LOCALITY AND FLOATING QUANTIFIERS *

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1. INTRODUCTION

This paper discusses the nature of locality exhibited by floating numeral quantifiers (NQs) in Japanese. It is well known that the locality of a floating NQ and its associated nominal element is blocked by a set of adverbials and nominal elements. After reviewing previous work on this topic, I will point out some problems and suggest a solution in terms of the feature-based Relativized Minimality (FRM) proposed by Rizzi (2004).

The paper is organized as follows. Section 1 reviews a number of syntactic approaches to floating NQs. Section 2 discusses some problems posed by functional approaches. Section 3 suggests a solution based on Rizzi's FRM, along the lines of Endo (2006, forthcoming). Section 4 extends the analysis to a new type of RM effects discussed by semantic approaches to NQs. Section 5 concludes the discussion.

2. BACKGROUND

There have been at least two major syntactic approaches to floating quantifiers. One is proposed by Sportiche (1988) and pursued by Shlonsky (1991), according to which a quantifier and an associated nominal element are generated as a constituent, and the nominal element is raised to a higher position by leaving behind the associated quantifier. Another approach is proposed by Dowty and Brodie (1984), who analyze floating quantifiers as quantificational adverbials, where the quantifier and the associated nominal element are related through predication.

The first systematic analysis of floating numeral quantifiers (NQ) in Japanese is proposed by Miyagawa (1989), who follows the second approach, i.e. a floating quantifier and its associated nominal element are linked through predication. Floating NQs in Japanese differ from English/French-type floating quantifiers in consisting of a numeral expression such as *san* 'three' and a classifier that agrees with the type of entity being counted. For example, to count people, one would use the classifier *nin*, while to count bound volumes such as books and magazines, the classifier *satu* is used (cf. Miyagawa 1989).[1]

Based on observations by Haig (1980) and Kuroda (1980) regarding the locality between a floating numeral quantifier (NQ) and its associated nominal element, Miyagawa proposes the following constraint:

(1) Mutual C-Command Requirement
For a predicate to predicate of a NP, the NP or its trace and the predicate or its trace must c-command each other.

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[1] This might be similar to Hebrew floating quantifiers where the quantifier hosts a clitic pronoun which must agree with the quantified DP in number and gender in certain configurations. Cf. Shlonsky (1991).

This constraint deals with the following unergative vs. unaccusative asymmetry:

(2) a. Gakusei-ga ofisu-ni futa-ri t ki-ta. (unaccusative)
student- NOM office-to 2- CL_{SUB} come- PAST
'Two students came to the office'

b. * Kodomo-ga geragerato san-nin warat-ta. (unergative)
children-NOM loudly 3- CL_{SUB} laugh- PAST
'Three children laughed loudly.'

In (2a), the subject 'students' is the underlying direct object of the unaccusative verb 'come', and is moved into the subject position (specifier of TP in current-day terms); the trace of the subject and the associated NQ '2-CL' c-command each other to satisfy the mutual c-command requirement in (1). In (2b), on the other hand, the subject of the unergative verb 'laughed' is based-generated outside VP (the specifier of vP under current analyses); the subject 'children' and the associated NQ '3-CL' in VP are in different projections, and thus may not c-command each other in violation of the condition in (1).

Kuno and Takami (2002; 2003:284) challenge this syntactic approach and propose a functional constraint to the effect that a floating NQ may not be linked to its associated nominal element across a focalized element. According to them, the sentence in (2a) is normally interpreted as an answer to the implicit question 'Who came to the office?' rather than as an answer to 'Where did students come?' In this interpretation, the intervening locative adverbial 'to the office' does not represent focus information, and thus does not block the locality of the NQ '3-CL' and its associated nominal element 'students'. In contrast, the sentence in (2b) in isolation is interpreted as an answer to 'What did the children do?' or 'How did the children laugh?' Here, the intervening manner adverbial 'loudly' represents focus interpretation, and a floating NQ may not be linked to the associated nominal element across this focus element due to their functional constraint.

Kuno and Takami (2002: 419) motivate this difference in information structure between locative vs. manner adverbials by observing that the manner adverbial 'loudly' and the locative adverbial 'in classroom' behave differently with respect to topicalization in Japanese. Japanese topicalization places a topic element at the sentence-initial position by suffixing the topic morpheme *wa*. As shown below, manner/instrumental adverbials may not undergo topicalization, unlike locative/temporal adverbials:

(3) a. * Zibun-no kane-de-wa gakusei-ga denwa sita.
self- GEN money-with- TOP students- NOM telephoned
'With their own money, students telephoned'

b. * Gera gera-to-wa kodomo-ga warat-ta.
loudly- TOP kid- NOM laugh- PAST
'Loudly, kids laughed'

(4) a. Kyoositu-de-wa gakusei-ga abare-mawat-ta.
classroom-in- TOP student- NOM rage- PAST
'In classroom, students raged'

b. Butai-de-wa kodomo-ga odot-ta.
stage-on- TOP kid- NOM dance- PAST
'On stage, kids danced'

Based on the fact that topicalization is old information, Kuno and Takami (2002) claim that manner/instrumental adverbials, which resist topicalization, express new information and have

a focalizing function. In contrast, locative/temporal adverbials express old information and may undergo topicalization.

The same asymmetry can be observed in English topicalization as well, as shown by Larson and Yamakido's (2001) examples in (5) below, which is based on Murasugi's (1991) Japanese data in (6):

(5) a. That place, I saw there.
b. That day, I was sick, then.
c. * That reason, I left therefore.
d. * That way, I spoke so/thus. (Larson and Yamakido 2001)

(6) a. Sono kyoositu-wa Mary-ga siken-o uketa.
that classroom- TOP Mary- NOM exam- ACC took
'As for that class room, Mary took an exam there.'
b. Sono hi-wa Mary-ga siken-o uketa.
that day- TOP Mary- NOM exam- ACC took
'As for that day, Mary took an exam then.'
c. * Sono riyuu-wa Mary-ga kubi-ni natta.
that reason- TOP Mary- NOM was.fired.
'As for that reason, Mary was fired for it.'
d. * Sono hoohoo-wa Mary-ga teiri-o syoomeisita.
that way- TOP Mary- NOM theorem- ACC proved
'As for that way, Mary proved a theorem in that manner.' (Murasugi 1991)

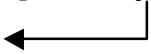
Here, we see the locative/temporal adverbials '(in) that place' and '(on) that day' may serve as topics, while manner and reason adverbials 'that way' and '(for) that reason' may not.[2]

To sum up so far, we see the following general pattern:

(7) Temporal/locative adverbials (topic) may intervene between a floating NQ and its associated nominal element, while manner/instrumental adverbials (focus) may not.

Recently, a more syntactic approach has been proposed by Miyagawa and Arikawa (forthcoming) for this locative/temporal vs. manner/instrumental asymmetry. Following Sportiche (1988), Miyagawa and Arikawa assume that a NQ and its associated nominal element are base-generated as a constituent, out of which the associated nominal element moves to the specifier of TP to satisfy the EPP, stranding the NQ behind in its base-generated position. They respond to Kuno and Takami's (2002) observations about two types of adverbials as follows. Manner/instrumental adverbials cannot intervene between a NQ and its associated noun phrase simply because the 'DP-NQ' pair is generated in a position higher than a manner/instrumental adjunct, and thus necessarily precedes a low manner/instrumental adverbial, as depicted below.

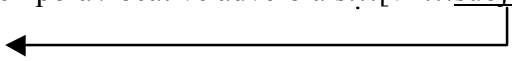
(8) …[vP…subject-NQ…manner/instrumental adverbial…



[2] Luigi Rizzi (personal communication) points out that this asymmetry would ultimately stem from the argument status of locative/temporal adjuncts, and the non-argumental status of reason/manner adjunct. I am grateful to him for helpful discussions on this point.

In contrast, locative/temporal adverbials are located outside vP, higher than the 'DP-NQ' pair, and thus may intervene between a NQ and its associated noun phrase because the subject can move to a position higher than a temporal/locative adverbial.

(9) …temporal/locative adverbials…[vP…subject-NQ…



Here, movement of the subject yields the linear word order 'subject…adverbial…NQ' (see Ko (2007) for a different account of a similar paradigm in Korean).

To summarize so far, we have seen Miyagawa and Arikawa's recent syntactic approach, according to which manner/locative adverbials may not intervene between a floating NQ and its associated nominal element simply because these adverbials are generated low inside vP; in contrast, temporal/locative adverbials may intervene between a floating NQ and its associated nominal element since they are high in the syntactic tree starting out outside vP.

With this background in mind, I would like to raise the following questions:

(10) a. Is the high vs. low distinction of adverbials sufficient to deal with the distribution of NQs?
b. Is the insight behind Kuno and Takami's functional approach irrelevant?
c. Does the subject target the specifier of TP when it strands a NQ?

In the following section, I will discuss these points in detail.

3.1. Adverbials Reconsidered

First of all, recall that temporal/locative adverbials do not block the locality between a floating NQ and its associated noun phrase:

(11) a. Gakusei-ga kyoositu-de 4-nin abaremawat-ta. (locative)
student- NOM classroom-in 4- CL_{SUB} rage PAST
'Four students raged in the classroom'
b. Kodomo-ga butai-de 10-nin odot-ta. (locative)
kid- NOM stage-on 10- CL_{SUB} dance PAST
'Ten kids danced on the stage'

Note that temporal/locative adverbials, such as 'in the classroom' and 'on the stage', suddenly come to act as interveners when they are suffixed by a focus particle like *dake* 'only' and *sae* 'even':

(12) a. Gakusei-ga kyoositu-de-*sae/dake 4-nin abaremawat-ta.
student- NOM classroom-in-even/only 4- CL_{SUB} rage- PAST
'Four students raged *even/only in the classroom'
b. Kodomo-ga butai-de-*sae/dake 10-nin odot-ta.
kid- NOM stage-on-even/only 10- CL_{SUB} danced- PAST
'Ten kids danced *even/only on the stage'

As many as 26 Japanese informants that I consulted all reported that the sentences are detectably degraded when these focus particles are suffixed to locative/temporal adverbials. This is especially so when the subject is contrastively focused as we will discuss in detail below. This is a basic insight of Kuno and Takami's functional approach, according to which

a NQ may not float crossing over a focalized element. This fact does not seem to be captured by Miyagawa and Arikawa's approach because locative and temporal adverbials are higher than the "base" position of the 'DP-NQ' pair, and thus the subject may skip the high adverbials.

3.2. Information Structure Reconsidered

Let us next ask why a focalized element may not intervene between a floating NQ and its associated nominal element. Kuno and Takami (2002) attribute this to a functional constraint against double focalization. Based on the fact that a floating NQ may serve as an answer to a wh-question, as illustrated below, Kuno and Takami claim that a floating NQ is a focalized element. Then, the ungrammaticality arises when two elements (FQ and another focalized element like a manner adverbial) appear in a single clause.

(13) a. Speaker A: Taroo-wa ringo-o nan-ko t abe-ta no?
Taro- TOP apple- ACC how.many-CL_{OBJ} eat- PAST Q
'How many apples did taro eat?'
Speaker B: Taroo-wa ringo-o 3-ko tabe-ta.
Taro- TOP apple- ACC 3- CL_{OBJ} eat- PAST.
'Taro ate 3 apples'

b. Speaker B:*Taroo-wa ringo-o tabe-ta 3-ko.
Taro- TOP apple- ACC eat- PAST 3- CL_{OBJ}
'Taro ate apples, 3'

In (13a), the floating NQ *3-ko* is appropriate as an answer to a question asking for the number of apples eaten because it may serve as new information and focus. In (13b), on the other hand, the same floating NQ sounds strange in the right-dislocated position. Since right-dislocated elements are old information and not focus, a floating NQ may not serve as an answer to a question asking for the number of apples eaten. Based on this fact, Kuno and Takami claim that manner/instrumental adverbials may not intervene between a floating NQ and its associated nominal element because it violates the ban against double focalization in a single clause: a manner/instrumental adverbials and a floating NQ may not be focalized in the same clause for functional reasons.

Although this account looks natural and attractive, it does not seem to explain why a sentence improves when a floating NQ precedes a manner/instrumental adverbial, as illustrated below:

(14) a. Gakusei-ga kinoo 2-ri zibun-no kane-de denwa-sita.
student- NOM yesterday 2- CL_{SUB} self-Gen money-with telephone
'Two students telephoned with their own money yesterday'

b. Gakusei-ga kinoo 2-ri geragera-to warat-ta.
student- NOM yesterday 2- CL_{SUB} loudly laugh- PAST
'Two students laughed loudly yesterday'

Here, the ban against double focalization seems to be too strong to rule out these sentences as well.

3.3. The EPP Reconsidered

Miayagwa and Arikawa claim that the subject associated with a floating NQ targets the specifier of TP to satisfy the EPP. Let us examine this claim by considering binding facts. The standard assumption is that the specifier of TP is identified as an A-position and may serve as the antecedent of an anaphor. Note, however, that when a nominal element associated with a floating NQ enters into an anaphor binding relation the sentence is degraded, as illustrated below:

(15) a. ?? Gakusei-ga 3-nin zibun-no kyoositu-de sawaide-iru.
student- NOM 3- CL_{SUB} self- GEN classroom-at clamor- ASP
'Three students are clamoring in their classroom'
b. Gakusei-ga 3-nin kyoositu-de sawaide iru.
student- NOM 3- CL_{SUB} classroom-at clamor- ASP
'Three students are clamoring in their classroom'

Although the judgment is subtle, all the Japanese informants that I consulted generally tend to find the anaphor binding to be degraded in this environment in (15a), compared with the case without binding in (15b).

The same point can be made with respect to short scrambling. It is usually assumed that short distance scrambling exhibits the properties of A-movement , for instance, in allowing anaphor binding, obviating weak crossover, and so on (Mahajan (1990), Saito (1992)). However, when a direct object undergoes short scrambling stranding its NQ, it seems to target an A'-position. For instance, in (16) below, when the direct object undergoes short scrambling over the indirect object stranding a NQ, anaphor binding becomes detectably degraded, as demonstrated by Yamashita (2007):

(16) ?? Taro-ga gakusei-o 2-ri otagai-no supervisor-ni
Taro- NOM student-ACC 2-CL_{SUB} each.other-GEN supervisor-DAT
syookai sita.
introduced.
'Taro introduced two students to each other's supervisor'

Here, we see the following generalization:

(17) A nominal element targets A'-position when it strands its associated NQ.

This suggests that the subject DP that is associated with a floating NQ does not target the specifier of TP contrary to the statement made by Miyagawa and Arikawa.

To summarize this section, we have seen some problems revolving around purely syntactic and functional approaches to floating NQs:

(18) (i) Information structure is relevant in connecting a floating NQ to the associated nominal element.
(ii) The subject does not target the specifier of TP (A-position) to satisfy the EPP when it leaves behind a floating NQ.
(iii) A focalizing adverbial counts as a relevant intervener only when it is located between a floating NQ and its associated nominal element.

In the following section, I will provide a unified analysis of this paradigm based on Rizzi's (2004) locality principle, as pursued in Endo (2006, forthcoming).

4. REFINEMENTS: FEATURE-BASED RELATIVIZED MINIMALITY (FRM)

Let me first introduce some basic concepts to be utilized in our discussion to follow. First, Rizzi (1997) shows that there are fine-grained structures in the CP zone, as schematized below:

(19) Force Top* Int Top* Focus Mod* Top* Fin IP[3]

The CP zone may be targeted by various discourse-related syntactic operations from the base-position to form a chain, which is defined as follows:

(20) $(A_1,....A_n)$ is a chain iff, for $1 < i < n$
(i) $A_i = A_{i+1}$
(ii) A_i c-commands A_{i+1}
(iii) A_{i+1} is in a Minimal Configuration with A_{i+1}

Chain formation is legal when each chain link enters into a minimal configuration, which is defined as follows:

(21) Y is in a Minimal Configuration (MC) with X iff there is no Z such that
(i) Z is of the same structural type as X, and
(ii) Z intervenes between X and Y.

Here, "structural type" refers to either heads or specifiers, the latter being further classified into the following feature classes:

(22) a. Argumental: person, number, gender, case
b. Quantificational: Wh, Neg, measure, focus...
c. Modifier: evaluative, epistemic, Neg, frequentative, celerative, measure, manner,....
d. Topic

In a nutshell, in the following configuration, locality holds between X and Y (i.e. they are in the minimal configuration) unless Z intervenes between X and Y; i.e., Z is of the same feature class as X, Z c-commands Y, and Z does not c-command X:

(23) ... X ... Z ... Y ...

This is an updated version of Relativized Minimality, first proposed by Rizzi (1990), and is recently refined by Rizzi (2004) in terms of feature classes, which I will call feature-based Relativized Minimality (FRM).

Let us see how FRM works by looking at some concrete examples. In Italian, a low celerative adverb like *rapidamente* 'rapidly' may not jump over a higher epistemic adverb like *probabilmente* 'probably' of the same modifier class:

[3] The elements with the symbol * mean that they are reiterative.

(24) a. I tecnici hanno (probabilmente) risolto rapidamente il problema
'The technicians have probably rapidly resolved the problem'
b. * Rapidamente, i tecnici hanno probabilmente risolto ___ il problema
'Rapidly, the technicians have probably resolved the problem'

Rizzi (2004) claims that this movement is illegal since the low adverb targets the specifier of Modifier Phrase (ModP) in the CP zone for highlighting effects to form a modifier chain:

(25) …[ModP……high adverb….low adverb…
(modifier chain)

Here, a higher adverb of the same modifier class intervenes in the modifier chain, and thus FRM is violated. The failure of chain connection results in violation of Full Interpretation at LF.

The sentence, however, becomes acceptable when the displaced celerative adverb is focused, as follows:

(26) RAPIDAMENTE i tecnici hanno probabilmente risolto il problema (non lentamente)
'RAPIDLY the technicians have probably solved the problem (not slowly)'

According to Rizzi, a focalized adverbial may target Focus Phrase (FocP) in the CP zone to create a focus chain, as shown below:

(27) …[$_{FocP}$……high adverb….low adverb…
(focus chain)

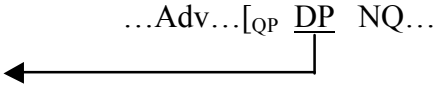
Here, the higher adverbial does not count as the relevant intervener for the focus chain, since focus (the quantificational class) and the higher adverbial (the modifier class) belong to different feature classes with respect to FRM. For this reason, legal chain formation can be established to create a well-formed LF representation above.

With FRM in mind, let us consider why manner/instrumental adverbials count as relevant interveners for a floating NQ and its associated noun phrase.[4] Following Miyagawa and Arikawa, I assume that a NQ and its associated nominal element start out as a constituent. Although they do not postulate a specific syntactic structure for this string, I follow Shlonsky's (1991) analysis of floating quantifiers in French and Hebrew in postulating

[4] Ko includes resultatives in the paradigm of manner/instrumental adverbials in Korean, and I will assume that resultives belong to the paradigm of instrumental/locative adverbials in Japanese as well. According to Kuno and Takami (2002), what Japanese manner/instrumental adverbials and resultatives have in common is that they are new information serving as a focus element in the clause, as we saw with the incompatibility with topicalization. I discussed topicalization facts with manner/instrumental adverbials above. Here are some examples of resultatives from Kuno and Takami (2002):

(i) a. * Aoku-wa gakusei-ga ie-o nut-ta.
Blue- TOP student- NOM house- ACC paint- PAST
'Blue, students painted a house'
b. * Gera gera-to-wa kodomo-ga warat-ta.
loudly- TOP kids- NOM laugh-PAST
'Loudly, kids laughed'

Quantifier Phrase (QP), i.e. QP is headed by a numeral quantifier in Japanese, and the associated nominal element undergoes movement from the specifier of QP (see Shlonsky (1991) for differences in French and Hebrew). Thus, a nominal element in the specifier moves out of QP to form a chain across an adverbial as follows.

(28) 

Note that this is a typical configuration that violates RM. For instance, in the French partial wh-movement construction of the following sort from Obenauer (1984) and Rizzi (1990; 2004), the quantificational wh-element *combien* 'how many' may not move from the specifier of DP to cross another quantificational element such as adverbs of quantification:

(29) a. Combien a-t-il consulté [___ de livres]?
'How many has he consulted [of books]?'
b. * Combien a-t-il beaucoup consulté ___ de livres?
'How many has he a lot consulted of books?'

In (29), the specifier of the noun phrase *combien* 'how many' moves into the CP zone to form a focus-chain. In (29b), this focus-chain is disrupted by the adverb of quantification *beaucoup* 'a lot' of the same quantificational class to violate FRM. The same holds for the Japanese floating NQ construction, i.e. a nominal element moves out of the specifier of QP to form an A'-chain, as we saw earlier from anaphor binding facts. What position does this A'-movement target? A hint can be found in Hamano's (1997) suggestion that the floating NQ construction is a kind of contrastive focus construction. Her claim is based on the following fact.

(30) a. * Ima made-ni sensee-ni san-nin piano-o naratta.
now by teacher-DAT 3-CL piano-ACC learned
'So far, I have taken piano lessons from three instructors'
b. Ima made-ni huransu-zin-no sensee-ni san-nin piano-o naratta.
now by French-GEN teacher-DAT 3-CL piano-ACC learned
'So far, I have taken piano lessons from three French instructors'

As Hamano states, one normally takes lessons from instructors, but in the sentence in (30a) there is no other contextually relevant subset that can be contrasted with 'instructors'. In this environment a floating NQ sounds unnatural. In (30b), in contrast, the descriptive term 'French' is chosen for 'instructors', and it becomes easier to conceive of another contrastive subset such as 'American instructors', and in this type of context, floating NQs sound natural.

Building on Hamano's insight, I suggest that a subject is contrastively focalized when it leaves behind a NQ and targets the specifier of FocP (cf. Kang (2002) for similar discourse factors involved with floating quantifiers in Korean). In our framework, this means that the contrastively focalized subject targets FocP to form a focus chain, just like partial wh-movement in French. Recall here Kuno and Takami's observation that manner and instrumental adverbials express new information and serve as focus in the clause. When a focalized subject moves across a manner/instrumental adverbial, the following representation is obtained:

(31) (quantificational class)
…[FocP…Adv…[$_{QP}$ DP NQ…
focus chain (=quantificational class)

Here, the focus-chain of the quantificational class is crossed by a focalized adverbial of the same quantificational element, in violation of FRM. For this reason, no legal chain connection can be established in this type of sentence, leading to the violation of Full Interpretation at LF.

In contrast, temporal/locational adverbials do not count as the relevant intervener for a floating NQ and DP pair. To see the point, recall Kuno and Takami's observation that temporal/locational adverbials may undergo topicalization, and are not focalized elements. Exploiting their insight, we may conjecture that temporal/locational adverbials do not belong to the quantificational class, but to the modifier class or the topic class. Because the modifier class and the topic class are distinct from the quantificational class, temporal/locative adverbials do not count as the relevant intervener for the focus-chain created by a nominal element that strands a NQ, as depicted below.

(32) (modifier/topic class)
…[$_{FP}$…Adv…[$_{QP}$ DP NQ…
focus chain (=quantificational class)

Let us next consider how the various properties of floating NQ we saw above follow in our approach. First, recall that anaphor binding is impossible for a nominal element that strands a NQ. This is because the nominal element targets the specifier of FocP to form an A'-chain, and no anaphor-binding from an A'-position is possible as we see below.

(18) ?? Taroo-ga gakusei-o 2-ri otagai-no supervisor-ni
Taro- NOM student-ACC 2-CL$_{SUB}$ each.other-GEN supervisor-DAT
syookaisita.
introduced.
'Taro introduced two students to each other's supervisor'

Second, we saw that a temporal/locative adverbial may be suffixed by a focus particle, in which case it suddenly acts as an intervener for a floating NQ and its associated noun phrase. This situation seems to be basically the same as the focalized adverbials in Italian witnessed above. In Italian, a focalized low adverbial of the modifier class may target FocP to form a focus chain of the quantificational class. In the Japanese case at hand, we may take the temporal/locative adverbials to belong to the quantificational class when they are suffixed by an extra focus particle. The following is the relevant configuration:

(focus: quantificational class)
(33) …[$_{FocP}$…. temporal/locative adverbial-focus …[$_{QP}$…
(focus chain)

Here, FRM is violated, since the temporal/locative adverbial of the quantificational class counts as an intervener for the focus chain of the same quantificational class formed by the subject that strands a NQ. For this reason, no well-formed LF representation can be produced.

A note of caution is in order here. Although Hamano states that a nominal element associated with a floating NQ is interpreted as contrastive focus, it is not always the case that a contrastive focus interpretation is required. This point can be illustrated by the following example, where the subject is associated with a floating NQ in a presentational sentence:

(34) Hora gakusei-ga kyoositu-de 3-ni sawaide iru.
look student- NOM classroom-at 3- CL_{SUB} clamor- ASP
'Look! Three students are clamoring in the classroom'

Here, the speaker intends to draw the attention of the hearer to the fact that students who are not familiar in the previous discourse are clamoring in the classroom, and the whole sentence is presented as new information as signaled by the vocative element *hora* 'look!'. Note that 'students' is not contrasted with any other elements like teachers here, as Naoko Okura (personal communication) points out. In this interpretation, the subject is most naturally interpreted as being highlighted or emphasized, which we have already seen in the case of Italian adverb preposing. Rizzi (2004) shows that the adverb preposing for highlighting effects in Italian targets a syntactic position that is distinct from FocP. Then, in the Japanese case at hand, in the highlighting interpretation of the subject above, it may cross a focalized adverbial without violating FRM, since highlighting (argumental chain of the subject) and focus (intervening adverbial) belong to different classes with respect to FRM.

Let us next examine the case where intervention effects disappear when a floating NQ precedes a focalized adverbial, which we raised as a problem for functional approaches. The following is the relevant configuration:

(35) …[$_{FocP}$ … [$_{QP}$ DP NQ…[vP…locational/temporal-focus particle Adv…
(focus chain) ⟵

Here, the floating NQ appears in a position higher than a manner/instrumental adverbial, and from this position, a focus chain may be created. Note that the focalized temporal/locational adverbials do not count as interveners for the focus-chain here, since they do not satisfy the structural description of the minimal configuration: X…Z…Y…, where Z counts as the intervener when Z c-commands Y and does not c-command X. The locational/temporal adverbial in (35) (Z) does not c-command the noun phrase associated with a floating NQ (Y), and thus does not satisfy the structural description of the minimal configuration and therefore does not count as a relevant intervener for the focus chain.

Let us turn to the EPP issue. We saw earlier that a nominal element targets an A'-position when it strands a NQ. This runs counter to Miayagwa and Arikawa's claim, where the associated nominal element is claimed to target the specifier of TP to satisfy the EPP. Does this mean that movement of the subject DP is not EPP-driven when it strands a NQ? The answer seems to be negative. As Roberts (2005) discusses at length, the EPP has several variants: (i) all clauses have to have a subject position (Chomsky 1981), (ii) a DP occupies a specific position, such as the specifier of AgrSP or of the IP (Chomsky 1995), (iii) the EPP holds not just for IP but also CP, giving rise to V2 (Chomsky 2000, 2001). Our discussion favors the third view, according to which the EPP may be satisfied in various syntactic positions. See Endo (2006, forthcoming) for other cases in which the EPP is satisfied by various particles or XPs in the CP zone in Japanese, in line with Rizzi and Shlonsky (2006),

where it is shown that the EPP can be satisfied by certain morphemes appearing in left-peripheral head positions.[5]

5. SELECTIVE LOCALITY: QUANTIZED NOUN

There is another independent issue concerning the locality between a floating NQ and its associated DP. Miyagawa (1989) shows that the direct object generally may not intervene between the subject and its associated NQ:

(36) * …$Subj_i$…Obj…FQ_i…

The point is illustrated by the following example:

(37) * Gakusei-ga sake-o 3-nin nonda.
student-Nom sake-Acc 3-CL drank
'Three students drank sake'

Here, the connection between the floating NQ *3-nin* '3-CL' and the associated subject *gakusei-ga* 'student-Nom' is blocked by the direct object *sake-o* 'sake-Acc'.

Gunji and Hasida (1998) challenge the generalization in (36) by advancing numerous counterexamples, one of which is given below:

(38) Gakusei-ga sono botoru-no sake-o 3-nin nonda.
student-Nom that bottle of sake-Acc 3-CL drank
'Three students drank sake from that bottle'

The association between the NQ *3-nin* '3-CL' and the subject 'student(s)' is not blocked by the direct object *sono botoru-no sake-o* 'the sake from that bottle-Acc'. Gunji and Hasida assume that a floating NQ is the head of Measure Phrase (MP) and that MP can be connected with the associated subject when the direct object is *quantized* in the sense of Krifka (1988). According to Krifka, the denotation of a quantized MP is fixed in terms of quantity and not measurable any further. In (38), the quantity of sake in the direct object position is fixed and quantized by the element *sono* 'that'. In contrast, the direct object in (37), which blocks locality between the subject and the associated MP, is not quantized, but *cumulative* in the sense that it refers to some unspecified quantity of sake. Based on this fact, Gunji and Hasida advance the following generalization:

(39) An adverbially measurable NP intervening in an NP-MP pair can be associated with the MP and reduce acceptability.

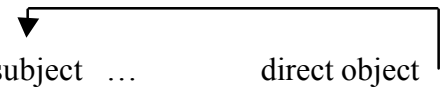
In our terms, this generalization can be paraphrased as follows: In the configuration …X…Z…Y…, where Y is a floating NQ or MP, Y is associated with the closer cumulative Z, not X. In contrast, when Z is quantized, Y is not associated with the quantized element Z; thus Y may be associated with the cumulative element X.

The illegal case has the following representation, where the direct object and the subject are both cumulative, not quantized:

[5] Rizzi and Shlonsky, for instance, analyze French C *qui* as a complex form consisting of *que* 'that' and a morpheme corrrespodning to the French expletive *il*, where the morpheme part satisfies the EPP.

(40)


Note that this is a typical FRM configuration, where a certain feature class element is skipped by the same feature class element. In contrast, the legal case has the following configuration:

(41)


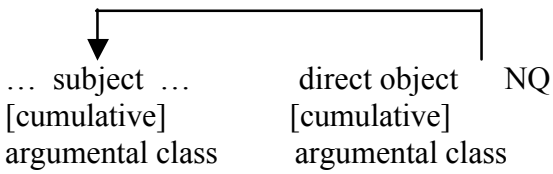
Here, the chain is created by a cumulative subject, but this time, the quantized direct object does not count as the relevant intervener, since cumulative and quantized are different types.

How can this difference be expressed within the FRM approach? The problem is that the features [quantized] and [cumulative] do not belong to any of the feature classes we saw in (22). So, we need to ask what class [quantized] and [cumulative] features belong to. My suggestion is the following:

(42) Cumulative nominal elements belong to the argumental class, and can be turned into the topic class by carrying the feature [quantized].

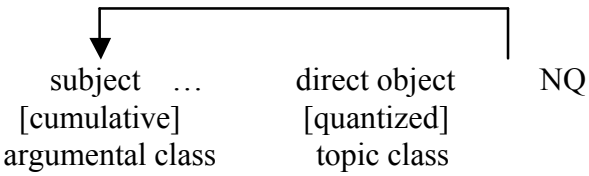
The intuition behind this idea is basically the same as that of D-linking: a wh-element that belongs to the quantificational class can be turned into the topic class when it is D-linked. Here, a quantified expression may belong to the topic class when its variable has a range fixed in the previous discourse (Pesetsky 1987). Similarly, I suggest that a quantized element belongs to the topic class where its denotation is fixed in the previous discourse.

Let us see how this idea deals with the paradigm above. First, consider the illegal case in (40):

(43)


Here, the argumental chain created by the subject is disrupted by the direct object of the same argumental class due to FRM, and thus legal chain formation cannot be established and an ill-formed LF representation results.

Next, consider the legal case in (42), where a cumulative nominal element skips over a quantized nominal element:

(44)


Here again, an argumental chain is created by the subject, but the intervening direct object is identified as an element of the topic class. Because the argumental class and the topic class are distinct with respect to FRM, a well-formed LF representation can be obtained.

Let me finally touch upon an observation made by Takami (1998), who notes that a cumulative direct object does not always count as an intervener, as in the following conversation.

(45) A: Kono sinkan-zassi uremasu ka?
this new magazine is.selling Q
'Is this new magazine selling well?'
B: Ee, kesa-mo gakusei-san-ga sore-o go-nin katteikimasitayo
yes, this.morning-also student-NOM it-ACC 5-CL bought.
'Yes, (already) five students bought it this morning'

Here, in the B utterance, the direct object 'it' appears between 'student' and the associated NQ, but the sentence sounds perfect. Ishii (1999) points out that this improvement is witnessed when the sentence has a distributive reading, as opposed to a non-distributive reading in the sense of Kitagawa and Kuroda (1992). According to Kitagawa and Kuroda, the distributive reading implies the occurrence of multiple events while the non-distributive interpretation implies the occurrence of a single event. Thus, the interpretation of (45b) is that students bought a new magazine on separate occasions. However, notice that the sentence becomes degraded when the direct object is not quantized, as follows:

(46) A: Saikin hon-no uriage-wa doodesu ka?
Recently book-Gen sale-Top how Q
'How are books selling recently?'
B:?? Ee, kesa gakusei-san-ga sinkan zassi-o go-nin
yes, this.morning student-NOM new, magazine-Acc 5-CL
katteikimasitayo
bought.
'Yes, (already) five students bought the new magazine this morning'

Here, the direct object 'new magazine' is introduced for the first time in the discourse by B and the intervening direct object is not quantized. In this context, we detect FRM effects, even though the B statement is clearly interpreted as distributive. Thus, the distinction between distributive vs. non-distributive does not seem to be strong enough to regulate the distribution of a floating NQ sentences. Rather, all the ill-formed cases above involve quantized direct objects, where FRM is not induced.

Incidentally, the degraded status of B in (46) does not come from pragmatic factors, since the sentence sounds fine when the floating NQ precedes the direct object, as follows:

(47) A: Kono sinkan-zassi uremasu ka?
this new magazine is.selling Q
'Is this new magazine selling well?'
B: Ee, kesa-mo sore-dake-o gakusei-san-ga go-nikatteikimasitayo
yes, this.morning-also it-only-ACC 5-CL student-NOM bought.
'Yes, (already) five students bought it this morning'

To sum up, I have suggested that the selective locality effects proposed by semantic approaches may be given a natural and unified account in terms of FRM by taking quantized elements to belong to the topic class.

6. CONCLUDING REMARKS

In this paper, I have discussed some problems of floating numeral quantifiers in Japanese posed by functional approaches and semantic approaches. I have suggested a unified analysis based on Rizzi's (2004) FRM, which enables us to capture the basic insight into the syntactic, semantic and functional analyses of floating numeral quantifiers, along the lines of Endo (2006, forthcoming). According to this approach, in the configuration …X…Z…Y…, the locality between X and Y is blocked by Z when X and Z are of the same feature class, where feature classes include discourse-related notions like topic and focus.

REFERENCES

Belletti, A. (2004) "Aspects of the low IP area", in L. Rizzi (ed.) *The Structure of CP and IP: The Cartography of Syntactic Structures*, volume 2, Oxford University Press, New York, 16-51.

Chomsky, N. (1981) *Lectures on Government and Binding*, Foris, Dordrecht.

Chomsky, N. (1995) *The Minimalist Program*, MIT Press, Cambridge, MA.

Chomsky, N. (2000) "Minimalist Inquiries: The Framework", in R. Martin, D. Michaels & J. Uriagereka (eds.) *Step by Step: Essays in Minimalist Syntax in Honor of Howard Lasnik*, MIT Press, Cambridge, MA, 89-155.

Chomsky, N. (2001) "Derivation by Phase", in M. Kenstowicz (ed.) *Ken Hale: A Life in Language,* MIT Press, Cambridge, MA, 1-52.

Dowty, D. & B. Brodie (1984) "The Semantics of Event-Related Readings: A Case for Pair-Quantification", in A. Szabolcsi (ed.) *Ways of Scope Taking*, Kluwer Academic Publishers, Dordrecht, 263-310.

Endo, Y. (2006) *A Study of the Cartography of Japanese Syntactic Structures*, PhD dissertation, University of Geneva, Geneva.

Endo, Y. (forthcoming) *Locality and Information Structure: A Cartographic Approach to Japanese*, John Benjamins, Amsterdam.

Gunji T. & K. Hasida (1998) "Measurement and Quantification", in T. Gunji & T. Hasida (eds.) *Topics in Constraint-based Grammar of Japanese*, Kluwer, Dordrecht, 39-79.

Haig, J. H. (1980) "Some Observations on Quantifier Floating in Japanese", *Linguistics* 18, 1065-1083.

Hamano, S. (1997) "On Japanese Quantifier Floating", in Kamio A. (ed.) *Directions in Functional Linguistics*, John Benjamins, Amsterdam, 173-197.

Ishii, Y. (1999) "A Note on Floating Quantifiers in Japanese", in M. Muraki & E. Iwamoto (eds.) *Linguistics: In Search of the Human Mind-A Festschrift of Kazuko Inoue*, Kaitakusha, Tokyo, 236-267.

Kang, B-M. (2002) Categories and Meaning of Korean Floating Quantifiers-With Some Reference to Japanese", *Journal of East Asian Linguistics* 11, 375-398.

Kitagawa, Y. & S-I. Kuroda (1992) "Passive in Japanese", Ms., University of Rochester, New York, and University of California, San Diego.

Ko, H. (2007) "Asymmetries in Scrambling and Cyclic Linearization", *Linguistic Inquiry* 37, 49-83.

Kuno, S. & K. Takami (2002) *Nichieigo-no Jidooshikoobun* [Intransitive Constructions in Japanese and English], Kenkyusha, Tokyo.

Kuno, S. & K. Takami (2003) "Remarks on Unaccusativity and Unergativity in Japanese and Korean", in W. McClure (ed.) *Japanese and Korean Linguistics* 12, 280-294, SCLI, Stanford.

Kuroda, S-Y. (1980) "Bun Koozou no Hikaku [The Comparison of Sentence Structures]", in T. Kunihiro (ed.) *Niti-Eigo Hikaku Kouza 2: Bunpou* [Lectures on Japanese-English: Comparative Studies 2: Grammar], Taisyukan, Tokyo, 23-61.

Krifka, M. (1988) "Some Linguistic Devices for Even Quantization and Even Measurement", paper presented at Conference on Events and Natural Language Metaphysics, Center for Cognitive Studies, University of Texas at Austin.

Larson, R. & H. Yamakido (2001) "A New for of Ellipsis in Japanese", Paper read at Japanese/Korean Linguistics 11.

Mahajan, A. (1990) *The A/A-bar Distinction and Movement Theory*, PhD dissertation, MIT, Cambridge, Mass.

Miyagawa, S. (1989) *Structure and Case-Marking in Japanese*, Academic Press, New York.

Miyagawa, S. & K. Aikawa (forthcoming) "Locality in Syntax and Floated Numeral Quantifiers", to appear in *Linguistic Inquiry*.

Murasugi, K. (1991) "Locative/Temporal vs. Reason/Manner Phrases", *Papers in English Linguistics and Literature* 33,153-170.

Obenauer, H. (1984) "On the Identification of Empty Categories", *Linguistic Review* 4, 153-202.

Pesetsky, David. 1987. Wh-in-situ: Movement and unselective binding. In *The representation of (In)definiteness*, E. Reuland and A. ter Meulen (eds), 98-239. Cambridge, Mass.: MIT Press.

Rizzi, L. (1990) *Relativized Minimality,* MIT Press, Cambridge, MA.

Rizzi, L. (1997), "The Fine Structure of the Left Periphery", in L. Haegeman (ed.) *Elements of Grammar,* Kluwer, Dordrecht, 281-338.

Rizzi, L. (2001) "Relativized Minimality Effects", in M. Baltin & C. Collins (eds.) *The Handbook of Contemporary Syntactic Theory*, Blackwell, Oxford, 145-176.

Rizzi, L. (2004) "Locality and Left Periphery", in A. Belletti (ed.) *Structures and Beyond: Cartography of Syntactic Structures*, volume 3, Oxford University Press, Oxford, 104-131.

Rizzi, L. & U. Shlonsky (2006) "Satisfying the Subject Criterion by a Non-subject: English Locative Inversion and Heavy NP Shift", in M. Frascarelli (ed.) *Phases of Interpretation*, Mouton de Gruyter, Berlin, 341-361.

Roberts, I. (2005) Principles and Parameters in a VSO Language. Oxford University Press, Oxford.

Saito, M. (1992) "Long Distance Scrambling in Japanese", *Journal of East Asian Linguistics* 1, 69-118.

Shlonsky, U. (1991) "Quantifiers as Functional Heads: A Study of Quantifier Float in Hebrew", *Lingua* 84, 159–180.

Sportiche, D. (1988) "A Theory of Floating Quantifiers and its Corollaries for Constituent Structure", *Linguistic Inquiry* 19, 425-449.

Takami, K. (1998) "Nihongo no Suuryoosi Yuuri nituite [On Quantifier Float in Japanese]", *Gekkan Gengo* 27, No.1, 86-95, No.2, 86-95, No.3, 98-107.

Yamashita, H. (2007) *Mechanisms of Syntactic Relations in Universal Grammar: What can Japanese Say about Agree and Move*, PhD dissertation, Yokohama National University.