Subject Positions and Derivational Scope Calculation in Minimalist Syntax: A Phase-Based Approach

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Abstract

This paper proposes a new scope calculation system named a phase-based approach. The new system treats scope calculation as a feature-matching operation between more than one interpretable feature related to quantification (henceforth $F_{\text{quant}}$). We call this matching operation $F_{\text{quant}}$-matching. It is shown that the working space of $F_{\text{quant}}$-matching is restricted by a syntactic unit phases. Given the matching operation for scope calculation in CHL, scope interpretation can be derivationally determined in narrow syntax as far as it is permitted by the Phase Impenetrability Condition (PIC) proposed in Chomsky (2001). It is demonstrated that various mysterious scope facts in both English and Japanese are reducible to our phase-based scope system without any other special implement.

1 Introduction

This paper explores the correlation between subject positions and scope interpretation in Chomsky’s (2000, 2001) framework. Section 2 discusses variation in subject positions across languages. We claim that unlike English Nominative Case, C, rather than the finite T, is relevant to ga-marking in Japanese. We further argue for A'-properties of Japanese ga-marked subjects with emphasis on the parallelism between the ga-kara alternating constructions in Japanese and the preverbal and postverbal subject constructions in Greek and Catalan. In Section 3 and 4, based on our different subject positions, we propose a new scope system in terms of a syntactic unit called phases. It is demonstrated that the matching operation is subject to the PIC proposed in Chomsky’s (2001) Derivation by Phase, using various scope facts in both English and Japanese, including Double Object Constructions (henceforth DOCs). It is claimed that scope calculation can be derivationally determined in narrow syntax with only existent basic implements for sentence building, that is, match and PIC. Section 5 has a conclusion.

2 The Position of Ga-Marked Subjects in Japanese

Section 2 discusses the different status of the Nominative subject in English and the ga-marked subject in Japanese with the conclusion given in (1).

(1) a. English Nominative subjects are licensed by T and placed in the TP-layer with A-properties.
   b. Japanese ga-marked subjects are licensed by C and placed in the CP-layer with A'-properties.

2.1 Japanese Ga-Marked Subjects Function as A'-Binders: Fukui (1984, 1986)

Fukui (1984) claims that Japanese Nominative subjects show A'-properties in terms of zibun-binding and Safir’s Parallelism Constraint on Operator Binding (henceforth PCOB). Zibun ‘SELF’ can refer not only to subjects as in (2a), but also to gapless Topic phrases, as in (2b), and relative head nouns, as

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1 The term $F_{\text{quant}}$ is borrowed from Watanabe (1998).
in (2c). These positions are considered as typical A'-positions.

(2) a. ga-subject

\[ \text{John}-ga \text{ Mary-ni zibun}-no \text{ imooto-o syookai-si-ta}. \]
John-Nom Mary-to SELF-Gen sister-Acc introduce-do-Past
‘John introduced SELF’s sister to Mary.’

b. gapless topic

\[ \text{Sono hahaoya}-wa [ zibun}-no \text{ musuko-ga sindie simattaa]. } \]
the mother-Top SELF-Gen son-Nom die-Past
‘As for the mother, SELF’s son died.’ (Fukui 1984: 37)

c. relative clause head

\[ [\text{NP} [ zibun}-no \text{ hahaoya-ga kinoo } \text{ sindie simatta}] \text{ John}_i] \]
SELF-Gen mother-Nom yesterday die-Past John
‘John, SELF’s mother died yesterday.’ (Fukui 1984: 8)

Fukui (1984) attempts to give a unified account of these binding facts in (2) and proposes (3).

(3) **Zibun** must be bound by the closest A'-binder. (Fukui 1984: 27)

Namely, Fukui claims that the ga-marked subject in (2a) occupies an A'-position on a par with (2b) and (2c). Furthermore, making use of Safir’s Parallelism Constraint on Operator Binding, given in (4), he argues for the A'-status of Japanese subjects.

(4) **Safir’s PCOB (Parallelism Constraint on Operator Binding)**

If \( O \) is an operator and \( x \) is a variable bound by \( O \), then for any \( y \), \( y \) a variable, \( x \) and \( y \) are the same in their feature specifications. (slightly modified by Fukui 1984)

The Japanese binding facts illustrated in (5) are subject to Safir’s PCOB. *Kare ‘HIS’ and zibun ‘SELF’ are not the same in their feature specification. That is why (5a) and (5b) are ungrammatical. The main point is that Safir’s PCOB is a constraint on A'-binding and not on A-binding. That is, Japanese ga-marked subjects function as A'-binders.

(5) a. *\text{John}_i-ga kare\text{-no kaban to zibun\text{-no syasin-o mot-te-kaet-te-ki-ta}.} \]
John-Nom HIS-Gen bag and SELF-Gen picture-Acc take-TE-back-TE-come-Past
‘John came back with HIS’s bag and a picture of HIMSELF.’

b. *\text{John}_i-ga zibun\text{-no kaban to kare\text{-no syasin-o mot-te-kaet-te-ki-ta}.} \]
John-Nom SELF bag to HIS’s bag take-TE-back-TE-come-Past

\[ \text{SELF } \]
HIS

\[ \text{HIS } \]
HIS

\[ \text{SELF } \]
SELF

\[ \text{SELF } \]
SELF

(Fukui 1984)

On the other hand, the grammaticality of the English sentence (6) indicates that English Nominative subjects are A-binders.

(6) \text{John}_i came back with his bag and a picture of himself. (Fukui 1984)

To sum up, Japanese subjects have syntactically different properties from English Nominative subjects with respect to the A/A’ dichotomy. The former shows A'-status, the latter, whose Case is generally assumed to be licensed by the finite T, A-properties. What then is the position of Japanese subjects? On the basis of his research, Fukui (1984, 1986) proposes the adjunct hypothesis of Japanese subjects, that is, V'-adjoined position for Japanese subjects. In the subsequent subsections, accepting his claim that Japanese subjects are placed in A'-position with A'-property, we will reach a different conclusion with respect to the position of Japanese ga-marked subjects. We claim that the most plausible position for Japanese ga-marked subjects is the CP-Spec position, which has A'-properties.

### 2.2 Scope Interaction with Negation

Consider the scope interaction between ga-marked subjects and Negation (henceforth Neg). Ga-marked subjects in non-scrambled sentences always take scope over sentential Neg as illustrated in
If we assume that sentential Neg is generated between vP and TP (Pollock 1989), it is plausible that Japanese ga-subjects are located outside vP.

To summarize the discussion so far, Japanese ga-marked subjects have A'-properties and are placed in the position higher than Neg, at least, outside vP. In the subsequent subsections, we forward our claim that a position somewhere in CP is one of the most plausible candidates for Japanese ga-marked subjects.

### 2.3 Against the Involvement of Finite T in Ga-Marking

This subsection further narrows down the discussion to the question of the possible positions for Japanese subjects. It is shown that C, rather than finite T, is involved in ga-marking in Japanese.

Takezawa (1987) argues that not only English Nominative Case, but also Japanese ga is assigned by finite T (INFL in his terms). Takezawa (1987) shows that ga cannot be assigned to vP-internal elements without the finite T, using the Small Clause type examples in (8) and causative constructions in (9). The predicates of these types do not permit any Tense morphemes in the embedded clause.

#### (8) Small Clause type complements

a. with a finite Tense morpheme

\[
\text{John-}ga \ [\text{Mary-no yokogao}-ga \ \text{totemo utukusi-i}] \ \text{COMP think-Past}
\]

`John thought Mary's profile was (lit.) very beautiful.'

b. without a finite Tense morpheme

\[
\text{John-}ga \ [\text{Mary-no yokogao}-*ga/-o \ \text{totemo utukusiku}] \ \text{omot-ta.}
\]

(lit.)`John thought Mary's profile very beautiful.' (Takezawa 1987:73-75)

#### (9) Complement subject positions of -sase 'CAUS' and -moraw 'receive'

a. John-wa \ [\text{Mary-nil*-ga} \ \text{susi-o \ eat -CAUS-Past}

`John made Mary eat susi.'

b. John-wa \ [\text{Mary-nil*-ga syukudai-o \ help-TE-receive-Past}

(lit.)`John received Mary's helping (his) homework.'

\( (= \text{John had Mary help with his homework}.) \) (Takezawa 1987:76)

Contrary to Takezawa's claim, there is evidence that the existence of the finite T is not relevant to ga-marking. Some subordinate clauses with the non-finite T permit a ga-marked subject as illustrated in (10). (11) provides a piece of evidence that the subordinate clauses such as nagaramo 'though' and temo 'even if' disallow the Tense morphemes -ru 'Pres' and -ta 'Past'.

#### (10) a. [\text{Zen syusyoo-ga} \ \text{aredake huhyoo-o \ kai-nagaramo}]

\[
\text{this election-Top, \ the LDP-Nom swept the board}
\]

\( (= \text{The LDP swept the board in this election [cp though the former Prime Minister was blamed so much]}.) \)

b. [\text{Amie-ga} \ \text{hut-temo}], \ \text{watast-i-ru}

\( (= \text{John had Mary help with his homework}.) \)

\( (\text{Takezawa 1987:76}) \)

2 Kuroda observed the same point with sentences using nagara as in (i).

(i) \text{Titioya-ga keikan de ari nagara, kare-wa tumi-o okasite-simat-ta.}

`Though his father is a policeman, he committed a sin.'
(11) a. *[CP Zen syusyoo-ga aredake huhyoo-o kaw-ra/-ta nagaramo], ...
   V-Pres/-Past-though
   *I'll go out even if it rains.*

   b. *[CP Ame-ga hu-ra/-ta-temo], ...
      V-Pres/-Past-even if

(10) and (11) show that unlike English Nominative subjects, the ga-marked subjects are not dependent on the existence of the finite T. The crucial difference between Takezawa’s (8a) and (8b)-(9a-b) is not whether the embedded clauses have a finite T or not, but whether or not they have a C-projection. The embedded clauses in (8b) and (9a-b) must be a VP with no higher projections, that is, neither a TP nor a CP, because they cannot take sentential adverbs such as saikin ‘recently’ asu ‘tomorrow’, and kinoo ‘yesterday’, as illustrated in (12) and (13). Contrary to (12a), the adverb saikin ‘recently’ is not related to the embedded clauses in (12b) and (13a-b). This means that there is no finite T connected with the sentential adverb in these embedded clauses. The embedded clauses must be smaller than TP.

(12) a. Kinoo, John-ga [cp ga the former Prime Minister-Nom recently so much disrepute-Acc buy-though]
   yesterday John-Nom recently Mary-Gen profile-Nom very beautiful-Pres COMP think-Past
   *Yesterday, John thought [Mary’s profile was (lit.) is] very beautiful recently."

   b. *Kinoo, John-ga [saikin i Mary-no yokogao-o totemo utkusiku] omot-ta.
   yesterday John-Nom recently Mary-Gen profile-Acc very beautiful think-Past
   (lit.)*Yesterday, John thought [Mary’s profile very beautiful recently]."

(13) a. *Kinoo, John-ga [asu i Mary-ni susi-o tabe]-sase-ta.
   yesterday John-Nom tomorrow Mary-Dat susi-Acc eat-CAUSE-Past
   *Yesterday, John made [Mary eat susi tomorrow]."

   b. *Kinoo, John-ga [saikin i Mary-ni syukudai-o tetudat-te]-morat-ta.
      yesterday John-Nom recently Mary-Dat homework-Acc help-TE-receive-Past
      (lit.)*Yesterday, John received Mary’s recent helping (his) homework."
      (= *Yesterday, John had [Mary help with his homework recently].)

On the contrary, the subordinate clauses, given in (10) as counterexamples, permit the embedded interpretation of sentential adverbs, as shown in (14).

(14) a. [cp Zen syusyoo-ga saikin aredake huhyoo-o kai-nagaramo],
   the former Prime Minister-Nom recently so much disrepute-Acc buy-though
   kiiio Zimintoo-ga hutatabi senkyo-de asyoosi-ta.
   yesterday, the LDP-Nom again in the election sweep the board-Past
   *Yesterday, the LDP swept the board in the election again [though the former Prime
   Minister was recently blamed so much]."

   b. [cp Ame-ga konban hut-temo], watasi-wa asu dekake-ru.
      rain-Nom tonight fall-even if I-Top tomorrow go out-Pres
      *I’ll go out tomorrow even if it rains tonight."

Furthermore, Takezawa (1987) claims that [+stative] predicates such as -hosi ‘want/prefer’ do not assign accusative Case to the embedded subject. Instead, ga is assigned to it in situ from the matrix finite T (INFL) as shown in (15). According to Takezawa, the adjective -hosi permits S’(=CP)-deletion optionally. If S’(=CP) deletes, then ga is assigned from the matrix finite T in the ECM fashion.

(15) Watasi-wa [s[iotootoo-ga ie-ni kaet-te-ki-te] hos-i.
   I-Top my brother-Nom home-to back-TE-come-TE want-Pres

   ‘I want my brother to come back home.’

   However, if we assume that C is relevant to ga-marking, such a deletion operation can be eliminated. That is, -hosi ‘want’ takes a CP-complement when the embedded subject is marked with ga. We can reach a unified account for ga-marking in Takezawa’s grammatical contrast as in (8) and (9), subordinate clauses as in (10), and adjective-hosi ‘want/prefer’ type complements as in (15).
To sum up so far, we claim that the availability of ga-marking does not depend on the finite T, but on the existence of C.

(16) C, rather than finite T, is involved in ga-marking in Japanese.

Pushing the idea that C is involved in ga-marking, we should further develop our original and independent arguments for A'-status of Japanese ga-marked subjects. Next subsection discusses this point cross-linguistically.

2.4 Parallelism between the Preverbal and Postverbal Subject Constructions in Greek/Catalan and the Ga-Kara ‘Nom-from’ Alternating Constructions in Japanese

Alexiadou and Anagnostopoulou (1998) claim that in Greek/Catalan, the preverbal subjects show A'-status, whereas the postverbal subjects A-status. In this subsection, we observe that exactly the same is true with the ga-kara ‘Nom-from’ alternating constructions in Japanese.

2.4.1 Greek/Catalan: Alexiadou and Anagnostopoulou (1998)

In Greek and Catalan, SVO and VSO word order are both possible, as shown in (17).

(17) a. *O Petros pandreftike tin Ilektra. (SVO) (Greek)
    Peter married Ilektra
    ‘Peter married Ilektra.’

b. pandreftike *O Petros tin Ilektra. (VSO)
    married Peter Ilektra
    ‘Peter married Ilektra.’

A & A (1998) argue for the A'-status of the preverbal subjects. First, the preverbal subject in Greek can precede sentential adverbs such as xtes ‘yesterday’, as given in (18) and complementizers such as an ‘if’, as in (19).

(18) *O Petros xtes meta apo poleis prospathies sinandise ti Maria.
    Peter yesterday after from many efforts met Mary
    ‘After many efforts, Peter met Mary yesterday.’

(19) a. Epid O Petros an erthi i Maria tha figi
    because Peter if comes Mary FUT leave
    ‘Because if Mary comes, Peter will leave.’

b. *Because Peter if Mary comes, will leave.3

The second piece of evidence for the A'-status of the preverbal subjects comes from the bound variable interpretation of overt personal pronouns in Catalan. As given in (20), a bound variable reading is impossible in the preverbal position, but it is possible in the postverbal position (Barbosa 1995). They account for these facts on the basis of the assumption that the preverbal subjects occupy an A'-position. Thus, pronouns cannot be interpreted as bound variables.

(20) a. *Tots els setudeiants es pensen que ells aprovaran.
    All the students think that they pass
    ‘All the students think they will pass.’

b. Tots els jugadors, estan convencus que guanyaran ells.
    All the players are persuaded that win they
    ‘All the players are persuaded that they are the ones who will win.’

The third piece of evidence is related to the issue of scope ambiguity in Greek. Greek quantificational elements in the preverbal subject position have unambiguous scope, whereas in the postverbal position the subject can have ambiguous scope:

(21) a. SVO order: (some > every, *every > some)

3 A reviewer of Japanese/Korean linguistics pointed out that (19b) is perfect in English if there are a comma and a pose between Peter and if. However, we ignore the case with special poses and stresses in this paper. We leave the issues open to future studies.
Kapios fititis stihiothetise kathe arthro.
some student filed every article
'There is some student, who filed every article.'

b. VSO order: (some > every, every > some)
stihiothetise kapios fititis kathe arthro.
filed some student every article
'There is some student, who filed every article.'
'Every article was filed by a different student.'

In (21a) kapios fititis 'some student' in the preverbal position necessarily has wide scope over the universal quantifier phrase kathe arthro 'every article' in object position. On the other hand, the postverbal subject in (21b) can have narrow or wide scope.

To summarize, the facts given above indicates that the preverbal subject position in Greek/Catalan has A'-status. (22a) and (22b) are the structures of the preverval and postverbal subject constructions in Greek and Catalan.4

(22) a. SVO order (the preverbal Subj. construction)

[CP Subj. [TP T + V [VP [t_v Obj. ]]]]

b. VSO order (the postverbal Subj. construction)

[CP [TP T + V [VP [Subj. t_v Obj. ]]]]

2.4.2 Japanese: Ga-Kara 'Nom-From' Alternation

Japanese has a structure parallel to the Greek preverbal and postverbal subject alternation discussed above. Cho (1995), Inoue (1998, 2001), and Ito (2001) observe that a class of verbs, which has the -ga -ni -o Case pattern and a ni-phrase carrying the feature [+animate] and the sense of endpoint, permits the ga-kara 'Nom-from' alternation (ex. okur 'send', tutae 'report', sikar 'scold', iw 'say', hanas 'speak', ageru 'give'). Inoue (1998) calls the sentences with postpositional subjects Disguised Subjectless Sentences (henceforth DSSs). Typical examples are given in (23).

(23) a. Anata-ga/-kara Taroo- ni tegami- o okut-te-kudasai.
you-Nom/-from Taro-to a letter-Acc send-TE-imperative
'Please send a letter (from you).'
b. Anata-ga/-kara Taroo-o sikat-te-kudasai.
you-Nom/-from Taro-Acc scold-TE-imperative
'Please scold Taro.'
c. Watasi-ga/-kara Taroo- ni sono zizitu- o tutae-te-oki-masu.
I-Nom/-from Taro-to the fact-Acc tell-TE-put-Pres
'I will tell the fact to Taro.'

The ga-kara pairs of sentences given in (23) are very similar to the preverbal and postverbal subject constructions observed in Greek and Catalan.

First, the alternating subjects are placed in syntactically different positions. One is a vP-internal position. The other is outside vP. Unfortunately, the point with respect to word order restrictions given in (18) and (19) in Greek cannot be reproduced for Japanese, because Japanese is one of the head-final languages. However, contrary to the ga-marked subject, it is demonstrated that the kara-marked subject is in the vP-internal subject position by the causativization test. In Japanese, -ga '-Nom' cannot occur in the embedded clause in causative constructions. It has to be replaced with an embedded subject marker -ni 'NI', as illustrated in (24).

4 With respect to the EPP-satisfaction of T, A&A (1998) propose the EPP parameter as in (i).

(i) The EPP parameter

In Null Subject Languages (NSLs), it is parameterized as to whether the EPP-feature in T can be satisfied with a head X°.

Greek and Catalan take a value such that the EPP-feature in T is satisfied with X° via V-raising.
(24) a. John-ga ringo-o tabe-ta.
   John-Nom apple-Acc eat-Past
   'John ate an apple.'

   b. Mary-ga [John-*ga/’oki-ni ringo-o tabe]-sase-ta.
   Mary-Nom John-Dat apple-Acc eat-CAUS-Past
   'Mary made John eat an apple.'

As I mentioned above, it is not a sentential adverb, but a VP adverb that the embedded clause in (24b) can take, as illustrated in (25).

(25) a. VP adverb
   Mary-ga [gatugatu to John-ni ringo-o tabe]-sase-ta.
   Mary-Nom hungrily John-Dat apple-Acc eat-CAUS-Past
   'Mary made John eat an apple hungrily.'

   b. sentential adverb
      * Mary-ga [saiwai John-ni ringo-o tabe]-sase-ta.
      * Mary-Nom fortunately John-Dat apple-Acc eat-CAUS-Past
      * 'Mary made [John eat an apple fortunately].' (only a matrix reading)

(25) shows that the size of the embedded clause is smaller than TP, that is, VP. Next consider (26), where one of the DSS verbs, setumei-s ‘explain-do’, is the head of the complement VP of -sase ‘CAUS’.

(26) Troo-ga [dssr watasi-ni kanozyo no byoozyoo-o setumei-s]-aseta.
    Taro-Nom I-NI her condition-Acc explain-do-CAUS-Past.
    'Taro made me explain her condition to Marys.'

However, once the goal ni-phrase of setumei-s ‘explain’ is phonetically realized in the embedded clause, ni-subject is avoided and should be replaced with kara-subject:

(27) a.??Troo-wa [dssr watasi-ni Mary-ni kanozyo no byoozyoo-o setumei-s]-aseta.
    Taro-Top deliberately I-from Mary-to her condition-Acc explain-do-CAUS-Past.
    'Taro made me explain her condition to Marys.'

   b. Troo-wa [watasi-kara Mary-ni kanozyo no byoozyoo-o setumei-s]-aseta.
      Taro-Top I-from Mary-to her condition-Acc explain-do-CAUS-Past.
      'Taro made me explain her condition to Marys.'

(27) indicates that the embedded subject marker ni ‘NI’ can alternate with kara ‘from’ within the VP embedded clause. Furthermore, (28) shows that the kara-subject allows only VP adverbs on a par with ni-subject observed in (25).

(28) a. VP adverb
    Troo-wa [yukkurito watasi-kara Mary-ni kanozyo no byoozyoo-o setumei-s]-aseta.
    Taro-Top deliberately I-from Mary-to her condition-Acc explain-do-CAUS-Past.
    'Taro made me explain her; condition to Marys deliberately.'

   b. sentential adverb
      *Troo-wa [saiwai watasi-kara Mary-ni kanozyo no byoozyoo-o setumei-s]-aseta.
      *Taro-Top fortunately I-from Mary-to her condition-Acc explain-do-CAUS-Past.
      *'Taro made [me explain her; condition to Marys fortunately].' (only a matrix reading)

It follows that the kara-subjects are generated as a VP-internal argument subject, unlike the ga-marked subjects. This is parallel to the Greek non-inverted subject constructions. Namely, the subject in VSO order in Greek corresponds to the DSS kara-subject.

Second, the same contrast with respect to variable binding observed in Catalan, mentioned in (20), can be found between the ga-marked subject and the DSS kara-subject in Japanese, as illustrated in (29). In (20), the bound variable interpretation with overt personal pronouns is impossible in preverbal position, but it is possible in postverbal position.

(29) a.*Daremorga [karera-ga Taroo-o sikar-u to] it-ta.
    everyone-Nom they-Nom Taro-Acc scold-Pres Compsay-Past
    * 'Everyone said that they will scold Taro.'
b. Daremo-ga [karera-kara Taro-o sikar-u to] it-ta.
   everyone-Nom they-from Taro-Acc scold-Pres Compsay-Past
   ‘Everyone, said that they will scold Taro.’

Finally, in Greek, quantificational elements in the preverbal subject position have unambiguous scope, whereas in the postverbal position the subject can have ambiguous scope. In (21a), kapios fititis ‘some student’ in preverbal position has necessarily wide scope over the universal quantifier phrase kathe arthro ‘every article’ in object position. On the other hand, the postverbal subject in (21b) can have both narrow and wide scopes.

What is remarkable is that exactly the same contrast between the two subject positions in Greek can be observed in Japanese as a contrast between the ga-marked subject and the DSS kara-subject:

(30) a. ga-subject: (some > every, *every > some)
   Dareka-ga dono tegami-mo okut-te-oi-te-kudasai.
   ‘I hope that there is someone who sends every letter.’
   *I hope that each letter is sent by someone.’

b. kara-subject: (some > every, every > some)
   Dareka-kara dono tegami-mo okut-te-oi-te-kudasai.
   ‘I hope that there is someone who sends every letter.’
   ‘I hope that each letter is sent by someone.’

We have observed that Japanese sentences with the ga-kara alternating constructions parallel syntactically the preverbal and postverbal subject constructions in Greek and Catalan. It follows that like Greek and Catalan, these contrasts between the ga-subject and the kara-subject are reduced to the idea that the two subjects are placed in different syntactic positions. The kara-subject is placed in a vP-internal position and has A-properties, whereas the ga-subject is in a position higher than [Spec, TP], namely, in the CP-layer, and has A’-properties.

3 Proposals: Scope Interpretation

Assuming the difference in subject positions, we propose that Watanabe’s (1998, 2000) F quant movement in overt syntax is reducible to Chomsky’s (2001) Agree. We call this operation Fquant-matching. Following Watanabe (1998, 2000), we assume that if the F quant-matching operation is executed in narrow syntax, then this creates inverse scope reading at LF. As far as feature-matching is one of the legitimate operations in narrow syntax, it follows that its application is restricted by the syntactic unit phases and that it is subject to the PIC. We call the new scope system a phase-based approach. The phase-based approach eliminates a parameter with respect to the language variation of the availability of QR or the location of strong feature. Different scope phenomena between languages follow from a more general apparatus for sentence building, namely, match and the PIC.

3.1 Assumptions

Before demonstrating our new scope mechanism, we summarize our assumptions. First, we crucially use Chomsky’s (2001) Derivation by Phase version of PIC:

(31) The Phase Impenetrability Condition
   The domain of H is not accessible to operation at ZP, but only H and its edge.
   \[ Z P \ Z \ldots [ H \ Y P ] ] \] (where ZP and HP are strong phases) (Chomsky 2001)

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5 As for unavailability of the [Spec, TP] position in Japanese, Ueda (2002) discusses it in terms of the idea that Japanese is one of the non-agreement forced languages in the sense of Kuroda (1998). Ueda attempts to restate Kuroda’s insight as the \( \phi \)-defectiveness of Japanese T in Chomsky’s (2000 and 2001) framework. The crucial mechanism is as follows: \( \phi \)-features would allow T to be activated, but Japanese T has a null set of \( \phi \)-features. Thus, Japanese T can neither enter into an Agree-relation nor have the EPP feature. That is why Japanese [Spec, TP] is unavailable for Nominative subjects. Case-feature of subject NPs must wait for the next probe, that is, C.
The PIC is a syntactic condition, which restricts the size of ‘working space’ of syntactic operations and the timing of Spell-Out. (31) means that YP, which is a complement of a phase HP, cannot be accessible to operation at the next higher phase ZP, because the complement YP is spelled-out after the head Z is merged, projecting the next phase ZP. (32) is a schematic structure of the visible domain at ZP-phase level.

(32) The boxed portions indicate the visible domain at ZP-phase
\[
\begin{array}{c}
\text{ZP} \ldots \text{HP} \quad [\text{HYP}]
\end{array}
\]

Furthermore, we introduce a new notion \textit{deactivated NPs}, given in (33), and assume (34) with respect to the timing of the application of the matching operation.

(33) \textbf{Deactivated NPs} are NPs all of whose uninterpretable features are marked for deletion.

(34) The \(F_{\text{quant}}\)-matching operation applies to \textit{deactivated NPs}.

Given (31)-(34), it is demonstrated that mysterious scope takings in declaratives and ditransitives in both English and Japanese are appropriately reducible to the \textit{phase}-based scope system. The typical scopal contrast between the two languages given in (35) is accounted for in the following way.

(35) a. English: ambiguous (some > every, every > some)
Someone loves everyone.
b. Japanese: unambiguous (some > every, *every > some)
Dareka-ga daremo-o aisitei-ru.

(36) a. English: \([CP \quad [TP \quad \text{Subj.} \ T \quad \ldots \text{VP} \quad \text{[VP} \quad \text{Obj.} \text{]} \text{]} \text{]} \text{]}
\quad \text{\(F_{\text{quant}}\)-matching}

b. Japanese: \([CP \quad [TP \quad \text{Subj.} \ T \quad \ldots \text{VP} \quad \text{[VP} \quad \text{Obj.} \text{]} \text{]} \text{]} \text{]}
\quad \text{\(*F_{\text{quant}}\)-matching}

(35a) and (35b) are the schematic structures of (36a) and (36b) respectively. Assuming the notion of \textit{deactivated NPs}, given in (33) and the research results in Section 2, English subject QP becomes a deactivated NP when its uninterpretable Case-feature is marked for deletion by T. Thus, English subject QP can be a probe for \(F_{\text{quant}}\)-matching at the completion of TP. Therefore, in English, the Obj. QP is visible from the Subj. QP in [Spec, TP], because TP is not a strong phase and the complement of \(v^*\text{P}\), namely, VP, is not spelled-out yet. The boxed portion is the visible domain of a relevant \(F_{\text{quant}}\)-probe, namely, the Subj.QP in (36a). As the result, \(F_{\text{quant}}\)-matching is possible between the Subj. QP and the Obj. QP in English, resulting in the inverse scope at LF. Thus, (35a) is two-way-ambiguous at LF. One is the wide scope reading of the existential quantifier \textit{someone} in the canonical order. The other is the inverse scope reading via \(F_{\text{quant}}\)-matching, that is, the universal quantifier \textit{everyone} takes scope over the existential quantifier \textit{someone}. On the other hand, as discussed in Section 2, C, rather than T is involved in \textit{ga}-marking in Japanese. That is, Japanese \textit{ga}-marked subjects can be a deactivated NP at the completion of CP. When C merges with TP, the complement of the lower strong phase \(v^*\text{P}\), namely, VP is spelled-out and the Obj. QP is invisible from the subj. QP in CP-layer. \(F_{\text{quant}}\)-matching is impossible. Thus, Japanese shows the fixed scope in canonical order.

Furthermore, scope facts in Catalan given in (21) can be also reducible to our \textit{phase}-based scope system. The schematic structures of (21a) and (21b) are given in (37).

(37) Catalan (= (21))

a. SVO: unambiguous
\[
\begin{array}{c}
[CP \quad \text{Subj.} \ T \quad + \text{V} \quad \ldots \text{VP} \quad \text{[VP} \quad \text{Obj.} \text{]} \text{]} \text{]}
\quad \text{\(*F_{\text{quant}}\)-matching}
\]

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b. OSV: ambiguous

\[ \text{[CP} \quad C \text{[TP T + V]} \quad \text{[VP [Subj. v [vP t1 Obj.]]]]} \quad \text{OK}\]

In SVO order, the Obj. QP in v*P phase is invisible from the preverbal Subj. QP in CP phase, whereas in VSO order, the postverbal Subj. QP is in the domain of the same phase as the Obj. QP, namely, v*P. Thus, F\text{quant}-matching is possible, resulting in scope ambiguity. (38) shows that the same is true of the scope facts in ga-kara alternating constructions in Japanese.

(38) Japanese (= (31))

a. ga-Subj.: unambiguous

\[ \text{[CP} \quad C \text{[TP T + V]} \quad \text{[vP t1 Obj. v*]]} \quad \text{OK}\]

b. kara-Subj.: ambiguous

\[ \text{[CP} \quad C \text{[TP T + V]} \quad \text{[vP t1 Obj. v*]]} \quad \text{OK}\]

4 Mysterious Scope Taking in Double Object Constructions

This section discusses DOCs, whose scopal behaviors have been shrouded in mystery in the history of scope studies. It is shown that the phase-based approach sheds new light on this mystery. On the basis of a series of studies of Hale and Keyser (2002) and Takezawa (2000), we provide the three-layered vP structure (39) for DOCs in English and a class of ditransitive constructions in Japanese. In (39), v3 projects an external argument for the subject NP, which is the same as a normal transitiviser in transitive clauses. A remaining v*P1 guarantees the possessor relation between IO and DO in a sense of Hale and Keyser (2002) and Takezawa (2000). Furthermore, we propose that not only the subject NP, but also the IO moves from [Spec, v*P1] to [Spec, v*P2], because only the IO in DOCs allows quantifier stranding on a par with subject NP, as shown in (40). We assume that the IO gets a new theta-role, [+affected], in [Spec, v*P2], because the IO is subject to the animacy condition in both English and Japanese.

(40)

a. The students [vP [all1 t1]] passed the exam.

b. *John passed exams [all1 t1].

c. John gave students [all1 t1] apples.

Given the structure (39), the mysterious scope facts in both English and Japanese given in (41), (42), and (43), are also naturally accounted for under our phase-based approach without any other stipulative conditions.

(41) Scope fixing between IO and DO:

The IO always takes scope over the DO in both English and Japanese.

a. John gave someone everything. (IO > DO, *DO > IO)

b. John-ga dareka-ni dono hon mo age-ta. (IO > DO, *DO > IO)

(42) Asymmetrical scope taking:

The DO cannot take scope over the subject, but the IO can in English.

a. Someone gave everyone his report card. (Subj > IO, IO > Subj)

6 We assume that Case-feature of the kara-subject NP is vP-internally licensed by the postposition kara ‘from’. Therefore, the kara-subject can be a deactivated NP in the position within vP-layer.
b. Someone gave Bill everything. (Subj > DO, *DO > Subj)

(43) No contrast with respect to scope-taking between Subject-IO and Subject-DO in Japanese

a. Dareka-ga
daremo-ni
hon-o age-ta. (Subj > IO, *IO > Subj)
someone-Nom everyone-NI book-Acc give-Past
‘There is someone, who gave a book to everyone.’

b. Dareka-ga
Taro-ni
doremo-o age-ta. (Subj > DO, *DO > Subj)
someone-Nom Taro-NI everything-Acc give-Past
‘There is someone, who gave everything to Taro.’

Asymmetrical scope between the IO and the DO in both English and Japanese given in (41) can be predictable from the schematic structure (44)(= (39)). The complement of v1, namely, VP, is spelled out when v2 merges with v*P1 and thus, the DO is not visible from the IO position. Therefore Fquant-matching is impossible between the IO and the DO in both English and Japanese.

(44) \[\text{CP} \text{ C} \left[ \text{TP} \ Subj, v_p3 \ t \ v3 \ [v*p2 \ IO, \ v2 \ [v*p1 \ t \ v1 \ [vP \ V \ DO]]] \right] \]

The contrast between English (41a) and Japanese (42a) is attributed to the difference in subject positions in those languages discussed above. As shown in (45a) and (46a), the IO is visible from the English subject in [Spec, TP], because [Spec, v*P2] is an edge and is not spelled-out yet at the v*P3-phase level, whereas it is invisible from the Japanese ga-marked subject in CP-layer. That is why only English permits ambiguous reading between the subject QP and the IO.

As for the scope interaction between subject QP and DO, the DOs in both English and Japanese are too far from the subject positions. Thus, neither English nor Japanese allows Fquant-matching, resulting in unambiguous reading.

(45) English: structure immediately after the subject NP merges with TP (T’)

a. \[\left[ \text{TP} \ Subj, v_p3 \ t \ v3 \ [v*p2 \ IO, \ v2 \ [v*p1 \ t \ v1 \ [vP \ V \ DO]]]\right] \]

b. \[\left[ \text{TP} \ Subj, v_p3 \ t \ v3 \ [v*p2 \ IO, \ v2 \ [v*p1 \ t \ v1 \ [vP \ V \ DO]]]\right] \]

(46) Japanese

a. \[\left[ \text{CP} \ Subj, v_p3 \ t \ v3 \ [v*p2 \ IO, \ v2 \ [v*p1 \ t \ v1 \ [vP \ V \ DO]]]\right] \]

b. \[\left[ \text{CP} \ Subj, v_p3 \ t \ v3 \ [v*p2 \ IO, \ v2 \ [v*p1 \ t \ v1 \ [vP \ V \ DO]]]\right] \]

5 Conclusion

In this paper, it has been shown that unlike English Nominative subjects, ga-marked subjects are placed in the CP-layer with A’-properties. We observed that the ga-marked subjects and kara-marked subjects syntactically parallel those of the inverted and non-inverted subjects in Greek and Catalan.

Based on the assumption of different subject positions, we proposed a new scope calculation system called the phase-based approach. In our system the operation to create binary-absorbed quantifiers is reducible to a syntactic operation Agree. We called this operation Fquant-matching. This matching operation creates the inverse scope reading. We have demonstrated that our new scope system can give a unified account for various mysterious scope phenomena in several languages. Given our phase-based approach to scope calculation, scope interpretation can be derivationally determined in narrow syntax at every strong phase as far as Chomsky’s (2001) PIC permits. That is, the derivation in narrow syntax directly feeds the interpretation. Furthermore, if this approach is on the right track, the adequacy of the existence of phases as a syntactic unit as well as the relevance of the PIC in Chomsky’s Derivation by Phase is also demonstrated by the results of our research.
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