Multiple scrambling, headless vP-movement, and Cyclic Linearization[*]

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1.   Introduction

Japanese allows Multiple Scrambling (MS), which is traditionally analyzed as involving multiple instances of Single Scrambling (SS), as shown in (1). This paper examines scope and binding under MS, arguing for the headless vP-fronting account of MS in line with Koizumi (1995, 2000), where MS is analyzed as scrambling of vP that contains what appear to be scrambled elements, but no verb, as a result of verb movement out of vP.[1]

(1)   *Multiple SS analysis*
  a.   [Subj [$_{vP}$ IO DO V] T]
  b.   [IO DO Subj [$_{vP}$ t$_{IO}$ t$_{DO}$ V] T]

(2)   *Headless vP-fronting analysis*[2]
  a.   [Subj [$_{vP}$ IO DO V] T]
  b.   [Subj [$_{vP}$ IO DO t$_V$] V+T]
  c.   [[$_{vP}$ IO DO t$_V$] Subj t$_{vP}$ V+T]

It is also argued that a typical objection to the headless vP-fronting account based on the Proper Binding Condition (PBC) is resolved under a linearization-based approach to PBC effects in Japanese (Takita 2010).

[1]This paper focuses on MS where scrambled phrases form a phonological unit, which is the most natural prosody of MS (Koizumi 2000, Agbayani et al. 2015). This property of MS is expected under the headless vP-fronting analysis given that the scrambled phrases form a constituent (see Ishihara 2007 for independent evidence that vP is mapped onto prosody as a phonological unit of Major Phrase). For an analysis of cases where a different prosodic pattern is involved, i.e., where scrambled elements do not form a prosodic unit, see Arano 2017.

[2]For concreteness I assume here that V moves to T. What is important here is that V moves out of vP. The final landing site need not be within TP (It may be somewhere between vP and TP).

2.   Arguments for the headless vP-movement analysis

The multiple SS account in (1) claims that MS is just a multiple application of SS. It thus predicts that elements that undergo MS should behave as if they undergo SS. The headless vP-movement analysis in (2), on the other hand, expects there should be some differences between SS and MS. First, there is a difference in the category of the moved elements in SS and MS: what undergoes movement in MS is not what appear to be scrambled phrases on the surface, but the vP which contains them. Second, contrary to SS, MS should not affect the c-command domain of 'scrambled elements,' since they are dominated by vP. For example, the IO in (2) never c-commands the subject. This section shows that SS and MS indeed behave quite differently regarding scope and binding, and that the relevant properties of MS follow from the headless vP-fronting analysis.

2.1   Scope

Japanese is known as a scope-rigid language. Thus, (3a) shows no ambiguity: the subject takes wide scope over the indirect object. An application of SS makes such examples ambiguous. Thus, the indirect object can scope over the subject in (3b):

(3)   a.   3-tu-no   ginkoo-ga Toyota-dake-ni   monku-o   itta.
              3-CL-GEN bank-NOM Toyota-only-DAT complaint-ACC said
              'Three banks made complaints only to Toyota.'   3>only; *only>3

       b.   Toyota-dake-ni$_1$ 3-tu-no   ginkoo-ga t$_1$ monku-o   itta.
              Toyota-only-DAT 3-CL-GEN bank-NOM   complaint-ACC said
              '[Only to Toyota]$_1$, three banks made complaints t$_1$.'   3>only; only>3

Agbayani et al. (2015: 69) point out that MS is different from SS in this regard. Based on (4a), where an IO and a DO are scrambled, they argue that MS does not affect scope. (4b) shows that the word order between the scrambled elements does not matter here:

(4)   a.   Toyota-dake-ni$_1$ monku-o$_2$ 3-tu-no   ginkoo-ga t$_1$ t$_2$ itta.
              Toyota-only-DAT complaint-ACC 3-CL-GEN bank-NOM   said
              'lit. [Only to Toyota]$_1$ complaints$_2$, three banks made t$_2$ t$_1$.' 3>only; ??only>3

       b.   Monku-o$_2$ Toyota-dake-ni$_1$ 3-tu-no ginkoo-ga t$_1$ t$_2$ itta.
              'lit. Complaints$_2$ [only to Toyota]$_1$, three banks made t$_2$ t$_1$.' 3>only; *only>3

Under the traditional analysis of MS, where MS involves multiple SS, the contrast between (3b) and (4) is mysterious since both SS and MS involve SS of the IO, hence there should be no contrast here: the IO should be able to scope over the subject in (4), just as it does in (3b). The headless vP-movement analysis, on the other hand, correctly predicts this contrast, since vP-fronting does not affect scope, as shown in (5):

(5) [Toyota-dake-ni   monku-o   ii-wa]$_1$ 3-tu-no   ginkoo-ga t$_1$ sita.
     Toyota-only-DAT complaint-ACC say-TOP 3-CL-GEN bank-NOM   did
     '[Make complaints only to Toyota], three banks did.'   3>only; *only>3

Movement of vP does not change the c-command relationship between the subject and the IO. Furthermore, as discussed by Heycock (1995) and Takano (1995), predicate phrases obligatorily reconstruct. Given this property of vP-fronting, the vP-fronting approach to MS correctly predicts the examples in (4) to be unambiguous.

   Further support for the headless vP-movement analysis comes from examples involving quantificational IO and DO. (6a), with the IO-DO order, is unambiguous, with the IO taking wide scope. Hoji (1985) showed that VP-internal scrambling makes such examples ambiguous: the DO can scope over the IO in (6b):

(6) a. Mary-ga 3-tu-no   kaisya-ni   hon-dake-o   okutta.
         M.-NOM 3-CL-GEN company-DAT book-only-ACC sent
         'Mary sent three companies only books.'   3>only; *only>3

     b. Mary-ga hon-dake-o$_1$ 3-tu-no   kaisya-ni   t$_1$ okutta.
         M.-NOM book-only-ACC 3-CL-GEN company-DAT   sent
         'lit. Mary sent [only books]$_1$ three companies t$_1$.'   3>only; only>3

Examples in (7) involve MS of the IO and the DO. Importantly, word order between them makes a difference here: with the IO-DO order, the example is unambiguous, while with the DO-IO order, the example is ambiguous.

(7) a. [3-tu-no   kaisya-ni]$_1$ hon-dake-o$_2$ Mary-ga t$_1$ t$_2$ okutta.
          3-CL-GEN company-DAT book-only-ACC M.-NOM   sent
         'lit. [Three companies]$_1$ [only books]$_2$ Mary sent t$_1$ t$_2$.'   3>only; *only>3

     b. Hon-dake-o$_2$ [3-tu-no kaisya-ni]$_1$ Mary-ga t$_1$ t$_2$ okutta.
         'lit. [Only books]$_2$ [three companies]$_1$ Mary sent t$_1$ t$_2$.'   3>only; only>3

The lack of ambiguity in (7a) is surprising under the traditional multiple SS analysis. Since the scrambled DO c-commands a trace of the IO, the DO should be able to scope over the IO when the IO reconstructs below the scrambled DO. On the other hand, the situation in (7) is exactly what is expected under the vP-fronting analysis. (7a) is derived via headless vP-movement, which means that the DO never c-commands (a trace of) the IO, as shown in (8a). Therefore, the IO scopes over the DO. (7b), on the other hand, is derived by a combination of headless vP-fronting and VP-internal scrambling, as in (8b). As a consequence of VP-internal scrambling, the DO c-commands the IO, hence (7b) is ambiguous, like (6b):

(8) a. [$_{CP}$ [$_{vP}$ t$_{Subj}$ [$_{VP}$ IO DO t$_V$] t$_v$] [$_{CP}$ [$_{TP}$ Subj t$_{vP}$ V+v+T] C]
     b. [$_{CP}$ [$_{vP}$ t$_{Subj}$ [$_{VP}$ DO IO t$_{DO}$ t$_V$] t$_v$] [$_{CP}$ [$_{TP}$ Subj t$_{vP}$ V+v+T] C]

The vP-fronting analysis thus captures the fact that MS can affect the scope relationship between scrambled elements ((7)), but it cannot affect the scope relationship between a scrambled element and a non-scrambled element ((4)).

2.2 Binding

In this section we turn to binding, focusing on the anaphor *karezisin*. Nakamura (1989) shows that *karezisin* requires a local c-commanding masculine NP as its antecedent. In (9a), there are three R-expressions, *Taro*, *Kana*, and *Nao*. Among these elements, only *Taro* is a potential antecedent of *karezisin* because it is the only masculine NP. However, it is not local to *karezisin*, hence (9a) is unacceptable. (9b) shows that SS can make the anaphor local to the antecedent, making the coreference between the matrix subject and the anaphor possible. Importantly, (9c) shows that MS does not have this property:

(9)   a. *Taro-ga [Kana-ga Nao-ni karezisin-o syookaisita to] itta.
           T.-NOM K.-NOM N.-DAT himself-ACC introduced C said
           'Taro said that Kana introduced himself to Nao.'

        b. Karezisin-o$_1$ Taro-ga [Kana-ga Nao-ni t$_1$ syookaisita to] itta.
           himself-ACC T.-NOM K.-NOM N.-DAT introduced C said
           'lit. Himself$_1$, Taro said that Kana introduced t$_1$ to Nao.'

        c. ??Nao-ni$_1$ karezisin-o$_2$ Taro-ga [Kana-ga t$_1$ t$_2$ syookaisita to] itta.
           N.-DAT himself-ACC T.-NOM K.-NOM introduced C said
           'lit. [To Nao]$_1$ himself$_2$, Taro said that Kana introduced t$_2$ t$_1$.'

That MS does not feed binding follows from the vP-movement analysis. Huang (1993) points out that movement of NPs and movement of verb phrases show the following asymmetry with respect to Condition A:

(10)   a. [Which picture of himself] did John think Mary saw t?
        b. *[Criticize himself], John thinks Mary would not t.   (Huang 1993:107)

Takita (2010: 107) shows that the same asymmetry is also observed in Japanese:

(11)   *[Nao-ni karezisin-o syookaisi-sae]$_1$ Taro-ga [Kana-ga t$_1$ sita to] itta.
       N.-DAT himself-ACC introduce-even T.-NOM K.-NOM did C said
       'lit. [Even introduce himself to Nao], Taro said that Kana did.'

Huang (1993) argues that the reason for the ungrammaticality of the examples with predicate fronting is that the moved predicate contains a trace of its subject, which blocks binding from the outside. Huang's proposal can be restated as entailing that moved predicates are at least as large as vP. Then, the vP-movement approach to MS predicts the degradedness of (9c): since MS involves movement of headless vP, which contains a trace of the subject, binding from outside is blocked, as in (11). Under the traditional analysis of MS,

however, the contrast between (9b) and (9c) is puzzling since it is unclear what could block reconstruction of the anaphor into the embedded [Spec, CP] in (9c), but not in (9b).

The vP-movement approach to MS makes a further prediction. Consider the following examples where the IO is the only antecedent for the anaphor within the DO. As (12b) shows, the anaphor can be licensed under reconstruction of VP-internal scrambling:

(12) a. Nao-ga [Kana-ga Taro-ni karezisin-no syasin-o   miseta to] itta.
       N.-NOM K.-NOM T.-DAT himself-GEN picture-ACC showed C said
       'Nao said that Kana showed Taro a picture of himself.'

   b. Nao-ga [Kana-ga [karezisin-no syasin-o]$_1$ Taro-ni t$_1$ miseta to] itta.
       N.-NOM K.-NOM himself-GEN picture-ACC T.-DAT   showed C said
       'lit. Nao said that Kana showed [a picture of himself]$_1$ Taro t$_1$.'

Given the structure in (8), then, the vP-fronting approach to MS predicts that, when the IO and the DO undergo MS, the anaphor should be able to undergo reconstruction below the scrambled IO. This prediction is borne out:

(13) a. Taro-ni$_1$ [karezisin-no syasin-o]$_2$ Nao-ga [Kana-ga t$_1$ t$_2$ miseta to] itta.
       T.-DAT   himself-GEN picture-ACC N.-NOM K.-NOM   showed C said
       'lit. Taro$_1$ [a picture of himself]$_2$, Nao said that Kana showed t$_1$ t$_2$.'

   b. [Karezisin-no syasin-o]$_2$ Taro-ni$_1$ Nao-ga [Kana-ga t$_1$ t$_2$ miseta to] itta.
       'lit. [A picture of himself]$_2$ Taro$_1$, Nao thinks that Kana showed t$_1$ t$_2$.'

The vP-fronting approach to MS thus captures the fact that reconstruction for binding purposes is allowed when an antecedent is another scrambled element ((13b)), but not when it is a matrix subject ((9c)). This is difficult to capture under the traditional analysis of MS since reconstruction of the anaphor should be allowed under MS as well as SS.

3.   Proper Binding Condition and Cyclic Linearization

This section discusses an argument raised against the present approach. The argument concerns the PBC (Fiengo 1977), which requires that traces be bound. Its effects in Japanese have been much discussed in the literature (Saito 1985, 1989, 2003, Kitahara 1997, Hiraiwa 2010, Takita 2010). Consider the following contrast regarding 'standard' vP-fronting:

(14) a. [$_{vP}$ Bill-ni okane-o   age-sae]$_1$ Mary-ga [Jim-ga t$_1$ sita to] itta.
         B.-DAT money-ACC give-even M.-NOM J.-NOM   did C said
       'lit. [Even give money to Bill]$_1$, Mary said that Jim did t$_1$.'

   b. *[$_{vP}$ Bill-ni t$_2$ age-sae]$_1$ Mary-ga [Jim-ga okane-o$_2$ t$_1$ sita to] itta.
         B.-DAT   give-even M.-NOM J.-NOM money-ACC   did C said
       'lit. [Even give t$_2$ to Bill]$_1$, Mary said that Jim did money$_2$ t$_1$.'

(14a) involves headed vP-fronting with all VP-internal arguments remaining inside the vP. In (14b), the DO moves out of the vP, which is followed by vP-fronting. (14b) is taken to be unacceptable due to a PBC violation. Given that internal arguments show PBC effects under 'normal' headed vP-fronting, it appears that we would expect to find such effects under MS too. However, this is not the case. (15) is an example of MS corresponding to (14b) and is acceptable:

(15)   [Riyuu-mo   naku   Bill-ni t_2 t_3]$_1$ Mary-ga [Jim-ga okane-o$_2$ t_1 ageta$_3$ to] itta.
        reason-even without B.-DAT   M.-NOM J.-NOM money-ACC gave   C   said
        'lit. [Without any reason]$_1$ [to Bill]$_2$, Mary said that Jim gave that money t_2 t_1.'

The contrast between (14b) and (15) seems problematic for the headless vP-fronting account, since there is an unbound trace of the moved internal argument in both cases. In fact, (15) has more violations of the PBC since it has an unbound trace of the verb as well as that of the internal argument. However, the original PBC, which demands that every trace be bound, is quite clearly too strong. For example, there are languages like German that allow remnant movement very productively (Müller 1996, 1998). Given this state of affairs, many attempts have been made to deduce PBC effects from independent principles which would allow some "violations" of the PBC (Collins 1994, Müller 1996, 1998, Kitahara 1997, Hiraiwa 2010). Whether the relevant contrast between the 'standard' vP-fronting and MS poses a real problem to the headless vP-movement account then depends on the way the PBC effects are deduced.

    In this section I pursue the idea that PBC effects in Japanese are reduced to linear order preservation effects (Kathol 2000, Müller 2000, 2001, Sells 2001, Fox & Pesetsky 2005, Williams 2003). Specifically, following Takita (2010), I implement this idea in terms of Cyclic Linearization (Fox & Pesetsky 2005). I show that the contrast noted above naturally follows from this version of the PBC.

3.1   Cyclic Linearization: Fox & Pesetsky 2005

Under the theory of cyclic Spell-Out (Chomsky 2000 et seq.), Fox & Pesetsky (2005) propose that linearization applies cyclically, and that orderings established at a given point of the derivation have to be preserved at the end of later cycles. Information on linearization is expressed as ordering statements of the form $\alpha < \beta$, which means that "the last element dominated by α *and not dominated by a trace* precedes the first element dominated by β *and not dominated by a trace* (Fox & Pesetsky 2005:10)."

    Suppose that VP and CP are Spell-Out domains in which linearization takes place, and consider the following derivation.

(16)   a.   [$_{VP}$ X Y] : Spell-Out of VP $\rightarrow$ X<Y
        b.   [$_{CP}$ X Z [$_{VP}$ t_X Y]] : Spell-Out of CP $\rightarrow$ X<Z<VP $\rightarrow$ X<Z<Y

In (16a) we have VP in which X precedes Y. Once VP is spelled out, an ordering statement X<Y is established in PF, which cannot be modified later in the derivation. CP is the next

derivational point at which Spell-Out applies. Within CP, Z is introduced into the derivation, and X is moved above Z.[3] After Spell-Out of CP, we get an ordering statement X<Z<VP. Since the first element dominated by VP and not dominated by a trace is Y, this ordering statement is equivalent to X<Z<Y. This ordering is consistent with what we got at the VP-level. Thus, the derivation converges.

Let us turn to the following derivation, where Y, instead of X, moves within CP:

(17)   a. $[_{VP}$ X Y$]$: Spell-Out of VP $\rightarrow$ X<Y
        b. $[_{CP}$ Y Z $[_{VP}$ X $t_Y]]$: Spell-Out of CP $\rightarrow$ Y<Z<VP $\rightarrow$ Y<Z<X

The derivation within VP is the same as before. Within CP, Z is introduced into the derivation, and Y is moved above Z. Spell-Out of CP creates the ordering statement Y<Z<VP, which is equivalent to Y<Z<X. Note that the ordering statement at the VP-level and the ordering statement at the CP-level are contradictory: the former says that X precedes Y, and the latter says that Y precedes X. Since the ordering statement cannot be deleted once it is established, this derivation leads to a linearization failure. To get the order Y<Z<X licitly, Y must move within VP so that we get the ordering statement Y<X at the VP-level:

(18)   a. $[_{VP}$ Y X $t_Y]$: Spell-Out of VP $\rightarrow$ Y<X
        b. $[_{CP}$ Y Z $[_{VP}$ t_Y X $t_Y]]$: Spell-Out of CP $\rightarrow$ Y<Z<VP $\rightarrow$ Y<Z<X

3.2   Cyclic Linearization and the PBC

Following Takita (2010), I claim that the PBC effects in Japanese follow from Cyclic Linearization. I assume as before that VP and CP are Spell-Out domains.[4] Takita (2010) combines Cyclic Linearization with head-finality of Japanese, thereby deriving the effects of the PBC. Since internal arguments originate within VP, and V sits in the final position, Spell-Out of VP dictates that the internal arguments must precede the verb, though DO can precede IO because of VP-internal scrambling:

(19)   a. $[_{VP}$ IO DO V$]$: Spell-Out of VP $\rightarrow$ IO<DO<V
        b. $[_{VP}$ DO IO t_{DO} V$]$: Spell-Out of VP $\rightarrow$ DO<IO<V

Recall that an ordering statement cannot be changed later in the derivation once it is established through Spell-Out. Then, the ordering statements in (19) provide an account of the paradigm in (20), which illustrates a typical PBC effect:

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[3]In Fox and Pesetsky's system, elements undergoing Spell-Out can still move as long as it does not result in a contradiction with the previous ordering statements. For them, there is no Phase Impenetrability Condition in Chomsky 2000 et seq. Rather, its effects follow from the architecture of the system.

[4]Takita (2010) assumes, following Ko (2005, 2007), that vP, not VP, constitutes a Spell-Out domain in Japanese. Under this assumption, an explanation is required as to why a trace of the external argument does not show PBC effects under vP-fronting (see the acceptability of (14a)), while that of internal arguments does. Takita accounts for the absence of PBC effects with the external argument by assuming that vP-fronting involves a control structure with the fronted vP containing PRO, not a trace.

(20) a. Masao-ni$_1$ Taro-ga [Hanako-ga t$_1$ hon-o   ageta to] itta.
         M.-DAT T.-NOM H.-NOM   book-ACC gave C said
         'lit. Masao$_1$, Taro said that Hanako gave t$_1$ books.'

      b. [Hanako-ga Masao-ni hon-o   ageta to]$_1$ Taro-ga t$_1$ itta.
          H.-NOM   M.-DAT book-ACC gave C   T.-NOM   said
         '[That Hanako gave Masao books]$_1$ Taro said t$_1$.'

      c. *[Hanako-ga t$_2$ hon-o   ageta to]$_1$ Masao-ni$_2$ Taro-ga t$_1$ itta.
          H.-NOM   book-ACC gave C M.-DAT   T.-NOM   said
         'lit. [That Hanako gave t$_2$ books]$_1$ Masao$_2$ Taro said t$_1$.'

(20a) and (20b) involve scrambling of the IO and of the embedded clause, respectively. (20c) shows that unacceptability arises when the IO and the embedded clause are both scrambled, and the former follows the latter. The unacceptability of (20c) straightforwardly follows from Cyclic Linearization: at the most embedded VP-level, we get the ordering statement such that the IO precedes the V. In (20c), however, the V precedes the IO. Therefore, this example is unacceptable. This account can be extended to the case of 'normal' vP-fronting in (14b), which is repeated as (21). Its derivation proceeds as in (22):

(21) *[$_{vP}$ Bill-ni t$_2$ age-sae]$_1$ Mary-ga [Jim-ga okane-o$_2$ t$_1$ sita to] itta.
        B.-DAT   give-even M.-NOM J.-NOM money-ACC   did C said
      'lit. [Even give t$_2$ to Bill]$_1$, Mary said that Jim did money$_2$ t$_1$.'   [=(14b)]

(22) a. [$_{VP}$ IO DO V] : Spell-Out of VP   b. [$_{vP}$ Subj [$_{v'}$ [$_{VP}$ IO DO t$_V$] V+v]]
      c. [$_{TP}$ Subj [$_{TP}$ DO [$_{vP}$ t$_{Subj}$ [$_{v'}$ [$_{VP}$ IO t$_{DO}$ t$_V$] V+v]] T]]
      d. [$_{CP}$ [$_{vP}$ t$_{Subj}$ [$_{v'}$ [$_{VP}$ IO t$_{DO}$ t$_V$] V+v]] [$_{CP}$ [$_{TP}$ Subj [$_{TP}$ DO t$_{vP}$ T]] C]]
          : Spell-Out of CP

First, the Spell-Out of VP dictates that IO precedes DO, which in turn precedes V ((22a)). Then, v is introduced into the derivation, and Subj and DO are moved out of vP so that they can remain in the embedded clause after vP-fronting ((22b,c)). Importantly, the V must remain within vP since this is an example of headed vP-fronting. Finally, vP moves to the embedded [Spec, CP] and Spell-Out applies ((22d)). At this point we get the ordering statement IO<V<Subj<DO. This statement is inconsistent with what we got at the VP-level: Spell-Out of VP requires DO to precede V, whereas Spell-Out of CP requires DO to follow V. Thus, (21) is correctly ruled out as a violation of linearization.
    Let us turn to the derivation of headless vP-fronting with a stranded remnant:

(23) [Riyuu-mo naku   Bill-ni t$_2$ t$_3$]$_1$ Mary-ga [Jim-ga okane-o$_2$ t$_1$ ageta$_3$ to] itta.
       reason-even without B.-DAT   M.-NOM J.-NOM money-ACC gave   C said
      'lit. [Without any reason]$_1$ [to Bill]$_2$, Mary said that Jim gave that money t$_2$ t$_1$.'
                                                                    [=(15)]

(24)　a.　$[_{VP}$ IO DO V] : Spell-Out of VP
　　　b.　$[_{vP}$ Adv $[_{vP}$ Subj $[_{v'}$ $[_{VP}$ IO DO t_V] V+v]]]
　　　c.　$[_{TP}$ Subj $[_{TP}$ DO $[_{vP}$ Adv $[_{vP}$ t_{Subj} $[_{v'}$ $[_{VP}$ IO t_{DO} t_V] t_v]]]] V+v+T]]
　　　d.　$[_{CP}$ $\boxed{[_{vP}$ Adv $[_{vP}$ t_{Subj} $[_{v'}$ $[_{VP}$ IO t_{DO} t_V] t_v]]]}$ $[_{CP}$ $[_{TP}$ Subj $[_{TP}$ DO t_{vP} V+v+T]]
　　　　　C]] : Spell-Out of CP

The derivation at the VP-level is the same as before ((24a)). Subj and DO also move out of vP as before ((24b,c)). An important step is V-to-T movement in (24c). This movement is required since this is a case of MS, and the V needs to stay in the lower clause. Finally, headless vP-fronting takes place and Spell-Out is triggered at the CP-level ((24d)). At this point, we get the ordering statement Adv<IO<Subj<DO<V. Importantly, this ordering statement is consistent with the ordering statement at the VP-level. Due to the V-movement to T, V can stay at the end of the embedded clause and a linearization failure is avoided.

4.　Conclusion

This paper has provided evidence that MS in Japanese should be analyzed as headless vP-fronting. Specifically, we have seen that MS exhibits the properties of vP-fronting with respect to scope and binding. In addition to the facts on scope and binding, the analysis can also capture the observation that elements undergoing MS form a phonological unit (Koizumi 2000, Agbayani et al. 2015) given that they are within the same vP (see footnote 1). It has also been noted that there is an important difference between headed and headless vP-fronting with regard to PBC effects: while headed vP-fronting does not tolerate an unbound trace of internal arguments, headless vP-fronting, i.e., MS, tolerates it. I have shown this asymmetry can be accounted for by reducing PBC effects to Cyclic Linearization.

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