12) a.   [John$_i$-i   [caki$_j$/kunye$_j$-lul salanghanta-ko] malha-n] sasil-i
          John-NOM   self/she-ACC   love-COMP   said-REL fact-NOM
          Mary$_i$-eykey pwutamsulewessta.
          Mary-to   burdensome

          'The fact that John$_i$ said that (he$_i$) loves her$_i$ was burdensome to Mary$_i$.'

    b.   Mina$_i$-ka   [John$_k$-i   [*caki$_j$/kunye$_j$-lul salanghanta-ko]
          Mina-NOM   John-NOM   self/her-ACC   love-COMP
          malhay-se]   Mary$_j$-lul   miwehanta .
          said-because Mary-ACC hate

          'Since John$_k$ told Mina$_i$ that (he$_k$) loves Mary$_j$, she$_i$ hates her$_j$.'

In (12a), the experiencer NP of the psych-predicate *pwutamsulepta* is interpreted as an antecedent of *Mary* (Backward binding is allowed). However, in (12b) *caki* cannot be bound by the object antecedent that is not SELF. Pronouns, however, can be bound by antecedents that appear as an Experiencer argument and by the object in (12a) and (12b).

    In Korean, logophoricity seems to be related to the thematic roles Agent and Experiencer. The antecedent of reflexive *caki* is interpreted either as an individual who plays the central role performing an action or as an experiencer going through a particular physical or psychological process. An experiencer argument is not restricted to psych-predicates. It plays a more active role in the event structure described by the main predicate compared to other arguments of theme, goal, and source. With respect to reflexive binding, an Experiencer NP can be an antecedent of *caki* as we see in the following examples.

(13) Mary$_i$-ka   Yumi$_j$-eykey [caki$_{i/j}$ cip-ey   ka-key] hayssta.
      Mary-NOM Yumi-to   self   house-to go-ACC made

      'Mary$_i$ made Yumi$_j$ her$_{i/j}$ book to Yumi$_j$.'

(14) Jinwoo$_j$-eykey [caki$_{i/j}$-ka sihem-ey hapkyekhass-um-i] mitkici
      Jinwoo-to   self-NOM exam-to pass-ing-NOM   be believed
      ahassta.
      not-COMP

      'It was not believed to Jinwoo$_j$ that he$_{i/j}$ passed the exam.'

In (13) and (14), the reflexive *caki* can be bound by the dative NPs. Dative NPs can be interpreted as a sort of Experiencer that goes through a certain event or a psychological process. In addition, if the verb specifies a certain situation, then the dative NP can be the preferred antecedent of *caki*. For example, if the verb *tolakata* (go back) is used instead of *kata* as the embedded predicate, then the Experiencer antecedent is preferred in (13). Thematic roles of Agent and Experiencer share certain semantic entailments with respect to the event structure of the main verb. Those common properties can be captured by the notion of Proto-Agent role as suggested by Lee (1999). Lee (1999) uses the Proto-role analysis of Dowty (1991) for case marker realization in Korean and argues that an experiencer argument in Korean has strong Proto-Agent properties. Proto-Agent properties of an argument in Dowty (1991) are based on lexical entailments of a verb. They include volitional involvement in the event or state, sentience/perception, causing an event or change of state in another participants, and movement relative to the position of another participant. An argument with more Proto-Agent properties tends to be realized as the subject in many languages. We can account for the fact that Experiencer elements appearing with case marker *eykey* or with psych-predicates work as antecedents of *caki* in Korean since they are known to retain Proto-Agent entailments. Proto-Agent properties seem to be related to logophoricity. In other words, an argument with more Proto-Agent properties is easily considered as SELF.

5.0.2 Contrastiveness

Reflexive *caki* is associated with the meaning of discourse prominence or contrastiveness. *caki* is used when its antecedent shows contrastiveness with other discourse entities. Consider the following examples.

(15) Mira-ka   talum salamtul-eykey-nun kwantayha-myense,
     Mira-NOM other people-to-CTOP   generous-while
     caki$_i$/$^{?*}$kunye$_i$-ekye-nun emhata.
     self/she-CTOP   strict

     'Mira$_i$ is generous to other people while she$_i$ is strict about herself$_i$.'

(16) John$_i$-i   [caki$_i$/$^{?*}$ku-nun mwusiha-myense hyeng-un
     John-NOM   self/he-CTOP ignore-while   brother-CTOP
     chingchanha-nun] apeci-ka   miwessta.
     praise-REL   father-ACC hate

     'John$_i$ hates his father, who is ignoring him$_i$ while praising his brother.'

In (15), Mira's attitude toward others contrasts with her attitude toward herself. Here, *nun/un* are contrastive topic markers (CTOP). In (16), the father's behavior with one son contrast with his behavior with another. Contrastive topic markers are attached to two contrasting NPs and are differentiated from topic markers attached to topicalized elements in sentence initial position. In the context of a contrastive

interpretation, reflexive *caki* is licensed, while a pronoun is not. In (16), John's attitude toward others is opposite of that toward him.[2] The contrastiveness of the reflexive *caki* is frequently found in topic and relative constructions, where its antecedents play a contrastive role with others.[3]

(17)   [emeni-ka   hyeng-eykey-nun senmul$_j$-ul cwumyense
         mother-NOM brother-to-CTOP gift-ACC   give-while
         caki$_i$/$^?$ku$_i$-eykey-nun senmwul-ul cwuci ahn-un]   ai$_i$
         self/he-to-CTOP   gift-ACC   give did not-REL kid

         'the kid$_i$ whose mother did not gave a present to him$_i$ while she gave it to his bother.'

(18)   Mira$_i$-nun [talun aitul-un   motu ttetulessciman caki/$^?$*kunye$_i$-nun
         Mira-TOP   other kids-CTOP all   was noisy-END self/she-CTOP
         chimmwuk-ul cikyessta].
         quite   kept

         'As for Mira$_i$, although other kids$_j$ were all noisy, she$_i$ kept quite.'

As in (17) and (18), when the contrastive meaning is distinct, the occurrence of *caki* is more natural than that of an RP. In particular, when the sentence has a comparative meaning as in (18), the resumptive element is realized in terms of the RR *caki* rather than the RPs.

   Given that RR *caki* and RPs show the same characteristics with respect to logophoricity and contrastiveness, both in non-UDCs and UDCs, we conclude that these elements are the same objects. This approach is reminiscent of Pollard and

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[2] A pronoun and long-distance 'caki' can be licensed in the same position although they deliver different focus interpretations.

(i) a.   Minwoo$_i$-ka kyosil-ey   tule o-nun   John$_j$-ul po-ca,   caki$_i$/*$_j$-ka
          Minwoo-NOM classroom-to enter come-REL John-ACC see-when self-NOM
          insa-lul   hayssta.
          greeting-ACC did

          'When Minwoo saw John, who came into the classroom, he$_i$ (but not John) greeted (to him).'
    b.   Minwoo$_i$-ka kyosil-ey   tule o-nun   John$_j$-ul po-ca,   ku$_i$/$_j$-ka insa-lul
          Monwoo-NOM classroom-to enter come-REL John-ACC see-when he-NOM greeting-ACC
          hayssta.
          did

          'When Minwoo saw John, who came into the classroom, he$_i$ greeting (to him) first.'

In (ia), the implication is that it was *Minwoo* but not *John* who performed the act of greeting. This separates *Minwoo* from other discourse participants so the focus is on *Minwoo*. However, (ib) does not imply any contrast between *Minwoo* and others.

[3] Pollard and Xue (2001) point out that contrastiveness signified by pitch accent or by lexical/structural marking makes a nonsyntactic use of Chinese reflexive *ziji* (more) acceptable. This seems to be the case in Korean too.

Xue (1998, 2001) who pointed out that a distinction between structural and discourse binding should not be treated as lexical ambiguity. Instead, they proposed one type of *reflexive*, which can be either syntactically bound or pragmatically bound or both simultaneously. One their view, there is no notion of obligatory binding for reflexives in Chinese or in American English; rather, reflexives are subject to nonexclusive constraints of syntactic binding or discourse binding. We agree with them because the distinction between syntactic and nonsyntactic uses of reflexives can be captured simply in their theory without introducing lexical ambiguity and its redundant complications. Although Pollard and Xue (1998, 2001) do not consider resumptive pronouns, their combinatoric approach seems to be properly applied for a general realization of the RR *caki* in UDCs and the LD reflexive *caki* in non-UDCs in Korean. In addition, RPs in UDCs maintain the same sort of constraints in non-UDCs and UDCs, too. The only extra property of these elements is that they license a non-local feature that percolates upper phrasal categories in UDCs.

6 Conclusion

In this paper, we have provided SCO and coordination facts to support nonlocal feature propagation for RPs in Korean. Unlike Hebrew RPs, Korean RPs show inconsistent behavior with respect to island constraints; some of them are sensitive to island constraints while others are not. Thus, it is hard to provide a syntactic account for island constraints. Unbounded dependencies represented by traces, RPs, and the RR *caki* can be simply captured - without posing any extra mechanisms - in the traditional HPSG analysis of UDCs following Pollard and Sag (1994). In HPSG, traces are not all required to have the same features. In Korean UDCs, local values of traces, RPs, and the RR *caki* can originate the nonlocal SLASH feature. The three kinds of UDC elements appearing in gap positions do not form separate categories from their corresponding forms appearing in non-UDCs. In other words, *pro*s, overt pronouns, and the LD reflexive *caki* work in UDCs as inaudible traces, RPs, and the RR *caki* so that they are required to be semantically and syntactically bound by the nonlocal TO-BIND|SLASH feature.

In sum, Korean UDCs always involve the presence of one of three elements that give rise to a nonlocal SLASH feature: trace, resumptive pronoun, and resumptive reflexive. These three elements have certain properties with respect to the SCO constraint and coordination. Each of them shares certain information with a filler that appears in a possibly distant higher node. Furthermore, they share certain properties in common with their corresponding forms in non-UDCs.

Our UDC approach is different from accounts of Chomsky's minimalist program and GB theory, where all traces are considered to be the same category.[4] Chomsky's binding theory requires that fillers be reconstructed to the trace posi-

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[4]Within GB theory, noun phrases are classified by the two binary features, a(naphoric) and p(ronominal), and all traces are assumed to be R-expressions with -a and -p features.

tion before binding conditions are applied. Within this kind of approach, it is hard to capture the fact that RPs and RR *caki* work as traces. The HPSG system makes three different kinds of traces possible and captures the fact that traces, RPs, and the RR *caki* in UDCs belong respectively to the subset of *pro*s, pronouns, the LD reflexive *caki* in non-UDCs. In addition, our trace analysis of resumptive elements casts some doubt on traceless approaches proposed by Sag (1997) and Kim (1998). According to their traceless analyses, gap information is encoded in the lexical entry of a predicate without involving a structural position for an empty category. However, resumptive elements that trigger the SLASH feature need to appear in syntactic structures. Thus, the existence of audible correspondents of traces supports the traditional HPSG analysis of Pollard and Sag (1994), which assumes an empty category in a given syntactic structure. One way that a non-local dependency can be bound off is for a local tree to instantiate the filler-gap schema. In line with Levine et al. (2001)'s unitary analysis of English parasitic gaps, we argue that the non-local feature specification can be used to account for different kinds of Korean UDCs.

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