Multiple Nominative and Form Sequence

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1 Introduction

(1) **Possessive multiple nominative construction (possessive MNC)** (Kuno 1973: 70-71)
Bunmeikoku-**ga**   dansei-**ga** heikin-zyumyoo-**ga**   mizikai.
Civilized.countries-Nom male-Nom average-life.span-Nom short-Pres
'It is in civilized countries that male's average life span is short.'

(2) **Adjunct multiple nominative construction (adjunct MNC)** (Tateishi 1991: 30, cf. Kuno 1973)
Ano ziko-**ga**   takusan-no nihonzin-**ga**   sinda.
that accident-Nom many-Gen Japanese-Nom die-Past
'It was in that accident that many Japanese died.'

(3) **Standard analysis of the MNC** (Kuno 1973; Saito 1982; 2014; Fukui 1986/1995; Fukui and Speas 1986; Takezawa 1987; Kuroda 1988; Heycock and Lee 1989; Fukuda 1991; Tateishi 1991; Heycock 1993a, b; Ura 1993; Takahashi 1994; Ishii 1997; Namai 1997; Hiraiwa 2001; Vermeulen 2005; Yamada 2013; Narita 2014; Epstein, Kitahara, and Seely 2020)

{XP-*ga*, {YP-*ga*, { …
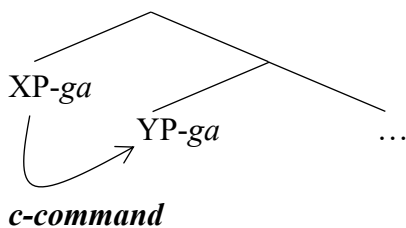
c-command

➔ An important consequence of the standard analysis is that **there is a hierarchical structural relation** between the multiple nominative phrases, and **there is a formal c-command relation** between them: XP-*ga* is structurally higher than YP-*ga*, and the former c-commands the latter, but not vice versa.

Our main claim

> **MNC is an instance of *Form Sequence* that produces a pure sequence, a flat structure where there is no formal c-command relation.**

Roadmap
Section 2 … Provide novel data showing that there is no formal c-command relation between MN phrases
Section 3 … Explain the data and derive some peculiar properties of the adjunct MNC
        … Explore a Determinacy account for the impossibility of MNC in English and its consequences
        … Discuss the potential of Form Sequence and identify a missing mode of structure-building
Section 4 … Conclusion

2 Data

The *ga*-phrases in the possessive MNC can be freely altered by scrambling (cf. Tateishi 1991: 283).

(4) **Possessive MNC** (= (1))
   a. Bunmeikoku-**ga** dansei-**ga** heikin-zyumyoo-**ga** mizikai.
   b. Bunmeikoku-**ga** heikin-zyumyoo-**ga** dansei-**ga** mizikai.
   c. Dansei-**ga** bunmeikoku-**ga** heikin-zyumyoo-**ga** mizikai.
   d. Dansei-**ga** heikin-zyumyoo-**ga** bunmeikoku-**ga** mizikai.
   e. Heikin-zyumyoo-**ga** bunmeikoku-**ga** dansei-**ga** mizikai.
   f. Heikin-zyumyoo-**ga** dansei-**ga** bunmeikoku-**ga** mizikai.

➔ The free word-order property in the possessive MNC hinders the verification of the height relation between the MN phrases, so we will focus on the adjunct MNC.

Properties of the adjunct MNC (Vermeulen 2005)

> (i)   an adjunct *ga*-phrase can be replaced with a postposition, but cannot be replaced with a possessor (➔(6a)).
>
> (ii) an adjunct *ga*-phrase must precede an argument *ga*-phrase; and if the argument *ga*-phrase precedes the adjunct *ga*-phrase, the sentence becomes unacceptable. (➔(6b))

(5) **Adjunct MNC** (Vermeulen 2005: 1330)[1]
   Ano mise-**ga** gakusee-**ga** hon-o yoku kau.
   that shop-Nom student-Nom book-Acc often buy-Pres
   'It is at that shop that students often buy books.'

(6) (Vermeulen 2005: 1351)
   a. Ano mise-**de/*no** gakusee-**ga** hon-o yoku kau.
      that shop-at/Gen student-Nom book-Acc often buy
   b. *Gakusee-**ga** ano mise-**ga** hon-o yoku kau.
      student-Nom that shop-Nom book-Acc often buy

➔ Example (5) meets the adjunct MNC properties as in (6), so it can be a genuine instance of adjunct MNCs.

In what follows, based on these properties of the adjunct MNC, we create relevant examples and inspect the structural relation between the MN phrases based on independently motivated syntactic tests, such as order between *wh*-phrases and negative polarity items (NPIs) and Condition C.

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[1] There are adjunct MNCs with more than two *ga*-phrases:

(i) (Tateishi 1991: 311-2)
   a. Natu-**ga** kono kooen-**ga** hito-**ga** takusan iru.
      summer-Nom this park-Nom people-Nom many be
      Lit. 'It is the summer in the park that there are many people.'
   b. Natu-**ga** Fukuoka-**ga** zinzya-**ga** takusan tatteiru.
      summer-Nom Fukuoka-Nom shrine-Nom many stand
      Lit. 'It is the summer in Fukuoka that many shrines are standing.'

2.2 Order of wh-phrases and NPIs

(7) **The c-command requirement on WH-NPI order** (Aoyagi and Ishii 1994)

    a. <u>**WH-NPI**</u>

       Dono gakusee-ga   kudamono-o ringo-**sika** tabe-na-kat-ta no?

       which student-Nom fruit-Acc   apple-only eat-Neg-Past. Q

       'Among fruits, which students ate only apples?'

    b. <u>**NPI-WH**</u>

      *Gakusee-ga   John-**sika** **dono** kudamono-o tabe-na-kat-ta no?

       student-Nom John-only which fruit-Acc   eat-Neg-Past. Q

       'Among students, which fruits did only John eat?'

➔ WH must not be asymmetrically c-commanded by NPI.

(8) **Adjunct MNC**

    Kono huru-honya-**ga**   gakusee-**ga**   hon-o   yoku kau.

    this   secondhand.bookstore-Nom student-Nom book-Acc often buy-Pres

    'It is at this secondhand bookstore that students often buy books.'

(9) a. Kono huru-honya-**de/*no**   gakusee-**ga**   hon-o   yoku kau.

      this   secondhand.bookstore-at/Gen student-Nom book-Acc often buy-Pres

    b. *Gakusee-**ga** kono huru-honya-**ga**   hon-o   yoku kau.

      student-Nom this secondhand.bookstore-Nom   book-Acc often buy-Pres

➔ Example (8) meets the adjunct MNC properties as in (9), so it can be a genuine instance of adjunct MNCs.

(10) **CHECK!** **The c-command requirement on WH-NPI order in adjunct MNC**

    a. <u>**WH-NPI**</u>

       Dono huru-honya-**ga**   ano gakusee-**sika** kyaku-**ga**   hon-o kaw-ana-i   no?

       which secondhand.bookstore-Nom that student-only   customer-Nom book-Acc buy-Neg-Pres. Q

       Lit. 'Which secondhand bookstore, only that student, customers buy books?'

    b. <u>**NPI-WH**</u>

       Huru-honya-**ga**   kono tenpo-**sika** **dono** gakusee-**ga**   hon-o   kaw-ana-i   no?

       secondhand.bookstore-Nom this shop-only   which student-Nom book-Acc buy-Neg-Pres. Q

       Lit. 'Secondhand bookstores, only this shop, which students buy books?'

(11) **CHECK!** **The c-command requirement on WH-NPI order in multiple adjuncts**

    a. <u>**WH-NPI**</u>

       Dono youbi-ni gengogaku-no   jugyo-**sika** gakusee-wa   shussekishi-nakat-ta no?

       what day-Dat linguistics-Gen class-only   student-Top   attend-Neg-Past.   Q

       Lit. 'On what day, only linguistics class, students didn't attend?'

    b. <u>**NPI-WH**</u>

      *Mokuyoubi-**sika**   **dono** jugyo-ni   gakusee-wa   shussekishi-nakat-ta no?

       Thursday-only   which class-Dat   student-Top   attend-Neg-Past.   Q

       Lit. 'Only Thursday, which class didn't students attend?'

➔ Under the standard analysis, (10b) should be unacceptable for the same reason as (7b) and (11b).

2.3 Condition C

(12) **Condition C** (Chomsky 1981; Whitman 1982; Saito 1983; Hoji 1985, a.o.)

    a. ?**Taroo$_i$**-no   hon-o   **soitu$_i$**-ga   mituke-ta.
       Taro-Gen   book-Acc guy-Nom   found-Past
       'That guy$_i$ found Taro$_i$'s book.'

    b. ***Soitu$_i$**-ga   **Taroo$_i$**-no   hon-o   mituke-ta.
       guy-Nom   Taro-Gen   book-Acc gound-Past
       'Taro$_i$'s book, that guy$_i$ found.'

➔ R-expression must not be asymmetrically c-commanded by any antecedent.

(13) **CHECK! Condition C in adjunct MNC**

    a. Kono tyoosa-ni-yoruto   **sono huru-honya$_i$-ga**   [**soko$_i$**-o   kiniitteiru gakusee-**ga**] yoku hon-o   kau.
       this   survey-according.to   that   secondhand.bookstore-Nom   there-Acc like   student-Nom often book-Acc buy-Pres
       'According to this survey, it is the secondhand bookstore$_i$ that students who like that place$_i$ often buy books.'

    b. ? Kono tyoosa-ni-yoruto   **soko$_i$-ga**   [**sono huru-honya$_i$**-o   kiniitteiru gakusee-**ga**] yoku hon-o   kau.
       this   survey-according.to there-Nom   that secondhand.bookstore-Acc like   student-Nom often book-Acc   buy-Pres
       'According to this survey, it is there$_i$ that students who like the secondhand bookstore$_i$ often buy books.'

(14) **CHECK! Condition C in multiple adjuncts**

    a. Kono   kiroku-ni-yoruto   **mokuyoubi$_i$** [**sono-hi$_i$**-no   subete-no jugyo-de] gakusee-wa   tesuto-o uke-nakat-ta.
       this   record-according.to Thursday   that-day-Gen all-Gen   class-in   student-Top   test-Acc take-Neg-Past
       Lit. 'According to this record, Thursday$_i$, in all classes of that day$_i$, students didn't take a test.'

    b. * Kono   kiroku-ni-yoruto   **sono-hi$_i$** [**mokuyoubi$_i$**-no subete-no jugyo-de] gakusee-wa   tesuto-o uke-nakat-ta.
       this   record-according.to that-day   Thursday-Gen all-Gen   class-in   student-Top   test-Acc take-Neg-Past
       Lit. 'According to this record, that day$_i$, in all classes on Thursday$_i$, students didn't take a test.'

➔ Under the standard analysis, (13b) should be unacceptable for the same reason as (12b) and (14b).

Summary so far

(3) **Standard analysis**

XP-*ga*

YP-*ga*   …
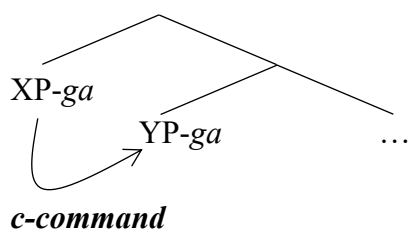
c-command

Point in CHECK

If there is a hierarchical structural relation between the MN phrases, and there is a formal c-command relation between them, (10b) and (13b) should be unacceptable because they violate the c-command requirements on WH-NPI order and Condition C.

3 Analysis

3.1 Multiple nominative construction as an instance of Form Sequence

Chomsky (2019/UCLA, 2020/LSJ, 2021/WCCFL) proposes the Form Sequence operation, an order-restricted flat-formation operation, especially in order to generate unbounded unstructured sequences.[2]

(15) **Form Sequence**
   $<(\&), X_1,…,X_n>$

➔ The presence of the coordinator $\&$ is optional, and if it is present, it usually appears before X_n in externalization (EXT).

Chomsky (personal communication)

"Form Sequence produces a pure sequence, yielding a flat structure where there is no formal c-command relation, but there is a strong tendency for a left-to-right counterpart."

Our main claim

MNC is an instance of Form Sequence that produces a pure sequence, a flat structure where there is no formal c-command relation.

(16) **Our analysis**
   <XP-*ga*, YP-*ga*, …>

   no c-command relation

➔ An important consequence of the proposed analysis is that **the MN phrases form a sequence where there is no formal c-command relation**.[3]

➔ Given this, we can easily solve the mystery of the standard analysis pointed out above, providing a principled account for why there seems no formal c-command relation between the multiple nominative phrases. **In (10a, b) and (13a, b), there is no formal c-command relation between the adjunct-*ga* phrases and the argument-*ga* phrases in the first place, so there is no violation of the c-command requirements imposed on WH-NPI order and Condition C.**

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[2] One of the unclear points in the definition of Form Sequence is that there is a difference in accessibility/extractability with Pair-Merge, even though they use the same operational notation, as in <a, b>. In Pair-Merge, elements in <a, b> cannot be accessed or extracted, while in Form Sequence, elements in <a, b> can be.   Chomsky (2021b/WCCFL) suggests that the reason why Form Sequence can access and extract elements in <a, b> is that Form Sequence is applied "after" set-Merge is applied, trying to derive the accessibility/extractability in Form Sequence from the timing of operation.   Alternatively, Goto and Ishii (2021) notice that <a, b> generated by Pair-Merge can set-theoretically be represented as in {a, {a, b}} as an instance of hierarchical, asymmetrical, structures (Wiener 1914; Kuratowski 1921), suggesting that the inaccessible/nonextractability property of Pair-Merge can be attributed to a violation of Determinacy, which states that operations have to take place in a fixed and determinate manner (Chomsky 2019a: 270).   See discussion below for Determinacy.

[3] A similar idea is found in Sorida (2014).

3.2 Consequences

Given that the adjunct MNC is a sequence, it is predicted that the **MN phrases do not form a constituent with another element outside of the sequence**, and they cannot pass constituency tests.

(17) **Coordinated adjunct MNC** (Vermeulen 2005: 1356)
　　　*Ano mise-**ga**　　[totemo ookiku]　　　katu [gakusee-**ga**　hon-o　　yoku　kau].
　　　that shop-Nom　very　big-Pres.Conj　and　student-Nom book-Acc often　buy
　　　Intended: 'It is that shop which is very big and [it is at that shop that] students often buy books.'

(18) a. Ano　mise-ga　　totemo　ookii.
　　　　that　shop-Nom　very　　big
　　　　'That shop is very big.'
　　 b. Ano　mise-**ga**　　gakusee-**ga**　　hon-o　　yoku　kau.
　　　　that　shop-Nom　student-Nom　book-Acc　often　buy
　　　　'It is at that shop that students often buy books.'

Our analysis of (17)
➔ Under our analysis, *gakusee-ga* does not form a constituent with *hon-o yoku kau*, so it follows that (17) violates the condition that only constituents can be coordinated.
➔ Under the standard analysis, where *gakusee-ga* forms a constituent with *hon-o yoku kau*, it is not clear why (17) is unacceptable

(19) **VP-fronting**
　　　[vP Gengogaku-no jugyo-de gakusee-ga　tesuto-o uke-*sae*] sensyuu　　*t*vP *si*-nakat-ta.
　　　　linguistics-Gen class-at　student-Nom test-Acc take-even　last week　　do-Neg-Past.
　　　Lit: 'Last week, at linguistics class, students didn't even take a test.'

(20) **VP-fronting in adjunct MNC**
　　 *[Gakusee-**ga**　hon-o　　yoku　kai-*sae*]ᵢ ano mise-**ga**　　*t*ᵢ *su*-ru.
　　　　student-Nom hon-Acc often　buy-even　that shop-Nom　　do-Pres.
　　　Intended: 'It is at that shop that students often even buy books.'

Our analysis of (20)
➔ Under our analysis, *gakusee-ga* does not form a constituent with *hon-o yoku kai-sae*, so it follows that (20) violates the condition that that movement only applies to a constituent.
➔ Under the standard analysis, where the argument *ga*-phrase *gakusee-ga* forms a constituent with *hon-o yoku kai-sae*, it is not clear why (20) is unacceptable.

(21) **Minimal Search to the MN-sequence**

　　　　　α = **no label**

　　　　⟨XP-*ga*, YP-*ga*⟩
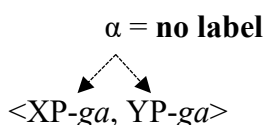
➔ α is not labeled due to the ambiguous Minimal Search (Chomsky 2013, 2015a).

Q. Is any label assigned when the MN-sequence is merged with H?

$$\beta = ?$$

$<_\alpha$ XP-*ga*, YP-*ga*$>$ H
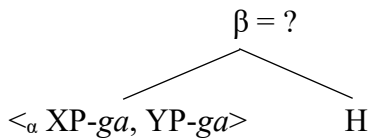
Case 1: When α is merged with *v*
   ➔ No label is assigned to β because EA-*v*P cannot have a label (Chomsky 2013)
Case 2: When α is merged with T without φ (Saito and Fukui 1998)
   ➔ No label is assigned to β because T is too "weak" to label (Chomsky 2015a)
Case 3: When α is merged with T with φ (INFL in Chomsky 2019/UCLA, 2020/LSJ, 2021/WCCFL)
   ➔ No label is assigned to β because of **a Determinacy violation (➔(25))**

It follows that **the MNC has no label**. If MNC has no label and if labels are required for further computations (Chomsky 2008; Hornstein 2009), it is predicted that **MNC cannot appear in an embedded clause.**

(22) **Embedded adjunct MNC** (Vermeulen 2005: 1335, fn. 7)

??/* Mosi ano mise-**ga** gakusee-**ga** yoku hon-o   kau-naraba, Mary-wa John-ni matigatte hokano honya-o   suisen-sita.

   if   that shop-Nom student-Nom often book-Acc buy-Cond.   Mary-Top John-Dat mistakenly other-Gen bookshop-Acc recommended

     'If it is at that shop that students often buy books, Mary has mistakenly recommended the wrong shop to John.'
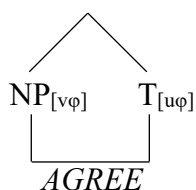
Summary so far

	Standard hierarchical analysis	Our sequence analysis
WH-NPI order: (10b)	?	✔
Condition C: (13b)	?	✔
Coordinated MNC: (17)	?	✔
VP-fronting in MNC: (20)	?	✔
Embedded MNC: (22)	?	✔

Q. Why is MNC not allowed in English?

(23)   *Civilized countries, male, the average lifespan is short.

We suggest that **Determinacy,** which essentially states that **rule application must be unambiguous** (Chomsky 1955/1975, 1964, 1973, 2013, 2019; Chomsky Gallego, and Ott 2019; Goto and Ishii 2020a, b, c), **applies in determining φ-valuation**.

(24) **Typical AGREE configuration**   (25) **AGREE configuration in MNC**

NP$_{[v\varphi]}$ T$_{[u\varphi]}$ $<$NP1$_{[v\varphi]}$, NP1$_{[v\varphi]}$, NP1$_{[v\varphi]}>$ T

    AGREE   *AGREE*
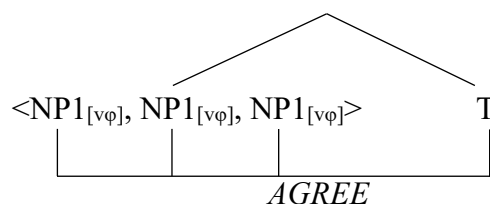
   ➔ unambiguous φ-valuation   ➔ ambiguous φ-valuation
   ➔ satisfying Determinacy   ➔ violating Determinacy

NB In Japanese, there is no need to determine φ-valuation, so Determinacy applies vacuously.

Above we argued that multiple NPs are not allowed in English since T's φ-valuation process results in a Determinacy violation. However, **if Form Sequence is one of the universal operations, multiple subjects should in principle be possible to appear around T even in English if they are non-NPs that do not involve φ-valuation with T.** This expectation is borne out as shown in (26a-c).

(26) **Multiple PPs**
    a. [After the meeting] [right at 2pm] work for you.
    b. [before 10 am] [on Saturday] sounds good to me.
    c. [under the stairs] [next to the fridge] is a good place to keep milk.

Note that the claim that the multiple PPs in (26) are really located within the TP is confirmed by the fact that **the sentences are still acceptable even the auxiliary inverts in yes/no question**, as shown in (27a-c) (we thank Andrew McInnerney for judgements).[4]

(27) **Subject-auxiliary-inversion in multiple PPs**
    a. Does [after the meeting] [right at 2pm] work for you?
    b. How does [before 10 am] [on Saturday] sound?
    c. ?Is [under the stairs] [next to the fridge] a good place to keep milk?

➔ We suggest that these cases may be instances of Form Sequence.

3.3 Sorting out the operations

Since Form Sequence is recently formalized by Chomsky, some might concern a theoretical validity of the analysis based on it. In this section, we dispel the uneasiness by showing that **Form Sequence is just one of the possible instantiations of the most basic syntactic operation, which we call *FORM*.**

First, let us consider the definitions of **MERGE**, **Form Sequence**, and **Pair-Merge**, respectively, that have been assumed to be the basic syntactic operations of narrow syntax in the (recent) minimalist framework.

(28) $\text{MERGE}(P, Q, WS) = WS' = \{\{P, Q\}, X_1, …, X_n\}$

(29) $\text{Form Sequence} = <(\&) X_1, …, X_n>$

(30) $\text{Pair-Merge}(X, Y) = <X, Y>$

It is important to note that these definitions are apparently different, but **they can be uniformly characterized based on possible combinations of the dichotomy between binarity restriction and order restriction: [± binary, ±order].**[5] In fact, with this characterization, we can notice not only that Form Sequence is just one of the possible cases meeting the restrictions, but also that there is another mode of structure-building operation that can be characterized as [-binary, -order], which has seemed to be overlooked until now. Let's call the overlooked case "***FORMSET FST***," borrowing Chomsky's terminology (personal communication).[6]

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[4] There seems to be variation in judgements on sentences such as (i) below involving locative PPs:
(i) [Under the tree] [next to the trunk] [in front of the hollow] ran Terry.
[5] Chomsky 2021/WCCFL suggests that binarity follows from Resource Restriction RR.
[6] Chomsky (personal communication): "Suppose we have operations FORMSET FST and FORMSEQUENCE FSQ (the former universally available). Without further comment, they permit {X,Y}

(31) **[±binary, ±order] dichotomy of structure-building operations**[7]

	MERGE	**FSQ**	**Pair-Merge**	**FST**
binary	+	-	+	-
order	-	+	+	-

(32)   MERGE = [+binary, -order] → {X, Y} (two-membered sets)

(33)   FSQ = [-binary, +order] → <X, Y, Z, …> (multi-membered sequences)

(34)   Pair Merge = [+binary, +order] → <X, Y> (two-membered sequences)

(35)   FST = [-binary, -order] → {X, Y, Z, …} (multi-membered sets)

What we want to say here is that **FSQ** and **FST** are by no means theoretically heterogeneous, but rather can be one of the major structure-building operations, and, in fact, they look **"freer"** than MERGE and Pair-Merge in the sense that they are **free from binarity restriction**.   Furthermore, when it comes to **FST**, it might be possible to say that it can be the **"freest"** operation among the four operations in the sense that **it is not constrained not only by binarity restriction but also by order restriction**.

Given these considerations, it might not be so implausible to conjecture that there is a very basic operation that **just puts SOs in WS into a relation**, and that such operations as we call MERGE, Pair-MERGE, FSQ and FST are just "special cases" of the basic operation, meeting the restrictions.   Let's call the most basic syntactic operation that just puts SOs in WS into a relation **_FORM_**.

How does FORM work?
In this presentation, as one possible approach, we would like to try to suggest an operational step like the following: **FORM requires Search to determine its input, applying to the SOs selected by Search and producing an output that is in a set relation or in a sequence relation.**   We call the idea **_Search-Form Hypothesis._**[8][9]

(36)   **_Search-FORM Hypothesis_**[10]
WS = […, P, Q, R, …]
a.   Search(WS: $n=2$) → (P, Q)   ← FORM(P,Q: -order)   → {P,Q}   (two-membered set)   (cf. MERGE)
b.   Search(WS: $n \geq 2$) → (P, Q, R) ← FORM(P,Q, R: +order) → <P,Q,R> (three-membered sequence) (cf. FSQ)
c.   Search(WS: $n=2$) → (P, Q)   ← FORM(P,Q:+order)   → <P,Q >   (two-membered sequence)   (cf. Pair-Merge)
d.   Search(WS: $n \geq 2$) → (P, Q, R) ← FORM(P,Q, R: -order) → {P,Q,R}   (three-membered set)   (cf. FST)

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and <X,Y>, two-membered sets and sequences. Merge is a special case of {X,Y}, meeting further conditions. Since <X,Y> is asymmetric, it can be interpreted as adjunction, as in "young man." That's an interpretation of a structure already available, not a new operation."

[7] Chomsky (personal communication): "Looks quite convincing. I'm not sure it's necessary to define pair-merge. Perhaps what's needed is an optional special interpretation of two-membered sequences."

[8] For relevant discussion on an involvement of Search "before" Merge-application, see Chomsky (2014, 2015b), Goto (2016), and Kato et al (2016).

[9] We need to clarify when and how Search is involved in other contexts, such as labeling, accessibility, and Internal MERGE IM.   See Goto (2016) for a possibility that labelability of SOs may affect Search in IM.

[10] These may look complicated, but it might be the case that MERGE is "the minimal case" of FST, while Pair-Merge is "the minimal case" of FSQ.   Thanks to Jae-Young Shim for this interpretation.

In this presentation, we have argued that MNC in Japanese (and some multiple PP subjects in English) be an instance of the so-called FSQ (36b), one of the instantiations of FORM.

Significantly, if the so-called FST (36d) is the "freest" form of FORM, it is natural to ask whether there are any empirical data showing that. In the next section, we suggest that the MNC may be instances of FST (36d) .

3.4 MNC as an instance of Form Set

(37) *Variable binding* (Hoji et al. 2013: 107, a.o.)
    a. **Toyota-sae$_i$-ga**   **soko$_i$**-no sitauke-o   hihansihazimeta.
       Toyota even-Nom its-Gen subsidiary-Acc began.to.criticize.
       'Even Toyota$_i$ began to criticize its$_i$ subsidiaries.'
    b. ***Soko$_i$**-no sitauke-ga   **Toyota-sae$_i$**-o   hihansihazimeta.
       its-Gen   subsidiary-Nom Toyota even-Acc began.to.criticize.
       'Its$_i$ subsidiaries began to criticize even Toyota$_i$.'

➔ A pronoun can be interpreted as a bound variable if it is c-commanded by a quantifier phrase.

(38) **Adjunct MNC**
    (Kazuaru mondai-no   nakademo …) kankyoumondai-**ga**   nihon-**ga**   yoku hihansareru.
     many   problem-Gen among   environmental.issue-Nom Japan-Nom often be.criticized
    '(Among many problems), it is for environmental issues that Japan is often criticized.'

(39) a. Kankyoumondai-**de/*no**   nihon-**ga**   yoku hihan sareru.
      environmental.issue-for/Gen Japan-Nom often be.criticized
    b. *Nihon-**ga**   kankyoumondai-**ga**   yoku hihan sareru.
      Japan-Nom   environmental.issue-Nom   often be.criticized

➔ Example (38) meets the adjunct MNC properties as in (39), so it can be a genuine instance of adjunct MNCs.

(40) **CHECK! Variable binding in adjunct MNC**
    a. **Kankyoumondai-sae$_i$-ga**   [**sore$_i$**-ni mukanshinna nihon-**ga**] yoku hihan sareru.
      environmental.issue-even-Nom it-Dat   indifferent   Japan-Nom often be.criticized
      Lit. 'Even environmental issues$_i$, Japan that is indifferent to them$_i$ is often criticized.'
    b. [**Soko$_i$**-de-no   kankyoumondai-ga]   **nihon-sae$_i$**-ga   yoku   hihan sareru.
       there-at-Gen   environmental.issue-Nom Japan-even-Nom often   be.criticized
      Lit. 'There$_i$, environmental issues, even Japan$_i$ is often criticized.'

(41) **CHECK! Variable binding in multiple adjuncts**
    a. **Mainichi$_i$** [**sono$_i$** tugi-no   hi](-ni) nisshi-o   kai-teiru.
      every.day   its   next-Gen day(-Dat) journal-Acc write-Prog.Pres
      Lit. 'Every day$_i$, its$_i$ next day, (I/you/(s)he/they…) keep(s) a journal.'
    b. *[**Sono$_i$** tugi-no hi](-ni)   **mainichi$_i$** nisshi-o   kai-teiru.
      its   next-Gen day(-Dat) every.day journal-Acc write-Prog.Pres
      Lit. 'Its$_i$ next day, every day$_i$, (I/you/(s)he/they…) keep(s) a journal.'

→ Under the standard analysis, (40b) should be unacceptable for the same reason as (37b) and (41b).

→ Note that even under the Form Sequence analysis, both (40a) and (40b) should be unacceptable because there is no c-command relation between the MN-sequence in the first place.

→ The variable binding facts suggest that MNC may be an instance of Form Set (36d):

(42) **FST analysis of (40)**

   {[…pronoun…]-*ga*, [[…QP…]-*ga*, …}

   mutual c-command relation

→ The MN phrases form a multi-membered set where there is a mutual c-command relation.

→ Given this, we can solve the problem of the standard analysis and the Form Sequence analysis above. In both (40a) and (40b), there is a mutual c-command relation between the MN phrases, so the pronouns can be interpreted as bound variables.

→ The Form Set analysis can also explain the WH-NPI order and Condition C facts (though the order restriction property remains to be explained otherwise).

4   Conclusion

● MNCs, such as Japanese adjunct MNCs and English multiple PP subjects, are instances of FSQ.
● MERGE, Pair-Merge, FSQ, and FST are just possible instantiations of Search + FORM.
● Japanese MNCs could be instances of FST.

Postscript In the past, research on Generative Grammar has paid particular attention to hierarchical structures, and in particular, Minimalist Program has often made full use of MERGE and Pair-Merge to derive them. However, if flat structures are also a kind of observable linguistic expressions that human language is capable of producing, language research that makes full use of FSQ and FST may become more popular in the near future.   In fact, before entering the Minimalist Program, there were several studies advocating flat structure analysis, but especially after the "X' theory" was proposed, it seems that the theoretical possibilities of these studies were not pursued in depth due to the strong faith in the "binary Merge-only hypothesis."   However, **now that FSQ and FST are being established theoretically, it may be that we don't have to be so obsessed with just binary Merge anymore, and it may be worthwhile to re-examine the previous studies that proposed flat structure analysis** (see Chomsky 1957, Neeleman, Tanaka, and van de Koot 2021 for coordination, Hale 1983 for non-configurational languages, Chomsky 1981 for double object constructions, Rudin 1986 for multiple WH-fronting languages, etc.).

Apendix
Order-restriction in multiple WH words in Bulgarian

(43)   (Rudin 1986: 123)
    a. <u>Koj</u>   <u>kogo</u>   e   vidjal?
       Who   whom AUX_{3SG} saw
       'Who saw whom?'
    b. *<u>Kogo</u>   <u>koj</u>   …

(44)   (Rudin 1986: 124)
    a. <u>Koj</u>   <u>kogo</u>   <u>kakvo</u>   e   pital?
       who   whom   what AUX_{3SG} asked
       'Who asked who what?'
    b. *<u>Koj</u>   <u>kakvo</u>   <u>kogo</u>   …
    c. *<u>Kakvo</u>   <u>koj</u>   <u>kogo</u>   …
    d. *<u>Kakvo</u>   <u>kogo</u>   <u>koj</u>   …
    e. *<u>Kogo</u>   <u>koj</u>   <u>kakvo</u>   …
    f. *<u>Kogo</u>   <u>kakvo</u>   <u>koj</u>   …

(45)   (Rudin 1986: 124)
    a. <u>Kogo</u>   <u>na</u>   <u>kogo</u>   e   pokazal   Ivan?
       who   whom   what AUX_{3SG} pointed-out Ivan
       'Who did Ivan point out to whom?'
    b. *<u>Na kogo</u> <u>kogo</u>   …

"In Bulgarian, clitics (in this case the auxiliary **e** and pronoun **ti**) may not split up the Wh-word sequence" (Rudin 1988: 461):

(46)   (Rudin 1988: 461)
    a. <u>Koj</u>   <u>kakvo</u>   ti   e   kazal?
       who   what   you has told
       'Who told you what?'
    b. *<u>Koj</u>   ti   e   <u>kakvo</u>   kazai?
       who   you has what   told

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