Licensing of Floating Nominal Modifiers and Unaccusativity in Japanese

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1. Introduction

Since Miyagawa (1989), licensing of "floating" numeral quantifiers (NQs) as in (1) has been used as a diagnostic test for unaccusativity in Japanese:

(1) a. **Gakusei-ga**   (**san-nin**)   ofisu-ni   (**san-nin**)   ki-ta[1]
      student-NOM   (three-CL)   office-LOC   (three-CL)   come-PST
      'Three students came to the office.'

    b. **Gakusei-ga**   (**san-nin**)   geragera-to   (***san-nin**)   waraw-ta
      student-NOM   (three-CL)   loudly   (three-CL)   laugh-PST
      'Three students laughed loudly.'

Miyagawa (1989) accounts for the contrast between (1a) and (1b) by incorporating two assumptions. First, he adopts the syntactic approach to the Unaccusative Hypothesis (Perlmutter 1978, Burzio 1986), according to which unaccusative subjects are base-generated as VP-internal arguments, while unergative subjects are base-generated as external arguments. Second, he assumes that a floating NQ and its associated NP (henceforth *the associate*) must be in a syntactically local configuration in their base-generated positions. Under these assumptions, the NQ in (1a) is licensed despite the presentce of the intervening adverb (henceforth *the intervener*) because *ki* 'come' is an unaccusative verb and its subject is base-generated as an internal argument inside VP. Thus, it is in the required local configuration with the NQ. In contrast, the same NQ in (1b) cannot be licensed because *waraw* 'laugh' is an unergative verb and its subject was base-generated outside VP as an external argument. Thus, it was never in the required local configuration with the NQ inside VP. The licensing of floating NQs therefore emerges as an important diagnostic test for unaccusativity in Japanese.

      More recent studies have revealed that the type of event denoted by a given sentence also affects the licensing of VP-internal floating NQs (Tsujimura 1994, 1996, Gunji and Hasida 1998, Mihara 1998, Nakanishi 2007, 2008, Miyagawa 2012). Consider the following examples.

(2) a. ***Tomodati-ga**   zyup-pun   **huta-ri** odor-ta.
      friend-NOM   ten-minutes   two-CL dance-PST
      'Two friends danced for ten minutes.'   (Miyagawa 2012:88; 9a)

[1]Abbreviations: ACC = accusative, BY = *by*-phrase, CAUSE = cause, CL = classifier, GEN = genitive, GER = gerundive, LOC = locative, NEG = negation, NOM = nominative, PASS = passive, PST = past, Q = quantificational, SFP = sentence final particle.

    b. **Tomodati-ga**   <u>zyup-pun-no   utini</u>   **huta-ri** odor-ta.
         friend-NOM   10-minutes-GEN within   two-CL dance-PST
         'Two friends danced in ten minutes.'   (Miyagawa 2012:88; 9b)

(2a) and (2b) have the same unergative verb *odor-* 'dance' and are identical except for the time adverbial. (2a) has an atelic interpretation due to the time-span adverbial *zyuppun* 'for ten minutes', while (2b) receives a telic interpretation due to the time-interval adverbial *zyuppun-no utini* 'in ten minutes'. The acceptability of (2b) suggests that VP-internal floating NQs can be licensed by unergative subjects in a sentence that denotes a telic event (Mihara 1998, Nakanishi 2007, 2008).

         In this paper, we maintain that the licensing of floating nominal modifiers (FNMs), such as NQs, is subject to syntactic factors. In particular, FNMs are sensitive to the base positions of their associates, as originally argued by Miyagawa (1989). However, we also argue that syntactic factors are not the sole determinant of the acceptability of sentences with FNMs. The licensing of FNMs is subject to at least two additional factors: (i) the derivational complexity of the sentence, and (ii) the lexical semantic properties of the modifiers. These three factors interact, and when they are in harmony, sentences are perfectly acceptable; when they pull in different directions, however, we find graded judgments and speaker variation. Our main evidence for this claim comes from the results of two formal acceptability judgment experiments with a set of nominal modifiers such as *nani-ka* 'something' or *dare-ka* 'someone', termed *Existential Indeterminate Pronominals* (EIPs):

(3)   a. **Kozutumi-ga**   ofisu-ni   **nani-ka**   todoi-ta
         package-NOM   office-LOC   what-Q   arrive-PST
         'Some package was delivered to the office.'
    b. **Gakusei-ga**   ofisu-ni   **dare-ka**   ki-ta
         student-NOM   office-LOC   who-Q   come-PST
         'Some student came to the office.'

The results of our experiments show that the licensing of VP-internal EIPs, like the licensing of VP-internal NQs, is affected by the derivational complexity of the sentence. This observation accounts for the similarity of the two constructions. However, EIPs and NQs are sensitive to different lexical semantic factors. The remainder of this paper develops our proposal that the licensing of FNMs is subject to multiple motivations. Section 2 presents several arguments in favor of the stranding approach to FNMs. Section 3 discusses the parallels between EIPs and NQs, and section 4 presents and analyzes our experimental evidence in support of the role of complexity and lexical semantics. Our conclusions are in Section 5.

2. Arguments for the "stranding" approach to floating NQs

Under Miyagawa's original (1989) proposal (henceforth the *stranding* approach), VP-internal floating NQs can be licensed by unaccusative subjects, but not by unergative subjects, because only unaccusative subjects can "strand" associated NQs inside VP. On the other hand, the contrast in (3) has motivated a hypothesis that VP-internal floating NQs are not derivationally related to their associate, but rather are licensed as base-generated event modifiers; as such, they are only indirectly linked to the associate. Under this latter approach (which we will refer to as the *adverbial* approach), the contrast in (3) obtains because NQs modify only telic events—only telic events can be individuated (Mihara 1998, Nakanishi 2007). In this section, we review some empirical evidence from the literature that supports the stranding approach.

         First, VP-internal floating NQs are sensitive to event types only when the subject is base-generated (Miyagawa 2012). For instance, passive subjects can license floating NQs even when the event is atelic. In (4a, b), the verbs *oikake-* 'chase' and *sikar-* 'scold' are activity verbs, thus denoting atelic events. The adverbial approach incorrectly predicts that examples like (4) should be unacceptable.

(4)   a. **Nezumi-ga** neko-ni **ni-hiki** oikake-rare-te   i-ru
         mouse-NOM cat-BY two-CL chase-PASS-GER be-PRS
         'Two mice are being chased by a cat.'

b. **Otoko-no   ko-ga**   roozin-ni   **hutari** sikar-are-te   i-ta
male-GEN   child-NOM   elderly-BY   two-CL scold-PASS-GER   be-PST
'Two boys were being scolded by an elderly person.'

Second, binding facts support the stranding analysis. As first discussed in Boskovič and Takahashi (1998), the associate of an NQ cannot bind an anaphor unless the associate and the NQ are adjacent to each other (see also Yamashita 2001, 2006, Fitzpatrick 2006 and Miyagawa 2006).

(5)   a. **Kyoozyu$_i$-ga**   **san-nin** zibun$_i$-no gakusei-no   tooku-ni   ki-ta
professor-NOM   three-CL self-GEN   student-GEN   talk-LOC   come-PST
b. *__Kyoozyu$_i$-ga__   zibun$_i$-no gakusei-no   tooku-ni   **san-nin** ki-ta
professor-NOM   self-GEN   student- GEN   talk-LOC   three-CL come-PST
'The three professors came to their students' talks.'

Under the assumption that the binder of an anaphor must be in an A-position, the associate must also be in an A-position in (5a). On the other hand, the unacceptable status of (5b), where the associate and the NQ are separated by the intervener, suggests that the associate is in an A'-position. We can capture the contrast in (5) by assuming that the associate in (5a) has A-moved together with the NQ, whereas the associate in (5b) has undergone A'-movement, stranding the NQ inside the VP.

Third, scope interactions among scope-bearing elements provide additional support for the stranding approach. Observe the following sentence from Miyagawa (2001):

(6)   Hon-o   zen'in-ga   yom-ana-katta-yo
book-ACC   all-NOM   read-NEG-PST-SFP
'Not all students read the book (you know).'
a. It is not the case that all students read the book (Neg > ∀)
b. For all students, it is the case that they did not read the book (∀ > Neg)

Miyagawa argues that (6) is ambiguous because the O-S-V order can be derived at least in two ways: by A-scrambling the direct object to [Spec, TP] (7a), or by A'-scrambling the direct object after the subject has moved to [Spec, TP] (7b).

(7)   a. [$_{TP}$ Object$_i$ [$_{vP}$ Subject [$_{VP}$ t_i V] v] NEG-T]
b. [$_{TP}$ Object$_k$ [$_{TP}$ Subject$_i$ [$_{vP}$ t_i [$_{VP}$ t_k V] v] NEG-T]]

In (7a), the universal quantifier subject *zen'in* 'all' is in [Spec, vP]. Assuming that negation is located above vP, it takes scope over the universal quantifier, generating the reading in (7a): Neg > ∀. In (7b), the subject first moves to [Spec, TP], followed by A'-scrambling of the direct object. Thus, the universal quantifier takes scope over negation, generating the *b* reading (∀ > Neg) (assuming that the subject does not undergo reconstruction). A similar ambiguity obtains for sentences with a floating NQ only if the associate and the NQ are fronted together (Yamashita 2001, 2006, Fitzpatrick 2006).

(8)   a. **Booru-ga   mit-tu** zen'in-ni   atar-ana-katta-yo
ball-NOM   3-CL   all-LOC   hit-NEG-PST-SFP
'Three balls didn't hit all (targets).'   (Fitzpatrick 2006: 119; (68))
(i) It is not the case that three balls hit all of the targets (Neg > ∀)
(ii) For all targets, it is the case that three balls did not reach them (∀ > Neg)
b. **Booru-ga** zen'in-ni   **mit-tu** atar-ana-katta-yo
ball-NOM   all-LOC   3-CL   hit-NEG-PST-SFP
'Three balls didn't hit all.'   (Fitzpatrick 2006: 119; (69))
(i) *It is not the case that three balls hit all of them (Neg > ∀)
(ii) For all, it is the case that three balls did not hit them (∀ > Neg)

The fact that (8b) only has the *universal > negation* scope interpretation suggests that an equivalent of (7b) is the only possible derivation for (8b). In other words, the unaccusative subject associate in (8b) has undergone A'-movement. Thus, the lack of ambiguity in (8b) provides additional support for the

stranding approach. The adverbial approach again fails to predict the difference in scope interactions between (8a) and (8b), since floating NQs and their associates are not derivationally related.

The contrast between unaccusative and unergative subjects in (1) still remains to be explained. Here, we argue, additional factors intervene. The configuration required for (1a) is derivationally simpler than the one required for (1b). For an unaccusative subject to strand an NQ VP-internally, only A'-movement of the associate is needed (9a). Meanwhile, for an unergative subject to strand an NQ behind a VP adverb, at least two instances of movement are needed: first, the fronting of the unergative subject, and second, the fronting of the VP adverb (9b):

(9) a. [**Gakusei-ga**]ᵢ   [$_{vP}$ [$_{VP}$ ofisu-ni [tᵢ   **go-nin**] ki]]   -ta
        student-NOMᵢ   [$_{vP}$ [$_{VP}$ office-LOC [tᵢ   5-CL]   come]] -PST
                                                                 ①   (= (1a))

     b. [**Gakusei-ga**]ₖ   [geragera-to]ᵢ [$_{vP}$ [$_{VP}$ [tₖ   **go-nin**] tᵢ   waraw]]   -ta
        student-NOMₖ   loudlyᵢ   [$_{vP}$ [$_{VP}$ [tₖ   **five-CL**] tᵢ   laugh]]   -PST
                                                                 ②   ①   (= (1b))

Furthermore, unergative sentences with VP-internal floating NQs are more acceptable if they denote telic events (as in (2) above). This is because telic events can be individuated, which makes the event-modifier interpretation of a floating NQ available (compare Nakanishi 2007 for a similar proposal).

In sum, licensing of FNMs is in principle syntactic in nature but is also subject to at least two non-syntactic factors: (i) derivational complexity and (ii) lexical semantic properties of modifiers. In what follows, we test these additional factors using another group of numeral modifiers: EIPs.

3. Existential Indeterminate Pronominals (EIPs)

Indeterminate pronominals in Japanese express different quantification forces depending on the co-occurring particle (Kuroda 1965, Nishigauchi 1990, Shimoyama 2006 among many others). Here, we will focus on indeterminate pronominals that express existential quantification with the particle *-ka*. We call them Existential Indeterminate Pronominals (EIPs). EIPs have received little attention in the literature (but see Hasegawa 1993, Watanabe 2006). In particular, the striking syntactic similarities between EIPs and NQs have previously escaped notice. Both NQs and EIPs (i) can co-occur with nominal expressions (associates), (ii) can precede or follow these associates, and (iii) can be separated from their associates. Importantly, when EIPs are stranded inside VPs, they appear to obey the same restrictions as VP-internal floating NQs: VP-internal floating EIPs associated with unergative subjects (10a) are degraded, but those associated with unaccusative subjects are readily licensed (10b).

(10) a. **Gakusei-ga** (**dare-ka**)   geragera-to   (#**dare-ka**)   waraw-ta
         student-NOM (who-Q)   loudly   (who-Q)   laugh-PST
         'Some student laughed loudly.'
      b. **Gakusei-ga** (**dare-ka**)   ofisu-ni   (**dare-ka**)   ki-ta
         student-NOM (who-Q)   office-LOC   who-Q   come-PST
         'Some student came to the office.'

These similarities between EIPs and NQs may be taken to suggest that EIP float also follows from A'-movement of the associates. However, testing this prediction is complicated. First, unaccusative subjects associated with EIPs can bind *zibun* 'self' only if they are in the sentence-initial position together with the EIPs, as in (11b).

(11) a. **Gakuseiᵢ-ga**   **dare-ka**   zibunᵢ-no   heya-ni   hair-ta
         student-NOM   who-Q   self-GEN   room-LOC   enter-PST
      b. *****Gakusei-ga**   zibunᵢ-no   heya-ni   **dare-ka**   hair-ta
         student-NOM   self-GEN   room-LOC   who-Q   enter-PST
         'Some student went into his/her room.'

While this observation is consistent with the hypothesis that EIP float involves A' associate movement, the test itself has a very limited application, since *zibun* 'self' requires an animate antecedent. Unfortunately, this condition is only met by one EIP, *dare-ka* 'someone'. Scope interactions between *zen'in* 'all' and negation are also inconclusive. Recall that scope readings are ambiguous in sentences where the associate and the NQ are both fronted, but only the reading *universal > negative* is available when the associate is fronted by itself (8). Sentences in which the EIP and its associate are both fronted are ambiguous, as expected (12a); unfortunately, fronting of the associate alone turns out to be unacceptable for reasons that we do not yet understand (12b).

(12) a. **Gakusei-ga dare-ka** <u>zenbu</u>-no   kurasu-ni   ko-ana-katta-yo
          student-NOM who-Q   all-GEN   class-LOC   come-NEG-PST-SFP
          'Some student did not come to all the classes.'
          (i) It is not the case that some student attended all the classes. (Neg > ∀)
          (ii) For all the classes, it is the case that some student did not come. (∀ > Neg)
      b. ***Gakusei-ga**   <u>zenbu</u>-no   kurasu-ni   **dare-ka** ko-ana-katta-yo
          student-NOM   all-GEN   class-LOC   who-Q   come-NEG-PST-SFP
          ('Some student from Taro's class did not come to all the classes.')

Thus, the A'-movement tests used to diagnose the associates of NQs do not produce clear results with EIPs. To further test their floating, we conducted formal acceptability judgment experiments that examined the predictions of our hypothesis.

4. Acceptability Judgment Experiments
4.1 Experiment 1

Experiment 1 examined our claim that licensing of FNMs is subject to derivational complexity. In particular, we tested whether the acceptability of floating EIPs is affected by the number of movement operations required. We manipulated both verb type (unaccusative vs. unergative) and the position of the intervener (VP-internal vs. VP-external adjunct). We selected only those verbs that have been identified as unaccusative or unergative by at least two diagnostics in previous studies. We use *-de* locative PPs as VP-internal adjuncts (cf. Koizumi 1994 and Mihara 1998) and *-de* cause PPs for VP-external adjuncts. The 'cause' adjunct takes scope over negation, which is below tense but above VP in Japanese (13a); the locative adjunct is under the scope of negation (13b).

(13) a. Taro-wa   Hanako-no   **kotoba-de**   gakko-o   yasum-ana-katta
          T-TOP   H-GEN   words-CAUSE   school-ACC   skip-NEG-PST
          'Taro did not skip school because of what Hanako said.' (Cause > Neg, *Neg > Cause)
      b. Taro-wa   **Hanako-no**   **soba-de**   hanasi-o si-ana-katta
          T-TOP   H-GEN   near-LOC   talk-ACC do-NEG-PST
          'Taro did not speak near Hanako.' (Neg > Loc, *Loc > Neg)

With unaccusative verbs, examples with floating EIPs are predicted to be as acceptable as their non-floating counterparts, regardless of the position of the intervening adverb, because all these derivations require only one movement.

(14) a. [**Gakusei-ga**   **dare-ka**]$_i$ [[$_{VP}$ <u>kaidan-de</u>   t$_i$ korob]] -ta
          [student-NOM   who-Q]$_i$ [[$_{VP}$ stairs-LOC   t$_i$ fall]]   -PST
                                                                                        ①

      b. [**Gakusei-ga**]$_i$ [[$_{VP}$ <u>kaidan-de</u>   t$_i$ **dare-ka**   korob]] -ta
          [student-NOM]$_i$ [[$_{VP}$ stairs-LOC   t$_i$ who-Q   fall]]   -PST
                                                              ①

(15) a. [**Kagu-ga**   **nani-ka**]$_i$ [$_{vP}$ <u>zisin-de</u>   [$_{VP}$ t$_i$ taore]]-ta
          [furniture-NOM   what-Q]$_i$ [$_{vP}$ earthquake-CAUSE   [$_{VP}$ t$_i$ fall]]-PST
                                                                                    ①

b. **[Kagu-ga]**$_i$ [[$_{vP}$ zisin-de [$_{VP}$ t$_i$ **nani-ka** taore]]-ta
[furniture-NOM]$_i$ [[$_{vP}$ earthquake-CAUSE [$_{VP}$ t$_i$ what-Q fall]]-PST
①

Likewise, examples with unergative verbs and a VP-external adjunct are predicted to be equally acceptable with a floating or non-floating EIP, since they also involve only one movement.

(16) a. **[Gakusei-ga dare-ka]**$_i$ [$_{vP}$ kazi-de [$_{vP}$ t$_i$ [$_{VP}$ nige]] -ta
[student-NOM who-Q]$_i$ [$_{vP}$ fire-CAUSE [$_{vP}$ t$_i$ [$_{VP}$ escape]]-PST
①

b. **[Gakusei-ga]**$_i$ [$_{vP}$ kazi-de [$_{vP}$ t$_i$ **dare-ka** [$_{VP}$ nige]] -ta
[student-NOM]$_i$ [$_{vP}$ fire-CAUSE [$_{vP}$ t$_i$ who-Q [$_{VP}$ escape]]-PST
①

With a VP-internal adjunct, however, the prediction is different. Examples with a non-floating EIP are expected to be relatively more acceptable than examples with a floating EIP, because the latter operation involves greater derivational complexity. While examples with a non-floating EIP require only one movement (17a), examples with a floating EIP require at least two instances of movement: (i) fronting of the VP-internal adjunct, and (ii) subject fronting (17b).

(17) a. **[Gakusei-ga dare-ka]**$_i$ [$_{vP}$ t$_i$ [$_{VP}$ kaidan-de sawag]] -da
[student-NOM who-Q]$_i$ [$_{vP}$ t$_i$ [$_{VP}$ stairs-LOC make_noise]] -PST
①

b. **[Gakusei-ga]**$_k$ [$_{vP}$ [kaidan-de]$_i$ [$_{vP}$ t$_k$ **dare-ka** [t$_i$ sawag]] -da
[student-NOM]$_k$ [$_{vP}$ [stairs-LOC]$_i$ [$_{vP}$ t$_k$ who-Q [t$_i$ make_noise]] -PST
② ①

In sum, we predict a contrast in acceptability between the floating and non-floating (adjacent) conditions in sentences with unergative verbs and a VP-internal adjunct.

4.1.1 Design

The experiment was an acceptability judgment task using a 7-point Likert scale. The 2 x 2 x 2 design manipulated (i) VERB TYPE (unaccusative vs. unergative), (ii) STRANDING (adjacent (non-floating) vs. floating), and (iii) ADJUNCT TYPE (VP-internal vs. VP-external adjunct). The experimental sentences were constructed using five unaccusative verbs (*moe-* 'burn1', *ware-* 'break', *yake-* 'burn2', *katamuk-* 'tilt', *korob-* 'tumble') and five unergative verbs (*nige-* 'escape', *sakeb-* 'shout', *asob-* 'play', *dekake-* 'go out', *sawag-* 'make noise'), with four lexicalizations for each verb. The resulting 160 experimental sentences (10 verbs x two stranding conditions x two adjunct types x 4 lexicalizations) were distributed into four different sets using the Latin Square design; the resulting four lists were mixed with forty fillers and pseudo-randomized. The experiment was presented in a paper-and-pencil format. Due to limited space, we only present schematic examples of the experimental sentences below.

(18) a. **Subject** **EIP** VP-internal adjunct unaccusative/unergative
b. **Subject** VP-internal adjunct **EIP** unaccusative/unergative
c. **Subject** **EIP** VP-external adjunct unaccusative/unergative
d. **Subject** VP-external adjunct **EIP** unaccusative/unergative

All the unergative verbs were presented with the animate EIP *dare-ka* 'someone' because they require animate subjects. Four of the unaccusative verbs (*moe-* 'burn1', *ware-* 'break', *yake-* 'burn2' and *katamuk-* 'tilt') were presented with the inanimate EIP *nani-ka* 'something'; the unaccusative verb *korob-* 'tumble' was paired with *dare-ka* 'someone' because the verb is more natural with animate subjects.

4.1.2   Results and discussion

The experiment was conducted at Kansai Gaidai University in Osaka, Japan and Daito Bunka University in Tokyo, Japan, with 78 students participating. The raw ratings were z-score transformed prior to analysis and then analyzed using linear mixed-effects models using VERB TYPE, STRANDING and ADJUNCT-TYPE as fixed factors and participants and items as random factors. Two planned pairwise comparisons were also conducted to isolate the effect of STRANDING and ADJUNCT-TYPE within each of the verb types. All *p*-values were estimated using the MCMC method implemented in the languageR package for R (Baayen 2007, Baayen et al. 2008).

Figures 1 and 2 show the results of the pairwise analysis of the mean acceptability of the stimuli with unergative and unaccusative verbs. Figure 1 shows that STRANDING was a significant predictor of acceptability for the unergative sentences with a VP-internal adjunct (p <.01). However, STRANDING was not a significant predictor for unergative sentences with a VP-external adjunct (p = .27). Figure 2 shows that STRANDING came close to significance with unaccusative verbs with the VP-external adjunct (p =.09), but was not a significant factor with VP-internal adjuncts (p =.27). Based on the assumption that the floating configuration with an unergative subject and a VP-internal adjunct is the only condition to require at least two movements, these results support our predictions.
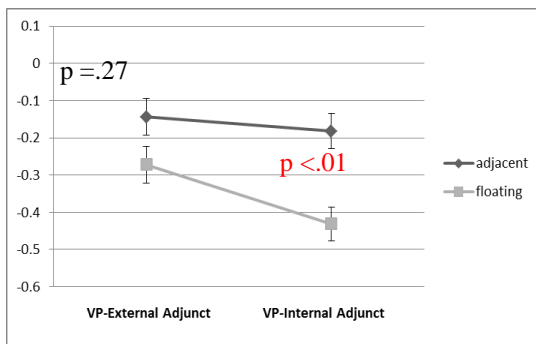
Figure 1: The effect of STRANDING and ADJUNCT-TYPE with unergative verbs
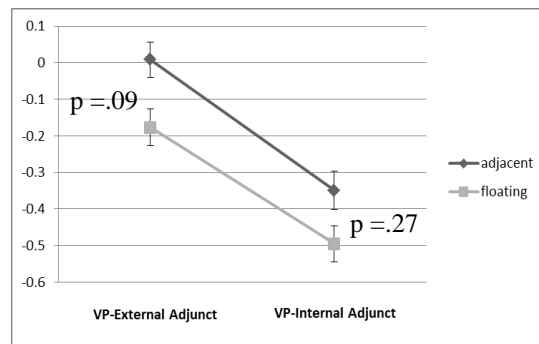
Figure 2: The effect of STRANDING and ADJUNCT- TYPE with unaccusative verbs

While the results of Experiment 1 largely bear out our predictions, there are outstanding issues. First, the mean acceptability of the unaccusative/VP-external-adjunct sentences was significantly higher than the mean of the unaccusative/VP-internal-adjunct sentences (p < .01); we hypothesize that this may be due to incompatibility between the unaccusative verbs used in the experiment and the locative PPs that were used as VP-internal adjuncts. Second, animacy could be a potential confounding factor. Given that the unergative sentences always had the animate EIP *dare-ka* 'someone', it is possible that the significant difference found for the unergative sentences with VP-internal floating EIPs was somehow due to the animate EIP *dare-ka* 'someone' being incompatible with a VP-internal position. These issues were addressed in Experiment 2.

4.2 Experiment 2

Experiment 2 examined the role of animacy and event telicity in EIP licensing. We used three unaccusative verbs that have been claimed to denote atelic events to test the effect of event telicity on EIP licensing: *more-* 'leak', *nagare-* 'flow' and *tare-* 'droop' (Tsujimura to appear). For unergatives, we used *waraw-* 'laugh', *sawag-* 'make noise', *nige-* 'escape', *abarer-* 'act violently', *odor-* 'dance' and *hasir-* 'run'. If telicity is a determining factor for licensing of floating nominal modifiers in general, VP-internal floating EIPs are predicted to be unacceptable with these verbs regardless of the nature of the intervener. We also examined the effect of animacy on EIP licensing with unaccusative verbs. The three verbs listed above were presented with the inanimate EIP *nani-ka* 'something', while three other unaccusative verbs (*oti-* 'fall', *hair-* 'enter', and *ki-* 'come') were presented with the animate EIP *dare-ka* 'someone'. If the additional differences found in Experiment 1 were due to the incompatibility of animate EIPs with the VP-internal position, we should expect that VP-internal

floating animate EIPs will not be licensed with unaccusative verbs either. Finally, we used a variety of different VP-external and VP-internal adjuncts that are compatible with the individual unaccusative and unergative verbs in Experiment 2 to avoid potential interpretative conflicts.

4.2.1 Design

Just like Experiment 1, Experiment 2 was an acceptability judgment task using a 7-point Likert scale, and was also presented in a paper-and-pencil format. All the experimental sentences had two conditions: VERB TYPE (unaccusative vs. unergative) and STRANDING (adjacent/stranded by a VP-external adjunct/stranded by a VP-internal adjunct). The unaccusative examples also varied by ANIMACY (the animate *dare-ka* vs. the inanimate *nani-ka*). In order to keep the number of experimental sentences reasonably small, sentences with the adjacent condition had both VP-external and VP-internal adjuncts (19). From these sentences, two floating conditions were constructed by placing the EIP either behind a VP-external adjunct (20a and 21a) or behind a VP-internal adjunct (20b and 21b). With four lexicalizations for each of the twelve verbs, there were a total of 144 experimental sentences (12 verbs x 3 conditions x 4 lexicalizations). Unlike Experiment 1, in which the experimental sentences were presented as independent sentences, the experimental sentences were presented as the complements of bridge verbs (*iw-* 'say', *omow-* 'think', *hookokus-* 'report', *syoogens-* 'testify', *kobos-* 'complain', and *hungais-* 'express anger'). They were distributed into four different lists using the Latin Square design and then mixed with 48 fillers. The order of presentation was pseudo-randomized. The following are schematic examples of the experimental sentences.

(19)   VP-ext. adjunct   **Subject EIP**   VP-int. adjunct   unaccusative/unergative
(20)   a.   **Subject**   VP-ext. adjunct   **EIP**   VP-int. adjunct   unaccusative verb
       b.   VP-ext. adjunct   **Subject** VP-int. adjunct   **EIP**   unaccusative verb
(21)   a.   **Subject**   VP-ext. adjunct   **EIP**   VP-int. adjunct   unergative verb
       b.   VP-ext. adjunct   **Subject** VP-int. adjunct   **EIP**   unergative verb

4.2.2 Results and discussion

The experiment was conducted at Gifu University, with 58 student participants. The data were analyzed in the same way as Experiment 1. Figure 3 shows the results of the analysis for the unergative sentences. The difference between the adjacent and the floating conditions was significant with both types of adjuncts, VP-external ($p < .01$) and VP-internal ($p < .01$). A pairwise comparison between the two adjunct types showed that the difference between VP-external and VP-internal adjuncts was also significant ($p < .01$). The results with the unaccusative sentences were divided into two sets by ANIMACY and pairwise comparisons were performed in order to examine the effect of STRANDING within each condition. Figure 4 on the next page shows the results of the pairwise comparisons for unaccusatives with the animate EIP *dare-ka* 'someone'. The adjacent condition was significantly different from both of the floating conditions (VP-external adjunct: $p = .01$; VP-internal adjunct: $p < .01$). However, the VP-external and the VP-internal adjunct conditions were not significantly different ($p = .08$). Figure 5 (also on the next page) shows the results of the pairwise comparisons for unaccusatives with the inanimate EIP *nani-ka* 'something'; these are the sentences with the verbs of substance emission.

Figure 3: The results with unergative verbs

Similar to the results with the animate *dare-ka* 'someone', the difference between the adjacent condition and the two floating conditions was significant (VP-external: $p = .03$; VP-internal: $p = < .01$), but the two floating conditions were not significantly different from each other ($p = .21$).

There are three main findings from Experiment 2. First, unlike Experiment 1, the difference between the adjacent condition and the floating conditions was significant regardless of VERB TYPE.
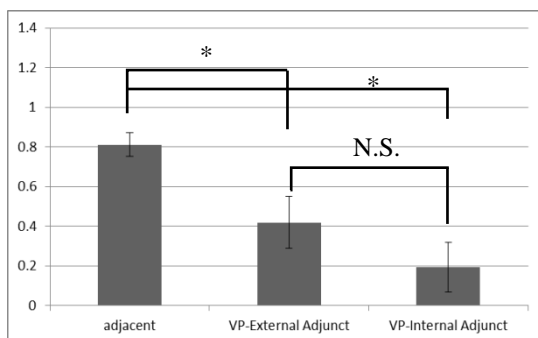
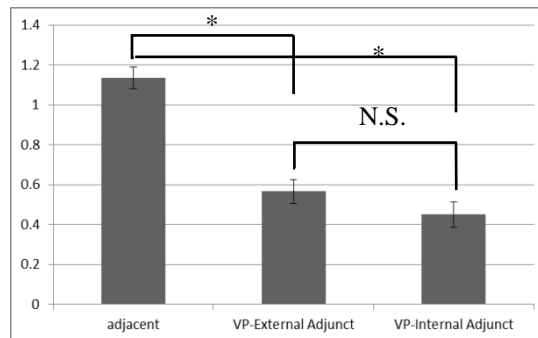Figure 4: The results with unaccusative verbs with *dare-ka* 'someone'

Figure 5: The results with unaccusative verbs with *nani-ka* 'something'

We speculate that this might be due to a difference in processing costs associated with A- vs. A'-movement. Under the proposed analysis, the adjacent condition involves A-movement of the associate and the EIP together, while the floating conditions involve A'-movement of the associate alone. Given the claim in the literature that there are extra processing costs associated with A'-scrambling (Miyamoto and Takahashi 2002a, 2002b, Ueno and Kluender 2003, Makuchi et al. 2013), it is possible that the derivation involving A'-movement (=the floating condition) incurs a higher processing cost than the one involving A-movement (=the adjacent condition), even though both derivations require only a single movement. This was amplified in Experiment 2 because the experimental sentences were presented as embedded sentences. Since the difference between the adjacent condition and the two floating conditions was significant across the board, we use the differences between the two floating conditions to compare the different verb types in the rest of the discussion.

Experiment 2 also showed that the subjects of the substance emission verbs were as good licensors of floating EIPs as the subjects of the three other unaccusative verbs. Verbs of substance emission denote atelic events, while *oti* 'fall', *hair* 'enter' and *ki* 'come' denote telic events; thus this result suggests that telicity is not a determining factor in the licensing of floating EIPs. Finally, the results of Experiment 2 showed that the difference between the two floating conditions was significant only with unergative verbs. Thus, unaccusative subjects appear to be better licensors of VP-internal floating EIPs than unergative subjects are, even when the EIP is animate (*dare-ka* 'someone'). However, we also uncovered a subtle effect of animacy on the acceptability of sentences with VP-internal floating EIPs. A visual inspection of the results shown in Figure 3, 4 and 5 suggests that the ratings of the unaccusative verbs with the animate *dare-ka* 'someone' appear somewhere between the ratings of the unergative verbs and the ratings of the unaccusative verbs with the inanimate *nani-ka* 'someone'. In fact, pairwise comparisons between the two groups of unaccusative verbs revealed a significant difference only in the VP-internal floating condition (p =.01). Thus, animacy may still play a role in the licensing of floating EIPs, but to a lesser degree than the role played by telicity in the licensing of floating NQs.

5. Conclusion

In this paper, we contrasted several analytical approaches to floating nominal modifiers (FNMs) such as numeral quantifiers, and argued in favor of an A'-movement (stranding) analysis in the general spirit of Miyagawa's (1989) account. We also proposed a multi-factor approach to FNMs, in which the integration of syntactic stranding is reinforced or weakened by the complexity of derivation and additional semantic effects. In particular, we hypothesized that the contrast in the ability of unaccusative and unergative subjects to license VP-internal FNMs reflects the complexity of the derivation of the relevant structures. We also hypothesized that the lexical semantic properties of FNMs can affect acceptability, which is not unexpected given the known effect of telicity on licensing of quantifier float. To establish evidence for our proposals, we investigated the as-yet-unexplored parallels between floating quantifiers and floating existential indeterminate pronominals (EIPs). We tested our hypotheses in two formal acceptability judgment studies that examined the licensing of floating EIPs. Our results confirmed that unaccusative subjects are better licensors of VP-internal floating EIPs than unergative subjects are. We also found subtle animacy effects; in particular, as far as

VP-internal material is concerned, the floating animate EIP (*dare-ka* 'someome') appears to be harder to license than the inanimate EIP (*nani-ka* 'something'). Our results further support the conception that FNM licensing is a valid diagnostic for unaccusativity in Japanese while highlighting the importance of controlling for the lexical/semantic properties of FNMs when using them in diagnostic tests.

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