Conditions on Cyclic Linearization

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1. Introduction

In this paper, I am going to discuss whether movement in the Cyclic Linearization model is totally free, as long as it observes Order Preservation among non-empty elements. I will demonstrate that this is not actually true, examining the Japanese Nominative-over-Nominative scrambling in the Nominative Object Constructions. On the basis of the analysis proposed, I will suggest two alternative ideas. One is that not all empty categories are invisible to Cyclic Linearization. The other is that a certain semantic constraint requires Order Preservation.

2. Cyclic Linearization

The Cyclic Linearization model proposed by Fox and Pesetsky (2004, 2005; henceforth F&P), which, following Bobaljik (2004), I call *CycLin* hereafter, is mainly characterized by the following two assumptions.

First, *CycLin* does not rely on the notion like the edge position (cf. Chomsky 2000 *et seq.*), which serves as an escape hatch for successive-cyclic movement. Instead, *CycLin* achieves the analogous effect by requiring that the relative ordering of elements in each Spell-Out domain (e.g. VPs, CPs, and DPs for Scandinavian languages) cannot contradict the ordering previously recorded on the Ordering Table. Consider the derivation of the English example (1):

(1) a. To whom will he say that Mary gave the book?
     b. [To whom will he [__ say [CP __ that Mary [VP __ gave the book __]]]]
     c. [To whom will he [__ say [CP __ that Mary [VP gave the book __]]]]

(1)b, where the derivation proceeds successive-cyclically, is tolerated in *CycLin*, since the ordering statement IO < V < DO is established in the first Spell-Out domain, and kept in the rest of the derivation. (1)c, on the other hand, where VP, the first Spell-Out domain, is skipped,

does not obey successive-cyclicity, since the ordering statement V < DO < IO in the VP contradicts IO < V < DO in the next Spell-Out domain, namely, CP. The contradiction in the ordering statement is not interpretable at PF, and hence the derivation crashes.

The other important assumption made by F&P is that traces are invisible to *CycLin*. They further argue that the effect of Holmberg's Generalization (HG) is a result of avoiding an ordering contradiction. According to F&P, even an element in the non-edge position can undergo movement, as long as the left-edge position of the Spell-Out domain is occupied by an empty element. This is because empty elements have no phonological content and hence never cause a contradiction to the ordering statement established in the former Spell-Out domain. Consider the following Swedish examples of Object Shift (OS) (2), quoted from F&P:

(2) a. Jag kysste henne inte [$_{VP}$ t_V t_O].
     I   kissed her   not
     'I did not kiss her.'
   b. *Jag har henne inte [$_{VP}$ kysst t_O].
     I   have her   not   kissed
     'I have not kissed her.'

Under F&P's assumption, OS does not proceed successive-cyclically through SpecVP. If this is correct, it will be predicted that OS is possible as long as it does not contradict the ordering statement established in the previous domain. The prediction is borne out. (2)a, where OS applies along with the verb-raising, keeps the ordering statement V < O. Though the trace left by the verb-raising is preceded by the object after OS, it is invisible and thus the sentence is grammatical. (2)b, on the other hand, V < O, the ordering statement in the first Spell-Out domain, conflicts with O < V in the subsequent Spell-Out domain as a result of OS. Here, what is preceded by the shifted object is not a trace, but a non-empty verb; therefore, the derivation induces an ordering contradiction, and hence the sentence is ungrammatical.

3. Problems

In this section, I will mention three problems for F&P's analysis, one of which is discussed in detail in Section 4, with reference to the Japanese Nominative Object Constructions.

First, it is pointed out in Bobaljik (2004) that F&P's theory cannot account for the asymmetry between CPs and VPs in terms of the number of elements that can be extracted out of them. More specifically, in contrast to VPs, which allows multiple elements to be extracted, extraction out of CPs is much more restricted in the sense that at most a single element is allowed to be extracted. Though intriguing, I do not discuss this problem further in this paper.

Second, Williams (2004) points out that F&P's theory does not extend to Serbo-Croatian

wh-movement. As is clear from the examples (3), Serbo-Croatian short-distance multiple *wh*-movement does not show Superiority effect:

(3) a. Ko   je   koga   vidjeo?
    who   AUX   whom   saw
   'Who saw whom?'
  b. Koga   je   ko   vidjeo?
    whom   AUX   who   saw
   'Who saw whom?'

Interestingly, however, if (3) is embedded in the higher Spell-Out domain, instantiating long-distance multiple *wh*-movement, Superiority effect shows up again, as shown in (4)b.

(4) a. Ko   si   koga   tvrdio   da   je   istukao?
    who   AUX   whom   claimed   that   AUX   beaten
   'Who do you claim that beaten whom?'
  b. *Koga   si   ko   tvrdio   da   je   istukao?
    whom   AUX   who   claimed   that   AUX   beaten
   'Who do you claim that beaten whom?'

This means that the ordering statement between two *wh*-phrases in the first Spell-Out domain can be altered or deleted in an intermediate Spell-Out domain, but has to be repaired in the subsequent Spell-Out domain.

In their reply (Fox and Pesetsky 2004), however, F&P argue that the contrast between (3) and (4) is not a problem for their theory. They note that the possibility of violating Superiority is limited to matrix clauses. This means that the possibility of violating Superiority is not due to the distinction between local and long-distance *wh*-movement, but to that between *wh*-movement in matrix and embedded clauses. Hence, they argue, (3) does not serve as an input to further *wh*-movement, and it is no wonder that (3) behaves differently from (4) in terms of Superiority. On the other hand, F&P admit that Superiority phenomena do not follow from *CycLin* and they will need to take other factors (e.g. Attract Closest) into consideration for this matter. In what follows, I will present further argument for constraints on *CycLin* other than Order Preservation.

In fact, they discuss a case in which *CycLin* is constrained by other factors than Order Preservation; namely, Inverse Holmberg Effects (IHE), in which a movement operation is constrained by another. For instance, Quantifier Movement (QM) in Icelandic blocks V-to-C movement triggered by the V2 requirement. As (5)a shows, QM in Icelandic targets the VP-external position which is lower than the OS position:

(5) a. Jón   hefur   ekkert sagt   Sveini.

    Jon   has nothing said   Svein-dat

    'John has told Svein nothing.'

  b. *Jón sagði ekkert Sveini.

    Jon   said   nothing Svein-dat

    'Jon told Svein nothing.'

However, this movement, being distinct from OS, has to observe successive-cyclicity. Hence, the first landing site for the quantifier is the edge-position of the VP. This movement, however, produces the ordering statement Q < V within the VP, the first Spell-Out domain. If the verb moves to C, in order to satisfy the verb-second requirement, then the ordering statement in the next domain (i.e. CP) results in V < Q, an ordering contradiction. F&P claim that the ungrammaticality of (5)b shows that their analysis is correct. This means that the constraint on V-to-C movement ultimately reduces to the ban on an ordering contradiction. The question is whether a movement operation is always possible as long as it does not result in an ordering contradiction. In Section 4, I will examine an instance showing that it is not always the case.

4. Nominative-over-Nominative Scrambling in Japanese

In this section, I am going to discuss the unacceptability of Nominative-over-Nominative (N-o-N) scrambling in the Japanese Nominative Object Constructions (NOCs), adopting the mechanism of *CycLin*. Following Ko (2004) in assuming that the scrambling of subject (i.e. nominative DPs) is logically possible, I will argue that the impossibility of N-o-N scrambling is best explained in terms of the requirement that aboutness relation must be maintained.[1]

4.1. Ko (2004)

Saito (1985) argues that the contrast between (6)b and (7)b is attributed to the general ban on the subject scrambling.

(6) a. John-ga   sake-o   san-bon   motte-ki-ta.

    John-nom   sake-acc three-classifier bring-come-past

  b. Sake-o   John-ga   san-bon   motte-ki-ta.

    sake-acc John-nom three-classifier bring-come-past

    'John came with three bottles of sake.'

(7) a. Gakusei-ga   san-nin   sake-o   nonde-iru.
      student-nom three-classifier sake-acc drink-progressive

    b. *Gakusei-ga   sake-o   san-nin   nonde-iru.
      student-nom   sake-acc three-classifier drink-progressive
      'Three students are drinking sake.'

Ko (2004) claims that the ungrammaticality of (7)b is not due to the general ban on the subject scrambling, but to the ban on illicit multiple scrambling (i.e. an instance of IHE, according to F&P), which ultimately results from the ban on anti-local movement. This is schematized in (8), where it is shown that movement from $Spec_1$ to $Spec_2$ is too local, and thus must be excluded:

(8) $[_{\alpha P}\ Spec_2\ [_{\alpha P}\ Spec_1\ \alpha\ ]]$

            ↑ _____*_____|
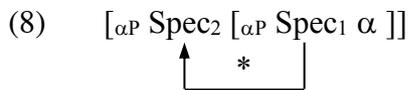
She further argues that the subject scrambling *per se* is legitimate, given the grammaticality of Korean data like (9):

(9) a. John-i_i   na-nun t_i Mary-lul   mannassta-ko sayngkakhanta.
      John-nom I-top   Mary-acc met-C   think
      'John, I think that met Mary.'

    b. Haksayng-tul-i_i   na-nun t_i sey-myeng   Mary-lul mannassta-ko sayngkakhanta.
      student-plural-nom I-top   three-classifier Mary-acc met-C   think
      'Students, I think that three met Mary.'

    c. Haksayng-tul-i_i   way t_i sey-myeng   hakkyo-lul   ttenass-nuncianta.
      student-plural-nom why   three-classifier school-acc   left-Q.know
      '(I) know why three students left the school.'

The Japanese sentences (10), roughly corresponding to (9) in the relevant respect, are also acceptable, if marginal, according to my judgment:

(10) a. John-ga   watasi-wa Mary-ni   atta-to   omou.
        John-nom I-top   Mary-dat   met-C   think
        'John, I think that met Mary.'
     b. Gakusei-ga   watasi-wa san-nin   Mary-ni atta-to omou.
        student-nom I-top   three-classifier   Mary-dat met-C think
        'Students, I think that three met Mary.'
     c. Gakusei-ga   naze   san-nin   gakkoo-o   yameta-ka   sitte-iru.
        student-nom why   three-classifier   school-acc left-Q   know
        '(I) know why three students left the school.'

First, (9)a and (10)a show that the embedded subject can scramble over the matrix subject.
Second, (9)b and (10)b show that the embedded subject can scramble over the matrix subject,
leaving the subject-oriented quantifier behind. Finally, (9)c and (10)c show that the subject
can scramble over a high adverb *way* and *naze* 'why'.[2] These data support her claim that the
subject scrambling *per se* is not prohibited at all.

4.2. The Nominative Object Constructions

    Tada (1992), Koizumi (1994, 1995, 1998), and Ura (1999, 2000), among others, argue
that in the Nominative Object Constructions (NOCs) like (11)a and (11)b, the objects undergo
LF-movement to the Spec of the higher functional category for Case-checking. Their claim is
based on the observation that the NOCs show different scope interpretation from their
accusative object counterparts, as in (12).[3, 4]

(11) a. Taroo-ni   eego-ga   hanas-e-ru.
         Taroo-dat English-nom   speak-able-present
      b. Taroo-ga   eego-ga   hanas-e-ru.
         Taroo-nom   English-nom   speak-able-present
      c. Taroo-ga   eego-o   hanas-e-ru.
         Taroo-nom   English-acc   speak-able-present
         'Taro can speak English.'

(12) a. John-ga   migime-dake-ga   tumur-e-ru.
         John-nom right-eye-only-nom   close-able
         'John can close only his right eye. (only < can but *can < only)'
      b. John-ga   migime-dake-o   tumur-e-ru.
         John-nom right-eye-only-acc   close-able
         'John can close only his right eye. (can < only but *only < can)'

However, as is pointed out in Saito and Hoshi (1998), the movement analysis of NOCs is

problematic since it predicts that (12)a should show an ambiguity; more specifically, given that the nominative object is base-generated in the θ-position and moved to the position where it c-commands the potential suffix, it should be interpreted in both θ- and Case-positions. Takano (2003) takes Saito and Hoshi's (1998) observation seriously, but disagrees with their mono-clausal analysis of NOCs for independent reasons. Takano therefore assumes that (11)a has a bi-clausal structure like (13):

(13)
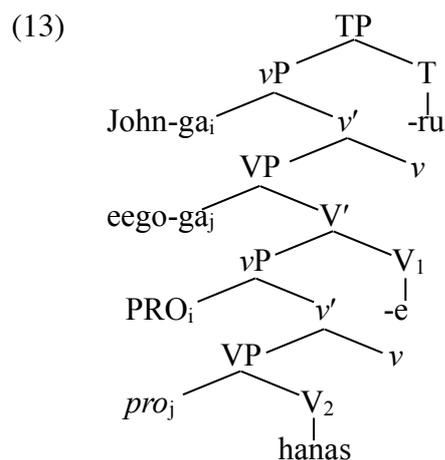
4.3. Proposal

First, adopting the structure in (13), let us consider whether the analysis based on *CycLin* can explain the ungrammaticality of (14), which is the result of scrambling the nominative object over the subject in (11)b.

(14) *Eego-ga   Taroo-ga   hanas-e-ru.[5]
      English-nom   Taroo-nom   speak-able-present
      'Taro can speak English.'

Suppose, following Ko (2004), that *v*P is a Spell-Out domain in Japanese.[6] Nothing seems to prevent the nominative object from moving first to the outer Spec of *v*P, establishing the ordering statement O < S, and then moving into the Spec of a higher projection. The ungrammaticality of (14) still remains unexplained, however. Then, suppose, just like OS in Scandinavian languages, that scrambling does not observe successive-cyclicity, and moves the object directly to the final landing site. Then, (14) can be excluded by saying that the original ordering statement S < O contradicts O < S. This option, however, is untenable, given the fact that accusative objects are rather freely scrambled over the subject, as in (15).[7] It is thus concluded that *CycLin* is constrained by some other factors.

81

(15) Eego-o   Taroo-ga   hanas-e-ru.
      English-acc Taroo-nom   speak-able-present
      'Taro can speak English.'

The question is what kind of constraint prevents the nominative object from undergoing scrambling over the subject. Following Takano (2003), let us assume that *eego-ga* in (13) is a proleptic object, which binds *pro*. Though Takano does not state it explicitly, his discussion naturally leads us to take the relation as a type of aboutness relation. What is crucial here is that an aboutness relation can only be established in the order A < B, where A is something spoken of and B is a comment on A.[8] Thus, a sentence in which A and B are ordered in the opposite order is generally uninterpretable. Compare (16)a, taken from Kuno (1973), with (16)b:[9]

(16) a. Sakana-wa tai-ga   ii.
        fish-top   red.snapper-nom good.
     b. *Tai-ga   sakana-wa ii.
        red.snapper-nom   fish-top   good
        'Speaking of fish, red snapper is the best.'

The same observation is true of the cases in which B is non-overt. Takano attributes the ungrammaticality of (17)b to the fact that the aboutness relation between the object (i.e. the embedded accusative subject) and *pro* is blocked, as a result of scrambling of the whole embedded CP:[10]

(17) a. Watasi-wa Mary-o$_i$ *pro*$_i$ tensai-da to   sinzite-iru.
        I-top   Mary-acc   genius-is that believe-progressive
     b. *pro$_i$ tensai-da to   watasi-wa Mary-o$_i$ sinzite-iru.
             genius-is that I-top   Mary-acc believe-progressive
     c. Mary-o$_i$ watasi-wa   *t* *pro*$_i$ tensai-da to   sinzite-iru.
        Mary-acc I-top   genius-is that believe-progressive
        'I believe of Mary that she is a genius.'

The question is why (14) is ungrammatical, even though the order of *eego-ga* and *pro* itself is not changed at all. I assume that the ungrammaticality comes from the unavailability of *eego-ga* as a licensor of *pro*. More specifically, I propose (18) as a constraint on aboutness constraint:[11]

(18)   *Constraint on Aboutness Relation*
In order for an aboutness relation to hold between A and B, either of the following must hold:
a. A < B is preserved, where A and B are arguments of different (complex) predicates.
b. (X <) A < B is preserved, where A, B, and X are arguments of the same (complex) predicate.

(14) and (16)b are ungrammatical due to a violation of (18)b, and so is (17)b due to a violation of (18)a. (17)c, on the other hand, violates neither of (18), since the arguments establishing the aboutness relation do not belong to the same predicate, and the A < B ordering is maintained.

A piece of evidence for my proposal is that (14) becomes perfect if the ordering statement S < O is 'recovered', say, by topicalization.[12]

(19)   Taroo-wa$_i$ eego-ga$_j$ naze t_i t_j hanas-e-ru   no?
Taroo-top English-nom why   speak-able-present Q
'Why can Taroo speak English?'

Given that a high adverb like *way* in (9)c in Korean and *naze* in (10)c in Japanese signal the application of scrambling (cf. footnote 2), it follows that *eego-ga* in (19) is scrambled to the position preceding these adverbs. Moreover, in (20) below, a non-*wh* adverb like *osoraku* 'probably' follows *eego-ga*, which Nakau (1980) classifies as a sentential adverb placed outside the proposition. This implies that scrambling of *eego-ga* has applied in (20), followed by the topicalization of *Taroo-ga*:

(20)   Taroo-wa$_i$ eego-ga$_j$ osoraku t_i t_j hanas-e-ru-daroo.
Taroo-top   English-nom probably   speak-able-present-will.
'Probably, Taroo will be able to speak English.'

Importantly, the grammaticality of (19) and (20) shows a kind of HG effect. More specifically, just like OS in Scandinavian languages is possible only when the ordering of the object relative to V is maintained, N-o-N scrambling is possible only when the ordering of the object relative to the subject is maintained. Thus, topicalization of *Taroo-ga* does not have to be mediated by successive-cyclic movement to the extra outer Spec of *v*P, which leads to the violation of (8).

If the analysis proposed thus far is correct, whether or not the nominative object can be scrambled is determined, though indirectly, by *pro*. This claim is further reinforced by the applicability of scrambling to the accusative object over the subject, as in (15). Takano assumes that (15) looks like (21) before scrambling:

(21)

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                          TP
                    vP         T
           John-ga_i     v'    |
                    VP      v   -ru
              vP        V_1
         PRO_i    v'    |
              VP     v  -e
        eego-o    V_2
                  |
                hanas
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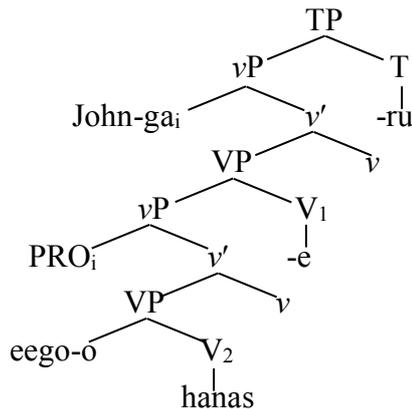
The accusative object *eego-o* in (21) does not have any aboutness relation and hence scrambling is free to apply.

5. Conclusion

Finally, I would like to consider another possibility. It might be equally plausible to assume that syntax prohibits N-o-N scrambling just in order to avoid processing complexity (Željko Bošković, p.c.). In other words, syntax looks at morphological case on DPs, and dislikes N-o-N scrambling just because it makes unclear the grammatical function each nominative DP bears.[13] If so, putting aside the issue of scope interpretation, it might be the case that the nominative and the accusative objects are not necessarily differentiated in terms of the structural position, but only in terms of the morphological case. Specifically, given that the nominative and the accusative objects in (11)b and (11)c, respectively, are located in the structurally identical position, the only clue for distinguishing the applicability of scrambling to these objects is morphological case on them. However, as is demonstrated in Bobaljik (2005), there is no evidence that syntax can see morphological case. Thus, I stick to the idea that the nominative and the accusative objects in the constructions under consideration must be structurally differentiated, free from considerations on morphological case. Takano's analysis is compatible with this idea and thus seems preferable.

An important implication of the analysis based on Takano's proposal is that movement can be constrained by an empty element. This is surprising, given F&P's claim that traces, which are also empty elements, are invisible and never constrain *CycLin*. This suggests that a finer classification of empty categories be needed for determining their visibility, though I leave the issue to further research. Alternatively, it might be the case that all empty categories are invisible to *CycLin*, and N-o-N scrambling itself is legitimate at PF, but not at LF. In other words, aboutness relation is not constrained by syntactic/phonological factors, but by semantic ones that requires that the participants in the relation be constrained by (18) for proper interpretation.

[1] See Kuno (1973) and Saito (1982), among others, for a discussion of the aboutness relation. Here, it seems to suffice to take the relation as something like 'speaking of A, B is *Predicate*'.

[2] See Ko (2005) for the claim that *way* in Korean and *naze* in Japanese are both directly Merged into SpecCP of the clause they modify.

[3] I will not discuss in this paper the validity of the scope interpretation of sentence pairs like (12)a and (12)b, since there are many native speakers of Japanese, including myself, who cannot detect any difference between them (Hiroshi Aoyagi, p.c.). See Tada (1992), Koizumi (1994, 1995, 1998), Ura (1999, 2000), Takahashi (2010, 2011), and Taguchi (2015), among others, for further discussion.

[4] Saito (1982) marks (11)a as '?', where the subject is dative and the object is nominative. I find no contrast in acceptability between (11)a and (11)b, so I treat them equally. Note moreover that I will not discuss the dative subject constructions (DSCs) in this paper, since it is not clear at this point whether they involve aboutness relation. See Ura (1999, 2000) for an analysis of the DSCs.

[5] The reviewer pointed out to me that N-o-N scrambling should in principle be possible, on the basis of the observation that (14) is more acceptable than i) below:

i) **Taroo-ga   Eego-ga   hanasu.
    Taro-nom   English-nom   speak
    'Taro speaks English.'

The reviewer thus suggested to me that the ill-formedness of (14) is not due to the ban on N-o-N scrambling, but due to the violation of the Constraint on Aboutness Relation (18), which must be more finely investigated. In future research, I will pursue this possibility, collecting and surveying the data of the similar kind.

[6] Ko actually provides some evidence that VP is also a Spell-Out domain in Korean, but I do not pursue the possibility for Japanese here.

[7] In fact, Takano gives (11)c the structure (21) below, where the accusative object is located in the position occupied by pro in (13). But it does not affect the current discussion.

[8] It might be possible to identify A and B as old and new information, respectively.

[9] According to the reviewer, what should be compared in terms of linear order in (16) should be *sakana-wa* and the whole chunk of *tai-ga ii*, rather than *tai-ga* alone. Given this, the well-formedness of i) below must somehow be explained without recourse to *CycLin*:

i) Tai-ga   ii,   sakana-wa.
    red.snapper-nom   good   fish-top
    'Speaking of fish, red snapper is the best.'

The reviewer's suggestion is that there must a pause between A (*tai-ga ii*) and B (*sakana-wa*), and it loosens the Constraint on Aboutness Relation (18). Here, I have an alternative approach in mind, which takes i) as an instance of Right Dislocation, and suppose that the sentence is derived in the following fashion, as proposed by Abe (1998, 2004):

ii) [TP [NP ~~sakana-wa~~] [VP tai-ga ii]]. [TP [NP sakana-wa] [VP ~~tai-ga ii~~]].

In ii), the whole sentence of (16)a is copied and the resultant two copies are linearly aligned. Then, the topic DP is deleted in the first copy. In the second copy, the VP, including nominative DP and the predicate, is deleted. Supposing that only constituents are targets of deletion, it is successfully guaranteed that the only possible derivations are (16)a and i). However, I continue to assume simply that only DPs are relevant for *CycLin*, as tacitly assumed in F&P.

[10] The reviewer raised the question of why *watasi-wa* in (17)c does not participate in the aboutness relation. I simply assume here that *watasi-wa* establishes an aboutness relation with the whole embedded CP. Since the ordering between A (*watasi-wa*) and B (the embedded CP) is preserved, (17)c does not violate either of the Constraints on Aboutness Relation (18).

[11] (18)b is not limited to the case of the scrambling of nominative DPs. This is shown by the following contrast between ia), a Googled example (05/05), and its scrambled counterpart ib):

i) a. Hokkaidoo-wa fuyu-wa   aisukuriimu-ga oisii.
       Hokkaido-top   winter-top ice.cream-nom good
       'As for Hokkaido, speaking of winter, ice cream is good.'
    b. ?Fuyu-wa   Hokkaidoo-wa aisukuriimu-ga oisii.
       winter-top   Hokkaido-top ice.cream-nom good
       'As for winter, speaking of Hokkaido, ice cream is good.'

Intuitively, *Hokkaido-wa* in ia) is the topic of the whole sentence, and an aboutness relation is established between *fuyu-wa* and *aisukuriimu-ga*. If *fuyu-wa* is scrambled over *Hokkaido-wa*, as in ib), the output

sentence is hardly interpretable, or, at least, loses the original aboutness interpretation between *fuyu-wa* and *aisukuriimu-ga*.

[12] I simply assume that topicalization involves movement of an NP to SpecCP or SpecTopP. See Saito (1985) for a discussion of how topicalization is a subcase of scrambling.

[13] This alternative seems to be another challenge for F&P's proposal, in the sense that movement may be constrained by factors other than Order Preservation.

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