Subject Positions and Derivational Scope Calculation: A *Phase*-Based Approach[*]

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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_{quant}[1]). We call this matching operation F_{quant}-*matching*. It is shown that the working space of F_{quant}-matching is restricted by a syntactic unit *phase*. Given the matching operation for scope calculation in C_{HL}, 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.

Introduction

This paper explores the correlation between subject positions and scope interpretation in Chomsky's (2000, 2001) framework. Section 1 discusses variation in subject positions across languages. We claim that unlike English Nominative Case, C, rather than the finite T, is relevant to

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[1] The term F_{quant} is borrowed from Watanabe (1998).

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 inverted and non-inverted subject constructions in Greek and Catalan. In Section 2 and 3, 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 4 has a conclusion.

1. The Position of *Ga*-Marked Subjects in Japanese

Section 1 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]

1.1 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 in (2c). These positions are considered as typical A'-positions.

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[2] We ignore multiple *ga*-marking through this paper.

(2) a. *ga*-subject

    John$_i$-ga   Mary-ni *zibun*$_i$-no 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

    Sono *hahaoya*$_i$-wa [*zibun*$_i$-no   musuko-ga sinde simatta].

    the mother-Top   SELF-Gen son-Nom   die-Past

    'As for the mother$_i$, SELF$_i$'s son died.'   (Fukui 1984:37)

c. relative clause head

    [$_{NP}$ [$_S$ *Zibun*$_i$-no hahaoya-ga kinoo   sinde simatta] *John*$_i$]

          SELF-Gen mother-Nom yesterday die-Past   John

    'John$_i$, SELF$_i$'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.* *John*i-ga *kare*i-no kaban to *zibun*i-no syasin-o

John-Nom HIS-Gen bag and SELF-Gen picture-Acc

mot-te-kaet-te-ki-ta

take-TE-back-TE-come-Past

'John_i came back with HIS_i bag and a picture of HIMSELF_i.'

b.* *John*i-ga *zibun*i-no kaban to *kare*i-no syasin-o mot-te-kaet-te-ki-ta.

      SELF   HIS

c. *John*i-ga *kare*i-no kaban to *kare*i-nosyasin-o mot-te-kaet-te-ki-ta.

      HIS   HIS

d. *John*i-ga *zibun*i-no kaban to *zibun*i-no syasin-o mot-te-kaet-te-ki-ta.

      SELF   SELF

(Fukui 1984)

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

(6) *John*i came back with *his*i bag and a picture of *himself*i.

(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.

1.2 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 (7).[3]

(7) a. Daremo-*ga*   ohiru-o   tabe-nak-atta. (every > Neg, *Neg > every)
      everyone-Nom lunch-Acc eat-Neg-Past
      'Nobody ate lunch.'

    b. 3-nin no gakusei-*ga* ohiru-o   tabe-nak-atta. (3 > Neg, *Neg > 3)
      3-CL Gen student-Nom lunch-Acc eat-Neg-Past
      'There are three students who did not take lunch.'

    c. 5-nin izyoo no gakusei-*ga*   ohiru-o   tabe-nak-atta.
      more than 5 students-Nom   lunch-Acc eat-Neg-Past
                            (more than 5 > Neg, *Neg > more than 5)
      'There are more than five students who did not take lunch.'

    d. Dareka-*ga*   ohiru-o   tabe-nak-atta.(some > Neg, *Neg > some)
      someone-Nom lunch-Acc eat-Neg-Past
      'There is someone who did not take lunch.'

If we assume that sentential Neg is generated between *v*P and TP (Pollock 1989), it is plausible that Japanese *ga*-subjects are located outside *v*P.

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 *v*P. 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.

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[3] Miyagawa (2001) claims that sentence (ia) is not ambiguous, but (ib) is ambiguous with respect to Negation.

(i) a. Subete no hito-ga sono hon-o   yom-anak-atta.
     everyone-Nom   the book-Acc read-Neg-Past
     'Nobody read the book.'
   b. Sono hon$_i$-o subete no hito-ga t_i yom-anak-atta.
     the book-Acc everyone-Nom   read-Neg-Past
     'Nobody read the book.'
     'Not all the people read this book.'

Miyagawa's observation is that the non-scrambled sentence is scope rigid with respect to the scope interaction between subject and Negation, but when the object is scrambled out to the pre-subject position, there appears an inverse scope between subject and negation. In this paper, we do not take up scrambling cases. See Ueda (2002 and 2003) for the detail discussion about the cases of scrambling and those of subject NPs with Floating Quantifiers (FQ subject).

1.3 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 *v*P-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 morphology in the embedded clause.

(8) Small Clause type complements

    a. with a finite Tense morphology

       John-*ga* [cp [tp [Mary-no   yokogao]-*ga* totemo utukusi-*i*]

       John-Nom   Mary-Gen profile-Nom very   beautiful-**Pres**

       to]   omot-ta.

       COMP think-Past

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

    b. without a finite Tense morphology

       John-*ga* [vP [Mary-no yokogao]-**ga/-o* totemo utukusiku] omot-ta.

       John-Nom   Mary-Gen profile-Nom/-Acc very   beautiful   think-Past

       (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 [Mary-ni/*-*ga*   susi-o   tabe]-sase-ta.

       John-Top Mary-Dat/-Nom susi-Acc eat -CAUS-Past

       'John made Mary eat susi.'

    b. John-wa [Mary-ni/*-*ga*   syukudai-o   tetudat-te]-morat-ta.

       John-Top Mary-Dat/-Nom homework-Acc help-TE-receive-Past

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

       (= 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'.[4]

(10) a. [CP Zen syusyoo-*ga*   aredake   huhyoo-o
        the former Prime Minister-Nom so much   disrepute-Acc
        kai-*nagaramo*], konkai-no senkyo-wa Zimintoo-ga assyoo sita.
        buy-though   this election-Top,   the LDP-Nom swept the board
        'The LDP swept the board in this election [CP though the former Prime Minister was blamed so much].'

     b. [CP Ame-*ga*   hut-*temo*], watasi-wa dekake-ru.
        rain-Nom fall-even if I-Top   go out-Pres
        'I'll go out even if it rains.'

(11) a. *[CP Zen syusyoo-*ga* aredake huhyoo-o kaw-*ru/-ta nagaramo*],...
                                    V-Pres/-Past-though
     b. *[CP Ame-*ga* hu-*ru/-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 *v*P 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.

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[4] Kuroda observed the same point with sentences using *nagara* as in (i).
  (i) Titioya-ga   keikan   de ari *nagara*, kare-wa tumi-o okasite-simat-ta.
      father-Nom policeman be   though he-Top sin-Acc commit-Perf-Past
      'Though his father is a policeman, he committed a sin.'

(12) a. John-*ga* [cp [tp *saikin* [tp[Mary-no   yokogao]-*ga*
        John-Nom   recently   Mary-Gen   profile-Nom
        totemo utukusi-*i*]]   to]   kinoo   omot-ta.
        very beautiful-Pres   COMP yesterday think-Past
        'Yesterday, John thought [Mary's profile was ((lit.) is) very
        beautiful recently].'

    b.* John-*ga*   [*saikin* [vp [Mary-no   yokogao]-*o*   totemo
        John-Nom   recently   Mary-Gen profile-Acc   very
        utukusiku]]   kinoo   omot-ta.
        beautiful   yesterday think-Past
        (lit.)*'Yesterday, John thought [Mary's profile very beautiful
        revently].'

(13) a.* Kinoo,   John-ga   [*asu*   [Mary-ni   susi-o
        yesterday John-Nom   tommorow   Mary-Dat susi-Acc
        tabe]]-sase-ta.   (only matrix reading)
        eat-CAUSE-Past
        *'John made [Mary eat susi fortunately].'

    b.* Kinoo,   John-ga   [*asu*   [Mary-ni   syukudai-o
        yesterday John-Nom   tomorrow   Mary-Dat homework-Acc
        tetudat-te]-morat-ta.
        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

        the former Prime Minister-Nom   recently   so much   disrepute-Acc

        kai-*nagaramo*], konkai-no senkyo-wa Zimintoo-ga assyoo sita.

        buy-though   this election-Top,   the LDP-Nom swept the board

        'The LDP swept the board in this election [cp though the former Prime Minister was recently blamed so much].'

    b. [cp Ame-*ga*   *konban* hut-*temo*],   watasi-wa asu

        rain-Nom tonight fall-even if   I-Top   tomorrow

       dekake-ru.

       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'(=CP) [S(=IP) otooto-*ga*   ie-ni   kaet-te-ki-te]]-

     I-Top   my brother-Nom home-to back-TE-come-TE

     hosi-i.

     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.

1.4 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.

1.4.1 Greek/Catalan: Alexiadou and Anagnostopoulou (1998)

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

(17) a. *Juan* leyo   el libro.   (SVO)   (Catalan)
         Juan read   the book
         'Juan read the book.'

     b. leyo *Juan* el libro.   (VSO)
         read Juan   the book
         'Juan read the book.'

     c. *O Petros* pandreftike tin Ilektra.   (SVO)   (Greek)
         Peter   married   Ilektra
         'Peter married Ilektra.'

     d. pandreftike *O Petros* tin Ilektra.   (VSO)
         married   Peter   Ilektra
         'Peter married Ilektra.'

(A & A 1998: 494)

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 poles 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[5]

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$_i$ es pensen que *ells*$_i$ aprovaran.

    All the student   think   that they pass

    'All the students think they will pass.'

  b. Tots els jugadors$_i$ estan convencus que guanyaran *ells*$_i$.

    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:

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[5] 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.

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

        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.[6]

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[6] 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^0.

Assuming that verbal agreement has the category status of a pronoun in NSLs with rich-agreement morphology as in (ii), V-raising checks the EPP-feature in T, whereas XP-raising has the same function in non-pro-drop-languages such as English.

(ii) NSLs with rich-agreement morphology: Greek

Person	Number	
	Singl.	Pl.
1st	agapo	agap*a*me
2nd	agapas	agapate
3rd	agapa	agapane

   (A & A 1998: 517)

Greek and Catalan take a value such that the EPP-feature in T is satisfied with X^0 via V-raising. A & A's EPP parameter in T accounts for the facts in NSLs with rich agreement morphology. However, how can sentences be derived in Japanese, an NSL with poor verbal agreement morphology? We take up this issue in footnote 6.

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

[CP Subj.ᵢ [TP   T +V [vP t_i t_V Obj.]]]
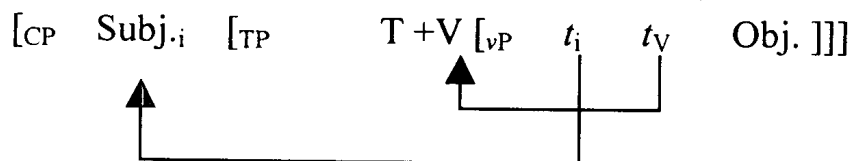
b. VSO order (the postverbal Subj. construction)

[CP   [TP   T +V [vP Subj. t_V Obj.]]]
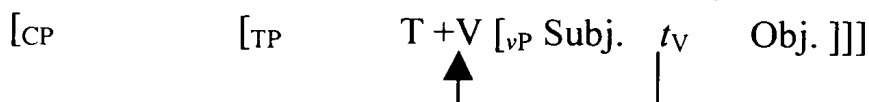
1.4.2 Japanese: *Ga-Kara* 'Nom-from' Alternation

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.'   (Ito 2001)

  d. Yosiko-*ga/-kara*   [giri no ozisan no   ie   de,
         Yosiko-Nom/-from uncle-in-law Gen house   at
         hoozi-o   suru no-wa okasii   to]   it-te-
         memorial service-Acc   do   NC-Top unusual Comp   say-TE-
         ki-ta.
         come-Past
         'Yosiko said that it is unusual that (her father's) memorial service is held at the house of an uncle-in law.'

e. ...[2-ri-no tomodati-*ga/-kara*   kawarugawaru   okutt-te-

2-CL-Gen friends-Nom/-from   one after another   send-TE-

ku-ru]   tegami-de....

come-Pres]   letter-with

'...with the letters, which two of my friends sent to me one after another, ...'

(Cho 1995)

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 *v*P-internal position. The other is outside *v*P. 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 *v*P-internal subject position by the causativization test, where a *v*P with the *kara*-subject is embedded. 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).

(24) a. John-*ga*   ringo-o   tabe-ta.

John-Nom apple-Acc eat-Past

'John ate an apple.'

b. Mary-ga [$_{vP}$ John-*ga/^{OK}-ni*   ringo-o   tabe]-sase-ta.

Mary-Nom John-Nom/-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, *v*P.[7] Next consider (26), where one of the DSS verbs, *setumei-s* 'explain-do', is the head of the complement *v*P of -*sase* 'CAUS'.

(26) Troo-ga [DSS*v*P watasi-*ni* kanozyo no byoozyoo-o *setumei-s*]-

Taro-Nom I-NI her condition-Acc explain-do-

(s)ase-ta.

CAUS-Past.

'Taro made me explain her condition (to someone).'

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 [DSS*v*P watasi-*ni* *Mary-ni* kanozyo no byoozyoo-o

Taro-Top I-NI Mary-to her condition-Acc

setumei-s]-(s)ase-ta.

explain-do-CAUS-Past.

'Taro made me explain her$_i$ condition to Mary$_i$.'

b. Troo-wa [watasi-*kara* *Mary-ni* kanozyo no byoozyoo-o

Taro-Top I-from Mary-to her condition-Acc

setumei-s]-(s)ase-ta.

explain-do-CAUS-Past.

'Taro made me explain her$_i$ condition to Mary$_i$.'

(27) indicates that the embedded subject marker *ni* 'NI' can alternate with

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[7] Koichi Takezawa (personal communication) suggests that the embedded clause in (25) might be smaller than TP, but a bigger than *v*P, because a Negative morpheme *nak* 'Neg' can appear between the embedded verb and -*sase* 'CAUS', as illustrated in (i). We assume here that the embedded clause can be expanded to an NegP when it takes a Negative predicate.

(i) ?Mary-ga [NegP John-ni sono ringo-o tabe-*nak*]-sase-ta.

Mary-Nom John-NI the apple-Acc eat-Neg-CAUS-Past

'Mary did not make John eat the apple.'

kara 'from'. 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
Taro-Top	[deliberately	I-from	Mary-to
kanozyo no byoozyoo-o		setumei-s]-(s)ase-ta.	
her condition-Acc		explain-do-CAUS-Past.	

'Taro made [me explain her$_i$ condition to Mary$_i$ deliberately].'

b. sentential adverb

*Troo-wa	[*saiwaini*	watasi-*kara*	Mary-ni
Taro-Top	[fortunately	I-from	Mary-to
kanozyo no byoozyoo-o setumei-s]-(s)ase-ta. (only a matrix reading)			
her condition-Acc		explain-do-CAUS-Past.	

'Taro made [me explain her$_i$ condition to Mary$_i$ fortunately].'

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 (30) and (31). The Catalan examples are reproduced here as (29). In (29), the bound variable interpretation with overt personal pronouns is impossible in preverbal position, but it is possible in postverbal position.

(29) a.* Tots els setudeiants$_i$ es pensen que ells$_i$ aprovaran.

all the student think that they pass

'All the students think they will pass.'

b. Tots els jugadors$_i$ estan convencus que guanyaran ells$_i$.

all the player are persuaded that win they

'All the players are persuaded that they are the ones who will win.'

(30) a.* Daremo_i-ga   [karera_i-*ga* zizyoo-o   hanas-u   to]
everyone-Nom   they-Nom   the situation   explain-Pres   Comp
it-ta
say-Past
'Everyone_i said that they_i will explain the situation.'

b. Daremo_i-ga [karera_i-*kara* zizyoo-o   hanas-u   to]
everyone-Nom   they-from   the situation   explain-Pres   Comp
it-ta.
say-Past
'Everyone_i said that they_i will explain the situation.'

(31) a.* Daremo_i-ga   [karera_i-*ga* Taroo-o   sikar-u   to]   it-ta.
everyone-Nom   they-Nom   Taro-Acc   scold-Pres   Comp   say-Past
*'Everyone_i said that they_i will scold Taro.'

b. Daremo_i-ga [karera_i-*kara* Taroo-o   sikar-u   to]   it-ta.
everyone-Nom   they-from   Taro-Acc   scold-Pres   Comp   say-Past
'Everyone_i said that they_i 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:

(32)(=(21))

a. SVO order: (some > every, *every > some)
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 (32a), *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

(32b) 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:

(33) a. *ga*-subject: (some > every, *every > some)

      Dareka-*ga*   dono tegami-mo okut-te-oi-te-kudasai.

      someone-Nom every letter   send-TE-put-TE-imperative

      '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.

      someone-from every letter   send-TE-put-TE-imperative

      'I hope that there is someone who sends every letter.'

      'I hope that each letter is sent by someone.'

(34) a. *ga*-subject: (some > every, *every > some)

      Dareka-*ga*   dono renraku mo gakusei ni si-mas-u.

      someone-Nom every information student-to do-Pol-Pres

      'There is someone who gives every message to students '

      *'Each message will be given by someone.'

   b. *kara*-subject: (some > every, every > some)

      Dareka-*kara*   dono renraku mo gakusei ni si-mas-u.

      someone-from every information student-to do-Pol-Pres

      'There is someone who gives every message to students '

      'Each message will be given 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 in the following two aspects: (i) the availability of a bound variable reading: personal pronouns in the preverbal subject position in Catalan and the *ga*-marked subject position in Japanese cannot function as bound variables, while those in the postverbal subject position and in the *kara*-marked subject position can; (ii) scope ambiguity: the preverbal subject in Greek and the *ga*-marked subject in Japanese can have only a wide scope reading,

whereas the postverbal subject in Greek and the *kara*-marked subject in Japanese have both a narrow and a wide scope reading. 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 *v*P-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.[8]

2. 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 (2000, 2001) *Agree*. We call this operation F_{quant}-*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*.

2.1 Assumptions

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

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[8] 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 ϕ-defectiveness of Japanese T in Chomsky's (2000 and 2001) framework. The crucial mechanism is as follows: ϕ-features would allow T to be activated, but Japanese T has a null set of ϕ-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.

(35) The Phase Impenetrability Condition

The domain of H is not accessible to operation at ZP, but only H and its edge.

$[_{ZP}$ Z ... $[_{HP}$ __ [H YP]]]

(where ZP and HP are strong phases)

(Chomsky 2001)

The PIC is a syntactic condition, which restricts the size of 'working space' of syntactic operations and the timing of Spell-Out. (35) 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*. (36) is a schematic structure of the visible domain at ZP-phase level.

(36) The boxed portions indicate the visible domain at ZP-phase

$[_{ZP}$ Z ... $[_{HP}$ __ | [H | YP]]]

↑ ↑ edge head

strong phase   strong phase

Furthermore, we introduce a new notion *deactivated NPs*, given in (37), and assume (38) with respect to the timing of the application of the matching operation.

(37) *Deactivated NPs* are NPs all of whose uninterpretable features are marked for deletion.

(38) The F_{quant}-matching operation applies to *deactivated NPs*.

Given (35)-(38), it is demonstrated that mysterious scope takings in declaratives and ditransitives in both English and Japanese are appropriately reducible to the *phase*-based scope system. The typical scopal contrast between the two languages given in (39) is accounted for in the following way.

(39) a. English: ambiguous (some > every, every > some)

　　　 Someone loves everyone.

　 b. Japanese: unambiguous (some > every, *every > some)

　　　 Dareka-ga daremo-o aisitei-ru.

(40) a. English: [$_{CP}$ C [$_{TP}$ *Subj.* T [$_{v*P}$ v^* [$_{VP}$ V *Obj.*]]]]]

^{OK}F$_{quant}$-matching

　 b. Japanese: [$_{CP}$ *Subj.* [$_{TP}$ 　　 [$_{v*P}$ 　 [$_{VP}$ *Obj.* V] v^*] T] C]

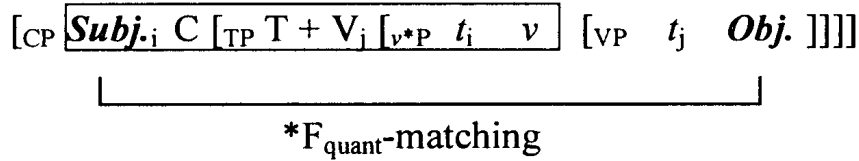　　　 strong phase　　　 strong phase

*F$_{quant}$-matching

(40a) and (40b) are the schematic structures of (39a) and (39b) respectively. Assuming the notion of **deactivated NPs**, given in (37) and the research results in Section 1, 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$_{quant}$-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^*P, namely, VP, is not spelled-out yet. The boxed portion is the visible domain of a relevant F$_{quant}$-probe, namely, the Subj.QP in (40a). As the result, F$_{quant}$-matching is possible between the Subj. QP and the Obj. QP in English, resulting in the inverse scope at LF. Thus, (39a) is two-way-ambiguous at LF. One is the wide scope reading of the existential quantifier *someone* in the canonical order. The other is the inverse scope reading via F$_{quant}$-matching, that is, the universal quantifier *everyone* takes scope over the existential quantifier *someone*. On the other hand, as discussed in Section 1, C, rather than T is involved in *ga*-marking in Japanese. That is, Japanese *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^*P, namely, VP is spelled-out and the Obj. QP is invisible from the subj. QP in CP-layer. F$_{quant}$-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 *phase*-based scope system. The schematic structures of
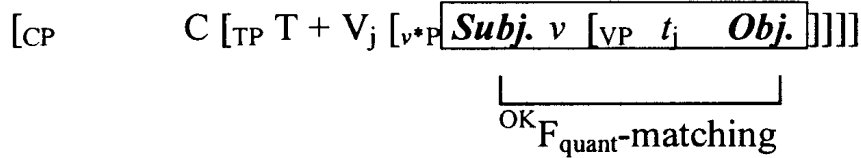
(21a) and (21b) are given in (41).
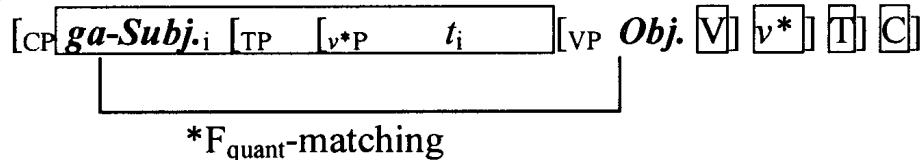
(41) Catalan (= (21))

    a. SVO: unambiguous

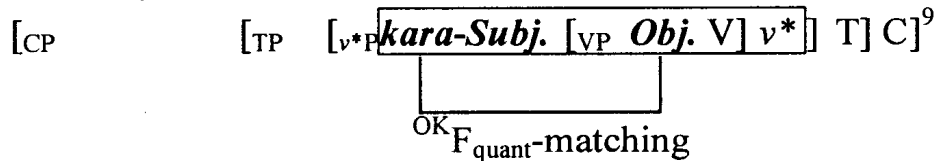$$[_{CP} \boxed{\textit{\textbf{Subj.}}_i \; C \; [_{TP} T + V_j \; [_{v^*P} \; t_i \quad v} \quad [_{VP} \quad t_j \quad \textit{\textbf{Obj.}} \;]]]]$$

          *F_{quant}-matching

    b. OSV: ambiguous

$$[_{CP} \qquad C \; [_{TP} T + V_j \; [_{v^*P} \boxed{\textit{\textbf{Subj.}} \; v \; [_{VP} \; t_j \quad \textit{\textbf{Obj.}}}]]]]$$

          $^{OK}F_{quant}$-matching

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_{quant}-matching is possible, resulting in scope ambiguity. (42) shows that the same is true of the scope facts in *ga-kara* alternating constructions in Japanese.

(42) Japanese (= (33) and (34))

    a. *ga*-Subj.: unambiguous

$$[_{CP} \boxed{\textit{\textbf{ga-Subj.}}_i} \; [_{TP} \quad [_{v^*P} \qquad t_i \qquad [_{VP} \; \textit{\textbf{Obj.}} \; \boxed{V}] \; \boxed{v^*}] \; \boxed{T}] \; \boxed{C}]$$

          *F_{quant}-matching

    b. *kara*-Subj: ambiguous

$$[_{CP} \qquad [_{TP} \quad [_{v^*P} \boxed{\textit{\textbf{kara-Subj.}} \; [_{VP} \; \textit{\textbf{Obj.}} \; V] \; v^*}] \; T] \; C]^9$$

          $^{OK}F_{quant}$-matching

3. Mysterious Scope Taking in Double Object Constructions (henceforth DOCs)

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 *v*P structure (43) for DOCs in English and a class of ditransitive constructions in Japanese. In (43), *v*3 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 (44).[10] We assume that the IO gets a new theta-role, *[+affected]*, in [Spec, *v**P2], because the IO is subje to the animacy condition in both English and Japanese.

(43) [$_{CP}$ C [$_{TP}$ Subj.$_j$ [$_{v*P3}$ t_j $v3$ [$_{v*P2}$ IO$_i$ $v2$ [$_{v*P1}$ t_i $v1$ [$_{VP}$ V **DO**]]]]]]]

(44) a. The students [$_{vP}$ [all$_i$ t_i] passed the exam.]
   b.* John passed exams$_i$ [all$_i$ t_i].
   c. John gave students$_i$ [all$_i$ t_i] apples.

Given the structure (43), the mysterious scope facts in both English and Japanese given in (45), (46), and (47), are also naturally accounted for under our *phase*-based approach without any other stipulative conditions.

(45) *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)
          IO   DO
   b. John-ga   *dareka-ni*   *dono hon mo* age-ta. (IO > DO, *DO > IO)
       John-Nom someone-NI every book   give-Past

---

(46) *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)
>   Subj   IO
>
> b. *Someone* gave Bill *everything*. (Subj >DO, *DO > Subj)
>   Subj   DO

(Hornstein (1995): 178)

(47) 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   Taroo-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 (45) can be predictable from the schematic structure (48)(= (43)). 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 F_{quant}-matching is impossible between the IO and the DO in both English and Japanese.

(48) $[_{CP}$ C $[_{TP}$ Subj.$_j$ $[_{v*P3}$ t_j $v3$ $[_{v*P2}$ $\boxed{IO_i \quad v2 \ [_{v*P1} \ t_i \ v1}$ $[_{VP}$ V DO]]]]]]]]

$$\underline{\hspace{5cm}}$$

*F_{quant}-matching

The contrast between English (46a) and Japanese (47a) is attributed to the difference in subject positions in those languages discussed above. As shown in (49a) and (50a), 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 subject positions. Thus, neither English nor Japanese allows F_{quant}-matching, resulting in unambiguous reading.

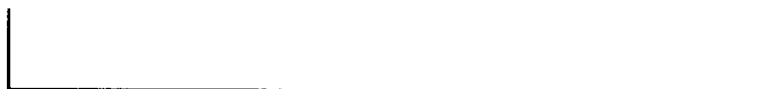(49) English: structure immediately after the subject NP merges with TP (T')

a. [TP Subj_i T [v*P3 t_i v3 [v*P2 IO_i v2 [v*P1 t_i v1 [VP V DO]]]]]

$^{OK}F_{quant}$-matching

b. [TP Subj_i T [v*P3 t_i v3 [v*P2 IO_i v2 [v*P1 t_i v1 [VP V DO]]]]]

$*F_{quant}$-matching

(50) Japanese

a.[CP Subj_i [TP [v*P3 t_i [v*P2 IO_i [v*P1 t_i [VP DO V v1 v2 v3 T C]

$*F_{quant}$-matching

b.[CP Subj_i [TP [v*P3 t_i [v*P2 IO_i [v*P1 t_i [VP DO V v1 v2 v3 T C]

$*F_{quant}$-matching

4. 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 F_{quant}-*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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