

## The Syntax and Semantics of Floating Numeral Quantifiers\*

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### 1. Introduction

It is well known that a numeral quantifier in Japanese can appear in various locations, as in (1).<sup>1,2</sup>

- (1) a. Kinoo [san-nin-no *kasyu*]-ga utat-ta.  
yesterday [three-CL-GEN singer]-NOM sing-PAST  
'Three singers sang yesterday.'
- b. Kinoo [*kasyu* san-nin]-ga utat-ta.  
yesterday [singer three-CL]-NOM sing-PAST

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<sup>1</sup> Nouns in Japanese lack an obligatory grammatical marking of definiteness and of plurality, and bare nouns can be used freely as arguments, as in (i). When these bare nouns occur with a numeral, the numeral must be followed by a classifier, a morpheme that indicates the semantic class of the host noun in terms of shape, size, animacy, etc. (see Downing 1996 for details). For instance, in (1), with *kasyu* 'singer', the classifier *-nin* needs to be used, which carries some semantic information about *kyaku*.

- (i) Kasyu-ga sinkyoku-o utat-ta.  
singer-NOM new song-ACC sing-PAST  
'A singer/singers/the singer(s) sang a new song/new songs/the new song(s).'

<sup>2</sup> When a numeral and its host NP are apart, as in (1)c, the numeral can precede its host NP, as in (i). Although I do not have space for discussion on this type, readers are directed to previous literature such as Takano (1984), Miyagawa (1989), Terada (1990), Yatabe (1990), Fukushima (1991), Gunji and Hashida (1998), Kawashima (1998), Takami (1998, 2001), Ishii (1999), Watanabe (2005, this volume), etc.

- (i) San-nin kinoo *kasyu*-ga utat-ta.  
three-CL yesterday singer-NOM sing-PAST

- c. *Kasyu-ga*      kinoo      **san-nin**      utat-ta.  
          singer-NOM   yesterday   three-CL      sing-PAST

Over the past few decades, this paradigm has attracted a great deal of attention. Among various issues discussed in the literature, especially important and at the same time controversial is the following: how is the configuration in (1)c syntactically derived?<sup>3</sup> Although researchers agree that the numeral and the host NP *kasyu* ‘singer’ are in the same nominal projection in (1)a and (1)b, opinions vary as to the status of (1)c, where the numeral appears away from its host NP.<sup>4</sup> There are at least two competing views addressing this question. One view holds that the numeral and the host NP in (1)c are adjacent in the underlying structure and that the host NP moves somewhere higher in the structure, stranding the numeral. Under this view, the numeral in (1)c is ‘floated’ in that it is left behind after the movement of the host NP, hence it has traditionally been called a floating numeral quantifier (FNQ). Another view holds that the numeral in (1)c is base-generated as an adjunct to a verbal projection, just like adverbs. Under the second view, the numeral in (1)c is not ‘floated’, but rather base-generated in-situ. In this paper, the term FNQ is used simply to refer to the numeral in (1)c without any theoretical implication. I refer to a family of proposals related to the first view as the stranding view, and ones related to the second view as the adverb view. One of the main goals of this paper is to shed light on some theoretical implications that emerge from the studies on FNQs by examining how the two competing theories fare with syntactic and semantic properties of FNQs. One of the core

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<sup>3</sup> In this chapter, I do not discuss another important question regarding the paradigm in (1); is there any transformational relation among the forms in (1)? This question is dealt with in Watanabe (this volume).

<sup>4</sup> In the following, I refer to the noun phrase that the numeral is associated with (*kasyu* in (1)) as the host NP. Here I put aside the question of whether the relevant noun phrase is an NP or a DP (see Watanabe this volume).

sets of data comes from the well-known word-order restriction on FNQs; the subject and its FNQ need to be adjacent, while the object and its FNQ need not, as in (2) (Haig 1980, Kuroda 1980).

- (2) a. \**Gakusei-ga* hon-o **san-nin** kat-ta.  
 student-NOM book-ACC three-CL buy-PAST  
 ‘Three students bought a book.’
- a’. *Gakusei-ga* **san-nin** hon-o kat-ta.  
 student-NOM three-CL book-ACC buy-PAST
- b. *Hon-o* gakusei-ga **san-satu** kat-ta.  
 book-ACC student-NOM three-CL buy-PAST  
 ‘A/the student(s) bought three books.’

Ever since this restriction was first noted in the literature, many researchers have attempted to account for the nature of the restriction. One of the most influential attempts can be found in Miyagawa’s (1989) stranding analysis, which has been successful in accounting for various distributional restrictions on FNQs, including (2). However, this view has been challenged by alternative theories, most notably, the adverb view. The adverb view is supported by the existence of numerous counterexamples to distributional restrictions on FNQs, including counterexamples to (2). Another piece of evidence for the adverb view comes from the observation that FNQs are subject to some semantic restrictions that can be straightforwardly explained if the FNQs are VP- (or V’-)adjoined adverbs. In the following, I discuss these issues more in detail and examine the two views in light of various empirical data.

## 2. The Stranding View and its Syntactic Implications

We have seen above that, although Japanese FNQs need not be adjacent to their host NP in the surface, as in (1)c and in (2)b, it is not the case that FNQs appear anywhere in a sentence, as in

(2)a. Indeed, it has been argued that, besides (2)a, there are more distributional restrictions on FNQs, which will be discussed shortly. The question then is what the source of such distributional restrictions is. Miyagawa (1989) answers this question by claiming that the distribution on FNQs is principled by some structural conditions, namely, c-command requirements. He first observes that the FNQ is unacceptable when it does not c-command its host NP at D-structure. This observation is based on the data such as (3), where the difference in grammaticality is accounted for by the difference in structures. Miyagawa suggests that the FNQ is a secondary predicate which does not form a constituent with the host NP (see also Ueda 1986, Miyamoto 1994), admitting ternary-branching structures (but see shortly below for a modification). Then, assuming that subjects are generated outside of the VP and that *Sinzyuku-de* is VP-internal, Miyagawa obtains (4)a as the structure for (3)a, where the host NP, the FNQ, and the VP are sisters. In this structure, the FNQ c-commands its host NP (and vice versa). In contrast, in (3)b, if *Sinzyuku-de* is VP-internal, the FNQ must also be VP-internal, yielding the structure in (4)b. Since the FNQ in this structure does not c-command the host NP, (3)b is ungrammatical. Note that, unlike (3)b, examples such as (1)c are grammatical. The contrast naturally follows by assuming that temporal adverbs like *kinoo* ‘yesterday’ are VP-external. Then, in (1)c, the host NP, the temporal adverb, the FNQ, and the VP are considered to be sisters. In this structure, the FNQ c-commands its host NP (and vice versa), just like in (4)a.

(3) a. *Tomodati-ga huta-ri Sinzyuku-de at-ta.*  
 friend-NOM two-CL Sinzyuku-in meet-PAST  
 ‘Two friends met in Sinzyuku.’

b. \**Tomodati-ga Sinzyuku-de huta-ri at-ta.*  
 friend-NOM Sinzyuku-in two-CL meet-PAST (Miyagawa 1989:28)

- (4) a. [<sub>S</sub> *Tomodati-ga* **huta-ri** [<sub>VP</sub> *Sinzyuku-de* *at-ta* ] ]  
 b. [<sub>S</sub> *Tomodati-ga* [<sub>VP</sub> *Sinzyuku-de* **huta-ri** *at-ta* ] ]

Miyagawa further observes that the c-commanding of the other direction must hold, that is, the host NP must c-command the FNQ, based on the data such as (5) (and (8) below). In (5), the classifier *-nin* in the FNQ semantically agrees with *tomodati* ‘friend’, but not with *kuruma* ‘car’. Under the intended interpretation, the host NP *tomodati* ‘friend’, being embedded, cannot c-command the FNQ, although the FNQ c-commands the host NP.

- (5) \* [*Tomodati-no* *kuruma*]-*ga* **san-nin** *kosyoosi-ta*.  
 [friend-GEN car]-NOM three-CL break down-PAST  
 ‘Three friends’ car(s) broke down.’ (Miyagawa 1989:29)

Based on these observations, Miyagawa argues that, for FNQs to be well formed, they must satisfy the mutual c-command requirement in (6).<sup>5</sup>

- (6) Mutual C-Command Requirement: The NP or its trace and the numeral or its trace must c-command each other. (Miyagawa 1989:30)

Miyagawa shows that the mutual c-command requirement is capable of accounting for the well-known observation that an FNQ can be associated with an argument, but not with an adjunct (Okutsu 1969, Harada 1976, Shibatani 1977, Inoue 1978, Kuno 1978b). More specifically, while subjects, objects, and what Inoue (1978) calls “quasi-objects” (such as the dative object in (7)c) are possible antecedents of the FNQ, as in (7), PPs cannot host the FNQ, as in (8). Miyagawa claims that there is a structural difference between arguments and adjuncts; the

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<sup>5</sup> Miyagawa (1989) later makes a revision and argues that the requirement applies throughout the derivation of the sentence. This is to accommodate the data involving a ‘scrambled’ host NP, such as (i) in footnote 2. Since these cases are not discussed in this paper, suffice it to say here that the requirement applies only at D-structure.

particles in (7) are cliticized onto the NP, whereas the particles in (8) have their own projection. With these structures, the difference in grammaticality between (7) and (8) naturally follows from the mutual c-command requirement; in (7), the NP, FNQ, and VP are sisters, and so the mutual c-command requirement is met. In (8), however, assuming that the host NP is embedded in the PP whose head is *-de* ‘in’ or *-ni* ‘to’, the host NP cannot c-command the FNQ.

- (7) a. *Gakusei-ga san-nin hon-o kat-ta.*  
 student-NOM three-CL book-ACC buy-PAST  
 ‘Three students bought the book.’ (Miyagawa 1989:24)
- b. *Hanako-ga pen-o san-bon kat-ta.*  
 Hanako-NOM pen-ACC three-CL buy-PAST  
 ‘Hanako bought three pens.’ (Miyagawa 1989:24)
- c. *Boku-wa yuumeina gakusya-ni san-nin at-ta.*  
 I-TOP famous scholar-DAT three-CL meet-PAST  
 ‘I met three famous scholars.’ (Miyagawa 1989:35)
- (8) a. \**Gakuseitati-wa kuruma-de ni-dai ki-ta.*  
 students-TOP car-in two-CL come-PAST  
 ‘Students came in two cars.’ (Miyagawa 1989:31)
- b. \**Kyonen, Hanako-wa paatii-ni mit-tu ki-ta.*  
 last year Hanako-TOP party-to three-CL come-PAST  
 ‘Last year, Hanako came to three parties.’ (Miyagawa 1989:36)

Most significantly, by applying the mutual c-command requirement to further empirical data on FNQs, Miyagawa argues that the FNQs give evidence for NP trace (see Sportiche 1988 for the same line of argument based on English and French data, see also McCloskey 2000). The

crucial examples are presented in (9), where an FNQ can be associated with the subject of a passive (9)a or of an unaccusative verb (9)b, but not with the subject of an unergative verb (9)c.

- (9) a. *Kuruma-ga* doroboo-ni **ni-dai** nusum-are-ta.  
 car-NOM thief-by two-CL steal-PASS-PAST  
 ‘Two cars were stolen by a thief.’ (Miyagawa 1989:38)
- b. *Gakusei-ga* ofisu-ni **huta-ri** ki-ta.  
 student-NOM office-to two-CL come-PAST  
 ‘Two students came to the office.’ (Miyagawa 1989:43)
- c. \**Kodomo-ga* geragerato **huta-ri** warat-ta.  
 children-NOM loudly two-CL laugh-PAST  
 ‘Two children laughed loudly.’ (Miyagawa 1989:44)

A key to Miyagawa’s analysis here comes from the well-known hypothesis that the subject of a passive and the subject of an unaccusative verb differ from the subject of an unergative verb in that they are base-generated as the object of the verb (Perlmutter 1978, among others). Miyagawa points out that, if we adopt this hypothesis, the contrast in (9) naturally follows. In (9), the PPs and the adverb are assumed to be in the VP, which indicates that the FNQs are also in the VP. Suppose that the subjects in (9)a-b are base-generated in the object position, that is, the position adjacent to the FNQ in the VP, and that they move out the VP, stranding the FNQ, as schematized in (10)a. In this case, positing the existence of the NP trace on the left of the FNQ, the mutual c-command requirement is met; the trace of the host NP and the FNQ c-command each other at D-structure. In contrast, the subject of the unergative verb in (9)c does not originate as the object; thus there is no trace of the subject inside the VP, as in (10)b, violating the mutual c-command requirement. More precisely, in (10)b, the FNQ never c-commands its host NP.

Miyagawa’s analysis is further supported by the fact that the subject of a transitive verb cannot be associated with an FNQ, as in (11). This is because, just like in the case of unergative verbs, there is no trace of the subject adjacent to the FNQ; hence the mutual c-command requirement cannot be satisfied. In sum, by positing an NP trace, Miyagawa’s analysis of FNQs explains why the subjects of unaccusative or passive verbs, but not the subjects of unergative or transitive verbs, can be associated with an FNQ.<sup>6</sup> The subjects in the first group, i.e., internal arguments, originate in the object position, and so the trace of the subject and the FNQ can c-command each other. In contrast, the subjects in the second group, i.e., external arguments, do not originate as the object, failing to satisfy the mutual c-command requirement.

(10) a. *NP*<sub>1</sub> [VP PP/Adv t<sub>1</sub> **FNQ** V ]

b. *NP* [VP PP/Adv **FNQ** V ]

(11) ?\**Kodomo-ga* kono kagi-de **huta-ri** doa-o ake-ta.  
 child-NOM this key-with two-CL door-ACC open-PAST

‘Two children opened a door with this key.’ (Miyagawa 1989:44)

Although ternary-branching structures were permitted at the time of Miyagawa’s (1989) proposal, all structures are considered to be binary in recent syntactic theories, assuming that structures are built by an operation called Merge (Chomsky 1995). To accommodate this, Miyagawa and Arikawa (2005) modify Miyagawa’s (1989) original proposal and assume that the

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<sup>6</sup> Another piece of evidence for Miyagawa’s analysis comes from the fact that the subject of a so-called indirect passive cannot host an FNQ, as in (i). Crucially, it has been argued that this type of passive, unlike (9)a, does not involve a movement of the subject; thus there is no NP trace that satisfies the mutual c-command requirement.

(i) \**Kodomo-ga* ame-ni **huta-ri** hur-are-ta.  
 child-NOM rain-DAT two-CL fall-PASS-PAST

‘Two children were rained on.’ (Miyagawa 1989:41)



FNQ and its host NP form a nominal constituent (such as a Num(ber) phrase), based on some previous work (Kamio 1977, 1983, Terada 1990, Kawashima 1998, Watanabe 2005, among others). This modification makes it possible to maintain the mutual c-command analysis even without ternary-branching structures; in (12), which is a modification of (10)a, the trace of the host NP and the FNQ c-command each other.<sup>7</sup> Furthermore, in (1)c, assuming that temporal adverbs such as *kinoo* ‘yesterday’ are adjoined somewhere higher in the structure (say, to IP), we can posit a structure in (13). In this structure, the trace of the subject and the FNQ c-command each other at D-structure. In the following, adopting this modification, I assume that, under Miyagawa’s stranding analysis, the FNQ and its host NP are in the same nominal projection.

(12)  $NP_1$  [VP PP/Adv [VP [NumP  $t_1$  FNQ] V ] ]

(13)  $NP_1$  [IP Adv [IP [NumP  $t_1$  FNQ] O V ] ]

Let us now go back to the word-order restriction in (2), which is repeated in (14) below. The mutual c-command requirement is capable of explaining this restriction; (14)a is ungrammatical because there is no subject trace to the right of the object, as in (15)a. In contrast, in (14)b, the object is base-generated within the VP and has undergone scrambling, leaving the trace to the right of the subject, as in (15)b, thus the mutual c-command requirement is met at D-structure.

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<sup>7</sup> Strictly speaking, an assumption that the FNQ and its host NP are within the same nominal projection does not guarantee the mutual c-command requirement to be necessarily satisfied. For instance, if we were to adopt a structure in (i), based on Li’s (1999) proposal for Chinese noun phrases, the host NP does not c-command the FNQ. Thus, to maintain the mutual c-command requirement, we need to assume a structure such as (ii) (Kawashima 1998). Although I put aside this question here, readers are referred to Watanabe (this volume).

(i) [NumP three [CIP -CL student ] ]

(ii) [NumP student [Num’ three-CL ] ]

- (14) a. \**Gakusei-ga* hon-o **san-nin** kat-ta.  
 student-NOM book-ACC three-CL buy-PAST  
 ‘Three students bought a book.’
- b. *Hon-o* gakusei-ga **san-satu** kat-ta.  
 book-ACC student-NOM three-CL buy-PAST  
 ‘A/the student(s) bought three books.’ (=2))
- (15) a.  $S$  [VP O **FNQ** V ]  
 b.  $O_1$   $S$  [VP [NumP  $t_1$  **FNQ**] V ]]

Summing up the discussion so far, Miyagawa (1989) observes that there is a certain syntactic locality constraint on the dependency between an FNQ and its host NP, and further claims that the locality constraint can be formulated as the structural requirement of mutual c-command in (6). His claim is based on two kinds of distributional restrictions, one that is considered as a purely structural restriction, and the other that serves as a piece of evidence for an NP trace, as summarized in (16). As for the first kind, we have seen that an NP in an embedded clause cannot be associated with an FNQ in the main clause (e.g. (5)), and that the host NP must be an argument, but not an adjunct (e.g. (7), (8)). As for the second kind, we have seen that the distributional restrictions on FNQs in (2), (3), (9), and (11) can be explained by positing the existence of an NP trace within the VP. More precisely, Miyagawa’s analysis accounts for why internal arguments, but not external ones, can host an FNQ when a VP-internal modifier intervenes between the host NP and its FNQ (e.g. (3), (9), (11)).<sup>8</sup> The analysis is also capable of explaining why the object cannot intervene between the subject and its FNQ (henceforth

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<sup>8</sup> Assuming that *Sinzyuku-de* ‘in Sinzyuku’ in (3) is a VP-internal modifier, we can account for the ungrammaticality of (3)b in the same way as that of (9)c.

\*S<sub>i</sub>-O-FNQ<sub>i</sub>, where the index *i* indicates S and FNQ are associated with each other), while the subject can intervene between the object and its FNQ (e.g. (2)).

(16) Distributional restrictions on FNQs

Structural restrictions

- a. \*Embedded NP as the host NP; (5)
- b. \*NP within PP as the host NP; (8)

Locality restrictions

- c. \*External argument as the host NP with a VP-internal adverb/PP; (3), (9), (11)
- d. \*S<sub>i</sub>-O-FNQ<sub>i</sub>; (2)

If Miyagawa's analysis is on the right track, it makes a strong prediction about where FNQs appear in a sentence: FNQs should be observed only at positions from (or through) which the host NP has moved (see also Sportiche 1988, McCloskey 2000). This approach to Japanese FNQs has come to be widely accepted, and FNQs are considered as one of the most significant diagnostics to investigate phrase structure and syntactic movement in the Japanese language. For instance, in the literature on Japanese syntax, FNQs have been used to examine where a certain NP originates in the structure (for instance, Takano this volume). Moreover, FNQs can play a role in determining whether a certain NP is an internal or an external argument, as shown in (9) and (11). In this context, it is important to point out Saito's (1985) claim about subject scrambling. Saito points out that there is a potential problem for the analysis of (14)a in that (14)a can be derived if both the subject and the object move, as in (17). To exclude this unwanted derivation, Saito argues that the subject in Japanese cannot scramble; since the subject cannot scramble, the derivation in (17) is unavailable to begin with. Saito's claim has had a great

impact on various aspects of the theory of Japanese syntax, and researchers have been debating the validity of this claim to this date (see section 3.2.1 below for more discussions).

$$(17) \quad S_1 \quad O_2 \quad [ \quad [_{\text{NumP}} \quad t_1 \quad \text{FNQ} ] \quad [_{\text{VP}} \quad t_2 \quad V ] \quad ]$$

### 3. Controversies

In the previous section, we have seen that, under the stranding view, a number of distributional restrictions on FNQs fall under a syntactic locality constraint on the dependency between an FNQ and its host NP. In this context, FNQs serve as a powerful tool for the investigation of the Japanese syntax. This section reveals that the stranding view, powerful as it may be, is not without problems. First, I show in section 3.1 that the distributional restrictions on FNQs presented in section 2 are challenged by numerous counterexamples. Section 3.2 summarizes some attempts to cope with the counterexamples under the stranding view. Section 3.3 presents some semantic restrictions on FNQs that may be problematic to the analyses presented in section 3.2. Then, in section 3.4, I explore an alternative analysis, namely, the adverb view. In section 3.5, I briefly discuss examples where FNQs have different properties depending on prosody.

#### 3.1. Counterexamples to the Stranding View

As shown in section 2, the stranding view is supported by the observation that the distribution of FNQs is syntactically restricted. However, a number of linguists object to the empirical generalization in (16) on the basis of various counterexamples (Fukushima 1991, Katagiri 1991, Kikuchi 1994, Hamano 1997, Mihara 1998, Takami 1998, 2001, Gunji and Hashida 1998, Ishii 1999, Nishigauchi and Ishii 2003). First, (18) and (19) are grammatical even though the mutual c-command requirement is not met. In particular, in (18), contra (5), the host NP is within

another NP, and so it cannot c-command the FNQ in the main clause.<sup>9</sup> In (19), contra (8), the host NP is within a PP, so here again it cannot c-command the FNQ.

- (18) a. Yamada Sensei-ga [gakusei-no kami]-o **san-nin** kit-ta.  
 Yamada Professor-NOM [student-GEN hair]-ACC three-CL clip-PAST  
 ‘Prof. Yamada cut three students’ hair.’ (Takami 2001:137)
- b. Ano isya-wa [zidoo-no me]-o **sanjuu-nin** sirabe-ta.  
 that doctor-TOP [pupil-GEN eye]-ACC thirty-CL examine-PAST  
 ‘That doctor examined 30 pupils’ eyes.’ (Kikuchi 1994:82)
- (19) a. Gantan-ni *osiego-kara* **go-nin** nengazyo-o morat-ta.  
 New Year’s Day-on my student-from five-CL card-ACC receive-PAST  
 ‘(I) received a card from five students of mine on New Year’s Day.’
- b. *Gakusei-kara* **nizyuu-mei-izyoo** okane-o atume-nakerebanaranai.  
 student-from 20-CL-or more money-ACC collect-must

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<sup>9</sup> Regarding the examples of the kind presented in (18) (i.e. inalienable possessions), my informants’ and my own judgments varied depending on which example we are looking at; while the judgments varied from ‘acceptable’ to ‘a little awkward’ for the examples in (18) and in (i), the speakers agreed that the example in (ii) are much worse. It seems to be the case that the examples improve whenever a one-to-one correspondence between the possessor and his/her body part is clear from the context. For instance, in (i), each child has one stomach being stabbed, while, in (ii), it is not clear how many fingers were broken per child.

- (i) John-ga [kodomotati-no hara]-o **juu-nin** sasi-ta.  
 John-NOM [children-GEN stomach]-ACC ten-CL stab-PAST  
 ‘John stabbed ten children’s stomach.’
- (ii) John-ga [kodomotati-no yubi]-o **juu-nin** ot-ta.  
 John-NOM [children-GEN finger]-ACC ten-CL break-PAST  
 ‘John broke ten children’s fingers.’ (Kikuchi 1994:82)

‘(We) must collect money from 20 students or more.’ (Takami 2001:128-129)

Second, there are examples where the FNQ is licensed even when there is no NP trace adjacent to the FNQ. In (20), unlike in (9)c and (11), the subject of an unergative verb or a transitive verb hosts the FNQ, even with a VP-internal modifier intervening between the subject and the FNQ. The structure of these sentences is given in (21). The stranding view would predict these examples to be ungrammatical; in (21), the FNQ does not c-command the host NP.

(20) a. *Kodomo-ga butai-de zyuu-nin odot-ta.*  
child-NOM stage-at ten-CL dance-PAST  
‘Ten children danced at the stage.’ (Takami 2001:129)

b. *Gakusei-ga tosyokan-de go-nin benkyoosi-tei-ta.*  
student-NOM library-at five-CL study-PROG-PAST  
‘Five students were studying at the library.’ (Mihara 1998:89)

c. *Gakusei-ga naihu-de koremadeni huta-ri te-o kegasi-ta.*  
student-NOM knife-with so far five-CL hand-ACC injure-PAST  
‘So far two students injured their hands with the knife.’ (Fukushima 1991:52)

(21) *NP* [VP PP/Adv [VP **FNQ** (O) V ]]

In the same vein, (22) provides counterexamples to the observation in (2) that the object cannot intervene between the subject and its FNQ. Crucially, in these examples, the object appears between the subject and its FNQ. This order is predicted to be unacceptable under the stranding view; in Miyagawa’s (1989) analysis, there is no trace of the subject adjacent to the FNQ in this order, as in (15)a; hence the FNQ cannot c-command the host NP, just like in (21).

(22) a. A: *Kono sinkan zassi uretemasu-ka?*  
this new magazine is selling-Q

‘Is this new magazine selling well?’

B: Ee, kesa-mo *gakuseisan-ga* sore-o **go-nin** katteikimasitayo.

Yes this morning-also student-NOM it-ACC five-CL bought

‘Yes, five students bought it this morning.’

b. Boku-wa apaato zumai-dakedo,

I-TOP apartment living-although

saikin *dooryoo-ga* ie-o **si, go-nin** tugitugito tate-ta.

recently colleague-NOM house-ACC four, five-CL one after another build-CL

‘Although I live in an apartment, four or five colleagues built a house one after another recently.’

c. *Gakusei-ga* repooto-o **san-nin-dake** teisyutusi-ta.

student-NOM report-ACC three-CL-only hand in-PAST

‘Only three students handed in a report.’ (Takami 2001:125-126)

These counterexamples to the mutual c-command requirement challenge the validity of the stranding view. Especially important are the examples in (20) and (22) that cast doubt on the existence of an NP trace, which further leads us to the question of whether FNQs are a solid diagnostic to investigate phrase structures, as has been assumed under the stranding view. In the case of (20), we may be able to say that the adverbs in these examples are adjoined not to VP, but somewhere higher in the structure in the same way as temporal adverbs, as in (13). If we were to adopt the structure in (13) as a structure of the sentences in (20), then the mutual c-command would be met in (20). However, in (22), there does not seem to be any obvious way of saving the stranding view without any major modification to the theory, and so the fact that the  $S_i$ -O-FNQ<sub>i</sub> order is (at least sometimes) acceptable remains as a problem for the stranding

view. The researchers who presented the counterexamples in (22) argue that an FNQ and its host NP need not have a local relation, and advocate alternative analyses to the stranding view. The most prominent would be the adverb view where the FNQ is considered as a VP- (or a V'-) adverb that does not necessarily have a locality dependency with its host NP.<sup>10</sup> Clearly, the stranding and adverb views make different predictions about locality: the stranding view predicts that the FNQ and its host NP show certain locality restrictions (hence  $*S_i\text{-O-FNQ}_i$ ), while the adverb view predicts that they need not show any locality restrictions (hence  $S_i\text{-O-FNQ}_i$  are acceptable). On empirical grounds, however,  $S_i\text{-O-FNQ}_i$  is sometimes acceptable, as in (2), and sometimes not, as in (22). Then, whichever view we adopt, we are faced with the questions in (23), which will be addressed in the following. Along the way, I examine a possibility of maintaining both views that may eliminate the questions in (23) all together. I also review how different approaches cope with the counterexamples to the stranding view other than (22) (namely, (18), (19), (20)).

- (23) a. Under the stranding view: why is  $S_i\text{-O-FNQ}_i$  sometimes acceptable?  
 b. Under the adverb view: why is  $S_i\text{-O-FNQ}_i$  sometimes unacceptable?

### 3.2. Reconsideration of Locality

As briefly sketched above, the researchers who offered the counterexamples in (22) where  $S_i\text{-O-FNQ}_i$  is acceptable conclude that no locality is required between the FNQ and its host NP, and thus argue against the stranding view on the basis of such examples. In contrast, some researchers argue that the examples in (22) need not be considered as “counter”examples to the

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<sup>10</sup> Some researchers implement a certain locality restriction under the adverb view. For example, Doetjes (1997) argues that FQs in Dutch and French are adverbs, but that they must c-command a trace of the host NP (see also Fitzpatrick 2006). The previous adverbial analyses on Japanese FNQs summarized here do not take such a view, and so suffice it to say here that, under the adverb view, FNQs are insensitive to locality.



stranding view. In other words, it is possible to maintain the stranding view even with the existence of the examples such as (22). In section 3.2.1, I first review Miyagawa and Arikawa's (2005) claim that locality is preserved even in (22). Then, in section 3.2.2, I turn to Ishii's (1999) claim that the FNQs in (22) are different in nature from FNQs that obey locality.

### 3.2.1. The Stranding View

Miyagawa and Arikawa (2005) acknowledge the examples in (22), but they claim that these examples are not counterexamples to locality. More precisely, they argue that syntactic locality is preserved even in (22), maintaining the stranding view advanced by Miyagawa (1989). They claim, following Ko (in press) but contra Saito (1985), that the subject in Japanese may scramble, and provide a derivation in (24) for the examples in (22). In particular, they present various arguments showing that, whenever the  $S_i$ -O-FNQ $_i$  order is acceptable, the object has moved outside of the vP and the subject has undergone A'-scrambling (but see Hoji and Ishii 2004 for arguments against this claim).<sup>11</sup> Crucially, in this derivation, the mutual c-command requirement is met at D-structure, i.e., there is no locality violation in (22). In other words, under this analysis, the examples in (22) are considered as counterexamples to the stranding view.

$$(24) \quad [_{TP} S_1 [_{TP} O_2 [_{vP} t'_2 [_{NumP} t_1 \text{ FNQ} ] [_{VP} t_2 \quad V ] ] ] ] ]$$

Regarding Haig/Kuroda's "standard" paradigm where the  $S_i$ -O-FNQ $_i$  order is ungrammatical, Miyagawa and Arikawa argue that the stress is on the object and that this stress pattern indicates the FNQ to form a constituent with the object. For example, they claim that, in (25)a, a neutral intonation with the nuclear stress is on the object *sake*. This pattern would give us the

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<sup>11</sup> More precisely, Miyagawa and Arikawa argue that, when the  $S_i$ -O-FNQ $_i$  order is acceptable, the object first moves to the edge of vP, then moves to the Spec of TP to meet the EPP requirement of T. Then the subject undergoes the A'-scrambling to a higher position (a higher Spec of TP, as in (24), or the Spec of CP). For various empirical examples to support their analysis, see Miyagawa and Arikawa (2005: section 5.1).

interpretation where the FNQ is associated with the object rather than with the subject, which is not the intended interpretation. In contrast, the “non-standard” paradigm where  $S_i$ -O-FNQ<sub>i</sub> is acceptable has a different prosodic pattern; in the non-standard case, the stress is on an element other than the object, and thus the constituency problem is avoided. For instance, in (25)b, the stress is on the adverb *imamadeni* ‘so far’, which marks the FNQ to be phrasally separate from the object, unlike in (25)a. In sum, for Miyagawa and Arikawa, the standard paradigm in (25)a and the non-standard paradigm in (25)b have different structures and that the structural difference is marked by different prosodic patterns.

- (25) a. \**Gakusei-ga sake-o san-nin non-da.*  
 student-NOM sake-ACC three-CL drink-PAST  
 ‘Three students drank sake.’ (Gunji and Hashida 1998:47)
- b. ?*Gakusei-ga sake-o imamadeni san-nin non-da.*  
 student-NOM sake-ACC so far three-CL drink-PAST  
 ‘Three students drank sake so far.’ (Gunji and Hashida 1998:57)

Miyagawa and Arikawa’s analysis would then predict that the  $S_i$ -O-FNQ<sub>i</sub> order is grammatical whenever a stressed element intervenes between the object and the FNQ, just like in (25)b. This prediction does not seem to be borne out, as shown in (26). In (26), the stress seems to naturally fall on the adverb *ikkini* ‘in one breath’, yielding the same prosodic pattern as (25)b. However, unlike (25)b, (26) is unacceptable. In this way, a difficulty with Miyagawa and Arikawa’s analysis may be that prosodic patterns with grammatical and ungrammatical  $S_i$ -O-FNQ<sub>i</sub> examples are not as clear-cut as they describe.

- (26) \* *Gakusei-ga sake-o ikkini san-nin non-da.*  
 student-NOM sake-ACC in one breath three-CL drink-PAST

‘Three students drank sake in one breath.’

### 3.2.2. The “Hybrid” View

A different approach has been proposed by Ishii (1999). Ishii argues that the mixed acceptability of  $S_i$ -O-FNQ<sub>i</sub> is due to the existence of two types of FNQs. When  $S_i$ -O-FNQ<sub>i</sub> is unacceptable, the sentence involves a stranding of the FNQ, predicting that the FNQ obeys a locality constraint (hence \* $S_i$ -O-FNQ<sub>i</sub>). In contrast, when  $S_i$ -O-FNQ<sub>i</sub> is acceptable, the FNQ is an adverb, predicting that we do not necessarily observe a locality constraint (hence  $S_i$ -O-FNQ<sub>i</sub> is acceptable). In the following, I refer to Ishii’s approach as the “hybrid” view. The hybrid view is motivated by semantic considerations of FNQs. What plays a crucial role here is a distinction between distributive and non-distributive interpretations proposed by Kitagawa and Kuroda (1992): ‘the distributive construal necessarily implies the occurrence of multiple events while the non-distributive construal implies the occurrence of only a single event’ (1992:88-89). In (27), these two interpretations are forced by the temporal expressions *kono issyuukan-no aida-ni* ‘during this week’ ((27)a; distributive only) and *sono toki totuzen* ‘then suddenly’ ((27)b; non-distributive only).

- (27) a. Kono issyuukan-no aida-ni syuuzin-ga **san-nin** nigedasi-ta.  
this week during prisoner-NOM three-CL escape-PAST  
‘There have been three jailbreaks this week.’
- b. Sono toki totuzen syuuzin-ga **san-nin** abaredasi-ta.  
then suddenly prisoner-NOM three-CL start to act violently-PAST  
‘Then, a group of three prisoners suddenly started acting violently.’

(Kitagawa and Kuroda 1992:89)

Ishii claims that the counterexamples to the mutual c-command requirement permit a distributive reading, but not a non-distributive reading. Let us go back to the example in (22)a. According to Ishii, this sentence can mean that each of the five students bought a copy of the new magazine separately (distributive), but cannot mean that the five students together bought a single copy (non-distributive).<sup>12</sup> Similarly, in (22)b, the distributive reading is enforced by *tugitugito* ‘one after another’. Moreover, (22)c lacks the non-distributive reading where three students handed in a single paper. Ishii’s claim is further supported by (28), where *ubaiau* ‘to fight over’ forces a non-distributive reading. As in (28)B, the sentence is unacceptable when the mutual c-command requirement is violated (due to the  $S_i$ -O-FNQ $_i$  order), while it is acceptable, as in (28)B’, when there is no locality violation. The observation here leads Ishii to the claim that there are two types of FNQs, the stranding and the adverb type. The stranding type is not sensitive to any semantic restriction, but it must obey the mutual c-command requirement. The adverb type is identified by the semantic restriction of having only a distributive interpretation. FNQs of this type, being adverbs, need not satisfy the mutual c-command requirement, as in (22).

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<sup>12</sup> We can imagine another scenario where each of the five students bought a copy of the new magazine at the same time, which amounts to a non-distributive reading under Kitagawa and Kuroda’s (1992) definition. This non-distributive reading seems to be available in (22)a, contra Ishii’s generalization that sentences such as (22)a only allow distributive readings. The semantic notion relevant here seems to be the distinction between distributive and collective readings (Dowty 1987, among others); a distributive reading obtains when each member of the subject serves as an agent, while a collective reading obtains when the subject as a group serves as an agent. The example in (22)a permits a distributive reading where each of the five students bought a copy, but lacks a collective reading where the five students as a group bought a single copy. Crucially, under the distributive-collective distinction, the situation where each of the five students bought a copy at the same time falls under a distributive reading, correctly predicting that such a situation is compatible with (22)a. See section 3.3 for more examples.

(28) A: Kono zassi ninki arimasu-ka?

this magazine is popular-Q

‘Is this magazine popular?’

B:\*Ee, sakki-mo sokode *gakuseisan-ga* saisin-goo-o

Yes a while ago-also there student-NOM recent-issue-ACC

**go-nin** ubaiatteimasitayo.

five-CL were fighting over

‘Yes. In fact, five students were fighting over the most recent issue over there just a while ago.’

B’: Ee, sakki-mo sokode *gakuseisan-ga* **go-nin** saisin-goo-o ubaiatteimasitayo.

(Nishigauchi and Ishii 2003:78)

Ishii further argues that the other counterexamples to the stranding view presented above also involve the adverb-type FNQ. In (18), we have seen that sentences can be acceptable even when the host NP, being embedded in another NP, does not c-command the FNQ. The examples in (29) show that such examples only have a distributive interpretation; (18)b is unacceptable when a non-distributive reading is forced, as in (29)a, while it is acceptable when a distributive reading is forced, as in (29)b. In the same vein, the examples such as (19), namely, the examples where the host NP is within the PP, are unacceptable under a non-distributive interpretation, as in (30).

- (29) a. ?\*Hora, ima soko-de isya-ga [zidoo-no me]-o **sanjuu-nin** sirabeteimasuyo.  
 see now there doctor-NOM [pupil-GEN eye]-ACC thirty-CL examine-PAST  
 ‘See, the doctor is examining 30 pupils’ eyes over there now.’
- b. Ano isya-wa kono ni-zikan-de [zidoo-no me]-o **sanjuu-nin** sirabeta.  
 that doctor-TOP this two-hour-in [pupil-GEN eye]-ACC thirty-CL examined  
 ‘That doctor examined 30 pupils’ eyes during the last two hours.’ (Ishii 1999:247)
- (30) \* Itido-ni *gakusei*-kara **nizyuu-mei-izyoo** okane-o atumeru-no-wa muri-desu.  
 at once student-from 20-CL-or more money-ACC collect-NL-TOP impossible-COP  
 ‘It is impossible to collect money from 20 students or more at once.’  
 (Ishii 1999:245)

Let us recapitulate what we have seen so far in terms of locality. Recall that, under the stranding view, there needs to be a strict locality restriction on the dependency between an FNQ and its host NP, predicting  $S_i$ -O-FNQ $_i$  to be unacceptable. The counterexamples such as (22) are problematic, as pointed out in (23)a, and thus some modification needs to be made on the original stranding view (e.g. Miyagawa and Arikawa’s (2005) proposal discussed above). In contrast, under the hybrid view, the questions in (23) do not arise in the first place; whenever  $S_i$ -O-FNQ $_i$  is disallowed, the FNQ is derived by stranding, hence there is a locality constraint. In contrast, whenever  $S_i$ -O-FNQ $_i$  is allowed, the FNQ is an adverb, hence no locality constraint. In this sense, the examples in (22) are not really “counterexamples” to locality, but they simply involve a different type of FNQ, namely, the adverb type. The hybrid view keeps the stranding analysis intact in that FNQs of the stranding type are analyzed by the original stranding view.

### 3.3. Semantic Restrictions on FNQs

Recall that Ishii's (1999) motivation for advocating the two types of FNQs comes from the semantic restriction on FNQs that only a distributive reading is available when the mutual c-command requirement is violated. However, it has been observed in the literature that FNQs in general are subject to a semantic restriction of the kind discussed in Ishii (Terada 1990, Kobuchi-Philip 2003, Nakanishi 2004a, to appear). For instance, the examples in (31) have a distributive, but not a collective reading.<sup>13,14</sup> (31)a means that each of the three boys made a toy boat, but it does not mean that the three boys together made a toy boat. In the same vein, (31)a can involve two friends, each of whom got married to someone, i.e. there are two couples, but it cannot mean that two friends married each other, which involves only one couple. Note that, under the stranding view, the mutual c-command requirement is satisfied in (31), unlike in (22);

<sup>13</sup> See footnote 12 on why the distributive/collective distinction matters, rather than Kitagawa and Kuroda's (1992) distributive/non-distributive distinction. See also Nakanishi (2004a) for further discussions.

<sup>14</sup> When so-called collectivizing adverbs such as *together* co-occur with FNQs, as in (i), only collective readings are available. Nakanishi (2004a) proposes that these adverbs serve to form a group, yielding the interpretation 'one group consisting of three boys'. It follows that (i) has the same semantic status as (ii), where there is no ambiguity between distributive and collective readings in the first place. This is because the distributive/collective distinction is defined in terms of plural individuals; *the boys made a toy boat* can be ambiguous as opposed to *the boy made a toy boat*, which does not have any ambiguity.

- (i) *Otokonoko-ga* kinoo **san-nin** {issyoni / (hito-kumi)-de} omotya-no booto-o tukutta.  
 boy-NOM yesterday three-CL {together / (one-group)-COP} toy-GEN boat-ACC made  
 'Three boys made a toy boat {together / as a group} yesterday.'
- (ii) *Otokonoko-ga* kinoo **hiro-ri** omotya-no booto-o tukutta.  
 boy-NOM yesterday one-CL toy-GEN boat-ACC made  
 'One boy made a toy boat yesterday.'

the temporal adverb is VP-external, as in (13) above, hence the FNQ and its host NP can c-command each other at D-structure. Then what the examples in (31) seem to indicate is that there is no strict correlation between the locality requirement and the semantic restriction contra Ishii (1999). It is true that, whenever  $S_i$ -O-FNQ<sub>i</sub> is acceptable, only the distributive reading is available. However, as shown in (31), this semantic restriction seems to be more widespread. The seeming generalization is that the semantic restriction is observed whenever FNQs appear away from their host NP on the surface, regardless of whether the mutual c-command requirement is satisfied. Then it seems inappropriate to argue for the hybrid view simply on the basis of the semantic restriction on distributivity discussed in Ishii (1999).

(31) a. *Otokonoko-ga* kinoo **san-nin** omotya-no booto-o tukut-ta.  
 boy-NOM yesterday three-CL toy-GEN boat-ACC make-PAST  
 ‘Three boys made a toy boat yesterday.’

b. *Tomodati-ga* kinoo **huta-ri** kekkonsi-ta.  
 friend-NOM yesterday two-CL marry-PAST

‘Two friends got married yesterday.’ (Nakanishi 2004a:75)

Interestingly, unlike in (31)a, both distributive and collective readings are available in (32).

(32) a. [**San-nin-no** *otokonoko*]-ga kinoo omotya-no booto-o tukut-ta.  
 [three-CL-GEN boy]-NOM yesterday toy-GEN boat-ACC make-PAST

b. [*Otokonoko* **san-nin**]-ga kinoo omotya-no booto-o tukut-ta.  
 [boy three-CL]-NOM yesterday toy-GEN boat-ACC make-PAST

As briefly mentioned in section 1, the researchers agree that the numerals in (32) (or the ones in (1)a-b) quantify over the nominal predicate. Then the fact that FNQs are semantically different from numerals that apparently quantify over nominal predicates may suggest that FNQs quantify





Another piece of evidence for event quantification comes from the observation that FNQs cannot occur with verbal predicates that express more or less permanent states (i.e., individual-level predicates) (Harada 1976, Ohki 1987, Fukushima 1991, Nishigauchi and Uchibori 1991, Mihara 1998). In (35), for instance, although the FNQ is compatible with the predicate *genki-da* ‘be healthy’ that expresses a temporal state, it is incompatible with *osu-da* ‘be male’ that expresses a permanent state. No such restriction can be found with numerals in a nominal projection, as in (36). It has been independently argued that, unlike predicates expressing temporal states, predicates expressing permanent states lack event arguments in their denotation (Kratzer 1995). If we take this view, the contrast in (35) naturally follows: (35)b is unacceptable because there is no event that the FNQ quantifies over. In contrast, the numerals in (36) have nothing to do with event quantification, thus any predicate can be used with them.<sup>15</sup>

- (35) a. Uti-no doobutuen-de-wa *kaba-ga* mada **san-too** genki-da.  
           my zoo-at-TOP hippo-NOM still three-CL healthy

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<sup>15</sup> Fukushima (1991) presents another set of data to show a semantic difference between FNQs and numerals in a nominal projection. In (i), we obtain two completely different interpretations depending on where the numeral is: while the numeral in (i)a expresses the quantity of the host NP (i.e., one cell), the FNQ in (i)b has nothing to do with it, as clear from the translation. However, the numeral in (i)b is different in nature from FNQs discussed in this paper. More specifically, the numeral in (i)b should be treated as a differential in comparative constructions (e.g. *two* in *John read two more books than Mary*) (see Nakanishi 2004a, 2004b for details).

- (i) a. [**Hito-tu-no saiboo**]-ga biikaa-nonakade hue-ta.  
           [one-CL-GEN cell]-NOM beaker-inside increase-PAST  
           ‘One cell proliferated/increased in the beaker.’  
       b. *Saiboo-ga* biikaa-nonakade **hito-tu** hue-ta.  
           cell-NOM beaker-inside one-CL increase-PAST

‘The number of cells increased by one in the beaker.’ (Fukushima 1991:77)

‘In my zoo, three hippos are still healthy.’

b. \*Uti-no doobutuen-de-wa *kaba-ga* zannennakotoni **san-too** osu-da.

my zoo-at-TOP hippo-NOM unfortunately three-CL male

‘In my zoo, unfortunately, three hippos are male.’ (Mihara 1998:110-111)

(36) a. Uti-no doobutuen-de-wa [**san-too-no** *kaba*]-ga genki-da / osu-da.

my zoo-at-TOP [three-CL-GEN hippo]-NOM healthy / male

b. Uti-no doobutuen-de-wa [*kaba* **san-too**]-ga genki-da / osu-da.

my zoo-at-TOP [hippo three-CL]-NOM healthy / male

Note that FNQs quantify not just over verbal predicates, but also somehow over nominal predicates as well. Recall that FNQs contain a classifier that semantically agrees with the host NP. For example, in (33)a, *-nin* agrees with *gakusei* ‘student’, indicating that the cardinality of the students is three. Moreover, (33)a is semantically different from (37), where *three times* is simply counting a number of events without being associated with the number of students: while (33)a means that three students hit Peter for unknown number of times, (37) means that a student or students whose cardinality is unspecified hit Peter three times.

(37) *Gakusei-ga* *kinoo* **san-kai** *Peter-o* *tatai-ta*.

student-NOM yesterday three-time Peter-ACC hit-PAST

‘A student/students hit Peter three times yesterday.’ (Nakanishi 2004a:85)

Thus, if we were to argue that an FNQ is an adverb, it cannot be an adverb that simply modifies a verbal predicate, but rather it must be a special kind of adverb that modifies a verbal predicate as well as a nominal predicate (which maybe somewhat similar to so-called subject-oriented adverbs such as *reluctantly* in *John reluctantly hit Peter*). Indeed, Fujita (1994) argues that an FNQ modifies its host NP via modification of the verbal predicate. Similarly, Nakanishi (2004a,

to appear) presents a semantic mechanism where an FNQ quantifies over events denoted by the verbal predicate as well as individuals denoted by the host NP.

Note that semantic properties of FNQs per se do not rule out the stranding view. Indeed, we might expect to observe some semantic differences as a result of transformations involved in the stranding view. For example, Watanabe (2005, this volume) discusses another semantic difference between the FNQ and the numerals in a nominal projection, namely, partitivity (the FNQ, but not the numerals in a nominal projection, evokes a partitive interpretation; see Inoue 1978, Fujita 1994, Hamano 1997; see also section 3.5 below) and argues that this semantic difference can be captured under the stranding view. The task for the stranding view then is to explain why FNQs have different semantic properties from numerals that apparently quantify over nominal predicates, as we have seen in this section. In other words, the stranding view needs to show that syntax can be the source of the semantic differences discussed here.

### **3.4. The Adverb View**

Summing up the discussion so far, the stranding view advocated by Miyagawa (1989) confines the distribution on FNQs to environments where locality constraint is met, and by doing so, it successfully accounts for some distributional restrictions on FNQs presented in section 2. However, the counterexamples to locality question the validity of such a constrained analysis. Some attempts have been made to deal with the counterexamples under the stranding view, as we have seen in Miyagawa and Arikawa's (2005) recent work. An alternative analysis is presented by Ishii (1999), who argues that there are two types of FNQs, a stranding type and an adverb type. Under this analysis, the counterexamples to locality involve the adverb type FNQs which are distinct from the stranding type FNQs in that they are not sensitive to locality. Thus, these examples do not pose a problem for the stranding view. Although Ishii's analysis offers an

attractive possibility of eliminating the questions in (23), we have seen in (31) that there does not seem to be a strict correlation between locality and the semantic restriction on distributivity. Moreover, further semantic restrictions on FNQs in (33)-(36) seem to indicate that FNQs quantify over events denoted by verbal predicates. Together with the counterexamples to locality (e.g. (22) where  $S_i$ -O-FNQ $_i$  is acceptable), the semantic data above led some researchers to advocate the adverb view; both FNQs and adverbs are closely related to verbal predicates, not to nominal predicates.<sup>16</sup> The substance of this view is that FNQs can occur in positions which cannot be straightforwardly associated with an NP trace, indicating that locality does not play a crucial role for the distribution of FNQs (see Bobaljik 1995, Fitzpatrick 2006 for cross-linguistic data on this point). Then the question that we need to address is the following (also in (23)b above): why is  $S_i$ -O-FNQ $_i$  sometimes unacceptable? I review here two analyses that directly address this question, namely, Takami's (1998, 2001) pragmatic approach and Mihara's (1998) semantic approach. Along the way, I also discuss how these approaches account for the distributional restriction on FNQs other than  $S_i$ -O-FNQ $_i$ , which is summarized in (16) above.

### 3.4.1. Pragmatic Consideration

Takami (1998, 2001) rejects Miyagawa's (1989) stranding analysis on the basis of the counterexamples to locality presented in section 3.1. The upshot of his analysis is that the distribution of FNQs does not depend on syntactic factors, as claimed in the stranding view, but

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<sup>16</sup> Note that, under this view, as long as a close connection between FNQs and verbal predicates is captured, it may not matter so much whether FNQs are categorized as "adverbs" (Nakanishi 2004a). Indeed, the approaches that I discuss in detail later in the paper, namely, Mihara (1998) and Takami (1998, 2001), do not specifically say that FNQs are adverbs. Regardless, I include their approaches in the adverb view in that, under their analyses, there are no locality restrictions on the dependency between an FNQ and its host NP. Furthermore, their analyses assume a close relation between an FNQ and a verbal predicate.

rather on pragmatic factors. It has been independently claimed that, in Japanese, the most important information (or new information) must appear in an immediately preverbal position (Kuno 1978a). Takami argues that FNQs must obey this information structure. Let us illustrate his point by examining the contrast in (38), where both sentences are in the  $S_i$ -O-FNQ $_i$  order.

- (38) a. ?\**Gakusei-ga* hon-o **yo-nin** kat-ta.  
           student-NOM book-ACC four-CL buy-PAST
- b. *Gakusei-ga* {sore / sono hon}-o **yo-nin** kat-ta.  
           student-NOM {it / that book}-ACC four-CL buy-PAST (Takami 2001:139)

In (38)a-b, the FNQ is interpreted as the most important information, being in a pre-verbal position. The difference in acceptability between the two comes from the information status of the object. In (38)a, the object is an indefinite NP, which is interpreted to convey new information. Thus, there is a conflict between the object and the FNQ as to which one should be the focus of the sentence. In contrast, in (38)b (also in (22)a), the object is a definite NP, which conveys less important information, thus the ideal information structure is preserved. Furthermore, Takami observes that the  $S_i$ -O-FNQ $_i$  order is always acceptable when the FNQ is followed by emphatic adverbs such as *-dake* ‘only’ and *-tomo* ‘all’, as shown in (22)c above. This also follows from the pragmatic condition: emphatic adverbs signal that the FNQ conveys the most important information, thus the sentence realizes the ideal information structure. In the case of (22)b above, the context that ‘I live in an apartment’ evokes the contrast with ‘my friends build a house’, so the object *ie* ‘house’ merely conveys predictable information. Thus, it does not need to be placed in a pre-verbal position, just like in (38)b. Takami further argues that his analysis is able to account for the contrast in (39), where both verbs are unergative and a VP-internal adverb intervene between the subject and its FNQ. In (39)a, *geragerato* ‘loudly’

conveys important new information, hence it needs to be placed in a pre-verbal position. In contrast, locative adverbs, such as *butai-de* ‘at the stage’, or temporal adverbs serve as a “scene-setter”, and so they do not convey important information, allowing the FNQ to sit in a pre-verbal position.<sup>17</sup>

- (39) a. \**Kodomo-ga* geragerato **huta-ri** warat-ta.  
 children-NOM loudly two-CL laugh-PAST  
 ‘Two children laughed loudly.’ (=9)c
- b. *Kodomo-ga* butai-de **zyuu-nin** odot-ta.  
 child-NOM stage-at ten-CL dance-PAST  
 ‘Ten children danced at the stage.’ (=20)a

In this way, Takami’s analysis appeals to pragmatic considerations to account for the mixed judgments on the  $S_i$ -O-FNQ<sub>i</sub> order and on the external argument hosting the FNQ. There seem to be some examples, however, where the pragmatic analysis does not go through. Consider (20)c, which is repeated in (40). Under Takami’s analysis, *naihu-de* ‘with the knife’ conveys important

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<sup>17</sup> Takami (1998, 2001) proposes another pragmatic condition in (i), which accounts for the data on structural restrictions, i.e., the data on an embedded NP as the host NP and on the NP within PP as the host NP. For instance, in (ii), *gakusei* ‘student’ in (a) can be topicalized, but not the one in (b). That is, *gakusei* serves as a Theme in (a), but not in (b). For lack of space, I do not discuss any further on this pragmatic condition.

(i) An NP can host an FNQ only when it can serve as a Theme of the sentence.

- (ii) a. Yamada Sensei-ga [*gakusei-no* kami]-o **san-nin** kit-ta.  
 Yamada Professor-NOM [student-GEN hair]-ACC three-CL clip-PAST  
 ‘Prof. Yamada cut three students’ hair.’ (=18)a
- b. \* Yamada Sensei-ga [*gakusei-no* tukue]-o **san-nin** ket-ta.  
 Yamada Professor-NOM [student-GEN desk]-ACC three-CL kick-PAST  
 ‘Prof. Yamada kicked three students’ desks.’ (Takami 2001:137)

new information, just like *geragerato* ‘loudly’ in (39)a. Regardless, (39)a and (40) differ in their acceptability. Moreover, it does not seem to be easy a task to determine “appropriate” information structure. In all the examples discussed in this section, the FNQ does convey new information. At the same time, some examples involve other elements expressing new information, and then the question is how to decide which one conveys more important information that has to be placed in a pre-verbal position.

- (40) *Gakusei-ga naihu-de koremadeni huta-ri (te-o) kegasi-ta.*  
 student-NOM knife-with so far five-CL (hand-ACC) injure-PAST  
 ‘So far two students injured (their hands) with the knife.’ (= (20)c)

### 3.4.2. Aspectual Consideration

Like Takami (1998, 2001), Mihara (1998) also argues that Miyagawa’s (1989) mutual c-command requirement is inadequate based on numerous counterexamples. However, he claims that Takami’s pragmatic condition is not sufficient, and argues that, besides the pragmatic condition, FNQs require an aspectual delimitedness. In particular, the sentence with an FNQ must express a completed situation and the FNQ must be tied to the enumeration resulting from the situation.<sup>18</sup> Let us illustrate his analysis by examining the data on the  $S_i$ -O-FNQ<sub>i</sub> order. Regarding (22)a-b, he points out that the sentences sound worse without the temporal adverbs *kesa-mo* ‘also this morning’ and *saikin* ‘recently’, respectively. These adverbs serve to signal that the relevant counting under a described situation has been completed. The examples in (41) seem to further support the validity of Mihara’s claim that the result state of counting (often signaled

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<sup>18</sup> For lack of space, Mihara’s analysis summarized here is simplified. In particular, I do not discuss the following two points that are crucial to his analysis; first, the host NP is subject to a different aspectual condition, depending on whether it is an external or an internal argument. Second, there is a certain distributional restriction on FNQs caused by a lexical conceptual structure of verbs.



by temporal adverbs) contributes to a wellformedness of FNQs. Under Mihara’s analysis, the sentence with an FNQ is grammatical as long as it is aspectually delimited, regardless of where the FNQ appears in the sentence. (41) provides us with a context where the enumeration is salient. In such a case, the  $S_i$ -O-FNQ<sub>i</sub> order in (41)a is as acceptable as the  $S_i$ -FNQ<sub>i</sub>-O order in (41)b.

- (41) a. *Gaikokuzin kankookyaku-ga* kyonen Tokushima-o **gosen-nin** otozure-ta.  
 foreign tourist-NOM last year Tokushima-ACC 5,000-CL visit-PAST  
 ‘5,000 foreign tourists visited Tokushima last year.’
- b. *Gaikokuzin kankookyaku-ga* kyonen **gosen-nin** Tokushima-o otozure-ta.  
 foreign tourist-NOM last year 5,000-CL Tokushima-ACC visit-PAST

Regarding (22)c, Mihara argues that emphatic adverbs such as *-dake* ‘only’ and *-tomo* ‘all’ signal that the counting event described by the sentence is ended. In other words, in (22)c, with the presence of the emphatic adverb, the sentence is aspectually delimited, hence the  $S_i$ -O-FNQ<sub>i</sub> order is acceptable. His analysis further accounts for why FNQs are incompatible with predicates that express a permanent state (*osu-da* ‘be male’), as in (35)b: these predicates are not aspectually delimited. Interestingly, FNQs are compatible with such predicates when they are followed by emphatic adverbs, as in (42). This is because the emphatic adverbs indicate that the speaker finished counting, thus (42) does not describe permanent states, unlike (35)b.

- (42) *Uti-no doobutuen-de-wa kaba-ga zannentakotoni san-too* {-dake/-tomo} *osu-da*.  
 our zoo-at-TOP hippo-NOM unfortunately three-CL {-only/-all} male  
 ‘In our zoo, unfortunately, {only/all} three hippos are male.’

Mihara’s analysis further extends to the contrast between unaccusatives and unergatives. Mihara argues that unaccusative verbs always express a completion, i.e., they are inherently

aspectually delimited. Thus, his analysis predicts FNQs to be always compatible with unaccusative verbs. As discussed in section 2, we know that this prediction is empirically correct (see (9)b). Unlike unaccusative verbs, unergative verbs are not semantically restricted. Thus, when they occur with FNQs, there needs to occur with an expression that aspectually delimits the relevant sentence. For instance, (43)a is unacceptable just like (9)c, but it is acceptable in a context that provides an aspectual delimitation, as in (43)b.<sup>19</sup>

- (43) a. ??*Gakusei-ga* tosyokan-de **sanzyuu-nin** benkyoosi-ta.  
 student-NOM library-at thirty-CL study-PAST  
 ‘Thirty students studied at the library.’ (Mihara 1998:106)
- b. *Heikan-magiwa-made* *gakusei-ga* tosyokan-de **sanzyuu-nin** benkyoosi-ta.  
 closing-close to-until student-NOM library-at thirty-CL study-PAST  
 ‘Until the closing time, thirty students studied at the library.’ (Mihara 1998:106)

Although Mihara’s analysis opens a new venue of research on FNQs, there seem to be examples where their acceptability does not depend on an aspectual consideration. For instance, (44)a and (44)b do not seem to differ in terms of aspectuality, but only the latter is acceptable. Regarding this contrast, Gunji and Hashida (1998) claim that the NP intervening between the subject and its FNQ must express an entity whose quantity is determinate. Besides an aspectual constraint, a constraint of this kind may be necessary to capture a wider range of data.

- (44) a. \**Gakusei-ga* sake-o **san-nin** non-da.  
 student-NOM sake-ACC three-CL drink-PAST

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<sup>19</sup> Mihara (1998) briefly notes that his analysis is able to account for why the NP within PP is generally not a suitable host NP, as in (8). He claims that the NPs *kuruma* ‘car’ and *paatii* ‘party’ in (8) do not come to exist as a result of a described situation, and so the FNQs in these examples do not express the result of counting.

‘Three students drank sake.’ (=(25)a)

- b. *Gakusei-ga* sono botoru-no sake-o **san-nin** non-da.  
student-NOM that bottle-GEN sake-ACC three-CL drink-PAST

‘Three students drank the sake in that bottle.’ (Gunji and Hashida 1998:50)

Summing up section 3.4, we have seen that a range of counterexamples to locality led some researchers to advocate an alternative view of the stranding analysis, namely, the adverb view. The adverb view is further supported by some data suggesting that FNQs quantify over something other than nominal predicates, in particular verbal predicates. Under the adverb view, we do not expect to observe any locality constraints (but see footnote 10), hence the  $S_i$ -O-FNQ<sub>i</sub> order is predicted to be always acceptable. To account for why this order is sometimes unacceptable, we need to appeal to semantic/pragmatic considerations such as Takami’s (1998, 2001) and Mihara’s (1998).

### 3.5. Some Notes on Prosodic Effects

Before concluding the paper, I briefly discuss the status of an FNQ that is adjacent to its host NP in the surface. Kitagawa and Kuroda (1992), followed by Fujita (1994), claim that when a numeral quantifier immediately follows its host NP, it can be structurally ambiguous between [NP-CASE Q] and [NP]-CASE [Q] (the brackets indicate constituency). Their claim is supported by the data on cardinal/partitive readings. While only a cardinal reading obtains when the numeral and its host NP form a constituent, as in (45)a, a partitive reading obtains when they are apart, as in (45)b. Kitagawa and Kuroda observe that, when the numeral and its host NP are adjacent to each other, as in (45)c, the sentence has both cardinal and partitive readings. They further claim that the two readings in (45)c can be teased apart by different prosodic patterns. In particular, with a prosodic boundary or a pause between the host NP and the numeral (indicated by //), (45)c

has a partitive reading only, implying that the host NP and the numeral are not in the same nominal projection at least on the surface. In contrast, without any pause between them, (45)c only allows a cardinal reading, indicating that they form a nominal constituent, just like in (45)a.

- (45) a. [Sokoni iawase-ta **go-nin**-no *otoko*]-ga tero-ni makikom-are-ta.  
 [there be- PAST five-CL-GEN man]-NOM terrorism-by involve-PASS-PAST  
 ‘Five (and only five) men who were there got involved in terrorism.’
- b. Sokoni iawase-ta *otoko*-ga tero-ni **go-nin** makikom-are-ta.  
 there be- PAST man-NOM terrorism-by five-CL involve-PASS-PAST  
 ‘Five of the men who were there got involved in terrorism.’ (Fujita 1994:35-36)
- c. Sokoni iawase-ta *otoko*-ga (/) **go-nin** tero-ni makikom-are-ta.

Similarly, in (46), the presence of a prosodic boundary influences the interpretation of the sentence; the sentence seems to be ambiguous between distributive and collective readings without a boundary, whereas it only allows a distributive reading with a boundary.

- (46) *Gakusei*-ga (/) **go-nin** *tukue*-o *moti*age-ta.  
 student-NOM five-CL desk-ACC lift-PAST (cf. (31)b)

Throughout the paper, to avoid this complication, I focused on cases where some element intervenes between an FNQ and its host NP. However, it is important to question what implications of the data presented in this section would have to the theory of FNQs.

#### 4. Implications for the General Theory

In this short overview, I have examined previous studies on Japanese FNQs by dividing them into two groups, namely, the stranding view and the adverb view. Among numerous important issues arise from the phenomenon, I have focused on issues of locality. The stranding view

advanced by Miyagawa (1989) observes that there are certain locality restrictions on the dependency between an FNQ and its host NP, as summarized in (47).

(47) Distributional restrictions on FNQs (also in (16))

Structural restrictions

- a. \*Embedded NP as the host NP; (5) (counterexamples in (18))
- b. \*NP within PP as the host NP; (8) (counterexamples in (19))

Locality restrictions

- c. \*External argument as the host NP with a VP-internal adverb/PP; (3), (9), (11)  
(counterexamples in (20))
- d. \*S<sub>i</sub>-O-FNQ; (2) (counterexamples in (22))

Under this view, FNQs have served as a powerful tool for the investigation of Japanese syntax. However, close scrutiny has revealed that there are a number of counterexamples to locality, as indicated in (47), which led some researchers to the adverb view. A further support for the adverb view comes from a range of semantic properties of FNQs summarized in (48).

(48) Semantic restrictions on FNQs

- a. \*Collective readings; (31)
- b. \*Single-occurrence events; (33)
- c. \*Predicates describing a permanent state; (35)<sup>20</sup>

The table in (49) summarizes how the two views fare with the properties of FNQs.<sup>21</sup> I would like to emphasize here that, whatever theory of FNQs we may choose (the stranding view, the

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<sup>20</sup> This property may be considered as a syntactic restriction rather than a semantic one, if we adopt a view such as Diesing's (1992) that the syntax of predicates describing a permanent state differs from the syntax of predicates describing a temporal state.

adverb view, the hybrid view, or something else), we need to make sure that the theory is capable of accounting for the range of properties of FNQs discussed here, and of making further predictions about other properties of FNQs, such as the sentence initial FNQs in (i) in footnote 2, scope issues briefly discussed below, etc.

(49) Comparison of the stranding and the adverb view

Properties of FNQs	The stranding view	The adverb view
Distributional restrictions in (47)	√ (locality restriction)	not necessarily expected (but see section 3.4)
Counterexamples to (47)	not necessarily expected (but see section 3.2)	√ (no locality restriction)
Semantic restrictions in (48)	not necessarily expected (but see section 3.3)	√ (result of quantification over verbal predicates)

The syntactic and semantic considerations on FNQs further lead us to the larger question of how the syntactic and the semantic components of grammar interact; can we maintain the compositionality of grammar? I.e., do semantic rules apply in accord with syntactic rules? In (1)a and (1)b, when the numeral combines with the host NP in syntax, a corresponding semantic rule makes the numeral express the number of relevant students. Does the FNQ in (1)c quantify over the host NP just like the numerals in (1)a-b? The answer is affirmative for the stranding view; the FNQ, being in the same nominal projection as its host NP, should quantify over the host NP in the same way as the numerals in (1)a-b. However, examples such as (31), (33), and (35) suggest that the FNQ has something to do with quantification over a verbal predicate. Then the challenge

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<sup>21</sup> Note that the properties listed here are not exhaustive in that there are other crucial properties of FNQs left untouched in this paper (for instance, the sentence initial FNQs in (i) in footnote 2, scope issues, etc.).

for the stranding view is to provide a mechanism of the FNQ having an effect on a verbal predicate. In contrast, under the adverb view, the FNQ syntactically combines with, and correspondingly semantically quantifies over, a verbal predicate. Then the challenge would be to account for the apparent connection between FNQs and its host NP; as pointed out above, the FNQ includes a classifier that semantically agrees with the host NP (see section 3.3 for more discussions).

I conclude the paper with discussion of some cross-linguistic issues. It is well known that floating quantifiers (FQs) exist in many other languages, and that, just like in the case of Japanese, there are competing theories in cross-linguistic studies, namely, the stranding view (Sportiche 1988, Shlonsky 1991, Merchant 1996, McCloskey 2000), the adverb view (Dowty and Brodie 1984, Bobaljik 1995, Junker 1995, Hoeksema 1996, Doetjes 1997), or the hybrid view (Fitzpatrick 2006). Furthermore, various arguments used to argue for or against the competing views in the cross-linguistic literature largely overlap with the arguments used in Japanese, i.e., the arguments based on distributional and semantic restrictions on FQs. Regardless of this fact, Japanese FQs and cross-linguistic FQs are strikingly different in that, while any quantifier can float in Japanese, quantifiers are often restricted to universal ones in other languages (e.g. in English, only *all*, *each*, and *both* are able to ‘float’). Indeed, the focus of this paper is on floating “numeral” quantifiers. Although it is not entirely clear what the source of this difference is, I would like to make two remarks regarding this question. First, it has been pointed out that Japanese FQs may be more closely related to so-called split quantifiers than to FQs in other languages (Bobaljik 2003). Some languages are known to have a construction called Split Topicalization, where some part of a noun phrase gets topicalized to the sentence-initial position and, as a result, it becomes split up from the rest of the noun phrase; in

the German example in (50)a, the NP *Bekannte* ‘acquaintances’ is separated from the numeral *zwei* ‘two’ by Topicalization, yet we obtain the interpretation ‘two acquaintances’. It is independently argued that split quantifiers as well as Japanese FQs are confined to narrow scope interpretations (for instance, van Geenhoven 1998 for German, Hasegawa 1993, Yamashita 2001 for Japanese). Moreover, it has been pointed out that Split Topicalization in German is subject to the same semantic restrictions as Japanese FQs summarized in (48) (Nakanishi 2004a). For instance, although (50)b permits both distributive and collective readings, (50)a has a distributive reading only, just like (31)b.

(50) a. *Bekannte* haben gestern **zwei** geheiratet.  
acquaintances have yesterday two married  
‘Two acquaintances married yesterday.’

b. [**Zwei** *Bekannte*] haben gestern geheiratet.  
[two acquaintances] have yesterday married (Nakanishi 2004a:75)

Given that FQ constructions and Split Topicalization share a configuration where a quantifier is separated from its host NP, it is interesting to determine how to classify cross-linguistic constructions involving the same configuration and examine in detail the syntax and semantics of different classes of constructions.

Second, there is another instance that may have a close connection to Japanese FQs, namely, so-called adverbs of quantification in English such as *mostly* or *for the most part*. It has been argued that these expressions can quantify over a nominal predicate (Berman 1991). For example, *for the most part, John likes his friends* has the possible interpretation ‘John likes most of his friends.’ Similarly, (51) has the reading ‘most of the boys built a model boat.’ It has been claimed that, under this reading, (51) can be understood distributively (most of the boys built a



model boat separately), but not collectively (most of the boys together built a model boat) (Nakanishi and Romero 2004). The same restriction seems to obtain with the Japanese example in (52).<sup>22</sup> As one of the possible interpretations, (52) could mean that most of the boys built a model boat, and under this interpretation, (52) is distributive, but not collective. Crucially, this is exactly the restriction we have observed with Japanese FNQs (see (31) above).

(51) For the most part, the boys built a model boat.

(52) *Otokonoko-ga* kinoo **hotondo** omotya-no booto-o tukut-ta.  
 boy-NOM yesterday most/mostly toy-GEN boat-ACC make-PAST  
 ‘For the most part, boys made a toy boat yesterday.’

The cross-linguistic data discussed above seem to suggest that we should compare Japanese FNQs not just with FQs in other languages, but also with extended cross-linguistic phenomena (e.g. Split Topicalization, adverbs of quantification, etc.).

The research on FNQs has been advanced a great deal over the past few decades, although there still remain a lot of questions that need to be answered. It is hoped that this paper serves as a partial overview of what has been done and further sheds light on some of the issues that require further investigations.

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<sup>22</sup> *Hotondo* is lexically ambiguous between being a quantifier, as in (i), or being an adverb, as in (ii). Crucially, unlike (52), (i) has both a distributive and collective readings.

- (i) [**Hotondo**-no *otokonoko*]-ga kinoo omotya-no booto-o tukut-ta.  
 [most-GEN boy]-NOM yesterday toy-GEN boat-ACC make-PAST  
 ‘Most of the boys made a toy boat yesterday.’
- (ii) John-ga **hotondo** ne-tei-ta.  
 John-NOM mostly sleep-PROG-PART  
 ‘Most of the time, John was sleeping.’

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