A Note on Quantifier Scope in English and Scrambling*

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Abstract

In this paper we suggest that the scope of quantified DPs (henceforth, QPs) both in Japanese and English is determined by the syntactic feature that drives scrambling. We first review Johnson's (2000) suggestion that there is a parallelism between the locality of QP scope and that of scrambling, and examine the possibility of reducing the rule of scope determination to covert A-scrambling. Then we suggest that QP scope is determined by those features that are responsible for both the syntactic movement and the semantic interpretation of DPs, including the topic feature in the sense of Miyagawa (2010), by showing that the facts about QP scope in English and Japanese are adequately accounted for by our approach.

Keywords: quantifier, scope, scrambling, topic

0. Introduction

In this paper we consider the relation between the scope of QPs and scrambling. We first examine the idea suggested by Johnson (2000) that QP scope can somehow be reduced to scrambling. We then examine the relation between scrambling and scope in Japanese and see that it is A-scrambling, as opposed to A'-scrambling, that allows a QP to take wide scope. Finally we suggest that QP scope is determined by those features that are responsible for both the syntactic movement and the semantic interpretation of DPs, including the topic feature in the sense of Miyagawa (2010), by showing that the facts about QP scope in English and Japanese are adequately accounted for by our approach.

1. Quantifier Scope in English and Scrambling

It has been widely observed in the past literature (May (1977), among others) that a simple sentence containing two QPs has two different interpretations with respect to the

relation of the scope of the two QPs:

(1) *Some boy* kissed *every girl*.
[ambiguous: some > every, every > some]

On one interpretation, in which *some boy* takes scope over *every girl* (some > every), the sentence is understood to assert the existence of one boy who kissed all the girls. On the other interpretation, in which *every girl* takes scope over *some boy*, the sentence is taken to describe the situation where each of the girls was kissed by a different boy.

The interpretive ambiguity with respect to QP scope is not observed in just any case involving two QPs. If two QPs belong to different clauses as in (2), only one of the QPs may take scope over the other:

(2) *Someone* believes that *everyone* left early.
[unambiguous: some > every, *every > some] (Hornstein (1995))

In (2), the only possible reading is one where the QP in the matrix clause (*someone*) takes scope over the QP in the complement clause (*everyone*). It is not possible to interpret the sentence as meaning that each of the person denoted by *everyone* is believed by a different person to have left early. Thus these facts suggest that the scope of a QP does not extend beyond the clause that contains the QP.

In the past works in the generative syntax, the scope of a QP has been represented structurally by applying the covert movement rule of Quantifier Raising (QR) (May (1977) among others) to QPs at the level of LF and the locality of the QP scope observed above has been captured by saying that QR cannot raise a QP out of the clause containing it (May (1977)).

In an attempt to understand the locality of QP scope as observed above, Johnson (2000) points out the similarity in the locality of the QP scope and that of scrambling. He notes that scrambling in Dutch is constrained in the same way as QP scope is. First, as QR allows a lower QP to take scope over a higher QP in a simple sentence, scrambling in Dutch may take place in a simple sentence:

(3) *Some boy* kissed *every girl*.
[ambiguous: some > every, every > some] (= (1))

(4) a. ... dat Jan gisteren *Marie* gekust heeft
that John yesterday Mary kissed has
'... that John kissed Mary yesterday.'
b. ... dat Jan *Marie* gisteren gekust heeft
that John Mary yesterday kissed has
(Thrainsson (2001))

In complex sentences, as Johnson points out, scrambling cannot raise a DP out of the finite complement clause to the matrix clause in Dutch. Accordingly, the scope of a QP in the finite complement clause cannot be extended to the matrix clause in English:

(5) *A different student* said that I had read *every book*.
[unambiguous: a > every, *every > a] (Johnson (2000))

(6) *... dat Jan *boken*$_i$ heeft besloten [dat er t_i gelezen heeft]
that Jan books has decided that he read has
'... that Jan has decided that he has read books.' (ibid.)

Moreover, Johnson notes that a QP in an infinitival complement clause may take scope over a matrix QP. Correspondingly, scrambling in Dutch allows a DP to move out of an infinitival complement clause:

(7) *A different student* wanted to read *every book*.
[ambiguous: a > every, every > a] (Hornstein (1995), Johnson (2000))

(8) ... dat Jan *Marie*$_i$ heeft geprobeerd [t_i te kussen].
that Jan Marie has tried to kiss
'... that Jan has tried to kiss Marie.' (Johnson (2000))

In addition, both QP scope in English and scrambling in Dutch are blocked by the presence of an overt complementizer (*for* in (9) and *om* in (10)):

(9) *A different student* wanted for you to read *every book*.
[unambiguous: a > every, *every > a] (Johnson (2000))

(10) *... dat Jan *Marie*$_i$ heeft geprobeerd [om t_i te kussen].
that Jan Marie has tried C^0 to kiss
'... that Jan has tried to kiss Marie.' (ibid.)

Thus these facts tell us that QP scope and scrambling are subject to the same constraint on locality. This similarity between the locality of QP scope and that of scrambling has led Johnson (2000) to pursue a line of approach to QP scope in which the rule of QR is somehow reduced to scrambling. Although Johnson does not present a specific formulation of this idea, one way to implement it is to say that the QP scope in English is determined by "covert scrambling" at the level of LF. If we assume covert scrambling, a constituent undergoing it must move in the same way as in overt scrambling. First, covert scrambling is an optional operation since overt scrambling is optional. Second, covert scrambling carries a constituent to the position that it would move to by overt scrambling. That position must either be the post-subject position, as in Dutch, or the pre-subject position, as in Japanese. If we assume these, the examples in (3), (5) and (7) have the following LF representations. In what follows I omit the case of covert scrambling to the post-subject position since it is irrelevant to the determination of scope.

(11) LFs for (3):
a. [[some boy] kissed [every girl]]]
b. [[every girl]$_i$ [some boy kissed t_i]]

(12) LFs for (7):
a. [[a different student wanted [*PRO* to read [every book]]]
b. [[every book]$_i$ [a different student wanted [*PRO* to read t_i]]

(13) LFs for (5):
a. [[a different student] said [that I had read [every book]]]
b. *[[every book]$_i$ [[a different student] said [that I had read t_i]]

The representation in (11a) yields the wide scope reading of the matrix subject *some boy*. If covert scrambling occurs as in (11b), the object is placed in the position to the left of the subject, as in the case of overt scrambling in Japanese. This gives rise to the

wide scope of the object QP *every book*. In (7), the object QP *every book* is in an environment where overt scrambling would allow it to move to the matrix clause. Thus covert scrambling can take the object QP to the matrix position, as in (12b). If it undergoes covert scrambling, it is given wide scope. On the other hand, the object QP *every book* in (5) is in an environment where it would be disallowed to be scrambled to the matrix position, as the corresponding Dutch example indicates. Therefore, the object may not move over the matrix subject and hence cannot take scope over it.

2. Scrambling in Japanese and QP Scope

Although QP scope and scrambling exhibit an interesting similarity, it is not the case that every case of scrambling allows the scrambled QP to take wide scope. A case of such a "mismatch" is found in Japanese.

In Japanese, a sentence containing two QPs in the order $QP_{SUBJ} - QP_{OBJ}$ has been widely observed in the literature to have only the reading where the subject QP takes wide scope over the object QP. Thus, in (14) the subject QP *dareka-ga* takes scope over the object *daremo-o*, but the reversed scope order is not possible.

(14) *Dareka-ga* *daremo-o* seme-ta
someone-Nom everyone-Acc blame-Past
[unambiguous: some > every, *every > some]

In contrast, if the object QP is scrambled to the left of the subject, either QP may take scope over the other:

(15) *Daremo-o* *dareka-ga* seme-ta
someone-Nom everyone-Acc blame-Past
[unambiguous: some > every, every > some]

This is also the case with scrambling of a QP out of an infinitival clause (Nemoto (1993)). Scrambling can move a constituent out of an infinitival clause, and when this happens to a QP it allows the scrambled QP to take wide scope over the matrix QP:[1]

(16) a. *3-nin-no gakusei-ga* [*PRO subete-no siken-o* uke-] tagat-ta
3-Cl-Gen student-Nom every-Gen test-Acc take-want-Past
'Lit. Three students wanted to take every test.'
[ambiguous: 3 > every, *every > 3]

b. *3-nin-no gakusei-ga* [*PRO subete-no siken-o* uke-yoo-to] omot-ta
3-Cl-Gen student-Nom every-Gen test-Acc take-Mod think-Past
'Lit. Three students thought of taking every test.'
[ambiguous: 3 > every, *every > 3]

(17) a. *Subete-no siken-o 3-nin-no gakusei-ga* [t_i uke-] tagat-ta
every-Gen test-Acc 3-Cl-Gen student-Nom take-want-Past
'Lit. Every test, three students wanted to take.'
[ambiguous: 3 > every, every > 3]

b. *Subete-no siken-o 3-nin-no gakusei-ga* [t_i uke-yoo-to] omot-ta
every-Gen test-Acc 3-Cl-Gen student-Nom take-Mod think-Past
'Lit. Every test, three students thought of taking.'
[ambiguous: 3 > every, every > 3]

In the examples in (16) where the object remains in its original position in the infinitival complement clause, only the matrix subject QP *3-nin-no gakusei-ga* may take wide scope. On the other hand, if the object is scrambled to the left of the matrix subject QP, it is allowed to take scope over the subject.

In the case of scrambling out of a finite complement clause, however, the scrambled QP cannot take scope over a matrix QP (Tada (1993)). Consider:

(18) a. *Dareka-ga* [Yamada-sensei-ga *subete-no gakusei-ni*
someone-Nom Yamada-teacher-Nom every-Gen student-Dat
suisenzyoo-o kaita-to] omot-ta
recommendation-Acc wrote-Comp think-Past
'Someone believes that Professor Yamada wrote a recommendation letter to every student.'
[unambiguous: some > every, *every > some]

b. *Subete-no gakusei-nii dareka-ga* [Yamada-sensei-ga t_i
every-Gen student-Dat someone-Nom Yamada-teacher-Nom

suisenzyoo-o kaita-to] omot-ta
recommendation-Acc wrote-Comp think-Past
'Lit. Every student, someone thought Professor Yamada wrote a recommendation letter to.'
[unambiguous: some > every, *every > some]

Unlike the cases of scrambling in (15) and (17), the long-distance scrambling of a QP, as exemplified in (18), does not allow the QP to take wide scope. Thus the locality of QP scope and that of scrambling do not seem to match perfectly.

This mismatch between QP scope and scrambling may be repaired if we take into account that scrambling is indeed divided into two different kinds of syntactic operation: A-movement and A'-movement. It has been pointed out in the literature since Mahajan (1990) that scrambling may be either type of movement. In Japanese, scrambling as A-movement can be confirmed by the availability of anaphor-binding, as in the following:

(19) a.?*$Otagai_i$-no sensei-ga $karera_i$-o hihansita (koto)
each.other-Gen teacher-Nom they-Acc criticized fact
'Each other$_i$'s teachers criticized them$_i$.'
b. ? $Karera_i$-o $otagai_i$-no sensei-ga t_i hihansita (koto)
they-Acc each.other-Gen teacher-Nom criticized fact
'Them$_i$, each other$_i$'s teachers criticized.' (Saito (1992))

In (19a), it is impossible for the anaphor (reciprocal pronoun) *otagai* to have the object *karera-o* as its antecedent. However, if the object is scrambled, it serves as the antecedent of the anaphor. If we assume that an anaphor must be bound by an antecedent in an A-position, (19b) shows that the object has scrambled to an A-position.

In addition to the clause-internal scrambling, scrambling out of an infinitival clause also makes it possible for the scrambled DP to bind an anaphor (Nemoto (1993)):[2]

(20) a. * Otagai$_i$-no sensei-ga [*PRO* karera$_i$-o hihansi-yoo-to] omot-ta
each.other-Gen teacher-Nom they-Acc criticize think-Past
'Lit. Each other's teachers thought of criticizing them.'
b. Karera$_i$-o otagai$_i$-no sensei-ga [*PRO* t_i hihansi-yoo-to] omot-ta
they-Acc each.other-Gen teacher-Nom criticize think-Past

'Lit. Them, each other's teachers thought of criticizing.'

(21) a. * Otagai$_i$-no sensei-ga [*PRO* karera$_i$-o hihansi-] tagat-ta
each.other-Gen teacher-Nom they-Acc criticize want
'Lit. Each other's teachers wanted to criticize them.'

b. Karera$_i$-o otagai$_i$-no sensei-ga [*PRO* t_i hihansi-] tagat-ta
they-Acc each.other-Gen teacher-Nom criticize want-Past
'Lit. Them, each other's teachers wanted to criticize them.'

In contrast, long-distance scrambling does not license anaphor-binding:

(22) a. * Otagai$_i$-no sensei-ga [$_{CP}$ Hanako-ga karera$_i$-o hihansita to]
each.other-Gen teacher-Nom Hanako-Nom they-Acc criticized Comp
itta (koto)
said fact
'Each other$_i$'s teachers said that Hanako criticized them$_i$.'

b. * Karera$_i$-o otagai$_i$-no sensei-ga [$_{CP}$ Hanako-ga t_i hihansita to]
they-Acc each.other-Gen teacher-Nom Hanako-Nom criticized Comp
itta (koto)
said fact
'Lit. Them$_i$, each other$_i$'s teachers said that Hanako criticized.' (Saito (1992))

The unavailability of anaphor-binding in (22) shows that long-distance scrambling can only be an instance of A'-movement (Saito (1992)).

Thus Johnson's point on the parallelism between QP scope and scrambling must be restated more properly in the following way: a QP may take wide scope where it may undergo A-scrambling. As for the case of QP scope in English in (3) and (7), where the lower QP may take wide scope, the lower QP is in an environment where it could undergo covert A-scrambling to the matrix clause. On the other hand, the lower QP in (5) cannot undergo covert A-scrambling to the matrix clause since long-distance scrambling cannot be a case of A-movement.

3. A Problem

The preceding sections have suggested the possibility of accounting for QP scope in English in terms of the (un)availability of covert A-scrambling. A-scrambling, whether it is overt or covert, gives the scrambled QP a wide scope, whereas A'-scrambling does not. Now since A- and A'-scrambling are instances of A- and A'-movement, respectively, we may ask whether other instances of A- and A'-movement affect QP scope in the same manner as A- and A'-scrambling.

This expectation is not necessarily borne out, however. Firstly, A-movement does not always allow an A-moved QP to take wide scope. Consider the following examples:

(23) a. *Everyone seems* to like Cecil's playing.
[ambiguous: every > seem, seem > every]
b. *Some politician* is *likely* to address John's constituency.
[ambiguous: some > seem, seem > some] (May (1977))

(24) *Drunks* are *likely* to win the lottery.
[unambiguous: *∃ > likely, likely > ∃] (Carlson (1977))

The subject QP of the raising construction has been observed to take either wide or narrow scope with respect to the raising predicate (*seem* and *likely*) as in (23). However, if the subject is a bare plural DP with its existential reading, as in (24), the subject can only take narrow scope under the raising predicate. Since the raising construction involves A-movement of the DP from the subject position of the *to*-infinitival clause to the matrix subject position, the obligatory narrow scope in (24) tells us that A-movement does not necessarily yield wide scope of the moved QP.

Secondly, as opposed to the conclusion in the preceding section that A'-movement of a QP cannot give the QP a wide scope, A'-movement can indeed change the scope relation. Consider the following examples:

(25) a. *All of us* have read *many of these books* with great enthusiasm.
[ambiguous: all > many, many > all]
b. *Many of these books, all of us* have read with great enthusiasm.
[unambiguous: *all > many, many > all] (Kuno (1991))

(26) a. *Many people* come to New York *every summer*.
[ambiguous: many > every, every > many]
b. *Every summer, many people* come to New York.
[unambiguous: *many > every, every > many] (Kuno and Takami (2002))

(25a) and (26a) are examples of scope ambiguity that is now familiar to us. What is noteworthy is the topicalization construction exemplified in (25b) and (26b). In these examples, the QPs *many of the books* and *every summer* are moved to the clause-initial position by topicalization, an instance of A'-movement. Note that the scope relation is affected in these topicalization cases: the topicalized QP in both examples obligatorily takes wide scope, in contrast to the non-topicalized QP in (25a) and (26a), which may take either wide or narrow scope. These examples tell us that A'-movement may indeed affect the scope of the A'-moved QP.

Thus we have contradictory results in the preceding and the present section. How can we overcome this problem and give an adequate account of all the cases of scope relation that we have discussed so far? In order to solve this problem, we need to answer the two questions below:

(27) a. What is it that A-scrambling in Japanese has but A-movement in English does not have?
b. What is it that both A-scrambling in Japanese and topicalization in English have in common?

If we can find an answer to these questions, they will make it possible to give an adequate account of both the QP scope in English and that in Japanese.

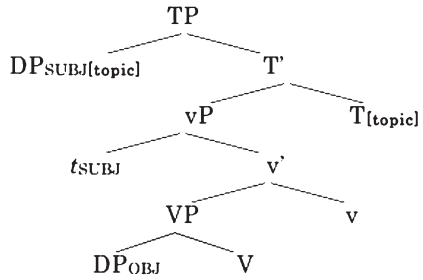
4. Triggers of A-Movement

We propose that the answers to the questions in the preceding section lie in the difference in the trigger of A-movement in English and in Japanese, as is proposed in Miyagawa (2010).

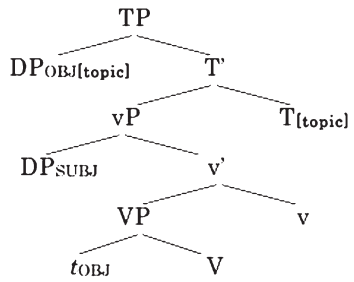
Miyagawa (2010) characterizes the difference in the word order in Japanese as a result of the difference in the choice of the constituent serving as the "topic" of the sentence. If the subject, generated in [Spec, vP], has the corresponding topic feature, it

is raised to [Spec, TP] by the topic feature on T. This results in the SOV order. If the object bears the topic feature, on the other hand, it is the object DP that is attracted into [Spec, TP]. This yields the OSV order. These two derivations are illustrated in (28):

(28) a.



b.



The topic feature is perceived in Miyagawa (2010) as having a semantic effect of establishing the topic-comment structure that corresponds to Kuroda's (1972-73) categorical expression. Although Miyagawa does not provide much evidence for this, there is a piece of evidence suggesting that the sentence-initial DP, whether it is the subject or the scrambled object, is understood to have a particular semantic effect (Homma (2014)). Consider the following discourses:

(29) A: Taroo-wa dare-o aisiteiru-no
Taro-Top who-Acc love-Q
'Who does Taro love?'

B: i) Hanako-desu. ??Taroo-ga Hanako-o aisitei-mas-u
Hanako-is Taro-Nom Hanako-Acc love-Pol-Pres
'Hanako. Taro loves Hanako.'

ii) Hanako-desu. Hanako-o Taroo-ga aisitei-mas-u
Hanako-is Hanako-Acc Taro-Nom love-Pol-Pres
'Lit. Hanako. Hanako, Taro loves.'

(30) A: Dare-ga Hanako-o aisiteiru-no
who-Nom Hanako-Acc love-Q
'Who loves Hanako?'

B: i) Taroo-desu. Taroo-ga Hanako-o aisitei-mas-u
Taro-is Taro-Nom Hanako-Acc love-Pol-Pres
'Taro. Taro loves Hanako.'

ii) Taroo-desu. ??Hanako-o Taroo-ga aisitei-mas-u
Taro-is Hanako-Acc Taro-Nom love-Pol-Pres
'Lit. Taro. Hanako, Taro loves.'

In these examples, B's responses all consist of a fragment answer, providing an answer to A's question, and of a complete sentence that repeats the information provided by the preceding fragment answer. The acceptability of the complete sentence depends on the placement of the constituent serving as the repeated answer: the constituent that repeats the preceding answer must be in the sentence-initial position.

We may say that this semantic property of a sentence-initial DP lend support to Miyagawa's (2010) point that the sentence-initial constituent serves as a topic since the referent of the sentence-initial DP has appeared in the preceding fragment answer.[3]

As for A-movement in English, on the other hand, Miyagawa (2010) proposes that the movement of the subject DP into [Spec, TP] is dictated by the Φ-feature on T, not the topic feature. This difference in the choice of the feature on T, as Miyagawa proposes, is what differentiates *agreement languages* such as English and *discourse configurational languages* such as Japanese.

Perceiving A-movement in Japanese as being composed of the attraction of a DP by the topic feature on T, we propose that the scope of a QP is determined by the presence/absence of the topic feature on the QP. Informally, the condition on scope is stated as follows:

(31) A QP takes scope where its topic feature is licensed. Otherwise, it takes scope in its underlying position.

Thus the sentences in (14) and (15) are accounted for as follows:

(32) *Dareka-ga daremo-o* seme-ta

someone-Nom everyone-Acc blame-Past
[unambiguous: some > every, *every > some]　(= (14))

Since it is the subject that has the topic feature in the order Subject-Object, it is the subject QP *dareka-ga* that has the topic feature. Then its scope is determined in [Spec, TP], whereas the scope of the object is determined in the object position. Since the subject in [Spec, TP] c-commands the object, the subject obligatorily takes wide scope.

If the object QP is scrambled to the left of the subject, there are two possibilities.

(33) *Daremo-o* *dareka-ga* seme-ta
someone-Nom everyone-Acc blame-Past
[unambiguous: some > every, every > some]　(= (15))

The first possibility involves the scrambling of the object *daremo-o* by the topic feature. In this case, the object with the topic feature has its scope determined in [Spec, TP]. Thus results in the wide scope of the object (every > some). The second possibility involves A'-scrambling of the object. The availability of A'-scrambling in simple clauses can be confirmed by the fact that a scrambled anaphor can be bound by the subject:

(34) Zibunzisin-o_i Hanako$_i$-ga t_i hihansita (koto)
self-Acc Hanako-Nom criticized fact
'Hanako criticized herself.'　(Saito (1992))

Let us suppose that A'-scrambling does not involve attraction by the topic feature. Then in the second derivation the object QP does not have the topic feature so that it must have its scope determined in the object position. This yields the narrow scope reading of the object.

The cases of scrambling out of an infinitival clause in (17) can be accounted for in the same way:

(35) a. *Subete-no siken-o 3-nin-no gakusei-ga* [t_i uke-] tagat-ta
every-Gen test-Acc 3-Cl-Gen student-Nom take-want-Past
'Lit. Every test, three students wanted to take.'
[ambiguous: 3 > every, every > 3]

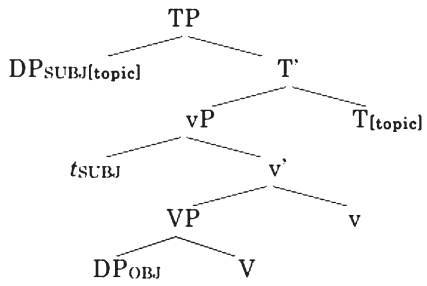
b. *Subete-no siken-o 3-nin-no gakusei-ga* [t_i uke-yoo-to] omot-ta
every-Gen test-Acc 3-Cl-Gen student-Nom take-Mod think-Past
'Lit. Every test, three students thought of taking.'
[ambiguous: 3 > every, every > 3] (= (17))

Since the object scrambled out of an infinitival clause can bind an anaphor in the matrix clause, this case of scrambling may be an instance of A-movement. If so, the scrambled object may have the topic feature licensed in the matrix [Spec, TP], where it takes wide scope. In the other derivation where the scrambled object has undergone A'-scrambling, the object has its scope determined in the object position in the infinitival clause. This results in the narrow scope of the scrambled object.

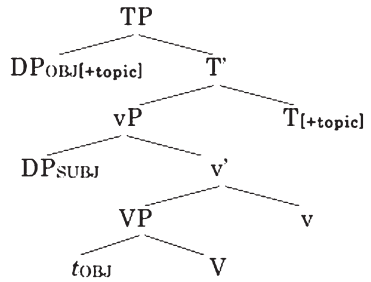
In the case of long-distance scrambling, which can only be an instance of A'-scrambling, the scrambled object cannot have the topic feature. Thus the scrambled object cannot have its scope determined in the matrix clause. This is the reason why the long-distance scrambling cannot give the scrambled QP a wide scope.

The unavailability of the topic feature in the case of A'-scrambling is confirmed by the following consideration. Recall that the topic-attracted scrambling, as Miyagawa (2010) proposes, is a movement to [Spec, TP], which is also the position that the subject occupies in the canonical order Subject – Object:

(36) a.



b.



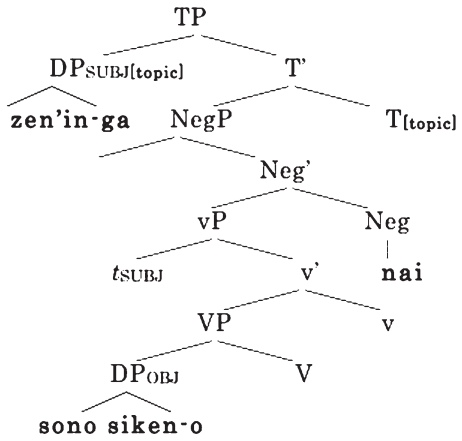
(= (28))

That is, the subjects in these two derivations occupies different positions. This difference is confirmed by the following, as Miyagawa shows:

(37) a. *Zen'in-ga* sono-siken-o uke-*nakat-ta*
everyone-Nom that-test-Acc take-Neg-Past
'Everyone did not take the test.'
[unambiguous: ∀ > Neg, *Neg > ∀]
b. Sono-siken-o *zen'in-ga* uke-*nakat-ta*
that-test-Acc everyone-Nom take-Neg-Past
'Lit. The test, everyone did not take.'
[ambiguous: ∀ > Neg, Neg > ∀] (Miyagawa (2001, 2010))

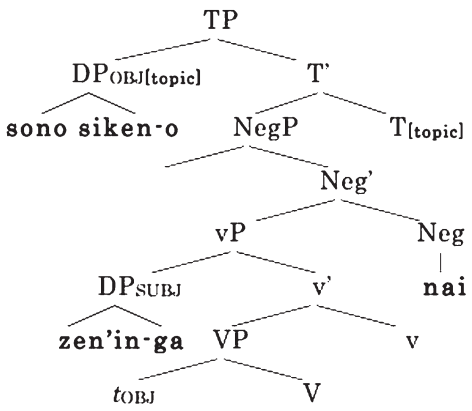
In the case of the order Subject – Object, the subject DP is moved into [Spec, TP] by the topic feature over the negation that is assumed to be located between TP and vP.

(38)



This gives the subject an obligatory wide scope over negation. On the other hand, if the object is scrambled into [Spec, TP], the subject stays in [Spec, vP] and thus takes narrow scope under negation.

(39)



This tells us that the topic-triggered A-scrambling to [Spec, TP] is diagnosed by the availability of the narrow scope of the subject under negation. Bearing this in mind, let us consider the following long-distance scrambling case:

(40) Sono-syukudai-o zen'in-ga [sensei-ga t_i dasu to] omowa-nakat-ta[4]
that-homework-Acc everyone-Nom teacher-Nom assign-Comp think-Neg-Past
'Lit. That homework, everyone did not think that the teacher would assign.'
[unambiguous: *Neg > ∀, ∀ > Neg] (Miyagawa (2001) (slightly modified))

In contrast to (37b), the subject *zen'in-ga* cannot take narrow scope under negation. This tells us that the long-distance scrambled object *sono-syukudai-o* cannot move to the matrix [Spec, TP], which in turn means that it is not triggered by the topic feature on T.

5. Covert Scrambling as Covert Topic-Movement

Having proposed the analysis where the availability of the topic feature for a QP determines the scope of the QP, let us now see how this works for the QP scope in English. English, as is argued in Miyagawa (2010), is a language where movement into [Spec, TP] is triggered by the Φ-feature on T, not the topic feature. However, this does not mean that English lacks the topic feature in its syntax. Let us suppose that English does have the topic feature in its clause structure but that the topic feature in English works in a way different from Japanese in that it triggers covert movement. Let us suppose that the topic feature on T in English drives movement of the corresponding feature alone, in the sense of Chomsky (1995). Let us also suppose that this covert

movement takes place "optionally", as in the case of overt scrambling. By "optionally" we mean that if a DP has the topic feature, that feature is attracted by the corresponding topic feature on T, but if it does not, that DP does not launch topic-feature movement.

If we assume these, the cases of scope interaction that we saw above are explained in the following way. First, recall that a simple clause containing two QPs is interpreted as ambiguous:

(41) *Some boy* kissed *every girl*.
[ambiguous: some > every, every > some]

In this sentence, either QP is in an environment where it would be able to undergo topic-attracted movement. If the subject QP *some boy* has the topic feature, the sentence has the structure represented in (42):

(42) $[_{TP}$ some boy$_i$ $[_{vP}$ t_i $[_{VP}$ kissed every girl$_j]]]$
[topic]
→ scope: *some boy* > *every girl*

Here the subject QP has already moved into [Spec, TP] by the Φ-feature. The topic feature of the subject does not have to move further covertly since it has already established the required relation with the topic feature on T. This derivation yields the wide scope of the subject (some > every).

In the other derivation, it is the object QP that has the topic feature. The topic feature on the object is attracted by the topic feature on T and moves to [Spec, TP]. This results in the following structure:

(43) $[_{TP}$ [topic]$_j$ [some boy$_i$ $[_{vP}$ t_i $[_{VP}$ kissed every girl$_j]]]$
[topic]
→ scope: *every girl* > *some boy*

This gives rise to the wide scope of the object QP. Thus the ambiguity of the sentence can be accounted for in terms of which of the two QPs has the topic feature.[5]

The availability of wide scope for a QP in an infinitival complement clause can be

accounted for in the same manner. Recall that a DP in an infinitival clause may undergo A-scrambling onto the matrix clause, which is now perceived as movement triggered by the topic feature on the matrix T. Now a QP in an infinitival clause in English is in an environment that would allow A-scrambling in Japanese. This means that a QP in an infinitival clause in English may undergo covert feature movement of the topic feature to the matrix clause.

(44) a. *A different student* wanted to read *every book*.
[ambiguous: a > every, every > a] (Hornstein (1995), Johnson (2000))
b. *A different student* wanted for you to read *every book*.
[ambiguous: a > every, every > a] (Johnson (2000))

The derivations for (44a) are represented as follows:

(45) a. [$_{TP}$ a different student wanted [*PRO* to read every book]]
[topic]
b. [$_{TP}$ [topic]$_i$ [a different student wanted [*PRO* to read every book$_i$]]
[topic]

Again the ambiguity of the examples in (44) is accounted for in the same manner as in the cases of simple sentences above. If the matrix subject bears the topic feature, it is given wide scope. On the other hand, if it is the object in the infinitival clause that bears the topic feature, the topic feature is allowed to undergo covert movement into the matrix clause. This allows the embedded object to take wide scope.

However, the covert movement of the topic feature is not possible across the clause boundary in the case of a QP in a finite clause. This is so since a QP in a finite clause is in an environment where A-scrambling would be impossible. This means that the topic feature of such a QP cannot undergo covert movement to the matrix clause. Therefore, the example in (5), repeated here as (46), cannot have the representation in (47):

(46) *A different student* said that I had read *every book*.
[unambiguous: a > every, *every > a] (Johnson (2000))

(47) *[$_{TP}$ [topic]$_i$ [a different student said [$_{CP}$ that I had read every book$_i$]]

This is why (46) cannot have the wide scope of the embedded object *every book*.

6. The Scope of the Raised QP and the Topicalized QP

In the preceding sections we have seen how the (un)availability of the topic feature in the sense of Miyagawa (2010) accounts for the (un)availability of wide scope of QPs. However, we have not presented any evidence thus far that our account of QP scope has advantage over an account based on the A/A'-distinction of movement. Thus let us discuss two cases where our account has empirical advantages over an A/A' distinction account.

6.1 QP Scope in the Raising Construction

Consider the following examples again:

(48) a. *Everyone seems* to like Cecil's playing.
[ambiguous: every > seem, seem > every]
b. *Some politician* is *likely* to address John's constituency.
[ambiguous: some > seem, seem > some] (May (1977))

(49) *Drunks* are *likely* to win the lottery.
[*∃ > likely, likely > ∃] (Carlson (1977))

As shown in (48), the subject QP of a raising predicate such as *likely* and *seem* is known to take either wide or narrow scope with respect to the raising predicate. However, if the subject is a bare plural NP with the existential interpretation, as in (49), the subject can only take narrow scope. Since the subject of a raising predicate is analyzed to undergo A-movement from its underlying position to the matrix subject position, the facts in (48) and (49) show that A-movement does not uniformly give the A-moved QP a wide scope.

The difference between (48) and (49) with respect to QP scope can be captured by our approach illustrated so far. The key to understanding this difference lies in the syntactic/semantic property of the QP involved and its relevance to the availability of the topic feature.

In Homma (2014) I have pointed out that the topic feature can only be borne by a

subtype of QP. The subtype of QP that can bear the topic feature include QPs with a prenominal quantifier and exclude those QPs that lack a quantifier or do not contain a quantifier in a prenominal position. The latter class of QP includes bare NPs and QPs with a floating quantifier. This distinction between these two classes of QP shows up when these QPs are scrambled to the left of the subject. Recall that when an object DP's movement to [Spec, TP] by the topic feature is diagnosed by the fact that the subject *zen'in* can take narrow scope under negation:

(50) a. *Zen'in-ga* sono-siken-o uke-*nakat-ta*
everyone-Nom that-test-Acc take-Neg-Past
'Everyone did not take the test.'
[unambiguous: every > not, *not > every]
b. Sono-siken-o *zen'in-ga* uke-*nakat-ta*
that-test-Acc everyone-Nom take-Neg-Past
'Lit. The test, everyone did not take.'
[ambiguous: every > not, not > every] (Miyagawa (2001, 2010))

The narrow scope of the subject *zen'in-ga* is possible when the scrambled QP is one containing a prenominal quantifier:

(51) a. Zen'in-ga 3-tu-no tesuto-o uke-nakat-ta
everyone-Nom 3-Cl-Gen test-Acc take-Neg-Past
'Everyone did not take three tests.'
[unambiguous: every > not, *not > every]
b. 3-tu-no tesuto-o zen'in-ga uke-nakat-ta
3-Cl-Gen test-Acc everyone-Nom take-Neg-Past
'Lit. Three tests, everyone did not take.'
[ambiguous: every > not, not > every] (Homma (2014))

However, if the scrambled QP lacks a prenominal quantifier, the subject can only take wide scope with respect to negation:[6]

(52) a. Zen'in-ga tesuto-o (3-tu) uke-nakat-ta
everyone-Nom test-Acc 3-Cl take-Neg-Past

'Everyone did not take three tests.'
[unambiguous: every > not, *not > every]

b. Tesuto-o (3-tu) zen'in-ga uke-nakat-ta
test-Acc 3-Cl everyone-Nom take-Neg-Past
'Lit. Three tests, everyone did not take.'
[unambiguous: every > not, *not > every]

If so, then these facts tell us that there is a restriction on the availability of the topic feature. The topic feature may be borne by QPs with a prenominal quantifier, but not by those without one.

This restriction enables us to account for the difference between (48) and (49). The example (48b), for example, has either of the two derivations below:

(53) a. [TP some politician$_i$ is likely [t_i to address John's constituency]]
[topic]
→ scope: some > likely

b. [TP some politician$_i$ is likely [t_i to address John's constituency]]
→ scope: likely > some

The subject QP *some politician* has a prenominal quantifier so that it is compatible with the topic feature. If it bears the topic feature along with the Φ-feature, the sentence has the representation in (53a). Here the topic feature of the subject is licensed in the matrix [Spec, TP]. Since this position is structurally higher than the predicate *likely*, this representation yields the wide scope of the subject. In the other derivation (53b), the subject is raised to the matrix [Spec, TP] but it does not bear the topic feature. Then its scope is determined in its original position (t_i). This results in the narrow scope of the subject. Thus the ambiguity of (48) can be correctly accounted for.

On the other hand, the subject *drunks* in (49) is a bare plural DP, a DP without a prenominal quantifier. The crucial point about (49), then, is that since it lacks a prenominal quantifier, it cannot have the topic feature, as with Japanese bare DPs. If so, the only representation for (49) is (54):

(54) [TP drunks$_i$ are likely [t_i to win the lottery]]
→ scope: likely > ∃

The only position for the determination of the scope of *drunks* is its original position marked by t_i. Thus the unambiguity of (49) is correctly captured.

An account of (48) and (49) only in terms of A-movement would not distinguish the difference between them with respect to the scope of the subject. Appealing to the availability of the topic feature for the types of QP involved, on the other hand, makes it possible to account for the difference between these two cases.

6.2 Scope of Topicalized QPs

In Section 3 we noted that topicalization makes the topicalized QP obligatorily take wide scope:

(55) a. *All of us* have read *many of these books* with great enthusiasm.
[ambiguous: all > many, many > all]
b. *Many of these books, all of us* have read with great enthusiasm.
[unambiguous: *all > many, many > all] (Kuno (1991)) (= (25))

(56) a. *Many people* come to New York *every summer*.
[ambiguous: many > every, every > many]
b. *Every summer, many people* come to New York.
[unambiguous: *many > every, every > many]
(Kuno and Takami (2002)) (= (26))

How can we extend our analysis to cover this case?

In the preceding sections we have entertained the idea that the topic feature in the sense of Miyagawa (2010) plays a crucial role in determining QP scope. In contrast, the Φ-feature, which drives A-movement to [Spec, TP], does not count in the determination of scope. The crucial difference between these two features is that the topic feature is relevant to the semantic interpretation of the DP bearing it, as we saw in Section 4, whereas the Φ-feature does not play such a role.

The topicalization in English is a process that affects the semantic interpretation of a DP undergoing this movement. As discussed in Gundel (1974), a topicalized DP either is interpreted as a "topic", as in (57a), or a "focus", as in (57b):

(57) a. John he CALLED.

(as a response to the question “What about John?”)

b. JOHN he called.
(as a response to the question “Who did he call?”)

Thus, it is reasonable to assume that the relevant syntactic feature that drives the topicalization of a DP (henceforth, the TOPIC feature) is a “semantic” one, in the way that the topic feature is.[7] If so, we may say that the TOPIC feature counts as a determinant of QP scope since it has to do with the semantic interpretation of a DP bearing it. Assuming that the relevant feature attracting a topicalized DP appears on C, the structure of a sentence involving topicalization in English is represented as follows:

(58) $[_{CP}$ DP_i C $[_{TP} \ldots [_{VP} V\ t_i\ ]]]$
[TOPIC]

Then the structure for (55b), for example, is represented as follows:

(59) $[_{CP}$ many of these books $[_{TP}$ all of us $[_{vP}\ t_j$ [have read t_i with great enthusiasm]]
[TOPIC] ([topic])

The scope of the topicalized QP *many of the books* is obligatorily determined in [Spec, CP] since it is the position where its TOPIC feature is licensed. The scope of the subject *all of us* is either determined in [Spec, TP] if it has the topic feature, or in [Spec, vP] if it does not. Irrespective of these choices for the subject, the position where the scope of the topicalized QP is determined, namely [Spec, CP], is necessarily higher than the scope position for the subject. Thus our account can successfully account for the difference in QP scope between (55a) and (56a) on one hand and their topicalized counterparts in (54b) and (56b) on the other.

7. Conclusion

In this paper we have extended the idea presented in Johnson (2000) and proposed an approach to QP scope in English and Japanese that crucially relies on the topic feature in the sense of Miyagawa (2010). We have shown that the topic feature, which drives movement to [Spec, TP] in languages such as Japanese, plays a crucial role in

determining QP scope in English as well by triggering covert movement of the corresponding topic feature on QPs. This approach also makes it possible to account for the scope property of the subject QP of the raising construction and the obligatory wide scope of the topicalized QP in English.

Notes

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[1] The examples that Nemoto (1993) points out involve object-control:

(i) *Daremo-o dareka-ga* Michael-ni [*PRO* t_i naguru-yoo-ni] meiziteoita
everyone-Acc someone-Nom Michael-Dat hit has.commanded
'Lit. Everyone, someone has commanded Michael to hit.'
[ambiguous: some > every, every > some (the judgment by Nemoto)] (Nemoto (1993))

To my ear, however, it is questionable if the scrambled universal QP *daremo-o* can really take wide scope over the matrix subject in this particular example. Nonetheless, Nemoto's point can be made more clearly with our examples in (17), which are to me much clearer cases of scope ambiguity than Nemoto's.

[2] As with the examples of QP scope, Nemoto's (1993) examples involve object-control, as opposed to our subject-control sentences in the text:

(i) a. * Joe-ga otagai$_i$-no yuujin-ni [*PRO* [Michael to Janet]$_i$-o hihansuru
Joe-Nom each.other-Gen friend-Dat Michael and Janet-Acc criticize
yoo(ni)] tanonda (koto)
asked fact
'Joe asked each other's friends to criticize Michael and Janet.'
b. [Michael to Janet]$_i$-o Joe-ga otagaii-no yuujin-ni [*PRO* t_i hihansuru
Michael and Janet-Acc Joe-Nom each.other-Gen friend-Dat criticize
yoo(ni)] tanonda (koto)
asked fact
'Joe asked each other's friends to criticize Michael and Janet.' (Nemoto (1993))

Nemoto (1993) observes that the binding of the anaphor *otagai* is possible in (ib) and hence concludes

that scrambling out of a control clause is A-movement. However, I do not find her example in (ib) to be as acceptable as in simple sentences. Instead of the object-control construction which Nemoto discusses, I find her point to be proved by the subject control construction. Therefore, I only discuss the subject-control construction in what follows in the text.

[3] A question arises at this point as to what the difference is between the topicality of a sentence-initial DP and that of a DP with the topic marker *wa*, as in the following examples:

(i) a. Taroo-wa Hanako-o aisitei-mas-u
Taro-Top Hanako-Acc love-Pol-Pres
'Taro loves Hanako.'
b. Hanako-wa Taroo-ga aisitei-mas-u
Hanako-Top Taro-Nom love-Pol-Pres
'Lit. Hanako, Taro loves.'

As has been pointed widely in the literature, a DP with the topic marker *wa* denotes a piece of old information and therefore cannot provide an answer to a question.

(ii) A: Dare-ga Hanako-o aisitei-mas-u-ka
who-Nom Hanako-Acc love-Pol-Pres-Q
'Who loves Hanako?'
B: *Taroo-wa Hanako-o aisitei-mas-u
Taro-Top Hanako-Acc love-Pol-Pres
'Taro loves Hanako.'

The difference in question has to do with this property regarding the old/new information. While the topic marker *wa* must carry old information, the sentence-initial DP in (5) and (6) denotes new information, although both serve as the topic of a sentence. The sentence-initial DP in (5) and (6) carries new information since it constitutes an answer to A's question. Importantly, a DP with the topic marker *wa* cannot occur in the environment in (5) or (6) since it has to carry old information.

(iii) A: Taroo-wa dare-o aisitei-mas-u-ka
Taro-Top who-Acc love-Pol-Pres-Q
'Who does Taro love?'
B: Hanako-desu. *Hanako-wa Taroo-ga aisitei-mas-u
Hanako-is Hanako-Top Taro-Nom love-Pol-Pres
'Lit. Hanako. Hanako Taro loves.'

(iv) A: Dare-ga Hanako-o aisitei-mas-u-ka
who-Nom Hanako-Acc love-Pol-Pres-Q
'Who loves Hanako?'
B: Taroo-desu. *Taroo-wa Hanako-o aisitei-mas-u
Taro-is Taro-Nom Hanako-Acc love-Pol-Pres

'Taro. Taro loves Hanako.'

[4] I have slightly revised Miyagawa's (2001) original example by adding the demonstrative *sono* to the scrambled object, which in Miyagawa (2001) does not contain any demonstrative. As we discuss shortly in Section 6 (See also Homma (2014)), bare DPs such as *tesuto-o* are resistant to the topic feature on their existential reading, unless we force a definite interpretation on them. Thus to prove the point that long-distance scrambling is not triggered by the topic feature, it will be more helpful to use a DP that can be the target of the topic feature.

[5] In the text I assume that the licensing of the topic feature is obligatory in English as well as in Japanese. Another possibility would be to say that neither of the two QPs undergo the covert topic movement. This would result in the wide scope of the subject. At this point, however, I do not know whether this third derivation is possible in English.

[6] As with what I noted in Note 4, a comment is in order on the reading of (52). The partial negation reading of the subject under scrambling of the bare DP object *siken-o* seems impossible unless we interpret *siken-o* as referring to a particular entity mentioned in the previous discourse, a reading that corresponds to a definite DP in English such as *the test*. If we interpret *siken-o* as having an existential reading, as with the English indefinite DP *a test* or *tests*, the narrow scope reading of the subject is impossible or at least difficult to obtain.

[7] I use the notation "TOPIC" to refer to the feature for topicalization in English in order to distinguish it from the topic feature.

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