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### Abstract

This paper argues that the asymmetries found in various remnant CP-movement constructions in Korean can be accounted for if we assume the contextual edge approach (henceforth, CE). CE shows that among edges of a phase, only the highest edge is available for movement/binding (Bošković to appear). The particular analysis provided here will reduce various generalizations with regard to Proper Binding Condition (Kitahara 1997, Müller 2001).

# New Definition of Edge and its Consequences for PBC

YongSuk Yoo\*

## 1 Introduction

This paper argues that the asymmetries found in various remnant CP-movement constructions in Korean can be accounted for if we assume the contextual edge approach (henceforth, CE). CE shows that among edges of a phase, only the highest edge is available for movement/binding (Bošković to appear). In (1), given that Serbo-Croatian allows free word order of possessors and adjectives in the NP, the extraction is only possible if it is located at the highest edge:

- (1) a.  $\boxed{\text{Na tebe}_j}$  sam vidio<sub>[NP [ponosnog<sub>t\_i</sub>] [NP oca]]</sub>  
of you am seen proud father  
‘I saw (Jovan’s) father who is proud of you.’
- b. \* $\boxed{\text{Na tebe}_j}$  sam vidio<sub>[NP Jovanovog [NP [ponosnog t<sub>i</sub>] [NP oca]]]</sub>  
of you am seen Jovan’s proud father
- c. ? $\boxed{\text{Na tebe}_j}$  sam vidio<sub>[NP [ponosnog t<sub>i</sub>] [NP Jovanovog [NP oca]]]</sub>  
of you am seen proud Jovan’s father  
(Bošković to appear:(24))<sup>1</sup>

Assuming NP is a phase in (1), the extraction is possible in (1a,c) because only the highest edge is the edge, i.e., if only the highest edge counts as the edge for the purpose of the Phase Impenetrability Condition (PIC). The Adjective Phrase in (1b) is then not located at the phasal edge, hence the extraction out of it is not possible due to the PIC.

In CE, the lower edge is accessible if and only if the higher edge moves first (Bošković argues that just like traces don’t count as interveners (Chomsky 1995, Bošković and Gajewski 2011, among others), they also don’t count as edges for PIC, see Bošković 2014 for an account of this). Bošković (to appear) observes that there is ‘base-c-command word order preservation effect’ without superiority effect, given *i*. traces do not count as the highest edge, *ii*. multiple movements proceed in tucking-in style (Richards 2001, among others).

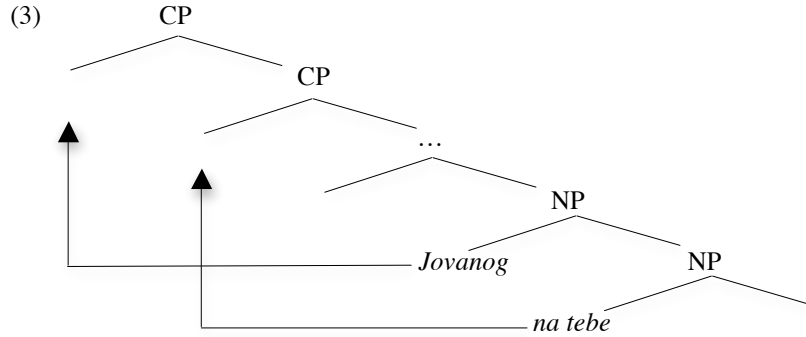
- (2) a. ?Jovanovog<sub>i</sub> na tebe<sub>j</sub> sam vidio [NP t<sub>i</sub> [NP [ponosnog t<sub>j</sub>] [NP oca]]]  
Jovan’s of you am seen proud father  
‘I saw Jovan’s father who is proud of you.’
- b. \*Na tebe<sub>j</sub> Jovanovog<sub>i</sub> sam vidio [NP t<sub>i</sub> [NP [ponosnog t<sub>j</sub>] [NP oca]]]  
of you Jovan’s am seen proud father

According to Bošković (2005), there is a focus requirement on Left Branch Extraction (LBE) with multiple NP adjuncts—such LBE involves focus movement. In (2), it cannot be a simple superiority (i.e., Attract Closest) effect since multiple focus movement is not sensitive to superiority effects (Bošković 2002). CE explains it without superiority: the higher Spec *Jovanovog* ‘Jovan’s’ has to move first, or *na tebe* ‘of you’ cannot move due to PIC violation (i.e., in CE only the higher Spec is a phasal edge). After the movement, the lower edge is now accessible then moves, in Richards-style tucking in into a lower Spec. The derivation can be shown as follows (for ease of exposition, we will ignore the intermediate steps of movement):

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<sup>1</sup>The judgements in (1) are comparative, not absolute. While some speakers find (1c) degraded, they still prefer (1b) to (1c). Note also that the adjectival complements in SC have to move out of the AP, see Bošković 2013.



The question arises if CE expects all multiple movements to exhibit the base-c-command preservation effects, regardless of the Superiority effects. I argue that CE in fact does not accompany the base-c-command preservation effects, but also it successfully explains the cases where the word order preservation effects are mitigated under multiple movements. I argue that if the multiple movements involve two different probes (or targets), like a mix of A/A'-movement, the word order does not need to keep the base-order. In this paper, I specifically examine the data involving CP-remnant movement, where the remnant CP can be fronted under Raising to Subject constructions (RTS) but not under Raising to Object Constructions (RTO) (Hiraiwa 2010).

- (4) a. \*<sub>CP</sub> t<sub>i</sub> yepputa-ko] J-ka M-ul<sub>i</sub> sayngkakhanta.  
 pretty-C J-NOM M-ACC think  
 'J thinks that M is pretty.' **RTO / \*Remnant CP movement**
- b. [<sub>CP</sub> t<sub>i</sub> yepputa-ko] J<sub>i</sub>-ka motu-ekey sayngkaktoyecita.  
 pretty-C J-NOM everyone-DAT think.pass  
 'J is thought to be pretty by everyone.' **RTS / ✓Remnant CP movement**

The asymmetry of remnant CP movement in (4a) and (4b) cannot be related to the traces, as in both cases the trace in the remnant CP are not properly bound (cf. Proper Binding Condition).

I argue that CE explains (4a–b): and (4a) will be treated in the same manner with Serbo-Croatian (2). In details, (4a) is the case where the movements target the same position (i.e., one probe), whereas (4b) is the case where the movements target different positions (i.e., two probes). Before generalizing the paradigms under CE, I want to show Korean data, which independently support CE (Section 2). Then I will analyze the particular constructions like (4) in terms of CE, deducing PBC under CE (Section 3). Finally, I generalize the paradigms to explain the cross-linguistic observation that A-movement does not block the remnant A'-movement (Müller 1996) (Section 4).

## 2 CE in Korean

In this section I provide various Korean sentences supporting CE. The first sentence involves Possessor Raising (PR) Construction, which can be realized with a Case marking on the possessor (Part-whole relations). I assume that the Case-marked possessor is raised out of NP (Ko 2005, among many others). Now, consider the following sentences where the NP has two possessors (note that only one possessor is in part-whole relation).

- (5) *There are four doors in the room: each one is owned by M, J, K, S.*
- a. J-ka [<sub>DP</sub> M-uy] [<sub>DP</sub> pang-uy] mwun-ul]] tatassta.  
 J-NOM M-GEN room-GEN door-ACC closed  
 'J closed the M's door which is in the room.'
- b. \*[pang-ul]<sub>i</sub> J-ka [<sub>DP</sub> M-uy] [<sub>DP</sub> t<sub>i</sub> mwun-ul]] tatassta.  
 room-ACC J-NOM M-GEN door-ACC closed

- c. J-ka<sub>[DP</sub> M-uy<sub>[DP</sub> **soyloman** <sub>[DP</sub> pang-uy<sub>[DP</sub> mwun-ul]] tatassta.  
 J-NOM M-GEN steel room-GEN door-ACC closed  
 ‘J closed the M’s door which is made out of steel.’
- d. \***pang-ul**<sub>i</sub> J-ka<sub>[DP</sub> **M-uy**<sub>i</sub> <sub>[DP</sub> soyloman <sub>[DP</sub> t<sub>i</sub> mwun-ul]] tatassta.  
 room-ACC J-NOM M-GEN steel door-ACC closed

I assume that Korean nominal modifiers are all in the same domain (edges of DP/NP) (cf. Kang 2014, among others), since Korean nominal phrases allow a free word order of their modifiers: Possessors, Demonstratives, Adjectives (and numeral classifiers): (4)\*3\*2\*1.<sup>2</sup>

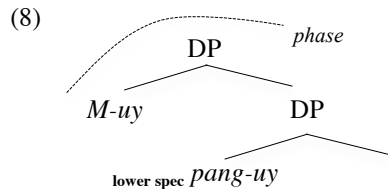
(6) Orders of Possessors, Demonstratives and Adjectives.

- a. phalan Chelswu-uy ce chayk  
 blue Chelswu-GEN that book  
 ‘that blue book of Chelswu’
- b. phalan ce chelswu-uy chayk
- c. Chelswu-uy phalan ce chayk
- d. Chelswu-uy ce phalan chayk
- e. ce Chelswu-uy phalan chayk
- f. ce phalan Chelswu-uy chayk

However, in (5), the leftmost possessor *M-uy* ‘M-GEN’ and the inalienable possessor *pang-uy* ‘room-GEN’ cannot change the order (see Bošković (to appear) for a semantic account of such word order restrictions):

- (7) ... \*pang-uy M-uy mwun-ul ...  
 room-GEN M-GEN door-ACC  
 Intended: ‘... M’s door in a room’

On the assumption that all the NP/DP modifiers in Korean are in the same domain (6), (5) shows that the inalienable possessor that is at the lower edge cannot move because of PIC (i.e., only the higher spec is the phasal edge). (Note that the two possessors do not form a constituent here, as indicated by the existence of NP modifier *soylomantun*):



Another construction that requires CE involves Exceptional Case Marking (ECM) (9b–c) and Long Distance Scrambling (LDS) (9a):

- (9) a. **kong-ul**<sub>i</sub> J-ka<sub>[CP</sub> M-i t<sub>i</sub> cal chanta-ko]sayngkakhanta.  
 ball-ACC J-NOM M-NOM well kick-C think  
 ‘J thinks that M kicks a ball well.’
- b. J-ka<sub>[CP</sub> **M-i** kong-ul cal chanta-ko]sayngkakhanta.  
 J-NOM M-NOM ball-ACC well kick-C think
- c. J-ka<sub>[CP</sub> **M-ul** kong-ul cal chanta-ko]sayngkakhanta.  
 J-NOM M-ACC ball-ACC well kick-C think

<sup>2</sup>Note that other languages like Chinese and Japanese allow the free-word order of NP-modifiers. Following Bošković 2008, I assume that it can be accounted for if we assume that the NP-modifiers are in fact all NP-adjoined.

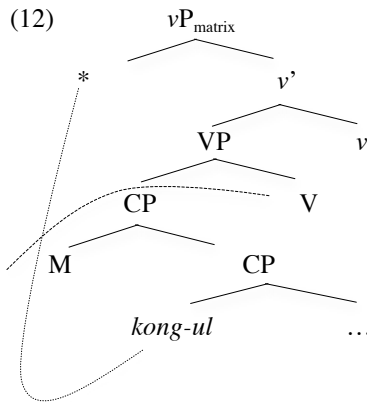
Following Taguchi (2009) among others, I assume that the ECMed subject in (9c) *Mary* is base-generated in the embedded CP, and the accusative Case particle is obtained via *Agree* with matrix *v* (Hiraiwa 2005).

- (10) [<sub>vP</sub> **v** [<sub>VP</sub> think [<sub>CP</sub> **Subj-ACC<sub>i</sub>** C [<sub>TP</sub> T [<sub>vP</sub> ... *pro<sub>i</sub>* ]]]]]

While ECM and LDS are both possible in Korean, the co-occurrence of both induces ungrammaticality:

- (11) **\*kong-ul<sub>i</sub>** J-ka [<sub>CP</sub> **M-ul<sub>j</sub>** t<sub>i</sub> cal chanta-ko] sayngkakhanta.  
 ball-ACC J-NOM M-ACC well kick-C think  
 ‘J thinks that M kicks a ball well.’

I account for (11) in the same manner as Serbo-Croatian (2): The ECMed subject is base-generated in SpecCP (higher spec), and the movement of the embedded object *kong-ul* ‘ball-ACC’ tucks in to the lower spec of the embedded CP (Richards 2001) (lower spec). The lower spec is inaccessible due to PIC:



Please note that the sentence in (11) allows an extraction of embedded subject and embedded object as shown below:

- (13) a. **M-ul<sub>i</sub> kong-ul<sub>j</sub>** J-ka [<sub>CP</sub> t<sub>i</sub> t<sub>j</sub> cal chanta-ko]sayngkakhanta.  
 M-ACC ball-ACC J-NOM well kick-C think  
 b. **\*kong-ul<sub>i</sub> M-ul<sub>j</sub>** J-ka [<sub>CP</sub> t<sub>i</sub> t<sub>j</sub> cal chanta-ko]sayngkakhanta.  
 ball-ACC M-ACC J-NOM well kick-C think  
 ‘J thinks that M kicks a ball well.’

However, there is a strong word-order preservation effect as in (13b). I will account (13b) after the next example.

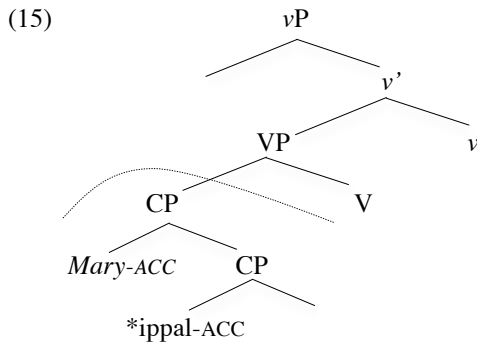
The inaccessibility of lower edge is discussed in Rackowski and Richards 2005 and Bošković in press; but the deduction of it is different. In Rackowski and Richards 2005,<sup>3</sup> a phase itself (e.g., CP) and the highest edge of a phase (e.g., SpecCP) are equidistant to higher probes. Things further inside of a phase, however, are only accessible if the phase itself has been agreed with. In Bošković in press, the lower spec is inaccessible due to PIC.

Korean can tease these two different approaches apart, favoring Bošković’s PIC approach.

<sup>3</sup>Rackowski and Richards (2005) develop a locality system which they argue that only the highest spec of a phase is allowed to be extracted.

- (14) a. J-ka [CP [DP Mary-uy [DP ippal]]-i [CP way ppacyessta-ko]] sayngakhatni?  
 J-NOM M.-GEN tooth-NOM why fell.out-C think.Q  
 b. J-ka [CP [DP Mary-uy [DP ippal]]-ul [CP way ppacyessta-ko]] sayngakhatni?  
 J-NOM M.-GEN tooth-ACC why fell.out-C think.Q  
 c. J-ka [CP [DP Mary-ka] [CP [DP ippal-i] [CP way ppacyessta-ko]]] sayngakhatni?  
 J-NOM M.-NOM tooth-NOM why fell.out-C think.Q  
 d. J-ka [CP **Mary-lul** [CP ippal-i [CP way ppacyessta-ko]]] sayngakhatni?  
 J-NOM M.-ACC tooth-NOM why fell.out-C think.Q  
 e. ?\*J-ka [CP **Mary-lul** [CP ippal-ul [CP way ppacyessta-ko]]] sayngakhatni?  
 J-NOM M.-ACC tooth-ACC why fell.out-C think.Q  
 ‘What is the reason x such that J thinks that Mary’s tooth fell out because of x?’

I assume that *way* ‘why’ is base-generated in the embedded CP (Ko 2005), which shows that the *Mary* and *ippal* ‘tooth’ are positioned at the embedded SpecCP. The construction of (14e) then can be described as follows:



Under Rackowski and Richards 2005, the Korean embedded CP should not agree with as the things other than the edge is not accessible (i.e., lower spec is not accessible). However, there is one case where it contradicts; for example, multiple scrambling out of the embedded clause:

- (16) J-eykey<sub>i</sub> kong-ul<sub>i</sub> M-i [CP K-ka t<sub>i</sub> t<sub>j</sub> cwuesstako] sayngakkhanta.  
 J-DAT ball-ACC M-NOM K-NOM gave.C thought  
 ‘M thought that K gave a ball to J.’

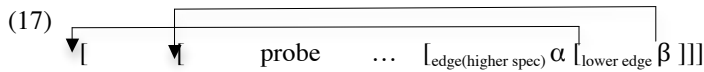
In (16), given that Korean embedded CP has not been agreed in Rackowski and Richards’ approach, the accessibility of the lower-edge in the embedded CP undercuts this approach.

Bošković (in press)’s PIC-based approach successfully explains both (14e) and (16). For (14e), the lower edge *ippal* (cf. (16)) is inaccessible due to PIC. In (16), after the movement of *J-eykey*, the trace does not count as edges for PIC in the same reasons for Serbo-Croatian (2), hence the lower spec is now accessible. The Korean data in (16) strongly supports that the inaccessibility of lower edge is due to PIC.

Now, coming back to (13b), the word-order preservation effect is in fact predicted under the current analysis. The ECMed subject should undergo movement given CE. The subsequent movement of the embedded object must tuck in, yielding the preserved word order. This results in the reduction of PBC, and provides a very particular prediction on the issues related to violations of PBC across languages.

### 3 Reduction of Proper Binding Condition: One Probe vs. Two Probes

In this section I argue that movements that are not related to the superiority effects may or may not show the superiority-like word order preservation effects. To begin with, I briefly review the schematic derivations under CE, when two elements are moving towards the same target (i.e., one probe).



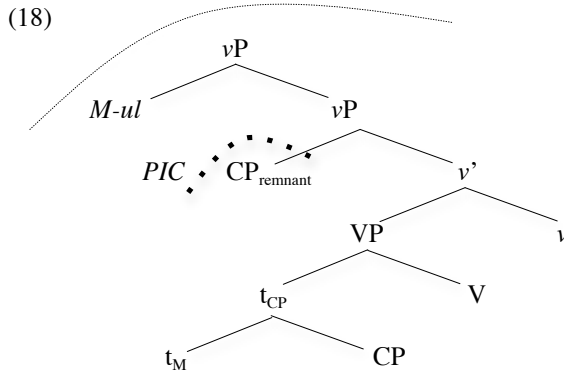
$\alpha$  has to move first given the lower edge is not accessible due to PIC. After its movement, now  $\beta$  is accessible but it tucks in to the lower spec of the landing site. Here, I observe that  $\alpha$  has to precede  $\beta$ . I argue that this explains Korean (4a) as well as Serbo-Croatian (2):

- (2') a. ?Jovanovog<sub>i</sub> na tebe<sub>j</sub> sam vidio<sub>[NP t<sub>i</sub> [NP [ponosnog t<sub>j</sub>] [NP<sub>oca</sub>]]]</sub>  
 Jovan's of you am seen proud father  
 'I saw Jovan's father who is proud of you.'  
 b. \*Na tebe<sub>j</sub> Jovanovog<sub>i</sub> sam vidio<sub>[NP t<sub>i</sub> [NP [ponosnog t<sub>j</sub>] [NP<sub>oca</sub>]]]</sub>  
 of you Jovan's am seen proud father  
 (4') a. \*[<sub>CP</sub> t<sub>i</sub> yepputa-ko] J-ka M-ul<sub>i</sub> sayngkakhanta.  
 pretty-C J-NOM M-ACC think  
 'J thinks that M is pretty.'

**RTO / \*Remnant CP movement**

In (2), the word order between *Jovanovog* and *na tebe* cannot be switched given (17). As noted earlier, Serbo-Croatian multiple focus movement is not sensitive to Superiority effects, which shows that (2) has to be independently accounted for under CE.

The ungrammaticality of (4a) is also explained in the same way: firstly, the embedded subject moves out of the CP creating CP-remnant. Secondly, CP-remnant should tuck in to the lower spec of the next phasal head. Now, the lower spec is inaccessible for movement unless the higher spec moves, resulting the word-order preservation effect.



The configuration in (18) blocks the remnant CP movement, without resorting to the existence of the trace (cf. Proper Binding Condition).

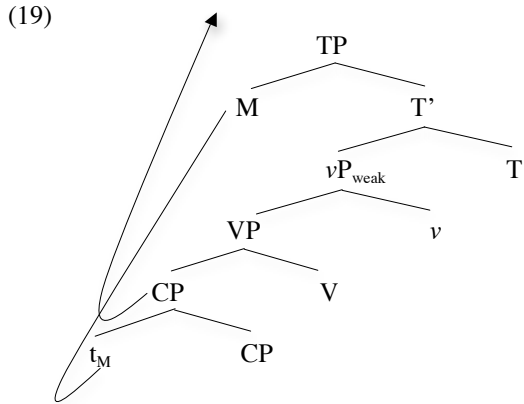
Now, I turn to (4b), where the remnant CP movement is in fact allowed.

- (4') b. [<sub>CP</sub> t<sub>i</sub> yepputa-ko] J<sub>j</sub>-ka motu-ekey sayngkaktoyecita.  
 pretty-C J-NOM everyone-DAT think.pass  
 'J is thought to be pretty by everyone.'

**RTS / ✓Remnant CP movement**

The grammaticality of (4b) is unexpected under PBC, as the trace in the remnant CP is not bound. I show that it is in fact predicted under CE, as the case involves two different probes (two different landing sites). Now the derivation can be shown as follows.



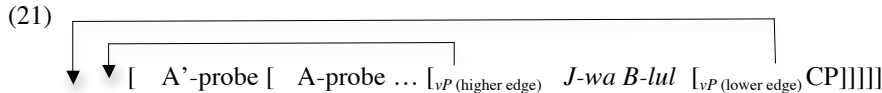


In (19), the matrix *v* is a weak phase (i.e., passive construction), thus the matrix T can attract the embedded subject which is located at [SpecCP]. Now, the remnant CP can undergo movement to matrix CP.

Bruening (2001) observes that the remnant CP movement of ECM constructions becomes available if the embedded subject undergoes A-movement:

- (20) [<sub>CP</sub> *t<sub>i</sub>* *ttoktokhata-ko*] **J-wa B<sub>i</sub>-lul** *selo<sub>i</sub>-uy* *sensayngnim-i* *t<sub>CP</sub>* *sayngkakan-ta*.  
 smart-C **J-and B<sub>i</sub>-ACC** each other<sub>i</sub>'s teachers-NOM think-DEC  
 'Each other<sub>i</sub>'s teacher thinks that J and B<sub>i</sub> are smart.'

On the assumption that A-scrambling and A'-scrambling are driven by different probes (Miyagawa 2001, among many others), the grammaticality of (21) can be accounted for in the same manner as (20):



Based on (2), (4) and (21), I generalize the word-order patterns as follows:

- (22) One probe: word order preservation effect under CE  
 Two probes: no word order preservation effect under CE

#### 4 Extension and Conclusion

The system developed here correlates various formerly unrelated constructions. As broader generalizations, we expect word-order preservation effects where normal superiority effects do not hold. In addition to this, the current system successfully accounts for the cases where the word order can be changed, specifically on remnant movement situations.

I expect that the current system fully deduces Müller 1996's generalization (cf. Kitahara 1997):

- (23) Müller 1996's generalization  
 X cannot undergo  $\alpha$ -movement resulting in a structure in which X dominates an unbound trace of Y, if the antecedent of Y has also undergone  $\alpha$ -movement.

Under the current system, the same  $\alpha$ -movement means the landing site is identical, resulting the word-order preservation effect. If the movements are different, then it is predicted to be possible, which is the case where there are two different landing sites (two probes).

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