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1. Introduction

Kuno and Takami's (2002) Quantifier Scope presents criticisms of the generalizations and explanations of quantifier scope phenomena in English, Chinese and Japanese in the framework of generative syntax, and argues that quantifier scope phenomena are best captured in their functional approach. This paper reviews Kuno and Takami's criticisms of Kuroda's (1969/70) and Hoji's (1985, 1986) syntactic generalizations about scope interaction between quantified noun phrases (QPs) in Japanese, and shows that their syntactic generalizations do hold for a number of constructions in Japanese, including the examples pointed out by Kuno and Takami as problems for the generalizations.

After presenting an overview of Kuno and Takami (2002) in Section 2, I provide defensive arguments for the Kuroda/Hoji generalizations in Sections 3, 4 and 5. Section 6 provides a conjecture on how syntax can deal with the continuum of the judgements on scope interpretation, an important property of quantifier scope pointed out in Kuno and Takami (2002).

2.1. Criticism of Syntactic Analyses

Kuno and Takami (2002) can be called an expanded version of Kuno, Takami and Wu (1999, 2001), which criticize syntactic accounts of quantifier scope interaction in Aoun and Li (1993, 2000), among others, and present an alternative, functional account of quantifier scope. It also includes criticisms of Hoji’s (1985, 1986) observations and explanations of scope interaction in Japanese, and presents alternative accounts of them in their functional approach. In their criticisms of syntactic accounts of quantifier scope interaction, Kuno and Takami show that (i) there are serious theoretical problems with syntactic accounts for scope interaction phenomena, (ii) there are unambiguous sentences which syntactic analyses predict to be ambiguous, and (iii) there are ambiguous sentences which syntactic analyses predict to be unambiguous. Thus they conclude that the generalizations about quantifier scope interaction in the syntactic approach are simply wrong. As they point out, although the problem in (ii) does not necessarily argue against the syntactic approach, the problem in (iii) is serious enough to make the syntactic approach untenable. This latter problem is found with the past treatments of QP scope interaction in Japanese.

Kuroda (1969/70) and Hoji (1985, 1986) propose the syntactic generalization of Japanese QP scope interaction in (1), observing such examples as (2):

(1) a. \(QP_{\text{Nom}} \ QP_{\text{Acc/Dat}} \ V\)
   \[[QP_{\text{Nom}} > QP_{\text{Acc/Dat}}, *QP_{\text{Acc/Dat}} > QP_{\text{Nom}}]\]

   b. \(QP_{\text{Acc/Dat}} \ QP_{\text{Nom}} \ e_i \ V\)
   \[[QP_{\text{Nom}} > QP_{\text{Acc/Dat}}, QP_{\text{Acc/Dat}} > QP_{\text{Nom}}]\]

(2) a. \(\text{dareka-ga} \ \text{daremo-o} \ \text{mita}\)
   someone-Nom everyone-Acc saw
   ‘Someone saw everyone.’
   \[[\text{SOME} > \text{EVERY}, *\text{EVERY} > \text{SOME}]\]

   b. \(\text{daremo-o_i} \ \text{dareka-ga} \ e_i \ \text{mita}\)
   everyone-Acc someone-Nom saw
   ‘Lit. Everyone, someone saw.’
   \[[\text{SOME} > \text{EVERY}, \text{EVERY} > \text{SOME}]\]

Furthermore, Hoji (1985, 1986) proposes the generalization in (3) about the scope order of VP-internal QPs, providing such examples as (4):

(3) a. \(QP_{\text{Dat}} \ QP_{\text{Acc}} \ V\)
   \[[QP_{\text{Dat}} > QP_{\text{Acc}}, *QP_{\text{Acc}} > QP_{\text{Dat}}]\]
b. $QP_{Acc} QP_{Dat} \epsilon_i V [QP_{Dat} > QP_{Acc}, QP_{Acc} > QP_{Dat}]$

(4) a. Taro-ga dareka-ni daremo-o shookaishita
Taro-Nom someone-Dat everyone-Acc introduced
‘Taro introduced everyone someone.’
[SOME > EVERY, *EVERY > SOME]

b. Taro-ga daremo-o$_i$ dareka-ni $\epsilon_i$ shookaishita
Taro-Nom everyone-Acc someone-Dat introduced
‘Taro introduced someone to everyone.’
[SOME > EVERY, EVERY > SOME]

However, Kuno and Takami (2002: 180, 233) point out that examples such as (5) and (6) are problematic for the above syntactic generalizations:

(5) dareka-ga minna-o kurushimete iru
someone-Nom everyone-Acc torture is
‘Someone is torturing everyone.’
[SOME > EVERY, EVERY > SOME]

(6) shachoo-wa ikutsuka-no shigoto-ni daremo-o wariateta
president-Top several-of task-Dat everyone-Acc assigned
‘The president assigned everyone to some tasks.’
[SEVERAL > EVERY, EVERY > SEVERAL]

In both examples, only the lefthand QP of the two QPs should take wide scope according to the generalizations in (1) and (3). The fact that these sentences are ambiguous contrary to the generalizations, Kuno and Takami argue, constitutes a serious problem for the syntactic approach. Observing other problematic examples for the above generalizations, Kuno and Takami conclude that the syntactic approach fails to capture all the facts about QP scope interaction and thus has to be discarded.


Having criticized the syntactic approach to quantifier scope, Kuno and Takami then argue that all the problematic cases for the syntactic approach can be properly captured with what they call the Quantifier Scope Expert System (henceforth, QSES). The system consists of the following “experts”:

(7) a. Subject Q > Object Q > Oblique Q: A quantified expression in a subject NP tends to have wide scope over one in a nonsubject NP, and a quantified expression in an object NP tends to have wide scope over one in
an oblique-case NP.

b. Lefthand Q > Righthand Q: The lefthand quantified expression tends to have wide scope over the righthand quantified expression.

c. Human Q > Nonhuman Q: A quantified expression in a human NP tends to have wide scope over one in a non-human NP.

d. Speaker/Hearer Q > Third-Person Q: A quantified expression in the speaker/hearer NP tends to have wide scope over one in a third-person NP.

e. More D(iscourse)-linked Q > Less D-linked Q: A quantified expression referring to the object that has been talked about in the preceding discourse tends to have wide scope over one that refers to an object that has been newly introduced into discourse.

f. More Active Participant Q > Less Active Participant Q: A quantified expression in an NP that refers to an active participant in the action represented by the sentence tends to have wide scope over a quantified expression in an NP that refers to a less active participant.

N.B. This principle applies only to nonsubject NPs.

g. More Specific Q > Less Specific Q: A quantified expression in a more specific NP tends to have wide scope over one in a less specific NP.

h. Each > Other Quantified Expression: Each tends to have wide scope over other quantified expressions. More specifically: each > some (+Nsg)/someone (sg)/Numeral > every > all > most > many > several > some (+Npl)/someone (pl) > a few [English]

i. Topicalized Q > Nontopicalized Q: A syntactically topicalized quantified expression always has wide scope over a syntactically nontopicalized expression. [absolute]

j. Wh-Q > Nonwh-Q [2 votes] [Chinese and Japanese]


As Kuno and Takami put it, the experts in (7a, b, i) are syntactic principles, while (7c, d, e, f, g) are either semantic, discourse-based, or pragmatic principles. (7h, j, k) are based on idiosyncratic properties of lexical items.
The QSES is designed to work in the following way. Given a sentence containing two QPs, one of which "commands" the other, each expert "casts one vote for the quantifier that it thinks should receive a wide-scope interpretation over the other (Kuno and Takami (2002: 46))." Then "the composite expert" decides which QP can take scope over the other. Let us look at how the system determines the scope interpretation of the following examples:

(8)  
a. Each student admires some professor.  
\[ \text{[EACH} > \text{SOME, *SOME} > \text{EACH]} \]

b. Every student admires some professor.  
\[ \text{[EVERY} > \text{SOME, SOME} > \text{EVERY]} \]

(Kuno and Takami (2002: 64))

(8b) is a widely-observed ambiguous sentence, while in (8a) the use of each forces the wide scope reading of the subject QP. The results of the voting by the scope experts in (7) are illustrated in the following charts (Kuno and Takami (2002: 64)):

(9)  
a. Each student admires some professor.  [unambiguous]  

\begin{tabular}{ll}
\hline
\text{each student} & \text{some professor} \\
Baseline & Baseline \\
Subject Q (7a) & \\
Lefthand Q (7b) & \\
\text{each} > \text{some (+Nsg)} (7h) & \\
4 votes & 1 vote \\
\hline
\end{tabular}

Composite Expert: Unambiguous (EACH > SOME)

b. Every student admires some professor.  [ambiguous]  

\begin{tabular}{ll}
\hline
\text{every student} & \text{some professor} \\
Baseline & Baseline \\
Subject Q (7a) & \\
Lefthand Q (7b) & \\
\text{some (+Nsg)} > \text{every} (7h) & \\
3 votes & 2 votes \\
\hline
\end{tabular}

Composite Expert: Ambiguous (EVERY-wide : SOME-wide = 3 : 2)

Besides the baseline votes that are given unconditionally to both QPs, each QP is given a vote from the experts whose condition it satisfies. The number of the total votes for each QP is then calculated by the composite expert to yield the scope interpretation of the sentence.

The advantages of Kuno and Takami’s proposal are summarized as follows. Firstly, as we can see in (7), the relevant factors that determine QP scope include not just syntactic ones but also semantic/dis-
course-oriented ones, and idiosyncratic properties of each quantifier. Thus Kuno and Takami spell out as many factors as there may be that influence quantifier scope interaction, thereby attempting to capture the subtlety of the phenomena. Secondly, Kuno and Takami claim that quantifier scope “is not simply a matter of ambiguity versus nonambiguity, but a continuum,” and that “therefore even if a given sentence is judged ambiguous, one interpretation is generally more dominant over the other (Kuno and Takami (2002:8)).” They claim that the QSES, but not any purely syntactic approaches, can adequately capture this property of QP scope. As shown in (9b), the resultant number of votes, as Kuno and Takami argue, captures the speakers’ judgements that the EVERY-wide reading is more dominant than the SOME-wide reading.

Thus Kuno and Takami (2002) is an important work for any researcher working on quantifier scope. Particularly for those researchers working in the generative syntactic framework, this book poses a serious challenge since Kuno and Takami’s empirical coverage is much wider than that of the past syntactic analyses of quantifier scope.

3. QP Types

In what follows, I provide arguments defending the generalizations in (1) and (3). Before doing so, however, it should be noted that we must be aware of the fact that QPs are divided into different types and that a different choice of a quantifier can lead to a different interpretive possibility. As the following example shows, the Kuroda/Hoji generalizations in (1) and (3) seem to be blurred by a different choice of the determiner in the QP. Consider (10), for example:

(10) dareka-ga sono-senshutachi-o shuzai-shita
    someone-Nom that-player-Pl-Acc interviewed
    ‘Someone interviewed those players.’
    [SOME > THOSE, THOSE > SOME]

Despite the Kuroda/Hoji generalizations, it is possible for the object DP to distribute over the subject DP, yielding the interpretation that for each player x, there is a reporter who interviewed x. Indeed, a number of linguists, including Kuno and Takami (2002), have reexamined the Kuroda/Hoji generalizations to show that such sentences as (2) and (4)
are indeed ambiguous.¹

It is argued in Hayashishita (2000a, b), however, that the Kuroda/Hoji generalizations do hold with a certain type of quantifiers. He divides quantifiers into two types and shows that the scope of Type B quantifiers obeys the generalizations in (1) and (3).

(11) Hayashishita’s (2000a, b) Quantifier Types:

a. Type A: QPs that can refer to a specific group Toyota to Nissan ‘Toyota and Nissan’, subete-no kaisha ‘all companies’, sannin-no otoko ‘three men’

b. Type B: QPs that cannot refer to a specific group sanninijoo-no gakusei ‘three or more students’, 40%ijoo-no gakusei ‘40% or more of the students’, sukunakutomo gakusei ‘at least three students’, kanarinokazu-no gakusei ‘a good number of students’

Hayashishita observes that in the base orders QP<sub>Nom</sub> QP<sub>Acc</sub> V and QP<sub>Dat</sub> QP<sub>Acc</sub> V, the second QP can be distributed over the first QP only if the second QP is of Type A. Consider (12) and (13):

(12) a. futatsu-ijoo-no ginkoo-ga itsutsu-no kouriten-o
2 or more-of bank-Nom five-of retail shop-Acc shienshita-ra ...
‘If two or more banks supported five retail shops …’
[2-MORE > 5, 5 > 2-MORE]

b. futatsu-ijoo-no ginkoo-ga 20.5%-ijoo-no
2 or more-of bank-Nom 20.5% or more-of kouriten-o shienshita-ra ...
retail shop-Acc support-if
‘If two or more banks supported 20.5% or more of the retail shops …’
[2-MORE > 20.5%-MORE, *20.5%-MORE > 2-MORE]

(13) a. Kimura-sensei-ga futatsu-ijoo-no kaisha-ni
Kimura-teacher-Nom 2 or more-of company-Dat sannin-no gakusei-o shookaishita-ra ...
3-of student-Acc introduce-if

¹ The generalization in (1) has been challenged by Kuno, Takami and Wu (1999), and the one in (3) by Kitagawa (1994) and Miyagawa (1997).
‘If Prof. Kimura introduces to two or more companies three students …’
[2-MORE > 3, 3 > 2-MORE]
b. Kimura-sensei-ga futatsu-ijoo-no kaisha-ni
Kimura-teacher-Dat 2 or more-of company-Dat
10%-ijoo-no gakusei-o shookaisha-ra ...
10% or more-of student-Acc introduce-if
‘If Prof. Kimura introduces to two or more companies
10% or more of the students …’
[2-MORE > 10%-MORE, *10%-MORE > 2-MORE]

Thus we can say that the Kuroda/Hoji generalizations are valid with a
certain type of QPs, namely those QPs that cannot denote a specific
group (Hayashishita’s Type B).2 If a syntactic generalization holds
with a certain part of a semantic phenomenon, we may take it as mean-
ing that the syntactic component must be responsible for capturing that
part of the phenomenon.

In what follows, I use Hayashishita’s Type B quantifiers in order to
avoid the unwanted complexity in scope interpretation when I show that
syntactic structure is responsible for the (un)availability of certain scope
interpretations in other syntactic environments.

4. Argument Structure and QP Scope

Kuno and Takami (2002) point out several examples of QP scope
interaction in Japanese that do not obey the Kuroda/Hoji generalizations
in (1) and (3). They argue that these counterexamples make syntactic
approaches to QP scope untenable, but that they can be accounted for
by the QSES. I show in this section that scope interpretation is affect-
ed by the choice of verbs and that the particular counterexamples point-
ed out by Kuno and Takami can naturally be accounted for with some
independently motivated assumptions on the argument structure of par-
ticular verbs.

2 As regards the wide scope, distributive reading of the Type A quantifiers in
(12a) and (13a), Hayashishita (2000a, b) proposes that this reading should be treated
as a “post-LF” process, in which a Type A quantifier is raised in the semantic repre-
sentation so as to take scope over the whole clause.
4.1. Object-Experiencer Psych Verbs

As Kuno and Takami (2002: 180–181) point out, the following examples are ambiguous:

(14) dareka-ga minna-o kurushimete iru
someone-Nom everyone-Acc torturing is
'Someone is torturing everyone.'
[SOME > EVERY, EVERY > SOME]

(15) nanika-ga daremo-o fuan-ni shite iru
something-Nom everyone-Acc worry
'Something worries everyone.'
[SOME > EVERY, EVERY > SOME]

These examples, as Kuno and Takami argue, are counterexamples to the Kuroda/Hoji generalizations since QP_{Acc} can take scope over QP_{Nom} in the word order QP_{Nom} QP_{Acc} V. They propose the following alternative account of the ambiguity of these examples:

(16) (For (14)):

\[
\begin{array}{ll}
\text{dareka} '\text{someone}' & \text{minna} '\text{everyone}' \\
\text{Baseline} & \text{Baseline} \\
\text{Subject Q (7a)} & \text{Universal Q (7k)} \\
\text{Lefthand Q (7b)} & \\
\text{3 votes} & \text{2 votes} \\
\text{Composite Expert: Ambiguous (SOME-wide : EVERY-wide = 3 : 2)} & (Kuno and Takami (2002: 221))
\end{array}
\]

(17) (For (15)):

\[
\begin{array}{ll}
nanika '\text{something}' & \text{daremo} '\text{everyone}' \\
\text{Baseline} & \text{Baseline} \\
\text{Subject Q (7a)} & \text{Human Q (7c)} \\
\text{Lefthand Q (7b)} & \text{Universal Q (7k)} \\
\text{More Active Q (7f)} & \\
\text{3 votes} & \text{4 votes} \\
\end{array}
\]

I agree with the judgements that these sentences are ambiguous and the ambiguity is also found if we replace the QPs with Hayashishita’s Type B QPs in these sentences:

(18) futari-ijoo-no gakusei-ga 20%-ijoo-no sensei-o
2 or more-of student-Nom 20% or more-of teacher-Acc
kurushimete iru
torturing are
‘2 or more students are torturing 20% or more of the teachers.’

[2-MORE > 20%-MORE, 20%-MORE > 2-MORE]

(19) (In an experiment examining what sounds can worry a child, ...)

futatsu-ijoo-no oto-ga 20%-ijoo-no hikenja-o
2 or more-of sound-Nom 20% or more-of subject-Acc
fuan-ni shita
worried made
‘2 or more sounds worried 20% or more of the subjects.’

[2-MORE > 20%-MORE, 20%-MORE > 2-MORE]

These examples are in contrast to the example in (12b) in the availability of the wide scope reading of the accusative QP:

(12) b. futatsu-ijoo-no ginkoo-ga 20.5%-ijoo-no
2 or more-of bank-Nom 20.5% or more-of
kouren-arai shienshita-ra ...
retail shop-Acc support-if
‘If two or more banks supported 20.5% or more of the retail shops ...’

[2-MORE > 20.5%-MORE, *20.5%-MORE > 2-MORE]

Thus these examples appear to constitute counterexamples to the Kuroda/Hoji generalizations.

However, we can easily notice that these particular examples in (14), (15), (18) and (19) all involve what are known as object-experiencer psychological verbs (kurushimeru ‘torture,’ fuan-ni suru ‘worry’) whose argument structure has been argued to be crucially different from that of agentive verbs such as the one in (12b). The verbs in these examples have the property of taking the Experiencer argument in the object position and the Causer or the Target of Emotion argument as the subject. The thematic roles of Causer and Target of Emotion have been identified by Pesetsky (1995), who points out the following examples to argue for the distinction of these roles:

(20) Bill was very angry at the article in the Times.

(21) The article in the Times angered Bill greatly.

((21) and (22) from Pesetsky (1995: 18))

Pesetsky observes that sentence (20) is true if and only if the article in the Times was evaluated by Bill. He calls the thematic role borne by this DP the Target of Emotion. In contrast, sentence (21) is true even if the article simply caused Bill’s anger, without Bill’s forming any
opinion about it. Thus he calls the relevant thematic role the Causer.

On closer inspection of (18) and (19), we find these two thematic interpretations with the subject QP. It can either be interpreted as the Causer or the Target of Emotion. In (18), for example, the subject DP can either simply have caused the professors’ annoyance without being the target of emotion (Causer) or be the target of the professors’ annoyance (Target of Emotion).\(^3\) If this is so, then we are able to account for the apparent counterexamples to the Kuroda/Hoji generalizations in the following way. Following Pesetsky (1995), Endo and Zushi (1993), and Matsuoka (2001), let us assume the thematic-hierarchy in (22), which maps each argument onto the syntactic structure as in (23):

\[(22) \text{Causer} > \text{Experiencer} > \text{Target of Emotion}\]

\[(23) \left[\text{VP}_1 \ [\text{DP Causer}] \ [\text{VP}_2 \ [\text{DP Experiencer}] \ [\text{VP}_3 \ [\text{DP Target of Emotion}] \ldots \right]\]

Let us also assume that the generalizations in (1) and (3) are subsumed into the following principle:

\[(24) \text{Scope Principle}: \quad \text{QP}_a \text{ takes wide scope over QP}_b \text{ iff QP}_a \text{ c-commands QP}_b \text{ or a trace of QP}_b.\]^4

The structure of sentence (18), then, is represented as follows:

\[(25) \ a. \ \text{The subject QP as the Causer}: \quad [\text{IP} \ [\text{DP futari-ijoo-no gakusei]-ga [VP}_1 \ t_i [\text{VP}_2 \ [\text{DP 20%-ijoo-no sensei]-o kurushimete iru]]]

\[b. \ \text{The subject QP as the Target of Emotion}: \]

\(^3\) The Target of Emotion (and the narrow scope) reading of the QP fits in such a context as follows: for 20% or more of the teachers of this school, there are two or more students who are always ill-mannered in classes and thus are the target of the teachers’ annoyance. Thus the teachers have formed negative opinions of, and are annoyed at, these students. On the other hand, the Causer reading of the QP is appropriate in such a context where students wrote good essays whose content triggered the annoyance of the teachers who read them (probably because the essays vividly described serious social problems). In this case, the teachers are just annoyed at the social problems described in the essays, but not necessarily at the students who wrote them.

\(^4\) This is originally a version of Scope Principle employed in Aoun and Li (1989). Note that while Aoun and Li (1989) apply the principle to QPs after they are raised by Quantifier Raising, we assume the principle to apply to QPs in their pre-QR positions.
The Scope Principle in (24) predicts that while (25a) yields only the QPNom > QPAcc interpretation, (25b) is ambiguous between the QPNom > QPAcc and the QPAcc > QPNom reading. This prediction is indeed borne out. The subject QP in (18) may take scope narrower than the object QP only under its Target of Emotion reading.5

In contrast, the subject QP of (12b) can most naturally be interpreted as the Agent of the described event. Assuming the Agent argument to be the highest argument in the thematic hierarchy, as in (26), and to be selected by the light verb v, as assumed in Chomsky (1995), the structure of (12b) is represented as (27):

(26) Agent > Causer > Experiencer > Target of Emotion
(27) [IP [DP futatsu-ijoo-no ginkoo]-i-ga [vP1 ti v [VP [DP 20.5%-ijoo-no kouriten]-o shienshita]]]

The object QP does not c-command the subject or its trace so that the structure correctly yields only QPNom > QPAcc reading.

As is now expected, sentence (18) only has the QPNom > QPAcc interpretation if we force the agentive reading on the subject QP with the use of the adverb itoteki-ni ‘intentionally.’ Consider:

(28) futari-ijoo-no gakusei-ga itoteki-ni 20%-ijoo-no 2 or more-of student-Nom intentionally 20% or more-of sensei-o teacher-Acc kurushimete iru torturing are ‘2 or more students are intentionally annoying 20% or more of the teachers.’

[2-MORE > 20%-MORE, *20%-MORE > 2-MORE]

5 The scope property of QPs in experiencer verb constructions is extensively discussed in Matsuoka (2001). His examples include the following, for example:

(i) futatsu-no beru-no oto-ga sannin-no kodomo-o yorokob-ase-ta 2 of bell-of sound-Nom 3 of child-of pleased
‘Two sounds of a bell pleased three children.’

Matsuoka points out that the Experiencer object QP can take wide scope over the subject only if the subject has the Target of Emotion reading.

The verbs dealt with by Matsuoka, however, are those Object-Experiencer verbs (i) which are derived by affixation of the causative verb (s)ase to their Subject-Experiencer counterpart, and (ii) whose Subject-Experiencer counterpart aligns its arguments as DPNom DPAcc V, in contrast to the pattern DPNom DPDat V of the Subject-Experiencer counterpart of the verbs dealt with in the text.
(28) lacks the wide scope reading for the object QP since, as with (12b), the agentive subject is generated in [Spec vP] so that the object QP does not c-command the subject or the trace of it.

4.2. Ditransitive Verbs

As we saw in Section 2, Hoji (1985, 1986) proposes the following generalization about QP scope and concludes that the dative and the accusative DP in Japanese have the hierarchical order in (30):

\[(= (3))\]
\[\begin{align*}
\text{a. } & \text{QP}_{\text{Dat}} \text{ QP}_{\text{Acc}} V \ [\text{QP}_{\text{Dat}} > \text{QP}_{\text{Acc}} \text{ only}] \\
\text{b. } & \text{QP}_{\text{Acc}} \text{ QP}_{\text{Dat}} \ e_{i} V \ [\text{ambiguous}] \\
\end{align*}\]

\[(30) \ [\text{VP D}_{\text{Dat}} [\text{D}_{\text{Acc}} V]]\]

Although this generalization has been defended by Hayashishita (2000a, b), as we saw in Section 3, it is worth paying special attention to the following examples pointed out by Kuno and Takami as problems for the generalization:

(31) *shachoo-wa ikutsuka-no shigoto-ni daremo-o wariateta*

president-Top several-of task-Dat everyone-Acc assigned

' The president assigned everyone to some tasks.'

[SOME > EVERY, EVERY > SOME]

(32) *koohosha-no dareka-ni ankeeto-yooshi-no sorezore-o watashite kudasai*

candidate-of someone-Dat questionnaire-of each-Acc

hand please

'Please hand each of the questionnaires to some candidate.'

[SOME > EACH, EACH > SOME]

((31) and (32) from Kuno and Takami (2002: 233))

As Kuno and Takami point out, these sentences are both ambiguous in spite of the fact that the relevant QPs are in the order QP_{Dat} QP_{Acc}. One might argue that this problem is only apparent since they both involve Type A quantifiers (*daremo-o* in (31) and *sorezore-o* in (32)) in the object position. But replacing these quantifiers with Type B quantifiers still yields scope ambiguity:

(33) *shachoo-wa futatsu-ijoo-no shigoto-ni 20%-ijoo-no shain-o wariateta*

president-Top 2 or more-of task-Dat 20% or more-of worker-Acc assigned

'The president assigned 20% or more of the workers to 2 or more of the tasks.'
(34) (For his joint research with private companies, Prof. Kimura looked at the list of companies and his publications, and decided on which papers to send to which companies.)

Kimura-sensei-wa futatsu-ijoo-no kaisha-ni 20%-ijoo-no ronbun-o watashita
Kimura-professor-Top 2 or more-of companies-Dat 20% or more-of paper-Acc handed

‘Prof. Kimura handed 20% or more of his papers to 2 or more of the companies.’

Thus these examples appear to constitute real counterexamples to the generalization in (3).

It is important to note, however, that this problem is arising from the assumption that DPDat DPAcc V is the only base order taken by Japanese ditransitive verbs. If the reverse order DPAcc DPDat is also a possible base order for ditransitive verbs, then we can solve this problem. Indeed, this possibility has been explored by Kitagawa (1994), Miyagawa (1997), and Matsuoka (2001), who argue that DPAcc DPDat V is the other possible base order for Japanese ditransitive verbs. Among these researchers, Matsuoka (2001) argues that DPAcc DPDat V is the base order for the particular class of ditransitive verbs which he calls pass-type verbs. This class of verbs includes such verbs as watasu ‘pass,’ ateru ‘hit,’ and butsukeru ‘bump.’ The other type of verbs, which he calls show-type verbs, takes the VP-internal arguments in the order DPDat DPAcc V. This latter group includes such verbs as miseru ‘show,’ abiseru ‘pour,’ and azukeru ‘entrust.’ The patterns of argument alignment with these two types are summarized as follows:⁶

⁶ One notable property of the two types of ditransitives is that while the inchoative counterpart of pass-type verbs appears in the pattern DPNom DPDat V, as in (i), that of show-type verbs takes the form DPNom DPAcc V, as in (iib):

(1) Pass-type:
   a. John-ga hanataba-o Mary-ni watashita
      John-Nom bouquet-Acc Mary-Dat passed
      ‘John passed a bouquet to Mary.’
   b. hanataba-ga Mary-ni watatta
      bouquet-Nom Mary-Dat passed
      ‘A bouquet passed to Mary.’
Matsuoka motivates his analysis by observing bound-variable construal of pronouns. Following Hoji (1985), he assumes the following restriction on bound-variable pronouns:

36. A pronoun is bound to its antecedent QP iff
   i) the QP c-commands the pronoun, or
   ii) the QP c-commands the trace of a constituent containing the pronoun.

Thus, as has been widely observed, the bound-variable construal of a pronoun is impossible in the following environment:

37. a. *[VP [... proi ...]-ni [QPi V]]
    b. *John-ga [VP [DP [proi chuomonshita] kyaku]-ni
       John-Nom ordered customer-Dat
       [[DP subete-no shinamono]-o miseta]]
       all-of goods-Acc showed
       ‘John showed the goods that (s)he ordered to every customer.’
       (Matsuoka (2001), cf. Hoji (1985))

This is because the antecedent QP subete-no shinamono-o, generated below the DP containing the pronoun, does not c-command the pronoun at any level. With a pass-type verb, however, the accusative QP may bind a pronoun in the dative DP in the order DPDat DPAcc:

38. John-ga [VP [[DP proi chuomonshita] seito]-ni
       John-Nom ordered student-Dat
       [[DP subete-no hon]-o watashita]]
       all-of book-Acc passed
       ‘John passed every book to the student who ordered it.’
       (Matsuoka (2001))

Binding of the pronoun by the antecedent accusative QP is possible in (38) since the QP c-commands the trace of the scrambled dative DP
which contains the pronoun. This is illustrated in (39):

(39) \([\text{VP} \ [\text{DP} \ [\text{proi} \ chuumonshita] \ seito]-ni_j \ [[\text{DP} \ subete-no hon]-o \ [t_i \ watashita]]]"

Interestingly, one of Kuno and Takami’s (2002) examples, namely (32), which they claim to be a counterexample to the generalization in (3), contains the pass-type verb watasu. The ambiguity of (32) and the modified example in (34) can now be adequately captured by the Scope Principle in (24), since the QPDat QPAcc order is a derived one, in which QPAcc c-commands the trace of QPDat. The structure of (32) and (34) is given in (40):

(40) \([\text{VP} \ QP_{\text{Dat}} \ [\text{QP}_{\text{Acc}} \ [t_i \ watas]]]"

As regards (31) and (33), we find these examples to involve the complex verb wari-ateru ‘assign,’ which consists of two base verbs waru ‘break’ and ateru ‘hit,’ the latter of which is a pass-type verb. Thus we may consider this complex verb to inherit the argument structure of ateru ‘hit’ so as to take the VP-internal arguments in the order DPAcc DPDat. This is indeed confirmed by the following test on bound-variable construal:

(41) John-ga \([\text{VP} \ [\text{DP} \ [\text{proi} \ izen \ yatta] \ shigoto]-ni \ [[\text{DP} \ subete-no shain]-o \ wariateta] \]"

‘John assigned to every employee the task that (s)he had done before.’

Then we can say that the examples in (31) and (33), as well as the ones in (32) and (34), have the following VP-internal structure:

(42) ... \([\text{VP} \ QP_{\text{Dat}} \ [\text{QP}_{\text{Acc}} \ [t_i \ V]]]"

Thus the ambiguity of (31) and (33) is not a problem for the generalization in (3). Rather, it supports the generalization since the QPs in (42) are in the structural relation that yields scope ambiguity.  

7 The QP scope facts with pass-type verbs are also discussed in Matsuoka (2001). He observes that the VP-internal QPs taken by pass-type verbs in their base order QPAcc QPDat V also yield ambiguous interpretation (The judgements are Matsuoka’s):

(i) John-ga \([\text{nisatsu-no hon]-o \ [sannin-no seito]-ni \ watashita]"

John-Nom two-of book-Acc three-of student-Dat passed
4.3. Subject of Unaccusative Verbs

As pointed out in Nakayama and Koizumi (1991), the subject QP of unaccusative verbs exhibits different scope property from the agentive subject. The subject QP of this type of verb is not explicitly discussed in Kuno and Takami (2002), but since Kuno and Takami’s examples incidentally include two that involve an unaccusative verb, it is worth showing that the scope property of the subject in this construction can be successfully captured in syntactic terms.

Nakayama and Koizumi (1991) observe that the subject QP of unaccusative verbs can take narrower scope than a temporal adverbial QP in the same clause, in contrast to the agentive subject which cannot. Observe the following examples:

(43) Agentive Subject:
(In my course, the students are advised, but not required to submit one short paper each month. I have found that ...)
20%-ijoo-no gakusei-ga futatsu-ijoo-no tsuki-ni 20% or more-of student-Nom 2 or more-of month-in repooto-o teishutsu-shita report-Acc submitted
‘20% or more of the students have submitted a paper in 2 or more of the months.’
[20%-MORE > 2-MORE, *2-MORE > 20%-MORE]

(44) Unaccusative:
(This research shows which pond got frozen on which days of the month.)

‘John passed two books to three students.’
[2 > 3, ?3 > 2]
(ii) John-ga [sannin-no seito]-ni [nisatsu-no hon]-o watashita
[3 > 2, ?2 > 3]

He proposes the following VP-internal structure for the two types of ditransitives:

(iii) a. Pass-type verbs: [VP DP_{Acc} [V DP_{Dat} V]]

b. Show-type verbs: [VP_{1} DP_{Dat} [VP_{2} DP_{Acc} [V V]]]

Matsuoka proposes that the base order of QP_{Acc} QP_{Dat} with pass-type verbs, but not the base order of QP_{Dat} QP_{Acc} with show-type verbs, yields scope ambiguity since the QPs in the former, but not in the latter, m-command each other.

Note that we may safely replace ‘c-command’ with ‘m-command’ in the definition of the Scope Principle in (24) without affecting the analysis in the text if we assume that the Causer, the Experiencer and the Target of Emotion DPs are each generated in their own VP-shell.
20%-ijoo-no ike-ga futatsu-ijoo-no hi-ni koot-ta
20% or more-of pond-Nom 2 or more-of day-in froze
‘20% or more of the ponds froze on two or more of the
days.’

[20%-MORE > 2-MORE, 2-MORE > 20%-MORE]

Unlike the agentive subject QP in (43), the subject QP of the unaccusative sentence in (44) may take narrow scope with respect to the temporal adverbial.

This fact can be easily accounted for in syntactic terms, as Nakayama and Koizumi show, by appealing to the derivational property of the subject of unaccusatives. As has been widely assumed and defended in the literature, the subject of unaccusative verbs originates in the object position and moves to the subject position to receive the Nominative Case. Coupled with the assumption that a temporal adverbial is adjoined to VP, the structure of the sentences in (43) and (44) is represented as follows:

(45) Structure of (44):
[IP [20%-ijoo ...]-ga [VP [futatsu-ijoo ...]-ni [VP ti koot-ta]]]

Since the subject QP c-commands the adverbial QP and the latter c-commands the trace of the former, the Scope Principle correctly predicts the ambiguity of this sentence.

Now consider the following examples discussed by Kuno and Takami:

(46) a. me-ga hitotsu dono tane kara-mo dete-kita
bud-Nom one every seed from came out
‘A bud is out of every seed.’

[*ONE > EVERY, EVERY > ONE]

b. kahoo-ga hitotsu dono ie-ni-mo aru mono-da
family treasure-Nom one every house-in exist
‘There is a family treasure in every house.’

[*ONE > EVERY, EVERY > ONE]

(Kuno and Takami (2002: 223))

Kuno and Takami observe that the subject QP in (46) cannot take wide scope over the other QP. They account for the unambiguity of these examples by the QSES and by appealing to a pragmatic factor. The result of voting for (46a), for example, is illustrated below:
They claim that although the QSES yields the wide scope interpretation of the subject QP only, the wide scope reading of dono tane-kara-mo ‘from every seed’ surfaces as the strong interpretation since the wide scope interpretation of the subject is pragmatically implausible: it is impossible for all the seeds to sprout into a single bud.

A problem with the above analysis of (46) by Kuno and Takami, however, is that a sentence such as those in (46) would be predicted to have only the wide scope interpretation of the subject if there is no pragmatic implausibility with this interpretation, since the number of votes received by the subject QP is significantly larger than that received by the other QP. Consider the following example:

(48) futa-shurui-no shorui-ga dono hako-kara-mo dete-kita
Two kinds of document came out of every box.

Notice that the situation described by the 2 > EVERY reading is not pragmatically implausible. It can be the case that two out of the several different kinds of documents were such that they were found in all the boxes: the other kinds of documents were found in some, but not all, of the boxes. On the other hand, it is equally possible to imagine a situation where each box is such that it had two kinds of documents, which is a situation that would be described by the EVERY > 2 reading. As we see from the number of votes in (47), Kuno and Takami would predict the obligatory wide scope of the subject QP for (48) since there is no pragmatic implausibility with the former interpretation.

However, the fact is that sentence (48) may be interpreted in either way: either QP can take scope over the other. It is possible for our syntactic approach to give a successful account of the ambiguity of (48). Since the verb detekuru ‘come out’ may safely be understood to be an unaccusative verb, we may represent the structure of (48) as follows:

(49) [IP [futa-shurui-no shorui]-ga [VP [dono hako-kara-mo] [t, dete-kita]]]
Since the subject QP is generated in the underlying object position and is moved to the subject position over the other QP *dono hako-kara-mo*, the two QPs in question are in the now familiar configurational relation that yields scope ambiguity.\(^8\)

Now the question is what makes the sentences in (46) unambiguous. Our syntactic approach is not inconsistent with Kuno and Takami’s point that a particular interpretation is rendered nonexistent due to pragmatic implausibility. The wide scope reading of the subject QP is made possible by the grammar, but the resultant interpretation is not consistent with how things are in the world we live in. However, our analysis of (46) is different from Kuno and Takami’s in that it ascribes the availability of the narrow scope reading of the subject QP to the fact that the grammar yields that reading, not to the alleged “power” in pragmatic factors of making an impossible reading a possible one.

5. A Note on Topicalized QPs

Kuno and Takami (2002) observe that a topicalized QP has the absolute right to take wide scope over a nontopicalized QP, pointing out the interpretive contrast between the following examples:

(50) a. *korerano hon-no ooku-o minna-ga yonda*

> these book-of many-Acc all-Nom read

> ‘Everyone has read many of these books’

> [MANY > ALL, ALL > MANY]

b. *korerano hon-no ooku-wa minna-ga yonda*

> many-Top

> ‘Many of these books, everyone has read’

> [MANY > ALL, *ALL > MANY]

(Kuno and Takami (2002: 227))

Kuno and Takami (2002: 227) note that “sentence initial QPs that are marked with the topic marker *wa* always have wide scope over QPs elsewhere in the sentence” and appeal to the expert in (7i) to account

\(^8\) Notice that (49) remains ambiguous if we replace the QPs with Type B QPs:

(i) *futa-shurui-ijoo-no shorui-ga 20%-ijoo-no hako-kara dete-kita*

> 2 or more kind-of document-Nom 20% or more-of box-from came out

> ‘2 or more of the kinds of documents came out from 20% or more of the boxes.’
for the obligatory wide scope of the topicalized QP in (50b), although
they do not provide the result chart of the voting by the QSES for
(50b):

(7) i. Topicalized Q > Nontopicalized Q: A syntactically topo-
cialized quantified expression always has wide scope over
a syntactically nontopicalized expression. [absolute]

They take (7i) to be “a principle which vetoes all other principles” so
that ANY topic QP is predicted to have obligatory wide scope over
other QPs in the sentence.

Kuno and Takami’s claim that a topicalized QP has obligatory wide
scope must be somewhat weakened, however, since in some cases a
topicalized QP can take narrower scope than another QP. Consider:9

(51) a. korerano hon-no sukunakutomo ni-satsu-wa
    these book-of at least 2-Top
    20%-ijoo-no gakusei-ga yonda
    20% or more-of student-Nom read
    ‘At least 2 of these books, 20% or more of the students
    have read.’
    [AT-LEAST-2 > 20%-MORE, 20%-MORE > AT-LEAST-2]

b. sukunakutomo futatsu-no kaisha-wa 20%-ijoo-no
    at least 2-of company-Top 20% or more-of
    ginkoo-ga shienshiteiru
    bank-Nom support
    ‘At least 2 companies, 20% or more of the banks sup-
    port.’
    [AT-LEAST-2 > 20%-MORE, 20%-MORE > AT-LEAST-2]

These sentences sound most natural if we put a contrastive stress on the
topic marker wa. Hoji (1985) calls this use of wa the contrastive wa
and differentiates it from the topic wa, which does not carry a stress on
it. Furthermore, Hoji argues that a clause-initial DP with the con-
trastive wa is derived via movement to that position from an argument
position, while a DP with the topic wa is base-generated in the clause-
initial position. This is illustrated below:

9 A similar fact in Chinese is pointed out in Aoun and Li (2000).
(52) a. DP with contrastive wa: [DP\(_t\)-WA [... \(t_i\) ...]]
b. DP with topic wa: [DP\(_t\)-wa [... \((\text{pro})_i\) ...]]

If this is so, then we can naturally account for the ambiguity of the sentences in (51). Since the topic marker in (51) is most naturally interpreted as the contrastive wa, the structure of these examples is represented as follows:

(53) [QP\(_t\)-WA [IP QP\text{Nom} [VP \(t_i\) V]]]

Since either QP c-commands (the trace of) the other, the Scope Principle correctly predicts the ambiguity of the examples.

It seems difficult, on the other hand, to obtain the contrastive reading for the topic DP in (50b). However, if we manage to force the contrastive reading on wa, as in the following example, the narrow scope reading of the topic DP emerges:

(54) zenbu-de naku-te-mo korera-no hon-no ooku-WA
all-be not-even if these-of book-of many-Top
minna-ga yonda
everyone-Nom read
‘Many, if not all, of these books, everyone read.’
[MANY > ALL, ALL > MANY]

As regards the lack of ambiguity in (50b), since the sentence-initial DP is most naturally construed as a topic DP, not a contrastive DP, the structure that yields this most natural reading is represented as (55):

(55) [QP\(_t\)-wa [IP QP\text{Nom} [VP \text{pro}_i V]]]

In this representation, the topic QP c-commands the subject QP, but it is the pronoun co-indexed with the topic QP, not the trace of it, that the subject QP c-commands. Thus the Scope Principle correctly predicts the obligatory wide-scope reading of the topic QP.

Thus Kuno and Takami’s claim that a DP with the topic marker obligatorily has wide scope only applies to the topic wa, but not to the contrastive wa. This difference can be naturally accounted for with Hoji’s analysis that a DP with the contrastive wa, but not the topic wa, is derived from its argument position.

6. Conclusion and Remaining Questions

This paper has defended the Kuroda/Hoji generalizations about QP scope interaction in Japanese, showing that the generalizations hold for a wider range of data than Kuno and Takami (2002) claim they do. Although the generalizations are adequate only with a particular class of
quantifiers, they hold with QP scope interaction in the psychological verb construction, the ditransitive verb construction, the unaccusative construction and the topic construction.

Since I have limited the discussion to QP scope interaction in Japanese, the next question to ask is whether the syntactic approach can successfully recapture the other scope interaction facts discussed by Kuno and Takami (2002) (WH/QP interaction in Japanese, English and Chinese, and QP/QP scope interaction in English and Chinese). This question must be left outside the scope of this paper because of the lack of space. But even if the syntactic approach cannot capture all the facts in Kuno and Takami (2002), this approach should not be invalidated as long as there are phenomena that call for syntactic generalizations and explanations, although it may remain necessary to consider semantic and discourse factors in order to account for all the facts of quantifier scope.

Another remaining issue has to do with Kuno and Takami’s (2002: 6) claim that quantifier scope “is not simply a matter of ambiguity versus nonambiguity, but a continuum.” We may then ask whether the syntactic approach could ever capture this aspect of the phenomenon. Quite obviously, the Scope Principle alone does not help to capture the continuum of the judgements on scope interpretation since it is designed only to predict one of the two options: ambiguity and nonambiguity. However, it does not seem impossible to capture some of the degree of availability of certain scope readings in syntactic terms.

Hoji (1985: 301–302) was already well aware of the fact that the contrast between the scope orders $Q_P_{Dat} > Q_P_{Acc}$ and $Q_P_{Acc} > Q_P_{Dat}$ in the basic order $Q_P_{Dat} Q_P_{Acc} V$ is weaker than the contrast between $Q_P_{Nom} > Q_P_{Acc}$ and $Q_P_{Acc} > Q_P_{Nom}$ in the order $Q_P_{Nom} Q_P_{Acc} V$. This seems so also if Type B quantifiers are involved. Consider:

(56) futari-ijoo-no sensei-ga 20%-ijoo-no gakusei-o
2 or more-of teacher-Nom 20% or more-of student-Acc
hometa
praised
‘2 or more of the teachers praised 20% or more of the students.’
[2-MORE > 20%-MORE, *20%-MORE > 2-MORE]

(57) Kimura-sensei-wa futari-ijoo-no dooryoo-ni
Kimura-teacher-Top 2 or more-of colleague-Dat
Both examples sound unambiguous, but there is felt to be a slight difference in the unavailability of the reverse scope order: the $QPAcc > QPDat$ reading in (57) is relatively less difficult to obtain than the $QPAcc > QPNom$ reading in (56).

If this is a fact, we may capture the relative strength/weakness of the availability of a particular reading by appealing to the closeness of QPs in the syntactic structure. The distance between the two QPs in (57) is crucially shorter than that between the QPs in (56) since both QPs in (57) are generated VP-internally while in (56) one of the QPs is generated outside the VP in which the other QP is generated.

Next consider the following pair of sentences:

(58) futari-ijoo-no hito-ga 20%-ijoo-no hito-o  
2 or more-of person-Nom 20% or more-of person-Acc  
aishiteiru  
love  
‘2 or more of the people love 20% or more of the people.’

(59) futari-ijoo-no hito-ga 20%-ijoo-no hito-o  
2 or more-of person-Nom 20% or more-of person-Acc  
hometa  
praised  
‘2 or more of the people praised 20% or more of the people.’

Both examples are in the form of $QPNom QPAcc$ followed by a transitive verb, and sentences with QPs appearing in this pattern are taken to have the $QPNom > QPAcc$ reading only. However, there is felt to be a contrast in the “unavailability” of the wide scope reading of the object QP between these sentences. There is less difficulty in somehow obtaining the $QPAcc > QPNom$ reading in (58) than in (59), although $QPNom > QPAcc$ is the more dominant reading in (58).

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10 Except for those sentences involving Object-Experiencer psychological verbs, as noted in Section 4.1.

11 Kuno, Takami and Wu (1999) and Kuno and Takami (2002) note a similar contrast between the verbs *aishiteiru* ‘love’ and *semeru* ‘blame.’
If this is a real contrast, we may account for it in terms of the structural closeness between two QPs. Notice that the subject of the verb aishiteiru 'love' is understood to bear the thematic role Experiencer. If so, the thematic hierarchy in (22) and (23) dictates the subject QP in (58) to originate in a VP-internal position. The object QP is generated in a lower position in VP than the Experiencer QP since it is either the Theme or the Target of Emotion argument. The relevant portion of the structure of (58) is given as follows:

$$\begin{align*}
\text{(60)} & \quad \left[\text{IP QP}_{\text{Nom}} [\_P \ldots [\text{VP}_1 \_i [\text{VP}_2 \text{QP}_{\text{Acc}} \text{aishiteiru}]])\right] \\
\end{align*}$$

On the other hand, the subject of (59) is the Agent argument and is generated outside VP (in the [Spec vP], as we have assumed). Then, with the assumption that there are functional projections between vP and VP(s), the distance between the QPs in (58) is crucially shorter than in (59). Although the Scope Principle alone can only predict non-ambiguity for both of these cases, we may say that this difference in the structural distance makes the reverse scope order marginally available in (58).

The account of the degree in the (un)availability of scope interpretations along these lines seems to be supported by a consideration of the following example:

$$\begin{align*}
\text{(61)} & \quad \text{futari-ijoo-no hito-ga [Kimura-sensei-ga} \\
& \quad 2 \text{ or more-of person-Nom Kimura-teacher-Nom} \\
& \quad 20\%-ijoo-no \text{ gakusei-o shidooshita-to] omotteiru} \\
& \quad 20\% \text{ or more-of student-Acc instruct-that think} \\
& \quad \text{‘2 or more of the people think that Prof. Kimura instructed} \\
& \quad 20\% \text{ or more of the students.’} \\
\end{align*}$$

This sentence, involving two QPs in different clauses, is clearly unambiguous, with the matrix subject QP taking wide scope over the QP in the complement clause. If we compare (59) and (61), the reverse scope reading in (61) will be felt even more unlikely than in (59). Now if the above reasoning is on the right track, then we can capture this fact in syntactic terms by saying that the two QPs in (61), separated by a clause boundary, are more distant from each other than the two QPs in (59).

The above analysis will show that the syntactic analysis can capture at least partially the fact pointed out by Kuno and Takami (2002) that quantifier scope interaction is a matter of a continuum. The next question, of course, will be to ask how much of this aspect of quantifier scope interaction the generative syntactic enterprise can successfully
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