Countable Nouns and Classifiers in Japanese

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Outline:

§1 Argue against the view that the semantics of nouns is (partly) responsible for obligatory classifiers in Japanese. (I don't have much to say about other obligatory classifier languages)

§2 Pursue the alternative idea that classifiers are required because of the numerals.

1 Against the (Popular) View on Nouns and Classifiers in Japanese

- Nominals in classifier languages like Japanese have the following properties:
  - Cannot combine directly with numerals; classifiers are obligatory (we'll talk about exceptions).

    (1) 一*(輪)の 花
    ichi-***(rin)**-no hana
    one-CL-GEN flower
    'one flower'

  - No (obligatory) number-marking, e.g. the same noun as (1) is used in the following examples.

    (2) 五輪の 花
    go-**rin**-no **hana**
    five-CL-GEN flower
    'five flowers'

    (3) たくさんの 花
    takusan-no hana
    a.lot-GEN flower
    'a lot of flowers'

  - (Bare nouns can denote kinds; Krifka 1995, Chierchia 1998a,b)

- **Popular view on the semantics of nouns and classifiers**:[1]
  - The denotations of nouns in obligatory classifier languages are incompatible with 'counting', and hence incompatible with direct modification by numerals.
  - The function of classifiers is to turn such denotations into countable ones. Consequently, *CL+NP* is semantically compatible with a numeral.

- NB: This is independent from the issue of mass vs. count noun denotations. It is widely believed by now that obligatory classifier languages make a semantic mass/count distinction in nouns, contra Denny 1986, Lucy 1992 (see Bale & Barner 2009, Inagaki & Barner 2009, Li, Dunham & Carey 2009, Doetjes 2012, among many others; See also the data in §§1.2–1.3).
- Appeals:
  - The analogy to mass nouns in English and other languages is often made, which are also unable to directly combine with numerals.

[1] See Borer (2005), Bunt (1985), Chierchia (1998a,b, 2010), Krifka (2008), Li (2011), Nemoto (2005), Rothstein (2007), Scontras (2013, 2014), etc. The details of the theories vary greatly, and the literature is so copious that we can't possibly mention all, let alone review them individually.

- The lack of (obligatory) number-marking on nouns in Japanese, Korean, Chinese, etc. is also suggestive: if nouns themselves are incompatible with counting, there shouldn't be singular or plural marking on the nouns themselves (But Japanese actually does have non-associative plural nouns; see Appendix).[2]

- I would like to challenge this view, and argue that **Japanese nouns denoting countable objects have denotations that are semantically compatible with direct modification with counting modifiers**, just as their English counterparts (See Watanabe 2006, Cheng & Sybesma 1999, Bale & Barner 2009 for similar views).[3]
- My arguments are based on the following observations in Japanese:

> §1.1 Numerals with optional classifiers
>
> §1.2 Counting modifiers *without* classifiers
>
> §1.3 Quantifiers with quantity vs. counting readings

1.1 Some numerals do not require classifiers

- With certain numbers (typically, large, approximate/round numbers) classifiers are often omitted (in a formal speech style). Some examples from the web:

(4) データは 約 1000の レイヤーに 分けられ、 ...
deeta-wa yaku **sen-no** reiyaa-ni wakerare, ...
data-TOP about 1000-GEN layer-into get.divided, ...
'The data are divided into about 1000 layers, and ...'[4]

(5) 地球上には 約 1500の 火山が ある
chikyuu-joo-ni-wa yaku **sen-go-hyaku-no** kazan-ga aru.
earth-on-LOC-TOP about 1000-5-100-GEN volcano-GEN exist
'There are about 1500 volcanos on earth.'[5]

  - **Other languages:** Relatedly, Bale & Coon (2014) observe that in Mi'gmaq (Eastern Algonquian) and Chol (Mayan), both of which are classifier languages, certain numerals require classifiers, while others are incompatible with them.
  - **Open issue**: It seems that in Japanese classifiers cannot be omitted when the numeral denotes a small and precise number or when the noun denotes humans. I have no quantitative data or formal account of these alleged restrictions at this point.

- (5) can be seen as suggesting that nouns like *reiyaa* (レイヤー) 'layer' and *kazan* (火山) 'volcano' have denotations that can directly combine with numerals. Then they must be compatible with counting.
- There are of course other analytical possibilities, e.g. there is a phonologically null classifier that only combines with approximate numerals, so (5) might not be a very strong argument.

[2] Cf. the **Sanches-Greenberg-Slobin Generalisaion**, which which states that languages with obligatory classifiers have no obligatory number marking on nouns (Doetjes 2012:§3). This is about obligatory number marking, and could well be a morpho-syntactic issue, about which I have little to say. Also, it should be noted that obligatory classifier languages with optional number-marking on nouns are also known, e.g. Yucatec (Mayan).

[3] I don't have much to say about morphosyntactic constraints requiring classifiers, e.g. Cheng & Sybesma 1999, Watanabe 2006; but I'm not sure if we need such constraints to begin with.

[4] `http://newswitch.jp/p/554`

[5] `http://www.47news.jp/47topics/e/257733.php`

1.2 Counting modifiers without classifiers

- There are (vague) counting expressions that do not involve classifiers:
  - **tasuu** (多数) 'many', **shoosuu** (少数) 'a few'

    (6) 昨日の 事故では 多数の 死者が 出た ようだ
    kinoo-no jiko-de-wa **tasuu**-no sisha-ga deta yooda
    yesterday-GEN accident-LOC-TOP many-GEN fatality-NOM came.out EVID
    'It seems that the accident yesterday resulted in many fatalities.'

    (7) 少数の 裕福な 人のみが 優遇されている
    shoosuu-no yuufukuna hito-nomi-ga yuuguusareteiru
    a.few-GEN wealthy person-only-GEN be.treated.well
    'Only a few wealthy people are treated well.'

  - **nan-byaku-toiuu** (何百という) 'hundreds', **nan-zen-toiuu** (何千という) 'thousands'

    (8) その 投稿に 何百という コメントが ついた
    sono tookoo-ni **nan-byaku-toiuu** **komento**-ga tsuita.
    that post-TO what-100-say comment-NOM provided
    'That post got hundreds of comments.'

- These modifiers are only compatible with nouns denoting countable objects:

  (9) # 太郎は 多数の 汗を かいた
  # Taro-wa **tasuu**-no ase-o kaita
  Taro-TOP many-GEN sweat-ACC secreted
  (intended) 'Taro sweated a lot.'

  (10) # 太郎は 何百という 汗を かいた
  # Taro-wa **nan-byaku-toiuu** ase-o kaita
  Taro-TOP what-100-say sweat-ACC secreted
  (intended) 'Taro sweated a lot.'

  Other modifiers, such as *takusan* (たくさん) 'a lot' and *tairyoo* (大量) 'a large amount of' that are insensitive to mass/count can be used here instead.

- Relatedly, Watanabe (2006) points out that the admonimal *wh*-determiner *dono* (どの) 'which' requires a count noun:

  (11) どの家も とても 古い
  dono-ie-mo totemo furui.
  which-house-MO very old
  'Every house is very old.'

  (12) # どの汗も 洗い流した
  # **dono-ase-mo** arainagashita
  which-sweat-MO washed.off
  (intended) '(I) washed off all the sweat.'

- The most straightforward way of understanding these data is to assume that some nouns (such as *sisha* (死者) 'fatality') are semantically countable and others (such as *ase* (汗) 'sweat') are not, just as in English.[6]
- Again, one could insist that these modifiers involve 'unpronounced classifiers', but that would be *ad hoc*, as it would not exclude the possibility of numerals that had unpronounced classifiers. Or to put it differently, the semantic explanation of obligatory classifiers would be lost, because the unacceptability of numeral+noun with no classifier (in typical cases, that is) would be based on nothing but lexical stipulation.
- Alternatively, one could concede that count nouns have countable denotations that the above modifiers can act on, but assume that they are nonetheless not of the right type for

[6]The above data might be problematic for a view like Cheng & Sybesma's 1999 that the mass/count distinction in obligatory classifier languages is encoded only in classifiers, as the above modifiers are sensitive to the mass/count properties of the nouns, which they predict to not exist.

numerals (e.g. because they are number neutral) and classifiers have non-trivial semantic functions (cf. Krifka 2008). This is coherent, but again, the semantic explanation of obligatory classifiers would be lost, because one could easily define the denotations of numerals that wouldn't require classifiers.

1.3 Quantifiers with quantity vs. counting interpretations

- Proportional quantifiers are compatible both with mass and count nouns and are incompatible with classifiers.
- With count nouns, they give rise to counting-based interpretations.

(13) 太郎は ほとんどの 本を 読んだ
Taro-wa **hotondo**-no hon-o yonda.
Taro-TOP most-GEN book-acc read
'Taro read most of the books.'

  - The only available interpretation of (13) is 'Taro read most of the books', and cannot mean 'Taro read most of the book' (Sauerland & Yatsushiro 2004). In particular, it presupposes that there are multiple books.[7]
  - And the truth-conditions are based on the number of books (just as in English). E.g., if there are 10 books, the sentence entails Taro have read 7–9 of them, *regardless of their lengths*.

(14) There are 10 books, Book 1, Book 2, ..., Book 10. Book 1 is 500 page long, Book 2 is 190 page long, Book 3 is 100 page long, and Books 4–10 are 30 page long each.
  a. **Situation 1** (quantity-based): **FALSE**
  Taro read Books 1, 2, and 3. (So he read 790 pages out of 1000)
  b. **Situation 2** (count-based): **TRUE**
  Taro read all the short books, Books 4–10 (So he read 210 pages out of 1000).

- With mass nouns, proportional quantifiers can have quantity-based interpretations. Note that the count-based interpretation is also possible, in an appropriate context (which is quite similar to the mass-to-count elasticity in English, e.g. *two beers*; cf. Inagaki & Barner 2009).[8]

(15) 太郎は ほとんどの 水を 飲んだ
Taro-wa **hotondo**-no mizu-o nonda
Taro-TOP most-GEN water-ACC drank
'Taro drank most of the water(s).'

(16) There are 10 glasses of water, Glass 1, Glass 2, ..., Glass 10. Glass 1 contains 500 ml of water, Glass 2 190 ml, Glass 3 is 100 ml, and Glass 4–10 contain 30 ml each.
  a. **Situation 1** (quantity-based): **TRUE**
  Taro drank the water in Glasses 1, 2, and 3. (So he drank 790 ml out of 1l)
  b. **Situation 2** (count-based): **TRUE**
  Taro drank the water in Glasses 4–10 (So he drank 210 ml out of 1l).

- Inagaki & Barner (2009) make essentially the same observations using comparatives (based on Barner & Snedeker 2005; see also Cheung, Li & Barner 2012 for Mandarin Chinese). The subjects of their experiments were presented pictures of two people, one with a big N and one with a lot of small N's and asked:

[7] Interestingly, the latter interpretation can be expressed in a different word-order, as Sauerland & Yatsushiro (2004) point out. Furthermore, it would also be true in Situation 1 in (14a). This is left undiscussed today.

[8] There's also a 'sub-kind' reading, where what is quantified is a different kind; This interpretation is more prominent with nouns like *biiru* (ビール) 'beer'.

(17) どちらの 人が より多くの Nを 持っている でしょう？
dochira-no hito-ga yori-ooku-no N-o motteiru deshoo?
which-GEN person-NOM more-lot-GEN N-ACC have Q
'Which person has more N?'

Their results indicate:

- Nouns that denote countable objects—e.g. *kutu* (靴) 'shoe', *roosoku* (ろうそく) 'candle', *kagu* (家具) 'furniture', etc.—give rise to count-based interpretations.
- Nouns that denote mass-y objects—e.g. *karashi* (からし) 'mustard', *ketyappu* (ケチャップ) 'ketchup', hamigakiko (歯磨き粉) 'toothpaste'—give rise to quantity based interpretations.
- Nouns that can be either—e.g. *himo* (紐) 'string', *kami* (紙) 'paper', etc.—give rise to count-based interpretations about 50% of the time.

- These observations strongly suggest that the meanings of the count nouns already encode what counts as one unit and are inherently compatible with counting. In particular, since proportional quantifiers and comparatives are compatible with the quantity interpretation as well, it cannot be the modifiers that trigger the (obligatory) count-based interpretation.

1.4 Section Summary and Outlook

1. Some noun denotations are countable (e.g. *hon* (本) 'book'), others are uncountable (e.g. *ase* (汗) 'sweat'), and perhaps still others can be used in either 'mode' (elasticity) (e.g. *mizu* (水) 'water'). (see Cheng & Sybesma 1999, Watanabe 2006, Cheng, Doetjes & Sybesma 2008, Bale & Barner 2009 for similar views).
2. If so, the function of classifiers should *not* be to turn a uncountable noun denotation into something countable.

2 Numerals and Classifiers in Japanese

- We concluded that Japanese has count nouns that are semantically compatible with 'counting'. Then, why is it that classifiers are (usually) obligatory in this language?

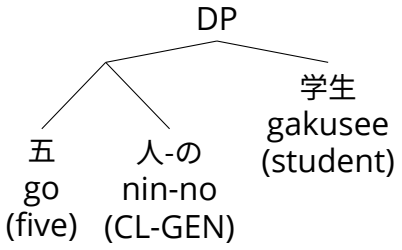
- **Rough idea**
  - **Classifiers are (usually) required in Japanese, because of the properties of numerals**, not because of the properties of the nouns (see Bale & Coon 2014 for a similar view; see also Krifka 1995).
  - Empirical support: Numerals, which require classifiers, cannot function as predicates, while those counting modifiers that don't require classifiers can.

2.1 Denotations of Numerals and Classifiers

- I assume the structure like (18), where the numeral and classifier form a constituent to the exclusion of the noun (cf. Tang 1990, Fukui & Takano 2000, Watanabe 2006), although nothing crucial hinges on this assumption.[9]

[9] Doetjes (2012) discusses some evidence that classifiers and nouns should form a constituent, at least in some classifier languages (that are not Japanese).

(18)



- Numerals in Japanese always denote numbers (of type n), which are non-predicative/functional singular terms on a par with individuals. Consequently, they cannot function as modifiers by themselves (unlike in English and other languages; see below).
- The main function of classifiers is to turn numbers (of type n) into modifiers (of type $\langle e, t \rangle$).
- E.g.: the classifier for humans, *-nin* (人) can be analyzed as (19) with the sortal restriction being a presupposition.[10]

  (19) $[\![\text{-nin}]\!] = \lambda n.\, \lambda x\colon\ ^{*}\mathbf{human}(x).\, |\{\, y \sqsubseteq x \mid \mathbf{human}(y)\,\}| = n$

  N+nin modifies a noun intersectively via type-shifting/Predicate Modification (Heim & Kratzer 1998, Rothstein 2013).[11]
- According to this idea, classifiers encode the unit of counting. In the case of *-nin* in (19), what is count is humans. Classifiers like *kumi* (組) 'pair', *daasu* (ダース) 'dozen', etc. are anallyzed as (20).

  (20) a. $[\![\text{-kumi}]\!] = \lambda n.\, \lambda x.\, |\{\, y \sqsubseteq x \mid \#(y) = 2\,\}| = n$
  b. $[\![\text{-daasu}]\!] = \lambda n.\, \lambda x.\, |\{\, y \sqsubseteq x \mid \#(y) = 12\,\}| = n$ where $\#(z) = |\{\, a \in AT \mid a \sqsubseteq z\,\}|$
- More examples:

  (21) a. $[\![\text{-rin}]\!] = \lambda n.\, \lambda x\colon\ ^{*}\mathbf{flower}(x).\, |\{\, y \sqsubseteq x \mid \mathbf{flower}(y)\,\}| = n$
  b. $[\![\text{-hiki}]\!] = \lambda n.\, \lambda x\colon\ ^{*}\mathbf{small}(x) \wedge\ ^{*}\mathbf{animal}(x).\, |\{\, y \sqsubseteq x \mid \mathbf{animal}(y)\,\}| = n$

2.2 Supporting Data

- **Observation**: Numerals in Japanese cannot function as predicates on their own. They need to combine with classifiers. Those counting modifiers that don't require classifiers can function as predicates by themselves.
  - **Baseline**: Numerals can appear bare in identificational sentences.

    (22) 学会開催に 必要な 学生の 数は 15だ
    gakkai-kaisai-ni hitsuyoona gakusee-no kazu-wa juu-go-da.
    conference-hosting-DAT necessary student-GEN number-TOP 10-5-COP
    'The number of students necessary to host a conference is fifteen.'

    (23) 2足す2は 4だ
    ni-tasu-ni-wa yon-da.
    2-plus-2-TOP 4-COP
    'Two plus two is four.'
  - If the subject does not denote a number, a classifier is required (or it'll receive an age interpretation, which I ignore here; see Watanabe 2012).

[10] See McCready (2009) for a view that the sortal restrictions of classifiers are conventional implicatures.

[11] Of course, something must be said about non-upward monotonic modified numerals due to Van Bentham's problem. Due to complications observed by Buccola & Spector (2015), I will not solve this problem here, but their approach with an independent maximality operator is compatible with the intersective semantics proposed here.

(24) 学会開催に 必要な 学生は 15*(人)だ
gakkai-kaisai-ni hitsuyoona gakusee-wa juu-go*(-nin)-da.
conference-hosting-DAT necessary student-TOP 10-5*(-CL)-COP
(lit.) 'The students necessary for hosting a conference is fifteen.'

(25) お客さんは 4*(人)だ
okyakusan-wa yo*(-nin)-da.
guest-top 4(-CL)-COP
'The guests are four.'

- Those modifiers that do not require classifiers can function as predicates without classifiers, including approximate, large numerals.

(26) このうち これまで 不正アクセスの 被害を 受けた
kono-uchi koremade fusei-akusesu-no higai-o uketa
this-among so.far unauthorised-access-GEN damage-ACC received
アカウントは 約 1500だ
akaunto-wa **yaku** **sen-go-hyaku**-da.
account-TOP about 1000-5-100-COP
'Among these, so far, about 1500 accounts have had unauthorised access.'

(27) ヘブライ語を 話せる 日本人は ごく 少数だ
heburai-go-o hanas-eru nihon-jin-wa goku **shoosuu**-da
Hebrew-language-ACC speak-can Japanese-person-TOP extremely few-COP
'Japanese people who speak Hebrew are very rare.'

(28) 本当の ことを 知らない 人が ほとんどだ
hontoo-no koto-o shir-anai hito-ga **hotondo**-da.
truth-GEN thing-ACC know-NEG person-NOM most-COP
'People who don't know the truth are the majority.'

- Japanese numerals' inability to function as predicates (and their contrast with counting modifiers that don't require classifiers) suggests that their denotations are not of a predicational type, and classifiers turn them into predicates (of type $\langle e, t \rangle$).

2.3 English and Other Non-Classifier Languages

- In English, numerals can function as modifiers, and also as predicates (Rothstein 2013). (We are not interested in the age interpretation):

(29) a. Soon we will be three.
b. The reasons are four.

- **Conjecture**: Numerals in non-classifier languages like English can function as predicates/modifiers on their own (cf. Rothstein 2013, Ionin & Matushansky 2006).
- But it seems that there are some constraints (at least in English; thanks to Martin Hackl, p.c.). This problem is left open here.

(30) a. *The guests look three.
b. *The guests look many.

2.4 Type-Shifting

- Classifiers can optionally be used in (31).

(31) 学会開催に 必要な 学生の 数は 15(人)だ
gakkai-kaisai-ni hitsuyoona gakusee-no kazu-wa juu-go(-nin)-da.
conference-hosting-DAT necessary student-GEN number-TOP 10-5(-CL)-COP

'The number of students necessary to host a conference is fifteen.'

- I adopt Rothstein's (2013) idea that a predicative numeral (of type $\langle e, t\rangle$) can be type-shifted to a number of type *n* by the operator $\cap$ (cf. Chierchia 1998b). She assume that English numerals denote function of type $\langle e, t\rangle$ (32a), which can be type-shifted to a number (of type *n*) (32b).

  (32) a. $[\![\text{four}]\!] = \lambda x.\ \#(x) = 4$
  b. $\cap[\![\text{four}]\!] = 4$

  The idea here is that the number 4 can be seen as the singular term correlate of the property of having four atomic members (just like kinds are singular term correlates of properties).

- Suppose that there are more singular terms that correspond to the property of having four humans, etc. Then, there's no reason why $\cap$ cannot map *N+nin* to such 'abstract numbers'.

  (33) a. $[\![\text{4-nin}]\!] = \lambda x:\ {}^{\star}\mathbf{human}(x).\ |\{\, y \sqsubseteq x \mid \mathbf{human}(y)\,\}| = 4$
  b. $\cap[\![\text{4-nin}]\!]$ = the number that corresponds to the property of having four humans.

  This allows us to account for the optionality of the classifier in (31).

- The dual of $\cap$, i.e. $\cup$, needs to be constrained, as if freely available, it would allow numerals in Japanese to turn to predicates without help of classifiers.

  (34) $\cup(\cap(\lambda x.\ \#(x) = 4)) = [\lambda x.\ \#(x) = 4]$

- Following Chierchia's (1998b) insights, we assume that these type-shifting operations are available only as last resorts, i.e. if there is no lexical item that does the same job. Since Japanese has classifiers, $\cup$ is unusable.

3 Conclusions

- Japanese nouns have denotations compatible with counting modifiers (just as in English).
- Classifiers are (usually) required, because numerals denote numbers (of type *n*) and cannot function as modifiers on their own (as $\cup$ is blocked in Japanese).

- If this is on the right track, the only difference between Japanese and non-classifier languages is the presence of classifiers in the lexicon. More concretely:
  - In all languages, numerals denote numbers (of type *n*).[12]
  - In non-classifier languages, $\cup$ can be used to turn them into predicates and they can function as modifiers.
  - In Japanese (and possibly other obligatory classifier languages), the use of $\cup$ is blocked due to classifiers.

A Plural Nouns in Japanese

A.1 Reduplicated Plural Nouns (N-Ns)

- We observe that **Japanese has genuine plural nouns** that are formed by reduplicating the noun (with *rendaku*-voicing, when applicable). I refer to these reduplicated nouns as *N-Ns*.

(35)

hana-bana	花々	flower-flower	hito-bito	人々	person-person
yama-yama	山々	mountain-mountain	kuni-guni	国々	country-country
mura-mura	村々	village-village	hoshi-boshi	星々	star-star
kami-gami	神々	god-god	hi-bi	日々	day-day

[12] Contra Rothstein (2013), who assumes the type $\langle e, t\rangle$ dentation to be the basic denotation for English numerals.

The relevant morphological process is not productive, and there are only about ten N-Ns in Tokyo Japanese (I don't know about other dialects or earlier stages of Japanese).

- N-Ns are associated with plurality inferences (on a par with English plural nouns), e.g. (36) entails that Taro brought more than one seasonal flower.[13]

(36) 太郎は 季節の 花々を 買った
Taro-wa kisetsu-no **hana-bana**-o katta.
Taro-TOP season-GEN flower-flower-ACC bought
'Taro bought seasonal flowers.'

Also, N-Ns are incompatible with singular expressions:

(37) 一輪の 花(#々)
ichi-rin-no hana(#-**bana**)
one-CL-GEN flower(-flower)
'one flower'

Compare this to:

(38) たくさんの 花(々)
takusan-no hana(-**bana**)
a.lot-GEN flower(-flower)
'a lot of flowers'

(39) 百輪の 花(々)
hyaku-rin-no hana(-**bana**)
100-CL-GEN flower(-flower)
'one hundred flowers'

- Importantly, N-Ns are not 'associative plurals' like *N-tachi* (Nakanishi & Tomioka 2004, Nemoto 2005). In particular, while *N-tachi* can refer to heterogeneous groups, *N-N* can only refer to homogeneous groups whose members are all describable by N.[14]
- This is important because the associative plural *N-tachi* is compatible with non-individuated denotations, e.g. Nakanishi & Tomioka (2004:124) assign the following meaning to *-tachi*.[15]

(40) $[\![\text{tachi}_{\langle et,et\rangle}]\!] = \lambda P_{\langle e,t\rangle}.\lambda Y_e.\ |Y| \geqslant 2 \wedge P$ represents Y

P itself does not need to have countable denotations; it just needs to 'represent' Y. But as an (intended) side-effect, Y can be a heterogeneous plurality that includes non-P individuals (insofar as P 'represents' Y).

A.2 Number Neutrality of Reduplicated Nouns (N-Ns)

- So Japanese has two types of nouns:
  - Singlets N's are number-neutral, e.g. *hana* (花) 'flower'.
  - Doublets N-Ns are plural, e.g. *hana-bana* (花々) 'flowers'.
- The most straightforward semantics would be:
  - Singlets N's have number neutral denotations.
  - Doublets N-Ns have plural-only denotations.
- To be more precise, let us assume that the domain of entities $\mathcal{D}_e$ is closed with the i-sum formation operation $\oplus$ (Link 1983). Let us also assume that noun denotations are sets of entities.

(41) *Simple-minded semantics*

[13] For reasons I don't understand, NN's sound generic or kind-denoting without modifiers. As I want to focus on non-generic, non-kind readings here, I will always have modifiers on NN's.
[14] Exception: the plural first-person pronoun *ware-ware* (我々) 'me-me'.
[15] Nakanishi & Tomioka (2004) also postulate a type $\langle e, et\rangle$ version for cases like *Taro-tachi*.

a. $[\![\text{hana}]\!] = \{ x \mid x \text{ is a single flower} \} \cup \left\{ x \;\middle|\; \begin{array}{l} x \text{ is a plural entity} \\ \text{consisting of flowers} \end{array} \right\}$

b. $[\![\text{hana-bana}]\!] = \{ x \mid x \text{ is a plural entity consisting of flowers} \}$

- Contrary to this, I argue that N-Ns should have number-neutral denotations. My arguments are essentially identical to those previously made for English plural nouns (Sauerland 2003, Sauerland, Anderssen & Yatsushiro 2005).
- In what follows, N-Ns will be systematically compared to clearly plural-only expressions, *2-CL-ijoo-no N* 'two or more N'.

1. Recall that in a simple positive sentence, N-Ns have a plurality inference.

(42) 太郎は 季節の 花々を 買った
Taro-wa kisetsu-no hana-bana-o katta.
Taro-TOP season-GEN flower-flower-ACC bought
'Taro bought seasonal flowers.'

So truth-conditionally, this is similar to (43).

(43) 太郎は 二輪以上の 季節の 花(々)を 買った
Taro-wa ni-rin-ijoo-no kisetsu-no hana(-bana)-o katta.
Taro-TOP two-CL-or.more-GEN season-GEN flower(-flower)-ACC bought
'Taro bought two or more seasonal flowers.'

2. However, N-Ns give rise to number neutral readings in negated sentences.

(44) 太郎は 季節の 花々を 買わなかった
Taro-wa kisetsu-no hana-bana-o kaw-anakat-ta.
Taro-TOP season-GEN flower-flower-ACC buy-NEG-PAST
'Taro didn't buy seasonal flowers.'

The truth-conditional difference between (44) and (45) is palpable: (45), but not (44), is true if Taro bought one seasonal flower.

(45) 太郎は 二輪以上の 季節の 花(々)を 買わなかった
Taro-wa ni-rin-ijoo-no kisetsu-no hana(-bana)-o kaw-anakat-ta.
Taro-TOP two-CL-or.more-GEN season-GEN flower(-flower)-ACC buy-NEG-PAST
'Taro didn't buy two or more seasonal flowers.'

3. Similarly for questions:

(46) 太郎は 季節の 花々を 買った の？
Taro-wa kisetsu-no hana-bana-o katta no?
Taro-TOP season-GEN flower-flower-ACC bought Q
'Did Taro buy seasonal flowers?'

If Taro bought one seasonal flower, the answer to (46) is YES (maybe with a qualification that it's only one), while the answer to (47) is clearly NO.

(47) 太郎は 二輪以上の 季節の 花(々)を 買った の？
Taro-wa ni-rin-ijoo-no kisetsu-no hana(-bana)-o katta no?
Taro-TOP two-CL-or.more-GEN season-GEN flower(-flower)-ACC bought Q
'Did Taro buy two or more seasonal flowers?'

4. Number-neutral readings crop up in other contexts, e.g. in the scope of distributive quantifiers, conditionals. I omit the data here (because they involve additional complications in the explanation, not because they cannot be explained).

Acknowledgements: I would like to thank many friends for ideas, comments, judgments, criticisms, etc., in particular: Martin Hackl, Makoto Kanazawa, Heejong Ko, Junri Shimada, Christopher Tancredi, Ziren Zhou, Eytan Zweig. My thanks also go to the audience of WAFL 11 held at the University of York, and the Semantics Research Group at Keio University. All the errors are mine, of course.

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