On the Multiple Subject Construction in Japanese:
A Cartographic Approach[†]

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In this paper, a new analysis is proposed for the multiple subject construction in Japanese. A previous analysis called the Multi-Spec Analysis assumes the multiple specifiers of T and positions the double subjects in them. On this analysis, however, why the double subjects have different meanings from each other cannot be accounted for structurally because both of them occupy the specifiers of the same syntactic category (i.e., T). To overcome this problem, the present study adopts the cartographic approach to syntax and proposes a new analysis: the Mono-Spec Analysis. Instead of the multiple specifiers of T, it assumes FocP above TP and positions the first of the double subjects in Spec-Foc and the other in Spec-T. I propose that the different meanings of the double subjects are attributable to this configurational difference. As theoretical implications, the relation between structure and meaning is discussed in consideration of multiple subject constructions in other languages such as Korean and Brazilian Portuguese.

Keywords: multiple subject construction, cartography, left periphery, Japanese

1. Introduction

The goal of this paper is to propose a new analysis of the *multiple subject* construction in Japanese from the cartographic approach to syntax. Pointing out the problems with the earlier attempts to assume multiple Spec's, the present study adopts insights from the cartographic approach and discusses the validity of that new analysis.

1.1. The Multiple Subject Construction in Japanese

The multiple subject construction (henceforth, MSC) in Japanese can be demonstrated as in (1) below.[1]

[†] Portions of this paper were presented at the Night Session of LSJ (Linguistic Society of Japan) Summer Institute 2012 at the University of Tokyo on August 24th, 2012, at the 145th Meeting of LSJ at Kyushu University on November 24th, 2012, at the meeting of a study group called "Ito-Gumi" at the University of Tokyo on July 22nd, 2013, and at the linguistic research presentation meeting at the University of Tokyo on December 20th, 2013. I would like to thank the audiences, in particular Nobuko Hasegawa and Yoshio Endo, for helpful comments. My best gratitude goes on to Akira Watanabe, Noriko Imanishi, Yuki Hirose, and two anonymous reviewers for insightful comments and suggestions on earlier versions of the current paper. I should also be grateful to peer reviewers. All the remaining errors and inadequacies are mine.

  The following abbreviations and notations are used in this paper:
Acc: Accusative; CP: Complementizer Phrase; Dat: Dative; DP: Determiner Phrase; FinP: Finite Phrase; FocP: Focus Phrase; Gen: Genitive; I(P): Inflectional (Phrase); MSC: Multiple Subject Construction; Nom: Nominative; NP: Noun Phrase; Spec: Specifier; TP: Tense Phrase; TopP: Topic Phrase; *v*P: little *v*erb Phrase; VP: Verb Phrase; 𝕏 stands for the lower copy of X; [ ] for the assigned interpretation (e.g., [ND] for Neutral Description, [Contr] for Contrastive).

[1] Although the construction in question is called in various ways such as the *multiple subject construction*, *multiple nominative construction*, *double subject construction*, *double nominative construction*, we call it the *multiple subject construction*. There are at least three types of this construction in Japanese as in (i) (in this paper, Nom is used consistently as the gloss for a Case particle *-ga*) (Q for a Question particle, Pres for Present).

(i) a. Dare-ga dore-ga (itiban) suki desu ka. (Kuno (2010: 67))
         who-Nom which-Nom most fond-of is Q
         'Who likes which (most)?'

(1)   Bunmeikoku   *ga*   dansei *ga*   heikin-zyumyoo ga   mizikai.
       civilized-countries Nom male   Nom   average life-span Nom   is-short
       'It is civilized countries that the average life-span of men is short in.'   (Kuno (1973: 70-71))

According to Kuno's (1973) descriptive generalization, the sentence in (1) is derived from the underlying sentence in (1') by a rule called *Subjectivization* in (2).

(1')   Bunmeikoku   no   dansei no heikin-zyumyoo ga   mizikai.
       civilized-countries 's   male   's average life-span Nom   is-short
       'It is civilized countries that the average life-span of men is short in.'   (Kuno (1973: 70))

(2)   **Subjectivization** (Kuno (1973: 71))[2,3]
          Change the sentence-initial NP-no to NP-ga, and make it the new subject of the sentence.

Following the rule in (2), all of the NP's marked with -*ga* in (1) are the subjects of the sentence (this is why (1) is called the *multiple subject* construction).

   Kuno (1973) presents the following observation for the MSC: only the sentence-initial NP-*ga* can receive the exhaustive-listing interpretation (i.e., a focus interpretation roughly expressing "X and only X"), while other NP's marked with -*ga* receive the neutral-description interpretation (i.e., the interpretation related neither to the exhaustive-listing one nor to the one as the object of the sentence (as in (ia) in fn. 1) (cf. Hasegawa (2011: 98))). Note that the sentence-initial NP-*ga* here means NP-*ga* as the result of final application of Subjectivization (see fn. 3).

2.   Earlier Analyses of the Multiple Subject Construction in Japanese

   This section reviews the syntactic analyses proposed so far for the multiple subjects in the MSC, points out the problems with them, and motivates the proposal for a new analysis of the multiple subjects. The earlier analyses of

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   b.   Dono seito-ga   titioya-ga satuzin-o   okasita   no desu ka.   (Kuno (2010: 67))
        which student-Nom father-Nom murder-Acc committed that is   Q
        'Which student is it such that his/her father committed murder?'
   c.   Haru-ga   tai-ga   uma-i.   (Akiyama (2004: 672))
        spring-Nom sea bream-Nom tasty-Pres
        'Sea breams are tasty in spring.'

While *dore-ga* 'which' in (ia) functions as an object, *titioya-ga* 'father' in (ib) and *tai-ga* 'sea bream' in (ic) function as subjects. Although *dono seito-ga* 'which student' in (ib) shows the possessive relation with the following *titioya-ga* 'father' (*dono seito-no titioya* 'which student's father'), *haru-ga* 'spring' in (ic) does not show such a relation with the following *tai-ga* 'sea bream.' In this paper, we treat (ib-c) as the multiple subject construction (cf. Kuno (1978)), with a particular focus on (ib) (the analysis to be proposed can be applied to (ic) as well). (See Kuno and Johnson (2005) for (ia), and Akiyama (2004, 2005); Vermeulen (2005) for (ic).)
[2] According to Kuno (1973: 45), Subjectivization may also be applied to the phrase expressing the location, NP-*ni* (only in existential sentences), as shown in the derivation from (ia) to (ib).
(i)   a.   New York *ni* koosoo-kentiku   ga   ooi.   (Kuno (1973 77), modified for consistency
          New York in high-rise-building Nom are-many   by the author)
          'In New York there are many high-rise buildings.'
      b.   New York *ga*   koosoo-kentiku   ga   ooi.   (Kuno (1973: 76))
          New York Nom high-rise-building Nom are-many
          'It is New York that there are many high-rise buildings in.'
(Kuno (1973: 76 (fn. 10)) notes that the example in (ib) is due to S.-Y. Kuroda (p.c., October 1969).)
[3] As for the derivation from (1') to (1), Subjectivization in (2) can be applied iteratively as illustrated in (ia-c).
(i)   a.   [Bunmeikoku no dansei no] heikin-zyumyoo ga mizikai. (= (1'))
      b.   [Bunmeikoku no] dansei *ga* heikin-zyumyoo ga mizikai.
      c.   Bunmeikoku *ga* dansei *ga* heikin-zyumyoo ga mizikai. (= (1))

the multiple subjects mainly assume the multiple Spec's.[4] That is, they assume the subject in the Spec of a head (e.g., I or T) and set the multiple Spec's of that head for the multiple subjects (in what follows, we name those earlier analyses the *Multi-Spec Analysis*).
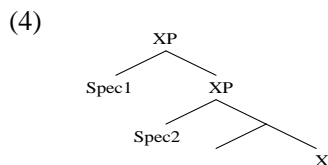
2.1. The Multi-Spec Analysis and Multiple Agree

Using the famous example of the MSC in (3), let us look at the Multi-Spec Analysis.[5]

(3) Zoo ga hana ga nagai   (Kuroda (1988: 128))
    elephant Nom trunk Nom long
   'Elephants have long trunks.'

The sentence in (3) is derived from (3') by the application of the rule in (2).

(3') Zoo   no hana ga nagai
     elephant Gen trunk Nom long

The Multi-Spec Analysis sets the multiple Spec's for a head X basically as in (4) (where the head X follows its complement for head-final Japanese).

(4)

Based on the Multi-Spec Analysis as in (4) (e.g., Shibatani (1977: 795-796 (fn. 9)); Kuroda (1988: 128); Ura (2000: 81); among others), the syntactic structure of the multiple subjects *zoo ga hana ga* 'elephant trunk' in (3) is the one represented as in (5).[6]

(5)
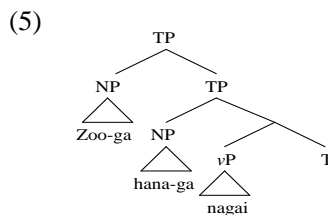
In (5), the analysis assumes that the subject of the sentence in Japanese occupies the Spec-T just as in English, and it sets the multiple Spec's of T for the multiple subjects in the MSC.
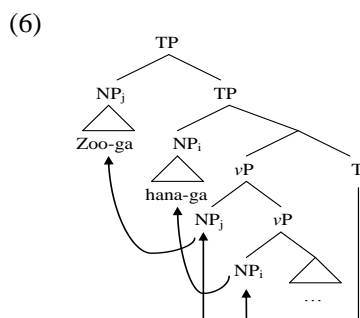
Regarding the Multi-Spec Analysis as in (4), Hiraiwa (2000) discusses the mechanism called *Multiple Agree*. For example, in (5), the multiple subjects occupy the multiple Spec's of T, and this can be analyzed as a result of the movement from Spec-*v* to Spec-T. In other words, in (5), both of *zoo-ga* 'elephant' and *hana-ga* 'trunk' originally positioned in the (multiple) Spec's of *v* move to the multiple Spec's of T. Why do both of them move to the Spec's of T? The mechanism called Multiple Agree works here. That is, uninterpretable φ-features of T

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[4] For the assumption of the multiple Spec's, Chomsky (2004: 109) discusses its theoretical motivation.
[5] As for the sentence in (3), see Mikami (1969: 9) (cf. Iori (2003)). For the difference in argumentation on the MSC between Mikami (1969) and Kuno (1973), see Kuno (1983: 89-92 (fn. 13)). Regarding Akira Mikami, see Shibatani (1978) for the subject of the sentence in the Japanese language.
[6] For simplicity, this paper uses NP for DP.

multiply agree with interpretable φ-features of both *zoo-ga* 'elephant' and *hana-ga* 'trunk,' and subsequently both of them move from the Spec's of *v* to the Spec's of T.[7] The relevant syntactic representation is the one in (6) (we look at only the relevant parts) (cf. Mihara and Hiraiwa (2006: 44)).

(6)

2.2. Problems with the Multi-Spec Analysis

In earlier studies on the MSC in Japanese, the Multi-Spec Analysis as in (4) has been proposed, and the mechanism called Multiple Agree as in (6) is discussed as supporting evidence for the assumption of the multiple Spec's. In the Multi-Spec Analysis, however, the following fact remains unaccounted for. That is the semantic difference in the multiple subjects observed in the MSC. As mentioned in §1.1, Kuno (1973) observes that only the sentence-initial NP-*ga* (e.g., *zoo ga* 'elephant' in (3)) can receive the exhaustive-listing interpretation, whereas the other NP's marked with -*ga* (e.g., *hana ga* 'trunk' in (3)) yield the neutral-description interpretation. Since the Multi-Spec Analysis as in (4) positions the multiple subjects in the multiple Spec's, the problem is why each of them is interpreted differently despite the fact that both of them occupy the Spec's of the same head (e.g., T in (5)). In other words, the Multi-Spec Analysis cannot account for the semantic difference in the multiple subjects in syntactic/structural terms.

A question remains whether the semantic difference observed in the multiple subjects in the MSC is attributable to the semantico-pragmatic interface or the syntactico-semantic interface. Since the multiple Spec's of the same head (e.g., T) are involved, the Multi-Spec Analysis may treat the semantic difference in the multiple subjects as relating to the semantico-pragmatic interface. Mihara and Hiraiwa (2006: 45) mention as follows: "In the standard analysis in generative grammar, it is assumed that two types of semantically different -*ga* can be checked by the same mechanism, Multiple Agree" (translated from Japanese into English by the author). This only states that in (6), the same syntactic operation (i.e., the movement from Spec-*v* to Spec-T for φ-feature valuation) as a consequence of Multiple Agree can be applied evenly to *zoo-ga* 'elephant' and *hana-ga* 'trunk' which are semantically different. However, it does not follow that it provides a syntactic account for the semantic difference in the multiple subjects. Due to the problem above with which the earlier analyses face, this paper proposes a possibility of the *Mono-Spec Analysis* and discusses whether the semantic difference in the multiple subjects in the MSC can be reduced to the consequence of the syntactico-semantic interface.[8,9]

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[7] For feature valuation, we adopt the theoretical framework assumed in Chomsky (2000 *et seq.*).

[8] A reviewer pointed out another problem with the Multi-Spec Analysis. That is, as seen in (6) above, the possessive relation between the two NP's marked with -*ga* is not captured if they occupy the outer and inner Spec's of *v*. This problem can be solved by the Mono-Spec Analysis in which the possessive relation is preserved in the two NP's base position (see (20) below).

[9] A reviewer questioned how the Mono-Spec Analysis accounts for cross-linguistic variation on in/availability of the MSC, although the Multi-Spec Analysis may treat it by presence/absence of agreement, which explains other linguistic phenomena uniformly. This parametric variation on the MSC is a future issue.

3. Proposal

The present study raises the following research question for the semantic difference observed in the multiple subjects of the MSC in Japanese:

(7) **Research Question**
    Can we treat the semantic difference in the multiple subjects of the MSC in Japanese as a consequence of the syntactico-semantic interface?

This paper presents a possible analysis for (7) by adopting the insights obtained from the so-called *cartographic approach* to syntax investigated productively since Rizzi (1997).

3.1. The Cartographic Approach

First, let us review the outline of the cartographic approach. The approach, mainly developed by Rizzi (1997) and Cinque (1999), among others, has the following purpose:

(8) **Purpose of the Cartographic Approach**
    The cartography of syntactic structures is the line of research which addresses this topic: it is the attempt to draw maps as precise and detailed as possible of syntactic configurations.

<div align="right">(Cinque and Rizzi (2010: 51))</div>

Following the spirit in (8), the syntactic domain, which was known as CP, has been investigated in detail. An example of that is the analysis of the C (Force-Finite) system, or left periphery, proposed by Rizzi (1997) as in (9).

(9) **The C (Force-Finite) System**[10,11]
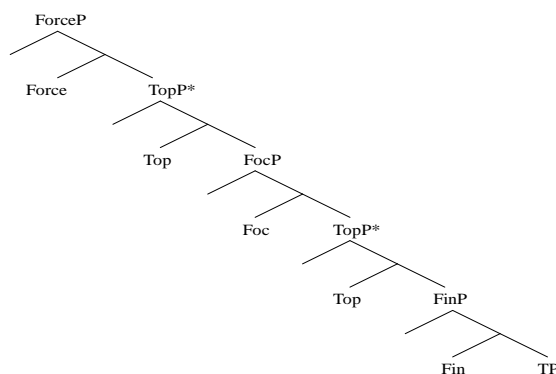
<div align="right">(cf. Rizzi (1997: 297))</div>

Rizzi (1997) observes the word order constraints shown by the elements belonging to the C system as in Italian (10).

(10)   a.   Credo che a Gianni, QUESTO, domani, gli dovremmo dire   (Rizzi (1997: 295))
                   C   Top   Foc   Top   TP
             "I believe that to Gianni, THIS, tomorrow we should say"

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[10] Defined simply, Force is a functional category related to illocutionary force (or the sentence types such as interrogative and imperative), Top(ic) to the topic interpretation, Foc(us) to the focus interpretation, and Fin(ite) to the clausal finiteness.

[11] There is a correlation between Force and Fin (e.g., if Force is imperative, Fin is not finite but non-finite), and the functional categories such as Top and Foc between them are optional (cf. Rizzi (1997: 287-288)).

b. Credo che domani, a Gianni, QUESTO gli dovremmo dire   (Rizzi (1997: 296))
        C   Top   Top   Foc   TP
c. Credo che QUESTO, a Gianni, domani, gli dovremmo dire   (Rizzi (1997: 296))
        C   Foc   Top   Top   TP

Based on the observation as in (10), Rizzi (1997) proposes that the syntactic domain analyzed as CP so far is, in fact, composed of rich functional categories as in (9). Rizzi (1997) also argues that the cartographic structure as in (9) is the universal hierarchy, which we can see from English (11), for example.

(11)   He prayed *that*   *atrocities like those,*   *never again would*   *he witness*
                   Force   Top   Foc   TP   (Radford (2009: 326))

We can see from (11) that the functional categories belonging to the C system are ordered the same as in (9).

   In (9), TopP* means Top is freely recursive, but this analysis has been questioned. For consecutive NP-*wa* in Japanese as in (12), for instance, only the sentence-initial NP-*wa* can receive the topic interpretation, and the NP-*wa* that follows it yields the contrastive interpretation instead.[12]

(12)   Gunma-wa negi-wa   yuumei-da.
        Gunma-Top leek-Top famous-is
        'As for Gunma, leeks are famous.'
        (*negi-wa* 'leek' does not allow the topic reading)
    cf. Gunma-wa   negi-wa yuumei-da ga, rakkasei-wa yuumei-de-nai.
        Gunma-Top leek-Top famous-is but, peanut-Top famous-is-not
        'As for Gunma, leeks are famous, but peanuts are not famous.'
        (*negi-wa* 'leek' and *rakkasei-wa* 'peanut' are contrastive)

As seen in (11), Radford (2009) does not present an example of recursive Top in English, either.

   The assumption of TopP below FocP as in (9) above is also cross-linguistically controversial (cf. Kiss (2007) for Hungarian; Frascarelli and Hinterhölzl (2007) for German and Italian). In Japanese, for example, in [… Top … Foc], it is easier to take Top as the topic interpretation, whereas in [… Foc … Top], it may be difficult for Top to receive the topic interpretation (see §4.1 below for the detailed discussion). In English as well, Radford (2009) presents an example of TopP above FocP as in (11) but no example of TopP below FocP. According to Frascarelli and Hinterhölzl (2007: 88), there are at least three types of Topic: (i) "aboutness topic" (Topic in the topic sense), (ii) "contrastive topic" (Topic in the contrastive sense), and (iii) "familiar/continuing topic" (Topic expressing the continuation of a topic). It may be the case that Rizzi's (1997) assumptions of recursive Top and of TopP below FocP can be reduced to the realization of those different types of Topic. Putting aside this possibility for future research, in what follows, we assume the cartographic structure of left periphery (at least) as in (13).

(13)   **The Cartographic Structure of Left Periphery**
            ForceP … TopP … FocP … FinP … [TP …

Adopting the insights from the cartographic perspective, the domain above TP, which has been treated as CP so far, can be decomposed into rich functional categories. As for the question about the semantic difference observed in the multiple subjects of the MSC in Japanese, we can make use of those functional categories in the C system in

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[12] Cf. Kuno (1973: 48). Instead of *theme*, we use *topic*. In this paper, Top is used consistently as the gloss for a particle *-wa*

order to propose a new analysis for that.[13]

3.2. The Mono-Spec Analysis

For our research question in (7), this paper proposes a new analysis, which we call the *Mono-Spec Analysis*, as in (14) for the MSC in Japanese from the cartographic approach (cf. Hasegawa (2011)).[14,15]

(14) **The Mono-Spec Analysis**[16,17]

In the MSC, each of the multiple subjects yielding different semantic interpretation occupies the Spec of the distinct functional head, and the meaning of each subject is computed by the Spec-head relation (as a consequence of the synactico-semantic interface).

The Mono-Spec Analysis assumes that the cartographic structure as in (13) holds in Japanese as well, and accounts for the semantic difference in the multiple subjects of the Japanese MSC in terms of the Spec-head relation of the phrase each of them belongs to.

For concreteness, let us look at how the Mono-Spec Analysis deals with the following typical example of the MSC in Japanese:

(15) **Double Subjects**

Zoo-ga   hana-ga   nagai.
elephant-Nom trunk-Nom long
'For elephants and only elephants, their trunks are long.'

Recall Kuno's (1973) observation on the multiple subjects of the MSC in Japanese: only the sentence-initial NP-*ga* can receive the exhaustive-listing (i.e., focus) interpretation, whereas the other NP's marked with -*ga* are interpreted as neutral-description. Following this observation, in (15), the sentence-initial *zoo-ga* 'elephant' produces the exhaustive-listing reading, whereas the subsequent *hana-ga* 'trunk' yields the neutral-description reading. Compare the two different analyses for how such double subjects as in (15) are dealt with. The earlier Multi-Spec Analysis positions both *zoo-ga* 'elephant' and *hana-ga* 'trunk' in the multiple Spec's of the same head

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[13] Since there has been productive research on Japanese from the cartographic approach (see Endo (2007), and also the references to be mentioned in Section 5 below), it appears to be valid to assume in Japanese the cartographic structure proposed as in (9) for Italian (note, however, that the present study assumes the syntactic structure as in (13)).

[14] As for the mono-Spec, Kayne (2004: 4) discusses its motivational background.

[15] Hasegawa (2011) also analyzes the MSC in Japanese from the cartographic perspective. As the expansion of Subjectivization in (2) proposed by Kuno (1973), Hasegawa (2011) presents the following more general rule:

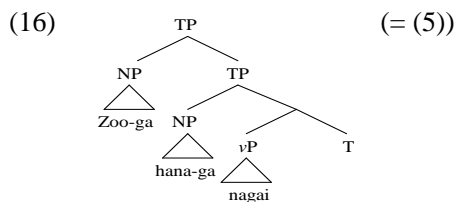(i) **Possessor Separation Rule**

The element marked by -*no* (Gen) Case in the NP is structurally separated from that NP and becomes a new constituent of the sentence.   (Hasegawa (2011: 89), translated from Japanese into English by the author)

This paper differs from Hasegawa (2011) in proposing the operation called *focalization*, which captures the subject receiving the focus interpretation among the multiple subjects by its movement to Spec-Foc (see §4.1 below for its details), that can be applied not only to the MSC expressing the possessive relation as in (ib) (fn. 1) but also to the MSC not expressing such a relation as in (ic) (fn. 1) and (ib) (fn. 2). Based on the Mono-Spec Analysis, this paper further discusses the semantic difference in the multiple subjects from a new perspective of word order constraints of particles -*ga* and -*wa* (see §4.1).

[16] Note that the Mono-Spec Analysis proposed in this paper is an analysis of the multiple subjects expressing the semantic difference, and that it does not deny at all such theoretically possible analyses as the multiple Spec's and Multiple Agree (cf. the triple-subject (27) in §4.1 below) (for the question how we can deal with the second -*ga* in the triple subjects, see Hasegawa (2011: 105 (fn. 20))).

[17] Chomsky (2004: 113) argues that in computation in narrow syntax, there is no such a relation as Spec-head. The Spec-head relation in (14) does not mean that it plays a substantial role in the syntactic computation. Instead, we assume that the Spec-head relation/configuration is a by-product of the syntactic computation, and that the semantic interpretation is computed by the head's feature in question interacting with the element(s) in its Spec.

(e.g., T) by the operation of Multiple Agree. That is, the Multi-Spec Analysis will take the following syntactic structure:

(16)   (= (5))

```
            TP
          /    \
        NP      TP
        △      /  \
      Zoo-ga  NP    \
             △    vP   T
           hana-ga  △
                   nagai
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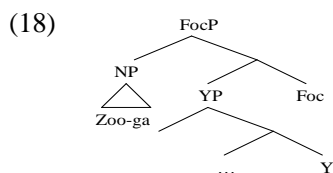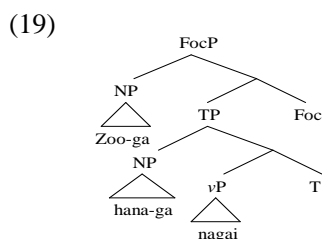Notice that the Multi-Spec Analysis cannot provide a structural account for the semantic difference in the multiple subjects because it assumes that both of them occupy the multiple Spec's of the same head as in (16). On the other hand, the Mono-Spec Analysis proposed in this paper positions *zoo-ga* 'elephant' and *hana-ga* 'trunk' in the Spec's of two distinct heads. A relevant syntactic configuration is given as follows:

(17)

```
            XP
          /    \
        Spec    \
              /    \
            YP      X
          /    \
        Spec    \
             …    Y
```
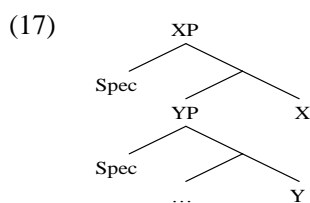
Then, how can the Mono-Spec Analysis as in (17) account for the observation that *zoo-ga* 'elephant' expresses exhaustive-listing and *hana-ga* 'trunk' neutral-description in (15)? Exhaustive-listing means "X and only X," that is, the focus interpretation. Based on the cartographic structure as in (13), let us treat X in (17) as Foc as in (18).

(18)

```
            FocP
          /      \
        NP         \
        △       /     \
      Zoo-ga  YP       Foc
             /    \
            …      Y
```

In (18), *zoo-ga* 'elephant' occupies Spec-Foc, and its exhaustive-listing interpretation is computed by the relation between the Spec and its head Foc. On the other hand, *hana-ga* 'trunk' in (15) expresses neutral-description like a normal (i.e., not focalized) subject and thus occupies Spec-T as in (19) (the interpretation will be computed by the relation between the Spec and its head T).

(19)

```
            FocP
          /      \
        NP         \
        △       /     \
      Zoo-ga  TP       Foc
             /    \
            NP     \
            △    vP   T
          hana-ga  △
                  nagai
```

Hence, adopting the Mono-Spec Analysis in (14), the semantic difference in the double subjects *zoo-ga hana-ga* 'elephant trunk' in (15) can be captured as a result of the computation in terms of the Spec-head relation of the phrase in question, in other words, as a consequence of the syntactico-semantic interface. This kind of argumentation in structural terms cannot be made by the Multi-Spec Analysis as in (16).

An issue to be examined empirically is whether or not *zoo-ga* 'elephant' actually occupies Spec-Foc as in (19). A possible direction to pursue is to assume the following movement mechanism:[18]

(20)

```
                    FocP
                   /    \
               NP_j      TP        Foc
              /   \     /  \
          Zoo-ga  NP_i      T
                 /   \
        zoo-no_j hana-ga  vP
                        /    \
                     NP_i     T
                    /   \
              zoo-no hana  ...
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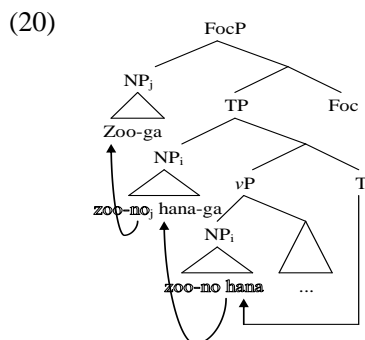
In (20), first, *zoo-no hana* (elephant-Gen trunk) moves from Spec-*v* to Spec-T for φ-feature valuation, resulting in the realization of Nominative Case on it (i.e., *zoo-no hana-ga* (elephant-Gen trunk-Nom)). Second, applying focalization (or focus movement), *zoo-no* (elephant-Gen) moves from Spec-T to Spec-Foc and receives the focus interpretation there (i.e., *zoo-ga* (elephant-Nom)).[19] That the extraction from the subject, or Spec-T, is possible is discussed by Morikawa (1993: 87-93), for example. However, empirical evidence is required to determine whether our assumption that the extracted element (*zoo-no* 'elephant' in (20)) moves to Spec-Foc is valid. In Japanese where it is relatively difficult to observe overt movement, a further issue is which kind of data should be used for examining our assumption.

4. Discussion

4.1. Multiple Subject Construction in Japanese

This section discusses the validity of the Mono-Spec Analysis of the MSC in Japanese by observing the word

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[18] A reviewer pointed out that if such mechanism as in (20) can be assumed, the following derivation would also be possible: from *zoo-no hana* 'elephant's trunk' in Spec-*v*, only *zoo-no* moves to Spec-T first, and then [*zoo-no* hana] moves to Spec-Foc as remnant movement, resulting in *hana-ga zoo-ga nagai* 'for trunks and only trunks, elephants' are long.' The question whether this is possible under the framework of *derivation by phase* (Chomsky (2001)) is put aside as a future issue.

[19] If this kind of assumption is possible, *-ga* in *zoo-ga* 'elephant' might be treated as not Nominative Case but a focus marker and may have to be distinguished from Nominative Case *-ga* in *hana-ga* 'trunk' (cf. *Zoo-wa hana-ga nagai* 'As for elephants, their trunks are long.' When *zoo-no* (elephant-Gen) receives the topic interpretation as in this sentence, not Nominative Case *-ga* but rather a topic marker *-wa* appears (i.e., *zoo-wa* (elephant-Top))). Notice, however, that *zoo-ga* 'elephant' possesses the Genitive Case in its based-generated position (i.e., *zoo-no* (elephant-Gen)). If *-ga* in *zoo-ga* is analyzed as focus marker, why is (ib) ungrammatical (Foc stands for a focus marker)?

(i) a. Zoo-ga   hana-ga   nagai.
         elephant-Nom trunk-Nom long
         'For elephants and only elephants, their trunks are long.'
    b. *Zoo-no-ga   hana-ga   nagai.
         elephant-Gen-Foc trunk-Nom long

In Korean, there is a phenomenon called *Case stacking* as in (ii).

(ii) *Nwukwu-eykey-ka Mary-ka mwusepni?*
     Who-Dat-**Nom**   M-Nom fear.Q
     "Who is afraid of Mary?"   (Schütze (2001: 203))

When the particle *-ka* attaches to the noun *nwukwu* 'who,' the particle *-eykey* originally attached to that noun remains, and consequently the two Case particles are stacked (i.e., *-eykey-ka*). Schütze (2001) discusses *-ka* as a focus marker (cf. Levin (2012)). In Japanese, Case stacking is not permitted as shown in (ib) (i.e., *zoo-no* (elephant-Gen) → *zoo-no-ga* (elephant-Gen-Nom)), rather *Case overwriting* (or Case Alternation) is involved instead as in (ia) (i.e., *zoo-no* (elephant-Gen) → *zoo-ga* (elephant-Nom)). In what follows, instead of Foc, Nom is used consistently for a particle *-ga*.

order constraints of particles *-ga* and *-wa* and expanding its scope to the triple subjects. In what follows, we assume the following two syntactic/stylistic operations:

(21) **Two Syntactic/Stylistic Operations**[20]

    a. **Focalization** (or Focus Movement)[21]

        Movement to Spec-Foc with the consequent computation of the focus interpretation in terms of the relation between the Spec and its head Foc

    b. **Topicalization**

        Movement to Spec-Top with the consequent computation of the topic interpretation in terms of the relation between the Spec and its head Top

Also, we follow Kuno's (1973) two observations as follows:

(22) **Kuno's (1973) Two Observations**[22]

    a. Only one NP-*ga* in a sentence can receive the exhaustive-listing or focus interpretation (i.e., *X and only X*) (in the case of multiple NP's marked with *-ga*, the NP's that follow the sentence-initial one express the neutral-description interpretation).   (Kuno (1973: 71))

    b. Only one NP-*wa* in a sentence can receive the topic interpretation (i.e., *as for X*) (in the case of multiple NP's marked with *-wa*, the NP's that follow the sentence-initial one express the contrastive interpretation (i.e., *X, compared to Y*)).   (Kuno (1973: 48))

As for (21a-b) and (22a-b), let us consider the following two examples:

(23)   a. Zoo-ga [Focus] hana-ga [Neutral-Description (ND)] nagai.

       elephant-Nom   trunk-Nom   long

       'For elephants and only elephants, their trunks are long.'

        (← focalization of *zoo-no* (*hana-ga*) (elephant-Gen (trunk-Nom)))

  b. Zoo-wa [Topic] hana-wa [Contrastive (Contr)] nagai.

       elephant-Top   trunk-Top   long

       'As for elephants, their trunks are long.'

        (← topicalization of *zoo-no* (elephant-Gen) (and some operation for *hana-ga* (trunk-Nom)))

In (23a), after the application of focalization, *zoo-ga* 'elephant' receives [Focus] (standing for the exhaustive-listing interpretation), whereas the subsequent *hana-ga* 'trunk' becomes [Neutral-Description] (henceforth, [ND]), following (22a). On the other hand, in (23b), after topicalization, *zoo-wa* 'elephant' is interpreted as [Topic]. Moreover, as a by-product of the application of some operation (for the contrastive interpretation), *hana-wa* 'trunk' becomes [Contrastive] (hereafter, [Contr]), as observed in (22b). In the examples that follow, the square brackets [ ] after NP-*ga*/-*wa* represent the interpretation that the NP in question will receive (partially based on the author's intuition).

    Interestingly, the Mono-Spec Analysis predicts that two particles *-ga* and *-wa* may show some word order constraints on their interpretations (see Heycock (2008) for the semantic difference in those particles). Compare (24) and (24') below.

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[20] As a reviewer suggested, we may assume that a relevant formal feature is involved as a driving force for each operation (e.g., [+Foc] for focalization and [+Top] for topicalization (cf. §4.2.1 and §4.2.2 below)).

[21] Both Kuno's (1973) Subjectivization in (2) and Hasegawa's (2011) Possessor Separation Rule in (i) (fn. 15) may be attributable to (more general) Focalization as in (21a).

[22] Rizzi (1997: 297) also argues that the multiple Foci in the exhaustive-listing sense are impossible (as for Topic, it is claimed to be freely recursive, although we discussed its controversial status in §3.1).

(24)   Kono class wa [Topic] dansei ga [Focus/ND] yoku dekiru.   (Kuno (1973: 64))
        this   class Top   male Nom   well are-able
        'As for this class, the boys do well (at studies).'
        (← topicalization of *kono class no* (this class-Gen))
(24')   Kono class ga [Focus] dansei wa ?[Topic]/?[Contr] yoku dekiru.
        'For this class and only this class, boys do well (compared to girls).'
        (← focalization of *kono class no* (this class-Gen) and topicalization of *dansei ga* (male-Nom))

As shown in (24), Kuno (1973) argues that *dansei ga* 'male' is ambiguous in that it may be interpreted either as exhaustive-listing (i.e., focus) or as neutral description. Recall the cartographic structure in (13), repeated here as (25).

(25)   **The Cartographic Structure of Left Periphery**
        ForceP … TopP … FocP … FinP … [TP …

Since *dansei ga* 'male' may occupy Spec-Foc or T, both of which are below TopP, this ambiguity can be accounted for structurally. How about (24')? It seems difficult to interpret *dansei-wa* 'male' in (24') as the topic interpretation (i.e., ?[Topic]). This reflects the hierarchy [Top … Foc … ?Top], that is, the observation that TopP below FocP is hard to receive the topic interpretation. It also seems hard to interpret *dansei-wa* 'male' in (24') contrastively (i.e., ?[Contr]). This is possibly because *kono class-ga* 'this class' that precedes it yields the exhaustive-listing interpretation and thus the sequence of two similar interpretations (i.e., [Focus] and [Contr]), both of which are related to some kind of comparison, might degrade the sentence.[23] In short, interpretation ambiguity in (24) and the low acceptability in (24') can be accounted for structurally in terms of (25).[24]

Now, let us see how the Mono-Spec Analysis deals with the triple subjects and the word order constraints of *-ga* and *-wa* in them. First, consider the sentence in (1) presented in §1.1, repeated as (26).

(26)   **Triple Subjects**
        Bunmeikoku   *ga*   dansei *ga*   heikin-zyumyoo ga   mizikai.
        civilized-countries Nom male   Nom   average life-span Nom is-short
        'It is civilized countries that the average life-span of men is short in.'   (Kuno (1973: 70-71))

As Kuno (1973) observes, only *bunmeikoku-ga* 'civilized countries' can receive the exhaustive-listing interpretation, whereas *dansei-ga* 'male' and *heikin-zyumyoo-ga* 'the average life-span' become

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[23] I own Shin-ichi Takana a debt of gratitude for this point by his reference to the Obligatory Contour Principle in phonology (Leben 1973), which, defined simply, bans the consecutive sequence of similar elements.
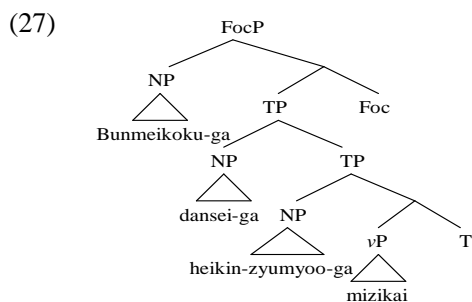[24] Consider (i) and (i').
(i)   Dansei wa [Topic] kono class ga [Focus] yoku dekiru.   (Kuno (1973: 73))
        male Top   this class Nom   well are-able
        'As for the boys, this class (and only this class) does well.'
(i')   ?Dansei ga   kono class wa yoku dekiru.
        male   Nom this   class Top well   are-able
For (i), Kuno (1973) discusses its derivation from *kono class ga* [Focus] *dansei ga* [ND] … (this class-Nom male-Nom …). That is, *dansei ga* (male-Nom) is topicalized in (i) (i.e., *dansei wa* (male-Top)). This is consistent with the order [Top … Foc]. Based on this discussion, the difficulty with interpreting (i') is attributable to the way of its derivation. Considering the underlying sentence *kono class ga* [Focus] *dansei ga* [ND] …, *kono class ga* (this class-Nom) is topicalized in (i') (*kono class wa* (this class-Top)). As a reviewer pointed out, this degrades the sentence because a focalized element cannot be topicalized for semantic compatibility. Furthermore, if *kono class ga* were topicalized, then *dansei ga* (male-Nom) in (i') would occupy some position higher than TopP. Following our cartographic structure as in (25), no FocP above TopP is permitted. That may also be why (i') is hard to interpret.

neutral-description.[25] Based on the Mono-Spec Analysis, the syntactic structure of (26) is the one as in (27).[26]

(27)

```
                    FocP
                 /        \
               NP          \
              /\          TP      Foc
        Bunmeikoku-ga    /    \
                       NP      TP
                      /\      /  \
                  dansei-ga  NP    TP
                            /\    /  \
                heikin-zyumyoo-ga vP    T
                                 /\
                               mizikai
```

In (27), the interpretation of each NP-*ga* can be accounted for in terms of the Spec-head relation it belongs to. As another possibility, the Mono-Spec Analysis might assume the following structure for (26):

(27')

```
                    FocP
                 /        \
               NP          \
              /\          XP      Foc
        Bunmeikoku-ga    /    \
                       NP      \
                      /\      TP      X
                  dansei-ga  /    \
                            NP      T
                           /\      /  \
                heikin-zyumyoo-ga vP
                                 /\
                               mizikai
```
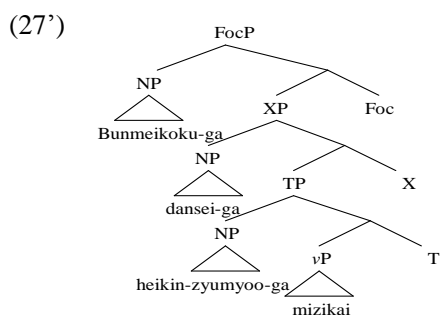
If *dansei-ga* 'male' receives some interpretation which is neither exhaustive-listing nor neutral-description, the Mono-Spec Analysis might present a new functional category X dedicated to the semantic interpretation of that NP-*ga*.[27]

Second, the Mono-Spec Analysis predicts the word order constraints of the particles *-ga* and *-wa* in the triple subjects as well as in the double subjects. Suppose we are now talking about the average standing height of the various ages in various countries in an imaginary world. Look at the possible word orders in (28a-f) below (*Kaboi* is the name for an imaginary country).[28]

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[25] This suggests that the consecutive sequence of [ND] is permitted (cf. 23).

[26] Recall that the Mono-Spec Analysis does not deny the theoretical possibilities of the multiple Spec's or Multiple Agree (see fn. 16).

[27] Kiss (1998) argues that there are two types of Focus: (i) "identificational focus" (Focus in the sense of exhaustive-listing) and (ii) "informational focus" (Focus providing new information by manipulating prosody). In (27') above, if *-ga* in *dansei-ga* (male-Nom) is prosodically manipulated, it becomes the latter type of Fucus. Hence, XP in (27') might be considered a phrase of informational Focus. In what follows, however, all the NP's marked with *-ga* except the one receiving the exhaustive-listing interpretation are not prosodically manipulated and are analyzed as neutral-description.

[28] There are two other possibilities as in (ia-b).

(i) a. Kaboi-ga [Focus] zyuu-dai-ga [ND] heikin-sinchoo-wa ?[Topic]/?[Contr] takai.
         Kaboi-Nom   teenager-Nom   average standing-height-Top   high
     b. Kaboi-wa [Topic] zyuu-dai-wa [Contr] heikin-sinchoo-ga ?[Focus]/[ND] takai.
         Kaboi-Top   teenager-Top   average standing-height-Nom   high

How can we capture the difficulty with both the interpretation of *heikin-sinchoo-wa* (the average standing-height-Top) in (ia) and the focus interpretation of *-ga* (-Nom) in (ib)? Recall our cartographic structure [… Top … Foc … ?Top …]. For (ia), no TopP below FocP is allowed and thus *heikin-sinchoo-wa* cannot take the topic reading. How about contrastive interpretation? On the assumption that the NP-*ga* with neutral-description occupies Spec-T, there is no relevant position for *heikin-sinchoo-wa*. Thus, the contrastive reading may also be hard to take. As for (ib), it seems difficult for *heikin-sinchoo-ga* to receive the focus interpretation. This suggests that no FocP below Contr(P?) is permitted (FocP below TopP is allowed, though). How about neutral-description? That interpretation appears to be possible in (ib). A future issue is what position Contr(P?) occupies (cf. fn. 27).

(28) a.   Kaboi-ga [Focus] zyuu-dai-ga [ND] heikin-sinchoo-ga [ND]   takai.
          Kaboi-Nom   teenager-Nom   average standing-height-Nom high
          'For Kaboi and only Kaboi, the average standing height of the teenagers is high.'

      b.   (?)Kaboi-wa [Topic] zyuu-dai-wa [Contr] heikin-sinchoo-wa [Contr]   takai.
          Kaboi-Top   teenager-Top   average standing-height-Top high
          'As for Kaboi, the average standing height, compared to other properties, of the teenagers, compared to other ages, is high.'

      c.   Kaboi-wa [Topic] zyu-dai-ga [Focus/ND] heikin-sinchoo-ga [ND]   takai.
          Kaboi-Top   teenager-Nom   average standing-height-Nom high

      d.   Kaboi-ga [Focus] zyuu-dai-wa ?[Topic]/?[Contr] heikin-sinchoo-ga [ND]   takai.
          Kaboi-Nom   teenager-Top   average standing-height-Nom high

      e.   Kaboi-wa [Topic] zyuu-dai-ga [Focus] heikin-sinchoo-wa ?[Contr] takai.
          Kaboi-Top   teenager-Nom   average standing-height-Top high

      f.   Kaboi-ga [Focus] zyuu-dai-wa ?[Topic]/?[Contr] heikin-sinchoo-wa [Contr]   takai.
          Kaboi-Nom   teenager-Top   average standing-height-Top high

For (28a-b), the interpretation of each NP-*ga*/-*wa* follows from Kuno's (1973) observations as in (22a-b).[29] Based on this, consider the word order constraints observed in (28c-f). The interpretation ambiguity of *zyuu-dai-ga* 'teenager' in (28c) (i.e., [Focus/ND]) suggests that the availability of the focus interpretation is not limited to the sentence-initial position (for the ambiguity, recall (24)). Contrastively, the low acceptability of *zyuu-dai-wa* 'teenager' in (28d) and (28f) implies that the topic interpretation is only possible in the sentence-initial position. This difference can be accounted for in terms of the cartographic structure [… Top … Foc … ?Top]. That is, FocP below TopP is possible and thus ambiguity occurs in (28c), whereas TopP below FocP is not permitted and thus (28d) and (28f) become low acceptability. Furthermore, the reason why *zyuu-dai-wa* 'teenager' in (28d) and (28f) is hard to interpret even if it receives [Contr] is possibly due to the sequence of similar semantic interpretations (i.e., [Focus] and [Contr]) in that both are related to some comparison (cf. (24') above (see also fn. 23)). The same applies to the low acceptability of (28e) where [Focus] and [Contr] are consecutive. Therefore, it follows that it is possible to explain the difference in semantic interpretation observed in the word order constraints of -*ga* and *wa* in (28a-f) structurally or as a consequence of the syntactico-semantic interface.

    Finally, we further discuss the possibility of cartographic approach to the Japanese language by looking at the insights obtained from the right periphery. Saito (2009) presents a cartographic analysis of CP recursion at the right periphery in Japanese. Consider the following sentences:

(29) a.   Taroo-wa [CP kare-no imooto-ga soko-ni ita (no) ka (to)] minna-ni tazuneta
          Taro-Top   he-Gen sister-Nom there-in was *no ka to* all-Dat   inquired
          'Taroo asked everyone *if* his sister was there.'   (Saito (2009: 14))

      b.   Taroo-ga [CP Hanako-wa zibun-no uti-ni   kuru no ka] siritagatteiru koto
          Taro-Nom   Hanako-Top self-Gen home-to come *no ka* want-to-know fact
          'the fact that Taro wants to know if Hanako is coming to his house'   (Saito (2009: 20))

Saito (2009: 14) argues that *no*, *ka*, and *to* in (29a) are three distinct complementizers: "*to* is the complementizer for paraphrases of direct discourse in the sense of Plann (1982); *ka* is the complementizer for CPs that represent questions; and *no* is a complementizer for CPs that represent propositions." It is also argued that they can co-occur as in (29a-b). Based on the semantic difference in those complementizers, Saito (2009) presents the following cartographic analysis:

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[29] A reviewer pointed out that the consecutive sequence of [Contr] in (28b) is hard to interpret. This may suggest that compared to the sequence of [ND] (fn. 25), [Contr] is subject to some kind of the Obligatory Contour Principle (fn. 23).

(30)   [… [… [… … [$_{\text{TP}}$ …] Fin (*no*)] (Top*)] Force (*ka*)] Report (*to*)]

<div align="right">(cf. Saito (2009: 21), TP added by the author)</div>

Notice that in (30), Top is assumed to be recursive (Top* as in Rizzi (1997)), but we have cast doubt on its recursive property above. In the cartographic structure of left periphery in Italian proposed as in (9), there is no such functional category as Report in (30). Saito (2009: 21) discusses the parametrization of the existence/absence of Report.[30] Combining Saito's (2009) discussion of the right periphery (i.e., the heads of functional categories as in (30)) with the present paper's proposal about the left periphery (i.e., the Spec's of those functional heads), the clause quoted in (31) can be structurally described as in (32).

(31)   Taroo-wa "[Kaboi-wa [Topic] zyuu-dai-ga [Focus] heikin-sinchoo-ga [ND]   takai no ka to]"
        Taroo-Top [Kobai-Top   teenager-Nom   average standing-height-Nom high *no ka to*]
        Hanako-ni   itta.
        Hanako-Dat said
        'Taroo said to Hanako, "As for Kaboi, is the average standing height of the teenager and only the teenager high?"'

(32)
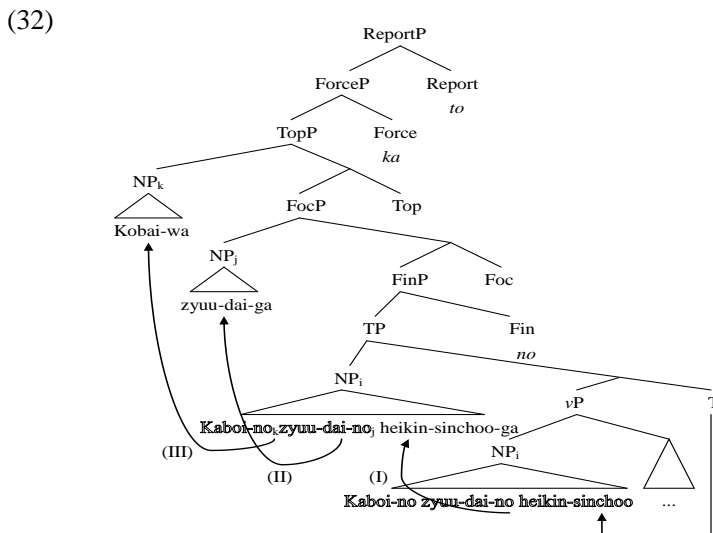
In (32), the NP *Kaboi-no zyuu-dai-no hekin-sinchoo* 'Kaboi's teenager's average standing height' moves from Spec-*v* to Spec-T for φ-feature valuation, and that NP is valued Nominative Case there, as shown by (I). After that, the NP *zyuu-dai-no* (teenager-Gen) moves from Spec-T to Spec-Foc by the application of focalization, as indicated by (II), and that NP receives the focus interpretation. On the other hand, the NP *Kobai-no* (Kaboi-Gen) moves from Spec-T to Spec-Top as a result of topicalization, as shown by (III), and that NP becomes the topic of the sentence (in (32), the indices *j* and *k* and the numbers in parentheses (II) and (III) are not intended to stand for the order of operation application). The validity of assuming such movement mechanisms as described in (32) is a future issue to be examined empirically (as in (20) above). Based on the word order constraints observed in (24) versus (24') and (28c) versus (28d) (i.e., TopP above FocP is possible, whereas ("aboutness") TopP below FocP seems hard to occur), it follows that the hierarchical structure of functional categories assumed in the C system is realized in the (particular) linguistic phenomenon, the MSC in Japanese, as in (32). If this conclusion is on the right track, we can make more explicit the relation between structure and meaning from the cartographic perspective.

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[30] Saito (2009: 21) also discusses the parametrization of the existence/absence of Focus in the C system. Recall that we have assumed in this paper the existence of Focus in the Japanese language.

4.2. Multiple Subject Constructions in Korean and Brazilian Portuguese

Before concluding, let us briefly discuss the validity of the cartographic approach to the MSC from a cross-linguistic perspective. Adoption of cartography in the analysis of multiple subjects is not a novel attempt (cf. fn. 15). This kind of attempt can be seen for the Korean and Brazilian Portuguese languages.

4.2.1. Multiple Subjects in Korean

MacDonald and Welch (2009) propose a cartographic analysis of double subjects in Korean. They classify post-verbal clitics that are attached to NP's as Case markers as follows: *-i/-ka* as Nominative Case marker (allomorphic in that *-i* follows a consonant-final nominal, and *-ka* a vowel-final nominal) and *-un/-nun* as Topic marker (also allomorphic in that *-nun* follows a consonant-final nominal, and *-un* a vowel-final nominal). As seen in (33) and (34), *-i/-ka* is used as Nominative Case marker as in the (a) examples, whereas *-un/-nun* is attached to "continued topics" as in (33b) or to "contrastive topics" as in (34b) (the gloss is adopted from MacDonald and Welch (2009)[31]).
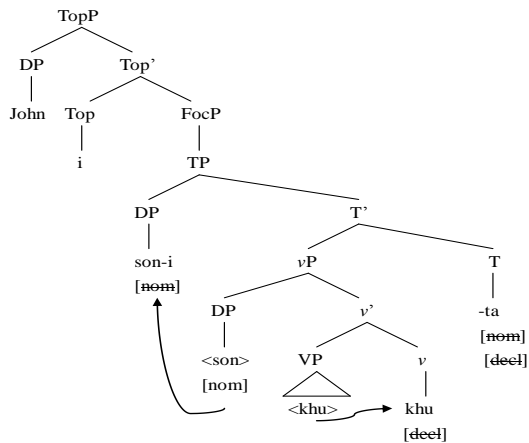
(33) a. han salam-tang pang-**i**   elma   i-pni-kka?
          one person-DAT room-**I/KA** how much COP-FOR-INTER
          'How much is a room for one person?'   ((9a) in MacDonald and Welch (2009: 5))

      b. 'ku pang-ey-**nun**   taylaypi iss-supni-kka?
          that room-LOC-**TOP** television exist-FOR-INTER
          'Is there a television in the room?'   ((9b) in MacDonald and Welch (2009: 6))

(34) a. ce   sayngsen-**i** ssa-ta.
          that fish-**I/KA**   cheap-DECL
          'That fish is cheap.'   ((10a) in MacDonald and Welch (2009: 6))

      b. saywu-**nun**   pissa-ta.
          shrimp-**TOP** expensive-DECL
          '[However], the shrimp is expensive.'   ((10b) in MacDonald and Welch (2009: 6))

Comparing with the (b) examples of (33)-(34), MacDonald and Welch (2009) argue that on NP's that convey introductory, non-contrastive information (i.e., topic), *-un/-nun* is replaced by *-i/-ka* as in the (a) examples of (33)-(34). Based on this observation, MacDonald and Welch (2009) propose a cartographic structural analysis of the double subjects in (35) as in (36) below.

(35) John-**i**   son-**i**   khu-ta.
      John-**NOM** hand-**NOM** big-DECL
      'As for John, his hand is big.'

                              ((14b) in MacDonald and Welch (2009: 7) from Kim, Sells, and Yang (2007: 2))

---

[31] COP: copula; DECL: declarative; INTER: interrogative; I/KA: nominative; TOP: topic marker; (no information is given for FOR).

(36)

```
                    TopP
                   /    \
                 DP      Top'
                 |      /    \
               John   Top    FocP
                       |      |
                       i      TP
                            /    \
                          DP      T'
                          |      /  \
                        son-i   vP   T
                        [nom]  /  \   |
                              DP   v' -ta
                              |   /  \ [nom]
                           <son> VP  v [decl]
                           [nom]  |  |
                              <khu> khu
                                  [decl]
```
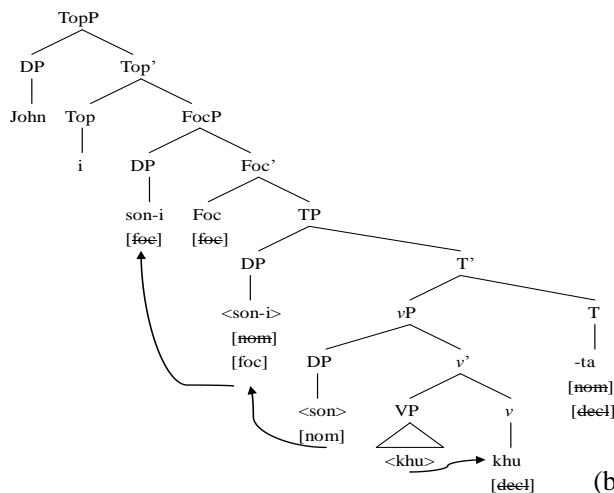
(based on (17) in MacDonald and Welch (2009: 9))[32]

In the case of the subject in Spec-T that receives the focus interpretation, MacDonald and Welch (2009) assume that the functional category, Foc, has a strong feature, and that the subject in Spec-T is raised to Spec-Foc in order to check it as in (37).

(37)

```
                    TopP
                   /    \
                 DP      Top'
                 |      /    \
               John   Top    FocP
                       |     /    \
                       i    DP    Foc'
                            |    /    \
                          son-i Foc   TP
                          [foc] [foc] /  \
                                    DP    T'
                                    |    /  \
                                 <son-i> vP  T
                                 [nom]  /  \  |
                                 [foc] DP  v' -ta
                                       |  /  \ [nom]
                                    <son> VP  v [decl]
                                    [nom]  |  |
                                       <khu> khu
                                           [decl]
```

(based on (18) in MacDonald and Welch (2009: 10))

Notice that the movement mechanism as in (37) is consistent with that suggested in (20) above in this paper.[33] The reason why the Foc head has a strong feature should be investigated in further research.

4.2.2. *Multiple Subjects in Brazilian Portuguese*

Let us turn to multiple subjects in Brazilian Portuguese. Bastos (2008) proposes a cartographic analysis of a sequence of sentence-initial NP's. First, Bastos (2008) presents the following observation on word order constraints of topicalized and focalized NP's in Brazilian Portuguese (capitalized words are prosodically emphasized):

---

[32] The notations used in the examples are adopted from MacDonald and Welch (2009). <X> stands for the lower copy of X.

[33] Note that in (37), a topicalized element is base-generated at Spec-Top. The question whether an element to be topicalized is moved to Spec-Top or based-generated there should be discussed in further research (cf. our assumption of topicalization in (21b) above).

(38) a. A flor, (foi) PRA MARIA (que) eu comprei ela.
the flower, (was) TO MARY (that) I bought it
'As for the flower, it was to Mary that I bought it.' ((4) in Bastos (2008: 19))

b. *(Foi) PRA MARIA (que) a flor, eu comprei ela.
(was) TO MARY (that) the flower, I bought her[*sic*]
'As for the flower, it was to Mary that I bought it.' ((5) in Bastos (2008: 19))

This suggests that in Brazilian Portuguese, TopP precedes FocP, but not vice versa. Recall that the present study has questioned TopP below FocP and assumed the cartographic structure of left periphery as in (25) above. Hence, the observation of un/grammaticality as in (38a-b) can be interpreted along the similar line proposed in the present study.

Second, Bastos (2008) discusses a cartographic analysis that the multiple topic construction is derived through internal movements within the nominal domain, and applies it to double and triple topics.[34] As for double topics, let us consider the sentence in (39).

(39) A caneca, a florzinha, (foi) MINHA MÃE (que) eu acho que pintou ela.
The mug, the little-flower, (it-was) MY MOTHER (that) I think that painted her[*sic*]
'As for the mug, as for the flower on it, (it was) my mother (that) I think that painted it.'
((7) in Bastos (2008: 20))

Bastos (2008) proposes TopP above DP and the internal movement in the nominal domain to check the strong topic feature [+Top] as in (40), and presents a cartographic structural analysis of (39) as in (41).[35,36]

(40)

(Bastos (2008: 21[*sic*])[37])

(41)

((8) in Bastos (2008: 20))

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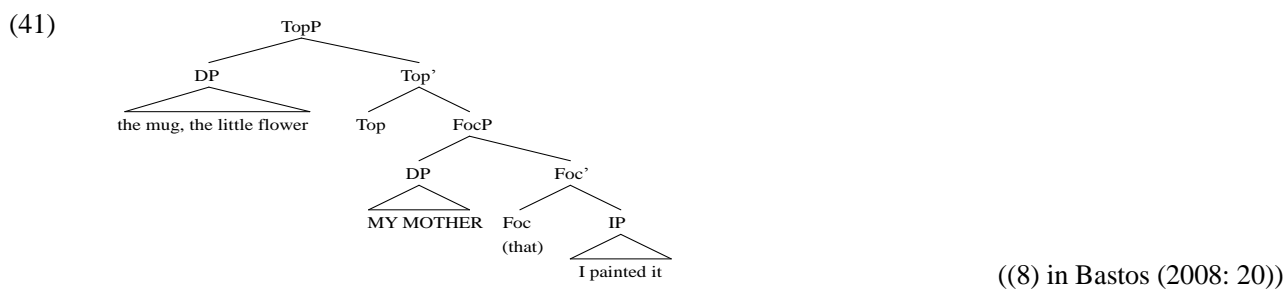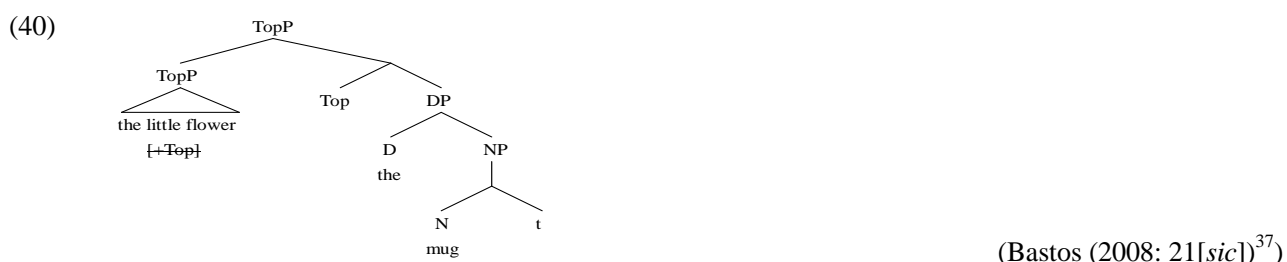
[34] Note that there must be a dominance relation among the multiple topics as in (39); otherwise, the ungrammaticality occurs as in (ia-b).
(i) a. *O livro, a Maria, (foi) o João (que) comprou ele pra ela.
The book, the Mary, (it-was) the John (that) bought it to her
'As for the book, as for Mary, (it was) John (who) bought it to her.' ((3a) in Bastos (2008: 17))
b. *A Maria, o livro, (foi) o João (que) comprou ele pra ela.
the Mary, the book, (it-was) the John (that) bought it to her
'As for Mary, as for the book, (it was) John (who) bought it to her.' ((3b) in Bastos (2008: 17))
[35] The notations are adopted from Bastos (2008).
[36] Notice that in (41), DP in Spec-Top is based-generated there (cf. fn. 33).
[37] In (40), 'the little flower' and 'the mug' should be reversed. The DP in Spec-Top in (41) is derived from 'the little flower of the mug' (cf. (42b) below).

The same analysis can be extended to triple topics. Let us consider the syntactic object in (42b).

(42) a. A of-B of-C
      b. a flor   do   fundo da   caneca.
          the flower of-the bottom of-the mug   ((13a-b) in Bastos (2008: 22))

If multiply topicalized, the triple-topic sentence as in (43b) is generated (the lowered F stands for Focus).

(43) a. C, B, A
      b. a cacena, o fundo, a flor,   (foi) ONTEM$_F$ (que) eu pintei   ela.
          the mug,   the bottom, the flower, (was) YESTERDAY$_F$ (that) I   painted her[*sic*]
          'As for the mug, as for the bottom, as for the flower, it was yesterday that I painted it.'
                                                                 ((22a-b) in Bastos (2008: 25))

Bastos (2008) shows the derivation of the triple topics from (42a) to (43a) as follows:

(44)

((23) in Bastos (2008: 26), partially modified by the author)

According to Bastos (2008), all of the sentence-initial NP's as in (43b) are assigned the "aboutness" reading. This can be achieved because Bastos (2008) assumes TopP above each DP instead of Rizzian recursive TopP. The reasons why we can assume TopP above DP, why the Top head in the nominal domain has a strong feature, and why each TopP shows the "aboutness" reading should be examined in future research.

   Although some problems remain to be solved, the proposed analyses of the multiple subject constructions in the Korean and Brazilian Portuguese languages suggest that the cartographic structure of multiple subjects discussed in the present study may hold universally, i.e., not only in Japanese but also in those other languages.

5. Conclusion

   This paper has raised the research question in (7), repeated here as (45), in consideration of the semantic difference observed in the multiple subjects in the Japanese MSC.

(45) **Research Question**
      Can we treat the semantic difference in the multiple subjects of the MSC in Japanese as a consequence
      of the syntactico-semantic interface?

As a possible alternative to the earlier analyses, i.e., the Multi-Spec Analysis of the MSC in Japanese, we proposed a new analysis as in (14), repeated here as (46), for the question in (45) from the cartographic approach.

(46) **The Mono-Spec Analysis**
      In the MSC, each of the multiple subjects yielding different semantic interpretation occupies the Spec of

the distinct functional head, and the meaning of each subject is computed by the Spec-head relation (as a consequence of the synactico-semantic interface).

Based on the Mono-Spec Analysis, we attempted to account for the semantic difference in the multiple subjects in structural terms (i.e., the Spec-head relation) or as a consequence of computation at the syntactico-semantic interface. As for the validity of the Mono-Spec Analysis, we briefly looked at the cartographic analyses of MSC's in other languages, Korean and Brazilian Portuguese. Those analyses suggest that the cartographic structure of multiple subjects discussed in this paper may hold cross-linguistically.

The primary remaining problem is how we can make the Mono-Spec Analysis compatible with Kuno's (2010) argument. Based on the argument that the ungrammaticality of (47) is attributable to the clause-boundness imposed on Subject Honorific Marking, Kuno (2010) proposes the embedding structure as in (48) for the MSC in Japanese.

(47)   *[$_{S1}$ Yamada-sensei-ga [$_{S2}$ <u>inu-ga</u> o-nakunari-ni   natte simatta]]
            Yamada-prof   dog   Subj.honorific-dying ended-up
        'Prof. Yamada('s) dog has died.'

(Kuno (2010: 81), the underline added by the author)

(48)   [$_{S1}$ NP$_1$-*ga* [$_{S2}$ NP$_2$-*ga* Verbal]]   (Kuno (2010: 81))

Note that the Mono-Spec Analysis proposed in the present paper is an analysis assuming a single clausal structure for the MSC in Japanese (i.e., the focused element is positioned in Spec-Foc, not somewhere else in the higher clause). Thus, we have to examine the validity of analysis for the MSC in Japanese by comparing the double-clause structure as in (48) and the mono-clause structure assumed by the Mono-Spec analysis.[38]

We may, however, be able to expand the scope of the cartographic approach to other linguistic phenomena observed in the Japanese language. Consider *scrambling* with the following set of sentences:

(49)   a.   Taroo-ga ano mise-de hon-o   katta   (koto)
              Taro-Nom that store-at book-Acc bought (fact)
              'Taro bought a book at that store'
        b.   Taroo-ga <u>hon-o</u>   ano mise-de katta   (koto)
              Taro-Nom book-ACC that store-at bought (fact)
        c.   <u>Ano mise-de</u> Taroo-ga hon-o   katta   (koto)
              that store-at Taro-Nom book-Acc bought (fact)
        d.   <u>Hon-o</u>   Taroo-ga ano mise-de katta   (koto)
              book-Acc Taro-Nom that store-at bought (fact)
        e.   <u>Ano mise-de</u> <u>hon-o</u>   Taroo-ga katta   (koto)
              that store-at book-ACC Taro-NOM bought (fact)
        f.   <u>Hon-o</u>   <u>ano mise-de</u> Taroo-ga katta   (koto)
              book-Acc that store-at Taro-Nom bought (fact)

(Nemoto (1999: 121), partially modified by the author)

Compared to (49a), there are some slight semantic differences in (49b-f). If the underlined scrambled element has some certain discourse function (e.g., Focus), we can assume that it is in the Spec of a relevant functional head (cf. Fujimaki (2011); Nakamura (2011)). Based on this kind of assumption, we can further make explicit the

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[38] Note that this question is related to how we can assume the clausal structure from the cartographic approach because it divides the root category C into several functional categories. In other words, an intriguing question for future research is which category in the left periphery is the root category for a clause (or a *phase* for derivation in the framework of Chomsky (2001)).

correspondence between structure and meaning. Scrambling is only one of the possible candidate phenomena that are worth investigating from the cartographic approach. In research on the Japanese language, in fact, the insights from the cartographic perspective have contributed to the description and explanation mainly of its left and right peripheries (see Saito (2010a) for the left periphery; Saito (2010b) for complementizers (the right periphery); Saito (2009), Hasegawa (2010a) for the right periphery and sentence types; Endo (2010) for sentence-ending particles; Hasegawa (2010b) for null subjects; Kuwabara (2010, 2011) for *wh*-questions; Fujimaki (2011), Nakamura (2011) for adverbs and scrambling). The MSC examined in this paper is not an exception. As discussed briefly, the usefulness of cartographic approach to syntax in description and explanation of linguistic phenomena may be extendable cross-linguistically as well.

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