

Classifier, Number and Countability

助数詞、数と可算性

付和文抄訳

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ABSTRACT

In this thesis I will investigate the possibility that the functional layer #P between DP and NP exists universally in every language, and even the function of that functional category is proposed to be uniform across languages. The research mainly treats the typological difference of Number Languages (NLs) and Classifier Languages (CLs). I propose that the features on N are assumed to be uniform in terms of countability, and also the view that the feature composition of the head # as well is asserted to be uniform across languages. Special attention will be paid to classifiers and numeral construction, which is again asserted to have quite equivalent underlying structure across languages. These conclusions are fully in accordance with the contemporary proposal of the Uniformity Principle.

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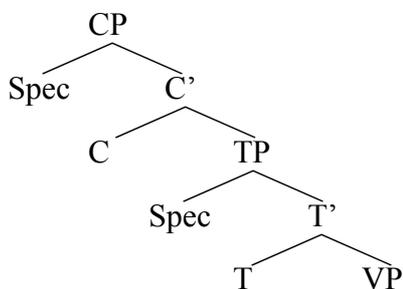
1. Introduction

Following Ritter's (1991) pioneering work on Modern Hebrew, many linguists have proposed on the DP-internal syntax that there is an intermediate functional projection Number Phrase, whose head corresponds to a noun's singular/plural marking (throughout discussion I will use the abbreviatory notation #P for Number Phrase, and also refer to its head as #). For example, as for Walloon, Bernstein (1991, 1993, 2001) insists that the prenominal plural marker attached to the prenominal adjectives (-ès for feminine, -s for masculine) corresponds to #. Here is a set of Walloon examples from Bernstein (2001).

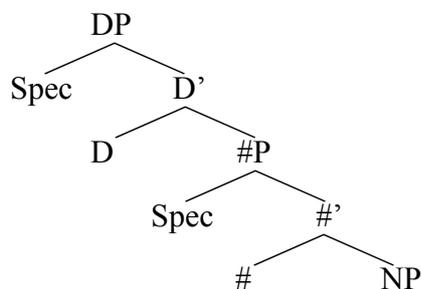
- (1) a. dèś vèt-ès -ouh (Walloon)
 some green-PL.FEM door
 "some green house"
 b. dèś nêur-s -ouy
 some black-PL.MASC eyes

The existence of #P in French is also suggested by Valois (1991), Chinese by Tang (1990) and Li (1999), Catalan by Picallo (1991), respectively. Generally, the idea of #P is widely accepted, partly due to the fact that number is presumably assumed to play an independent role in the syntax and semantics of DP, which evokes the apparent similarity to tense in the clausal domain.

- (2) a. clausal syntax



- b. DP-internal syntax



Then, an important empirical question is in our sight: Is #P universal? That is, does every language employ the intermediate #P layer between NP and DP? If the answer to this question is positive, such a conclusion is of great importance to the study of Universal Grammar. If negative, however, the explanation of the presence/absence optionality must be explained, and we are presumably obliged to resort to the notion of parameter for this explanation. Some languages are in some way parametrized to employ the functional category #P, others are not.

The birth of the Principles and Parameters' (P&P) Approach was a great breakthrough for the study of human language. The P&P approach posits that Universal Grammar consists of a finite set of principles which are invariable to language, and a limited number of parameters whose restricted value-setting optionality explains the variation of natural languages. After the emergence of the P&P approach, the inquiries into the theoretical

content of principles and parameters become a major research agenda of generative linguistics.

One important research stream within the P&P framework seeks the possibility that the computational component of human language is virtually uniform, invariant to languages. This hypothesis is first posited by Chomsky (2001) under the name of the *Uniformity Principle*.

(3) the Uniformity Principle (Chomsky 2001; (2))

In the absence of compelling evidence to the contrary, assume languages to be uniform, with variety restricted to easily detectable properties of utterances.

An explicit version of (3), dubbed as the *Silent Principle*, is proposed by Sigurdsson (2003) (cf. Miyagawa to appear).

(4) the Silent Principle (Sigurdsson 2003)

All languages share the same set of features; some are not pronounced.

The study of #P will shed some light on this matter. If the universal existence (or absence, which is unlikely) of the functional head # is certified, such conclusion is fully favorable to this research stream, because it guarantees that the functional category # universally plays role in grammatical computation. An even favorable result is that the feature composition of # is uniform across languages, conforming to (4). Though attractive, however, this possibility seems to face a substantial number of counterexamples, the languages which has no singular/plural morphological marking. Japanese is an instance of such languages. Consider (5).

(5) Kooen-ni inu-ga ita. (Japanese)

park-DAT dog-NOM be.there.PAST

“There is a dog in the park/ There are some dogs in the park.”

This example represents the fact that Japanese bare common nouns are generally ambiguous with respect to the singular/plural denotation. Indeed, every Japanese count noun can refer to either an individual or a set of individuals. Then, if the conception of # as the locus of singular/plural marking is correct, the fact that Japanese count nouns lack singular/plural opposition seemingly suggests that Japanese DP lacks #P.

What I will try to propose in this thesis is, nevertheless, the possibility that #P also exists in Japanese and other number-less languages and even that the feature composition of # is identical across languages. Specifically, I will argue that classifier is the category that occupy the head position of #P in these languages. This thesis is organized as follows: In §2 I introduce some pieces of argument that classifiers in Classifier Languages occupies the head of #P. §3 treat the status of nouns across languages in terms of their “countability”. I propose in §4 that the treatment of classifier as occupying # can be extended to other Classifier Languages as well. §5 investigate the agreement relation of # and N. In §6 I propose the elaborated notion of countability. §7 concludes this thesis. The appendix optionally argues that Japanese *-tati* is not the candidate for categories occupying #.

2. Equating Classifier with Number

2.1. Two Functions of Number

Before starting the investigation of #P, let me first provide preliminary assumption on the function of grammatical number, which is a quite conventional one.

One of the most obvious functions of number in languages like English is the singular/plural distinction.

- (6) a. I bought a/one book at the store. (English)
b. I bought some/three books at the store.

When the entity a noun refers to is a single object, the noun is grammatically marked as singular, for example (6a) in English. And when the referent of a noun is a set of objects, or in other words when the extension of a noun contains more than one objects, that noun will be plurally marked, as in (6b).¹

Note that these singular/plural marking can be applied only to count nouns like *car*, *boy*, *child*, *cat*, and so on. If a noun is mass, no singular/plural marking will be made on it.

- (7) a. water (English)
b. * a/one water
c. * some/three waters

Then, the countability of nouns is the prerequisite for the further singular/plural distinction. Grammatical number is certainly sensitive to whether nouns are countable or not.

Along this line of approach, let me briefly say that number has two functions; (i) indicating countability of nouns and (ii) marking singular/plural features on nouns. The notion of countability is investigated throughout this thesis.

I will assert that classifiers are the category occupying # in languages that have generalized classifier system. If this idea is correct, classifiers had to be said to play a role in these two functions that number in languages like English does.

2.2. Classifier and Countability

Seemingly, the (non-)employment of *classifier* in numeral construction is one of the most salient language variation. In some languages, such as Japanese, Chinese, Persian, Bangla, Korean, Thai, other Southeast Asian languages, etc., nouns are required to be

¹ Note that there are also languages which employs dual (and even trial) in their number inflection. However, Greenberg (1963) observes (7) from his statistic survey of language universal.

- (i) Greenberg's language universal 34.
No language has a trial number unless it has a dual. No language has a dual unless it has a plural.

Then, such additional dual and trial distinction on number is presumably a marked case, and in the discussion I put aside cases with dual and trial.

classifiers in CLs and number in NLs play part in countability. If we can prove that classifiers are also related to the singular/plural distinction, it will be a further piece of evidence for the argument that classifiers be equated with number. This subsection treats Chinese classifiers, and insists that they plausibly take a crucial part in the singular/plural distinction on the nominals.

Chinese bare count nouns can be construed both as singular and as plural.³ Here is a set of examples from Mandarin Chinese.

- (9) a. Hufei mai shu qu le. (Mandarin)
 Hufei buy book go SFP
 “Hufei went to buy a book/books.”
 b. Gou jintian tebie tinghua.
 dog today very obedient
 “The dog/dogs was/were very obedient today.”

Chinese is an instance of CLs, whose numeral and some other quantifiers require the presence of classifier in their construction.

- (10) a. san ge ren (Mandarin)
 three CLA people
 “three persons”
 b. san ben shu
 three CLA book
 “three books”

These are quite common properties found in other CLs as well. However, Chinese differs from other CLs in that this language allows “bare” classifiers to occur.

Cheng and Sybesma (1998) observe that Chinese classifiers are, unlike those of other major CLs, can occur without numerals or other quantificational expressions. (11) and (12) are from Mandarin and Cantonese, respectively.

- (11) a. Wo xiang mai ben shu (Mandarin)
 I would.like buy CLA book
 “I would like to buy a book”
 b. * Ben shu bu hao.
 CLA book not good
 “The/A book is not good.”

- (12) a. Keoi seung maai gaa ce. (Cantonese)
 he want buy CLA car

³ The definite/indefinite interpretation of Chinese nouns is rather restricted in terms of their syntactic position; thus, for example, Mandarin bare nouns in the subject position cannot be construed as indefinite, as in (4b). The environment of definite/indefinite interpretation is not our concern; see Cheng and Sybesma (1998) for the detailed account of it.

- “I want to buy a car.”
- b. Keoi maai-zo gaa ce.
he sell-ZO CLA car
“I sold the car.”
- c. Gaa ce zo-zyu go ceot-hau
CLA car block-CONT CLA exit
“The/*A car is blocking the exit.”

Their distribution of [Cl + N] sequences is rather restricted with respect to the syntactic position of them and obeys the dialectal variation. Thus in Mandarin the [Cl + N] sequences allow only indefinite interpretation, and they cannot occur in the preverbal position (as in (11b)). On the other hand, its Cantonese counterpart can be construed both as indefinite ((12a)) and as definite ((12b)), though the [Cl + N] in the preverbal position only receives definite interpretation (see Cheng and Sybesma 1998 for details). Apart from such distributional restriction, however, it is quite clear that Chinese classifier can appear without numerals and other quantifiers.

An important thing to observe is that, in both dialects, when such a “bare” classifier appears, the whole nominal is obliged to receive singular interpretation. While the Mandarin bare common nouns, as in (8s) (= (4a)), can be interpreted either as singular or as plural, its [Cl + N]s are construed only as singular, as in (13b) (= (11a)).

- (13) a. Hufei mai shu qu le. (Mandarin)
Hufei buy book go SFP
“Hufei went to buy a book/books.”
- b. Wo xiang mai ben shu.
I would-like buy CLA book
“I would like to buy a book/*books.”

Chinese is a language that lacks grammatical singular/plural marking on nouns. However, the presence of numeral-less classifier forces the singular interpretation. Classifiers in [Cl + N] construction are presumably assumed to be “singular” in some sense.⁴

Further observation is that Chinese actually has a “plural” classifier. Here is the data of the Cantonese classifier *-di*.

- (14) a. Siuming seung sik go mou wat ge saigwaa. (Cantonese)
Siuming want eat CLA no seed MOD watermelon
“Siuming wants to eat a seedless watermelon.”
- b. Siuming zungji sik di mou wat ge saigwaa.
Siuming like eat CLA.PL no seed MOD watermelon
“Siuming likes to eat seedless watermelons.”

⁴ Note that the [Cl + N] construction should not be treated as the phonologically reduced form of [yi-Cl + N] (yi ‘one, a’), because the distribution of [Cl + N] is quite different from that of [yi-Cl + N]. See Cheng and Sybesma (1998), particularly §3.1.

- (15) a. Gaa ce zo-zyu go ceot-hau.
 CLA car block-CONT CLA exit
 “The car is blocking the exit.”
- b. Di ce zo-zyu go ceot-hau.
 CLA.PL car block-CONT CLA exit
 “The cars are blocking the exit.”

When numeral-less classifier is present, the [Cl + N] nominal will generally have singular denotation. However, when the ordinal classifier is replaced by the generalized plural classifier *di*, the resulting nominal will be plural.

These facts evoke the parallelism between Chinese classifiers and grammatical number found in NLS. Indeed, Cheng and Sybesma (1998) concludes that the singular/plural marking actually exists also in Chinese, which takes the form of classifiers. In their theory, the ordinary classifiers such as *ben*, *gaa*, *go*, bears singular feature, though generally such singular denotation is suppressed by the presence of numeral. And when the denotation is plural, the classifier will have the corresponding plural form, which is exemplified by the Cantonese plural classifier *di*.⁵

The case is summarized as follows: Chinese lacks the grammatical number distinction on the noun morphology, but such distinction is presumably instantiated on the classifiers. This fact is quite suggestive for our research topic, the investigation for the empirical question whether #P is universal or not. Chinese grammar employs the singular/plural distinction, which is realized at the level of classifier, not at the level of noun head. Then the null hypothesis is that #P also exists in Chinese, and the # head is occupied by classifiers. This is really what Cheng and Sybesma (1998) proposed. They posit the following structure for Chinese DP, following Tang (1990).⁶

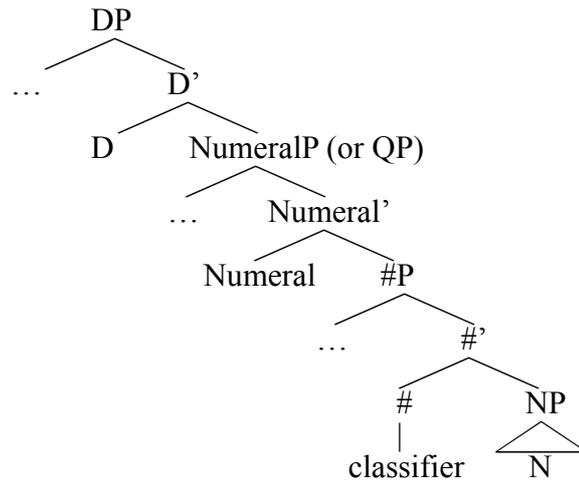
⁵ When a classifier is reduplicated, the resulting nominal denotes a universal quantification.

- (i) a. ge-ge xuesheng (Mandarin)
 CLA-CLA student
 “every student”
- b. Tiao-tiao daolu tong Beijing
 CLA-CLA road connect Peking
 “All roads lead to Peking.”

This fact also suggest that classifier is involved in pluralization in Chinese grammar.

⁶ Cheng and Sybesma (1998) still remains to label as CIP (Classifier Phrase) the functional category whose head hosts classifier, but they actually argue that classifier is analogous to grammatical number, so I label it as #P for explicitness.

(16)



This structure can easily explain the basic word order of Chinese DP, as (17) shows.

(17) zhe san ben shu
 DEM three CLA book
 “these three books”

The conception of Chinese classifiers as an instance of # kills two birds with one stone. On the one hand, it naturally explains the fact that Chinese classifiers involve the singular/plural denotation. On the other hand, it suggests that the existence of #P is also found in Chinese. This conclusion has a profound consequence on the study of Universal Grammar. In particular, if the treatment of classifier as occupying # can be generalized to other CLs as well, the universal existence of #P will be guaranteed to a satisfactorily great degree, a desired result for the hypothesis that #P exists universally.

3. Countability in Classifier Languages

3.1. Two Hypotheses for Mass

Consider again (6) and (7), repeated here.

- (6) a. I bought a/one book at the store. (English)
b. I bought some/three books at the store.
- (7) a. water
b. * a/one water
c. * some/three waters

These examples on one hand show that in English only count nouns can bear further specification of singular/plural. Moreover, numerals like *one* and *three* can directly modify count nouns like *student*, but cannot do mass nouns like *water* (as the ungrammaticality of phrases like *three water* shows). In order to be counted, these mass nouns require some other count nouns' "help" of providing an appropriate counting unit. This point is shown by the *pseudopartitive* construction, illustrated by (18).

- (18) a. three glasses of water (English)
b. three huge bottles of water
c. three liters of water

These facts are quite generally found in other NLs, and so it is safe to say that (19) holds for the diagnoses of nouns' mass status in NLs.

- (19) a. If a noun is a mass one, it cannot bear grammatical singular/plural inflectional morphemes on it.
b. If a noun is a mass one, it cannot be directly counted by numerals.

Intuitively speaking, these properties of mass nouns are the result of their not having minimal counting units. The minimal part of water is somewhat vague, and water does not have a built-in semantic partitioning on its own. That is why these mass entities cannot offer the readily-available counting units by themselves, and the nouns corresponding to them cannot be directly counted by numeral, let alone distinguished in terms of singular/plural opposition. Such intuition imposes many linguists to suggest that the denotations of mass nouns do not have minimal parts, and the semantic structures of these mass nouns are quite different from those of count nouns (Bunt 1985, Landman 1989a, 1989b, 1996, Link 1983). This position is formulated, most clearly by Bunt (1985), as the *Homogeneous Reference Hypothesis*.

Mass-nouns refer to entities as having a part-whole structure without singling out any particular parts and without making any commitments concerning the existence of minimal parts.

(Bunt 1985; pp. 46)

On the other hand, Chierchia (1998a, 1998b) proposes a radically different view on this matter, insisting that the denotations of mass nouns do have minimal parts, and have quite identical structure that the denotations of count nouns have. This position is called the *Inherent Plurality Hypothesis*.

I propose instead that the extension of mass nouns (like *change*) is essentially the same as that of plurals (like *coins*). A mass noun simply denotes a set of ordinary individuals, *plus* all the pluralities of such individuals. For example “change” denotes, roughly, single coins and the possible sets or pluralities of coins. This view is an “atomistic” one: we are committed to claiming that for each mass noun there are minimal objects of that kind, just like for count nouns, even if the size of these minimal parts may be vague.

(Chierchia 1995; pp.54)

According to this view, mass nouns are essentially the neutralization of the singular/plural opposition. Mass nouns come out of the lexicon with extensions containing not only singular individuals but also sets of individuals. For example, the extension of the mass noun *change* consists both of singular individual coins and the pluralities of coins, as is schematically shown in (20).

$$(20) \quad \text{change} = \left[\begin{array}{cccc} & \{a, b, c\} & \dots & \\ \{a, b\} & \{a, c\} & \{b, c\} & \dots \\ a & b & c & \dots \end{array} \right]$$

$$(21) \quad \text{coins} = \left[\begin{array}{cccc} & \{a, b, c\} & \dots & \\ \{a, b\} & \{a, c\} & \{b, c\} & \dots \end{array} \right]$$

$$\text{coin} = \left[\begin{array}{cccc} a & b & c & \dots \end{array} \right]$$

For Chierchia, pluralization cannot apply to mass nouns just because they come out of the lexicon with already pluralized, or in other words, already include pluralities in their extension.

3.2. Unambiguously Mass?

Now, consider again (19). Mass nouns in NLS quite generally show these two property; no singular/plural marking, and no available adjectival modification.

Interestingly, nouns in CLs generally have properties quite similar to those which (19) states. Consider (5) again, repeated here.

- (5) Kooen-ni inu-ga ita. (Japanese)
 park-DAT dog-NOM be.there.PAST
 “There is a dog in the park/ There are some dogs in the park.”

I have already mentioned that Japanese’s (and other CLs’) nouns are generally ambiguous with respect to singular/plural, and the bare nouns like *inu* in (5) can be construed either as singular or as plural. No inflectional number morpheme is present on these nouns, similarly to English mass nouns like *water*. Moreover, they cannot be in direct construction with numeral, as (22a) shows.

- (22) a. san-biki-no inu (Japanese)
 three-CLA-GEN dog
 “three dogs”
 b. * san-no inu
 three-GEN dog

Again, the Japanese noun *inu* ‘dog’ is analogous to *water* in this regard. These facts are quite generally holds of other CLs as well, which evokes many linguists’ suspicion that these nouns are indeed mass, and CLs are languages whose nouns are all mass ones. This position is pioneered most intensively by Chierchia (1998a, 1998b) and his followers.

Chierchia (1998a, 1998b) proposes that there are languages whose NPs are always mass noun, of which Japanese and Chinese are instances. In Chierchia’s semantics, NPs can be used not only as predicates for quantification or predication, but also as arguments in the form of kind reference. Languages are parametrized with respect to the feature [\pm arg, \pm pred], which determines the mapping of the denotation of NP in that language: in [+arg] languages bare NPs can be arguments on its own, referring to kinds, and in [+pred] languages NPs are used as predicates. Japanese, Chinese and other languages that employs generalized classifier system, namely CLs, are assumed to be [+arg, -pred] languages, in which NPs are unambiguously refers to kinds. A kind-referring NP has mass denotation, therefore, every NP in CLs has mass denotation.

If his assertion that nouns in CLs is unambiguously mass is combined with his mass theory, a radical conclusion is drawn from this combination. According to Chierchia’s Inherent Plurality Hypothesis, the denotation of mass nouns has essentially the same semantic structure as that of plurals. Not only nouns like *change* and *furniture*, but also *water*, *wine* and others have their own minimal parts. Specifically, there is no subsequent distinctive feature between *furniture*-like nouns and *water*-like nouns. Nouns in Japanese, Chinese, and other CLs are therefore equally “uncountable” to essentially the same degree.

However, I will introduce evidence that Chinese and Japanese and other CLs also have their own countable/uncountable distinction on nouns. The key of this argument is, again, classifiers.

3.3. Massifier and Count-Classifier

So far I have used the word classifier in a bit loose way, but let us get into a more

precise notion of classifier. For this reason, I would like to present the distinction of count-classifier and massifier in Cheng and Sybesma's (1998) sense.

Cheng and Sybesma (1998) proposes that Chinese classifiers are further subdivided into two classes, which they dubbed as *count-classifier* and *mass-classifier* (or in short *massifier*). Illustration is (23)-(24).

(23) Chinese count-classifiers (Mandarin)

- a. san ben shu
three CLA book
"three books"
- b. san ge ren
three CLA people
"three persons"
- c. san zhi bi
three CLA pen
"three pens"

(24) Chinese massifiers

- a. san ping jiu
three bottle liquor
"three bottles of liquor"
- b. san ba mi
three handful rice
"three handfuls of rice"
- c. san wan tang
three bowl soup
"three bowls of soup"

In Chinese, these two classifiers are distinguished by some of their grammatical behaviors. First, the modification marker *de* can intervene between massifiers and head nouns as in (26), but cannot between count-classifiers and nouns as in (25).

(25) a. ba tou (*de) niu (Mandarin)

eight CLA.head DE cow
"eight cows"

- b. jiu gen (*de) weiba
nine CLA DE tail
"nine tails"

- c. shi zhang (*de) zhuozi
ten CLA DE table
"ten tables"

(26) a. san bang (de) rou
three CLA.pound DE meat
"three pounds of meat"

- b. liang xiang (de) shu
 two CLA.box DE book
 “two boxes of books”

The second difference of their grammatical behavior is that only massifiers allow the modification of certain adjectives.

- (27) a. * yi da zhi gou (Mandarin)
 one big CLA dog
 “one big dog”

- b. * yi da wei laoshi
 one big CLA teacher
 “one big teacher”

- (28) a. yi da zhang zhi
 one big CLA.sheet paper
 “one large sheet of paper”

- b. na yi xiao xiang shu
 that one small CLA.box paper
 “that one small box of paper”

According to Cheng and Sybesma (1998), count-classifiers “simply name the unit in which the entity denoted by the noun naturally occurs,” while massifiers “*create* a unit of measure” to the nouns (Cheng and Sybesma 1998; pp. 515). For example, nouns like *gou* ‘dog,’ *shu* ‘book,’ and *laoshi* ‘teacher,’ have a built-in semantic partitioning on its own, and count-classifiers are the expression of such units inherent to each nouns. For *gou*, its unit is expressed as *zhi*. However, there is another class of nouns like *mi* ‘rice,’ *zhi* ‘paper,’ *rou* ‘meat’ that do not have inherent semantic partition, and these nouns requires some external unit of measure in order to be counted by numeral expression. Such external counting units are provided by massifiers. So the noun *mi* can be counted either by a massifier *ba* ‘handful’ or by *wan* ‘bowl.’⁷

- (29) a. san ba mi (Mandarin)
 three handful rice
 “three handful of rice”

- b. san wan mi
 three bowl rice
 “three bowls of rice”

Note that massifier can be also used to count the nouns which have natural inherent

⁷ Note that Chinese grammar do impose mass/count distinction on nominals, whose distinction is guaranteed by the employment of two different classes of classifiers, namely count-classifiers and massifiers. Whether Chinese nouns do have mass/count distinction or not is another important matter, particularly with regard to Chierchia’s proposal of semantic parameter (see Chierchia 1998a, 1998b).

countable unit of their own. Thus apart from its count-classifier *ben*, the noun *shu* ‘book’ can be measured by another unit *xiang* ‘box,’ as shown by (28b).

Watanabe (2004) argues that the distinction of massifier and count-classifier is also found in Japanese. Here is an illustration.

(30) Japanese count-classifiers (Japanese)

- a. ip-piki-no kitsune
one-CLA-GEN fox
“one fox”
- b. futa-ri-no kyooshi
two-CLA-GEN teacher
“two teachers”

(31) Japanese massifiers

- a. ni-hon-no wain
two-CLA-GEN wine
“two bottles of wine”
- b. yon-hako-no gengogaku-no hon
four-CLA.box-GEN linguistics-GEN book
“four boxes of linguistics books”

Quite similarly to Chinese *de*, the measure morpheme *-bun* provides a productive test of the distinction of count-classifier and massifier in Japanese. *-bun* can attach to massifiers but not to count-classifiers.

- (32) a. ni-hon-(bun)-no wain
two-CLA-BUN-GEN wine
“two bottles of wine”
- b. ni-hon-(*bun)-no botoru
two-CLA-BUN-GEN bottle
“two bottles”

This fact conceivably suggests that these two separate classes of classifiers are also found in Japanese.

If the distinction of count-classifier and massifier also exists in Japanese, the prediction is that Japanese massifiers also can be modified by adjectives, like Chinese massifiers do in (28). This prediction is borne out, but in a curious way. Look at the examples (33).

- (33) a. ((chiisana) botoru) ni-hon-no wain (Japanese)
small bottle two-CLA-GEN wine
“two (small) bottles of wine”
- b. ((ookina) danboorubako) yon-hako-no gengogaku-no hon
big cardboard.box four-CLA.box-GEN linguistics-GEN book
“four ((big) cardboard) boxes of linguistics books”

3.4. Countability

The distinction of massifier and count-classifier should be regarded as strong evidence for the argument that CLs also have mass/count distinction on nouns. Generally, there are two distinct classes of nouns in a CL; those which have each own built-in semantic partitioning unit and those which do not have such inherent counting units. For the former nouns their units are realized as count-classifiers. For the latter, no inherent count-classifiers are available to these nouns, and for counting them some external units must be provided, which take the form of massifier. Let me call the nouns of the former type are *countable* nouns, and those of the latter type as *uncountable* nouns. For the purpose of typology of nouns in CLs, let me introduce the notion of *countability*, which is briefly defined as (36).

- (36) A noun is countable if it has a count-classifier corresponding to the natural built-in partitioning on its own. Otherwise, the noun is uncountable.

The cases are summarized as follows: At first sight the nouns in CLs are quite similar to mass nouns in NLS, in that they do not bear singular/plural marking, and that they cannot be directly counted by numerals. However, CLs employs two types of classifier, massifier and count-classifier, and in terms of the availability of count-classifier, the attested countable/uncountable distinction on nouns exists in CLs, quite analogous to the mass/count distinction in NLS.

A natural question is in our sight; is the mass/count distinction in NLS semantically different from the countable/uncountable distinction in CLs? The negative answer is surely preferable. We want the result that humans' cognitive reality on counting is virtually uniform across languages, and the same intuition indicates that entities with built-in semantic partitioning are countable or count, and entities with no minimal parts are uncountable or mass. I will pursue this possibility, within the range of the ongoing research on #P.

Specifically, I argue that what occupies in #⁰ in CLs is indeed a count-classifier. Consider again (8), repeated here.

- (8) a. san-*(nin)-no gakusei (Japanese)
three-CLA-GEN student
“three students”
b. three student-*(s) (English)

I argued that # plays two functions; marking singular/plural opposition and indicating the “countability” of nouns. Singular/plural opposition on classifiers are found in Chinese, as discussed in 2.3. In the preceding discussion of this section we reached the conclusion that there are countable/uncountable distinction on nouns in CLs, and this distinction is made by the (un)availability of count-classifier. On the one hand, the countability of CL count nouns are indicated by the presence of grammatical number marking. On the other hand, the countability of CL countable nouns are indicated by the availability of corresponding count-classifier. Therefore, our treatment of # as countability indicator should capture this parallelism between number and count-classifier, and the null hypothesis is that they are forms of the instantiation of the same category #.

I henceforth use the word “classifier” to refer to count-classifier, and the #s in CLs are

morphologically realized as (count-)classifier in the numeral construction of CLs.

4. Syntax of Number

4.1. Incorporating the Universal Word Order

Now is the time to investigate the syntactic behavior of #P. In the preceding discussion I argue for the assumption that classifier is the form of instantiation of grammatical number in CLs, and this point is straightforwardly captured if we assume that classifiers and number both heads the same functional category #P.

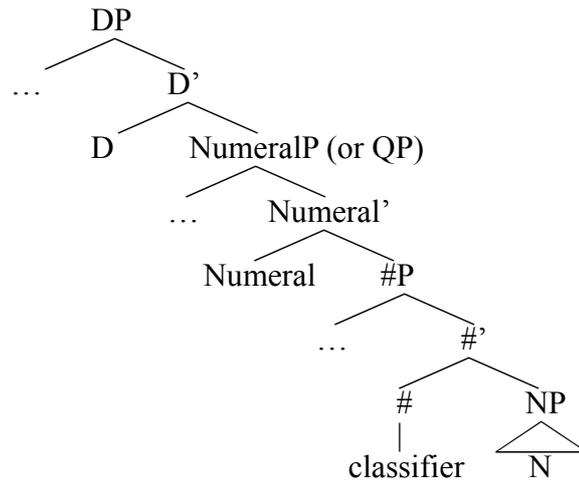
Greenberg (1963) observes that there is a universal tendency for languages without grammatical number to have generalized classifier system. Indeed, quite generally, Non-Classifier Languages tend to employ regular number morphology (the nominal inflection of singular/plural (and sometimes also dual) opposition) on its nominals, whereas CLs systematically lack it. This point is shown most clearly in the comparison of numeral classifier construction like (8), where either one of classifier or grammatical number is required to be present for the counting of nouns in language. The two examples of (8) provide representative cases. The numeral counting expressions in Japanese and other CLs typically require the presence of classifier, whereas numeral quantification in English and other Non-Classifier Languages generally calls for grammatical number. However, it seems quite unlikely that both of classifier and number morphology is required to be present in the numeral construction of one particular language. For numeral counting, either classifier or grammatical number, but not both, is required (In this regard, I will henceforth refer to languages that employs regular number morphology like English as Number Languages (NLs). This variety is supposedly corresponds to the taxonomy of Non-Classifier Languages). Universal Grammar allows these two extreme options to natural languages. An empirical question might be in our sight; what is the factor of this systematic distribution of number morphology and classifier? This difference in the variety of languages should be explained somehow within the framework of the contemporary Principles and Parameter's Approach.

In this regard, our current assumption that classifier is another category that occupies # has a tremendous advantage. Cheng and Sybesma's (1998) proposal amounts to hold that the functional head # is phonologically realized as classifier in Chinese. If the head position of #P is occupied by classifiers in other CLs as well, it will straightforwardly account for the observed systematic absence of grammatical number in CLs. This is really attractive possibility, and I will pursue it.

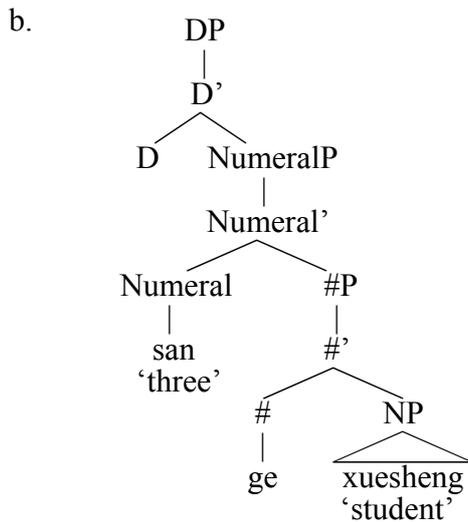
However, Cheng and Sybesma's (1998) proposal for the syntactic structure of Chinese DP cannot be extended to every CL in general. The problem is clearly represented by the Japanese case. For example, the nominal phrase (37a) is structurally represented as (37b), following Cheng and Sybesma's structure (16), repeated here.⁸

⁸ The empty D may not be required to be present, which matters little for our discussion.

(16)



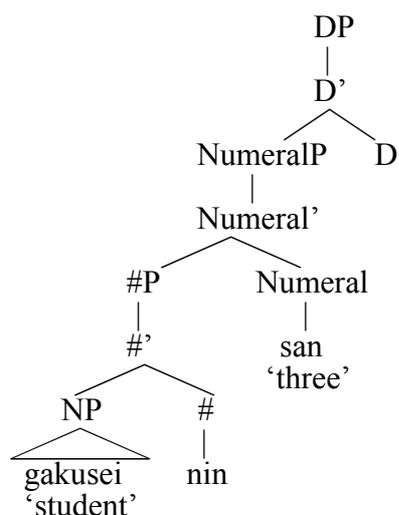
(37) a. san ge xuesheng
 three CLA student
 “three students”



Though they provide a plenty of evidence and discussion (mainly from Chinese data) for their structure (16), it has one fundamental defect, which would be made clear when we apply these structures to the head-final language Japanese. The full Japanese translation of (37a) is (38a), but the extension of (16) to Japanese DP results the structure (39), whose word order is completely ungrammatical, as shown in (38b).

(38) a. san-nin-no gakusei
 three-CLA-GEN student
 “three students”
 b. * gakusei-(no) nin-(no) san
 student-GEN CLA-GEN three

(39)



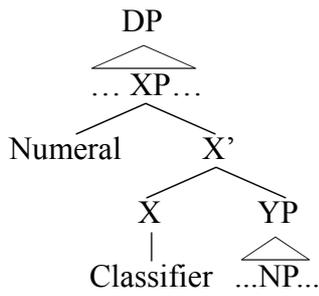
Now, the problem is clear; the value variation of the head-parameter changes the word order of elements in DP.

Via his statistical study of world languages, Greenberg concludes that “there is a heavy statistical predominance of the order [Numeral-Classifier] as against [Classifier-Numeral] in the classifier phrase of languages with the numeral classifier construction”(Greenberg 1975). Greenberg’s pioneering work and others’ following research reveals that there is a quite attested universal word order that *classifier directly follows numeral* (and some quantifiers). In the various CLs, word order of the numeral-classifier sequence is supposed to be universal. Thus Chinese sentence (40a) and Japanese (40b) shares the uniform numeral-classifier order, though they have generally different word order at the level of clauses. In Chinese verb precedes object, whereas in Japanese the order is reversed.

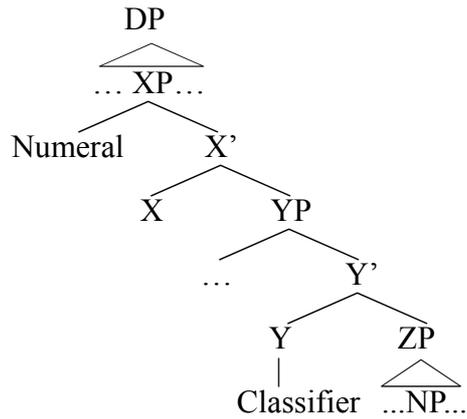
- (40) a. Wo xiang kan san ben shu (Mandarin)
I would.like read three CLA book
“I would like to read a book.”
- b. Watashi-wa san-satsu-(no) hon-o yonda (Japanese)
I-TOP three-CLA-GEN book-ACC read.PAST
“I read three books.”

The analysis of DP, therefore, must somehow incorporate this word order universal into its linguistic theory. Technically speaking, the syntactic structure of DP should be such that the word order of numeral-classifier is not to be affected by the value-variation of the head-parameter. Specifically, though Chinese is analyzed as head-initial and Japanese as head-final, the resulting word order sequence [Numeral-Classifier] should be uniform in both languages. This leads us to regard that the word order of numeral-classifier sequence is fixed independently of the value of the head-parameter. Suppose we construct a hypothesis which posit intermediate functional layers between NP and DP (I tentatively label such layers as XP, YP, ZP), then the structure of (41) would fail such requirement.

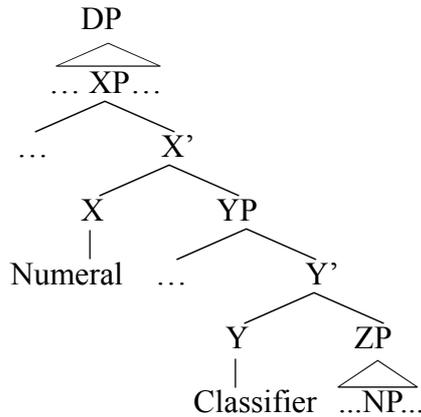
(41) a.



b.



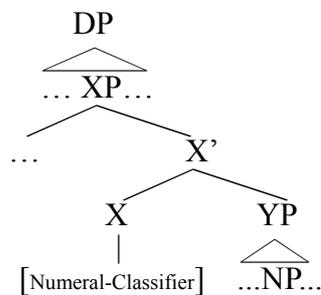
c.



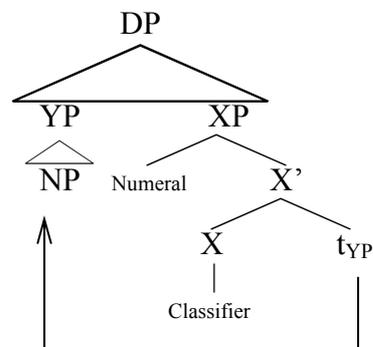
Structure (41a) and (41b) posit that numeral constitutes a phrasal category which makes a Specifier of an intermediate layer category XP. Hypothesis (41a) assumes that the functional head of that XP hosts a classifier, whereas hypothesis (41b) goes further to suppose that some functional head Y lower than X is the host of classifier. The other alternative (41c) supposes that both numeral and classifier occupy some X^0 category. In all of these cases, head-parametric variation would cause the separation of classifier and numeral or changes the order of numeral-classifier sequence, because head would interchange the position with its complement category in accordance with the value of head parameter.

Then, what kinds of structures are immune to this head-parameter dilemma? Seemingly, there are at least two alternatives to the solution, schematized below.

(42) a.



b.



In the hypothesis (42a), the numeral-classifier sequence occupies the single head position,

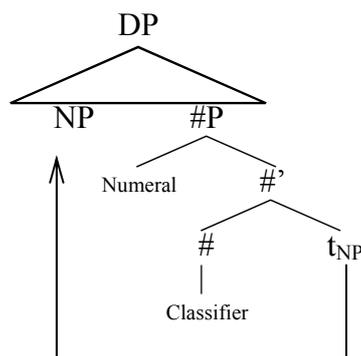
the internal structure of this complex head is left for the domain of morphology. In (42b), which is a variant of (41a), the YP containing NP (or NP itself) is somehow guaranteed to be obligatorily moved out of XP. Indeed, a lot of syntacticians pursue these alternatives. The former line is investigated by Kitahara (1993), Kawashima (1998), Bhattacharya (1998, 2001), and the latter most intensively by Watanabe (2004).

The structure (42b) looks more promising in its explanatory force. While the former approach, positing (42a), must “shift off” the account of universal numeral-classifier word order onto morphology, the latter approach can naturally treat and explain it within the domain of syntax. With the structure (42b), where numeral occupy the Specifier position of the category headed by classifier, the word order that numeral precedes classifier is straightforwardly guaranteed by the well-attested and theoretically-motivated universal that *Specifier precedes head and complement*. And if the complement category YP in (42b) is in some way obliged to move out of XP, the resulting XP would have the structure [numeral [classifier t_{YP}]] (or [numeral [t_{YP} classifier]]). When spelled out, this structure would be realized uniformly in PF as numeral-classifier sequence, independently of head-parameter value. Thus the structure (42b) naturally explains the observed uniformity of the numeral-classifier word order within the range of the Specifier-preceding thesis. I assume this null hypothetical structure in the following passages.

The preceding discussion reveals the possibility that the intermediate functional layer XP of (42b) is in fact #P. The # head hosts the number information of singular/plural distinction (and also dual in some languages), which are realized as grammatical number inflection in Germanic-Romance languages and other NLS, whereas Japanese, Chinese and other CLs use this head position hosting classifier. As is mentioned above, a language with regular grammatical number morphology generally lacks classifier system, and a language with classifier system generally lacks regular number morphology. This complementarity is straightforwardly accounted for if we assume the identification of their syntactic position under the one common functional category #.

In accordance with this line of consideration, I propose the structure (43) for the DP structure in CLs.

(43)



This structure is a simplistic version of (42b), obtained if we assume that YP is in fact NP. I simply assume this structure for CLs in general, because whether the additional YP exists or not does not matter much for our concern. Indeed, the structure (43) is what Watanabe (2004) proposes for the Japanese DP structure. Following him, I argue that this structure is

surely extendable to the other CLs.

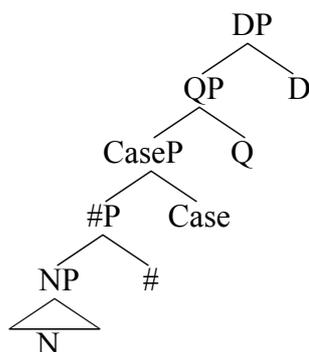
4.2. Watanabe's Analysis

If the structure (43) is on the right track, a mass of empirical question is naturally evoked: What triggers the movement of NP in (43)? Where is NP moved to? How does (43) apply to explain the actual nominal phrases in Japanese, Chinese or others?

To my knowledge, Watanabe (2004) is the only person who investigate the structure (43). I will outline his account of Japanese numeral classifier construction.

Watanabe propose the five layered DP structure, schematized in (44).

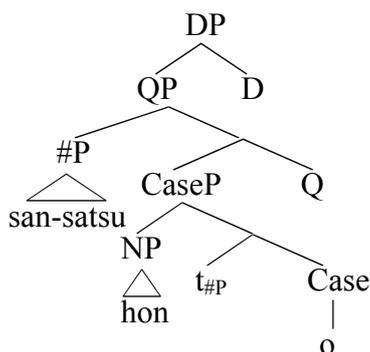
(44)



For concrete example, the Japanese DP *san-satsu-no hon-o* ‘three books (Accusative)’ in (45a) has the structure (45b), according to Watanabe.

(45) a. John-wa san-satsu-no hon-o katta.
 John-TOP three-CLA-GEN book-ACC bought
 “John bought three books.”

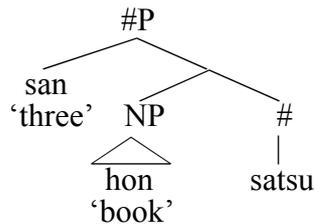
b.



A step-by-step account follows.

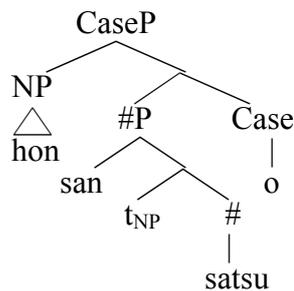
For Watanabe (and for us), the functional category immediately above NP is #P, which has the following internal structure. This structure is fully in accordance with (43).

(46)



The next functional head Case, which is assumed to host the case particle in Japanese, takes #P as its complement. This head agrees with NP by the Case concord requirement, which causes the movement of NP to the Spec of CaseP. The resulting structure is (47).

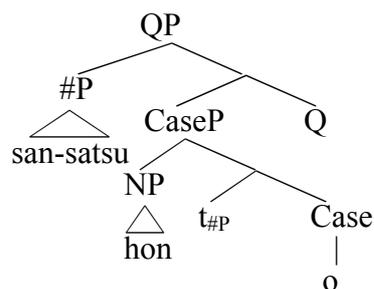
(47)



For our concern of the implementation of (43), Watanabe's treatment of Case is of importance. Watanabe proposes that the NP-movement out of #P is induced by the Case agreement between Case⁰ and N. N bears an uninterpretable [\emptyset Case] feature, value undetermined, which needs to be checked by the Case head.

In Watanabe's theory, Q can bear an EPP feature, and that Specifier position is filled by raising of #P as in (48). The following merger of D results in the structure (45b) for the nominal phrase of (45a).⁹

(48)



⁹ Watanabe (2004) further assumes that the word order of (i) is derived from (45b) by the optional CaseP-movement into DP Spec, as (i) shows.

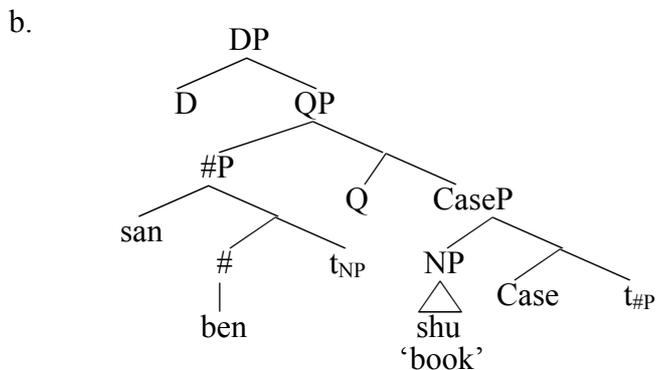
- (i) John-wa hon-o san-satsu katta.
 John-TOP book-ACC three-CLA bought
 "John bought three books."

- (ii) [DP [CaseP hon-o] [QP san-satsu t_{CaseP} Q] D]

Watanabe assumes the insertion of *no*, glossed as genitive case marker (GEN), is a matter of morphology and not structurally represented, following Kitagawa and Ross's (1982) analysis of *no*. As is shown above, massive phrasal movement takes place within the domain of DP in Watanabe's theory of DP. The presence/absence of such phrasal movements is, according to him, a well-established source of parametric variation.

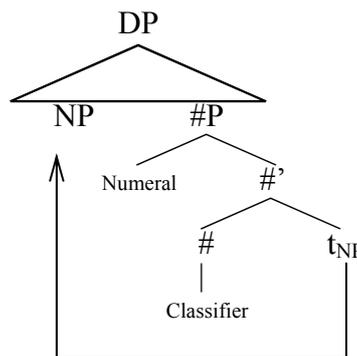
The structure of Watanabe's theory is sufficiently rich to explain the head-initial CLs as well as the head-final ones at one hand. Indeed, this structural representation is readily available also for the explanation of Chinese DP as well. The nominal of (49a) would be analyzed as (49b), according to this theory.

- (49) a. san ben shu
 three CLA book
 "three books"



In the previous discussion I argued that the universal word order [Numeral + CI] is straightforwardly accounted for if we assume the schematized structure (43), repeated here, for DP in CLs.

- (43)



And we investigate the trigger of such obligatory NP-movement. According to Watanabe's theory, that trigger is a Case concord requirement, which takes NP into the Spec of CaseP. With an additional assumption that Q also has an EPP feature to be satisfied by the movement of #P, the Japanese and Chinese word order, numeral-classifier-noun, can be uniformly explained.

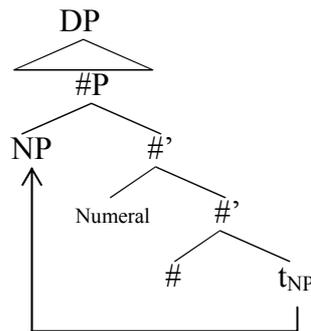
What I tried to emphasize in this section is that the structure (43), which is motivated

as a hypothesis for explaining the attested numeral-classifier word order universal, can be applied to the syntactic account of DP in each individual language. Watanabe's five-layered DP structure is one way of incorporating (43) into the virtual account of linguistic phenomena.

However, though possible, my impression is that there is not enough reason to believe that the NP-movement by the Case agreement requirement holds for *every* CL.

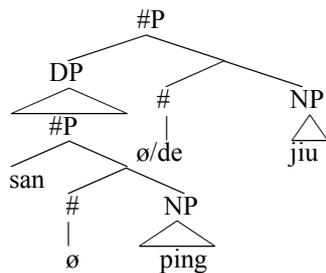
I will argue that NP universally moves out from the base #P-complement position in some way other than Case agreement in every CLs. Specifically, I will argue for the structure (50) in §5.¹⁰

(50)

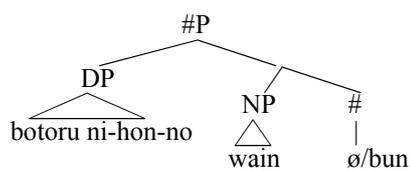


¹⁰ Note that by Watanabe's analysis the above-mentioned three cases; Chinese massifier (e.g. (24a)), Japanese massifier (e.g. (31a)), and English pseudopartitive (e.g. (35a)), have virtually the same underlying structure, as noted in §3.3.

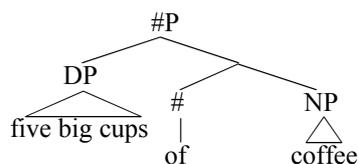
(i) Chinese massifier



(ii) Japanese massifier

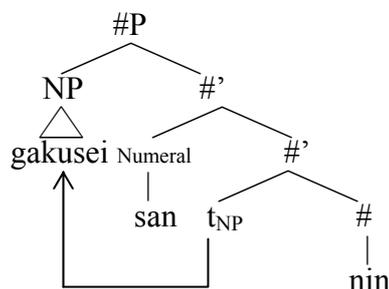


(iii) English pseudopartitives



straightforwardly captured if we assume that in CLs the agreement between # and N results in the NP phrasal movement into the outer Spec of #P, instead of the N-to-# head-movement found in NLs.

(54)



Compare (54) with (51). The sole difference between them is the way the #-N agreement is syntactically realized. For NLs, the N head is somehow allowed to incorporate into the higher head #, forming a complex head [N-#]. For CLs, on the other hand, this option is not permitted, but the agreement of # with N will raise the phrasal category NP into the Specifier position of #P.¹¹

5.2. Agree in What?

The next question is what is the feature which induces the agreement between # and N? The answer presumably lies in the countability.

In the discussion of §3.4 I introduce the notion of countability, repeated here.

(55) A noun is countable if it has a count-classifier corresponding to the natural built-in partitioning on its own. Otherwise, the noun is uncountable.

The two classes of nouns in CLs are readily distinguished in terms of this notion. Countable nouns have their corresponding (count-)classifier, Uncountable nouns are not. Now, let me extend this notion to account for the mass/count distinction in NLs as well, by positing that all Ns bear the interpretable feature specification of [\pm countable].

(56) N is [$+$ countable] if it has a natural built-in semantic partitioning on its own. Otherwise, N is [$-$ countable].

Specifically, I propose that the mass/count distinction on nouns are also executed by the feature specification of [\pm countable], just like the uncountable/countable distinction in CLs are. Mass nouns like *water* are [$-$ countable], and count nouns like *student* are [$+$ countable]. According to this feature, the typology of Ns will be (57).

¹¹ Indeed, Watanabe (2004) also refer to the possibility of this movement, but he put aside whether this movement actually occurs or not, because the later NP-movement into the CaseP Spec hide the effect of this movement in his theory.

(57) The typology of Ns

[+countable]: countable nouns in CLs; e.g. *gakusei* ‘student,’ *hon* ‘book,’ etc.
count nouns in NLs; e.g. *student, book*, etc.

[-countable]: uncountable nouns in CLs; e.g. *mizu* ‘water,’ *wain* ‘wine’
mass nouns in NLs; e.g. *water, wine, furniture*, etc.

Note that in doing this I explicitly argue against Chierchia’s proposal that all nouns in CLs are unambiguously mass. To the contrary, I argue that CLs exploit just the same countability distinction as that of mass/count in NLs, with resorting to the feature [\pm countable]. This line of approach is fully in accordance with the research of the Uniformity Principle, referred to in (3). The countability feature on Ns is proposed here as uniform across in the existing two classes of languages, NLs and CLs. The same [\pm countable] feature plays role in the grammatical computation in every languages.

Next, I propose that the agreement of # with N involves the countability feature [\pm countable]. It is, again, quite convincing. In accordance with the contemporary feature agreement mechanism in the minimalist framework (cf. Chomsky 2001), I assume (58).

(58) # bears an uninterpretable feature [\emptyset countable], which need to be checked by the interpretable counterpart on the agreeing Ns.

Then, the agreement relation between # and N is induced by the uninterpretable [\emptyset countable] feature on #. # as a probe seeks the agreeing feature in its c-commanding domain, and the interpretable [\pm countable] feature on N serves as the goal. The operation Agree hold between # and N, and the uninterpretable countability feature on # will be valued and checked out.

In NLs, the agreement relation Agree (#, N) will result in the head-movement of N to #. In CLs, on the other hand, it is manifested as the NP-movement into the Spec of #P.

Note that the singular/plural feature specification is only available to the count nouns (Ns with [+countable]) in NLs ((7) repeated).

- (7) a. water (English)
b. * a/one water
c. * some/three waters

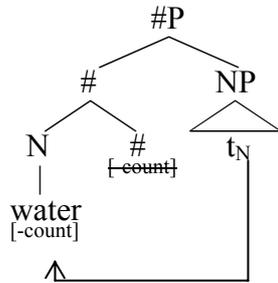
Then, it is presumably the case that only [+countable] nouns can have the further specification of [singular/plural] (Watanabe (2004) proposed the similar view). In this line of reasoning, I propose (59).

(59) Only when the uninterpretable [\emptyset countable] feature on # is valued as [+countable], # can bear the interpretable feature [\pm plural].

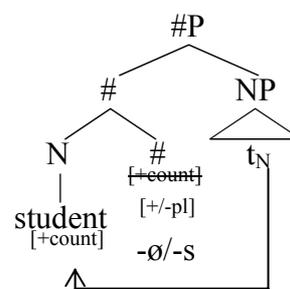
Now, we can treat uniformly the four cases; bare mass and bare count in NLs, and bare countable and bare uncountable in CLs. I will illustrate step-by-step. First, English mass. If the N is [-countable], for example *water*, Agree (#, N) results in the valuation of # as

[-countable], and the subsequent incorporation of N into #. Note that the feature valuation by Agree is immediately followed by the deletion (spelling-out) of that valued feature, so the now valued [-countable] feature on # will be deleted. Next, if the N is [+countable], e.g. *student*, the agreement relation results in valuing [+countable] on #. Then, this valuation evokes the further feature specification of [±plural] on #. [+plural] feature will be manifested as the plural affix *-s*, and [-plural] as zero singular morpheme $-\emptyset$.

(60) a.

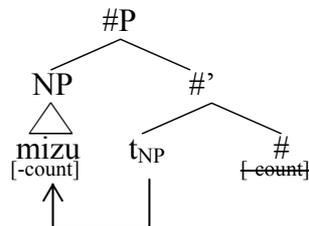


b.

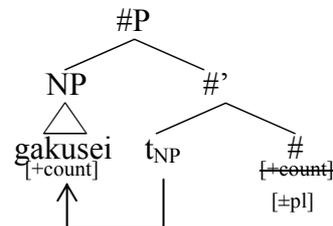


Turning now on Japanese cases. The uncountable noun *mizu* ‘water’ will be [-countable], and the agreeing # will be valued as [-countable], and this feature will be subsequently checked out. As discussed in §5.1, the agreement of # with N will be manifested as the NP-movement into #P Spec. The resulting structure will be (61a). Countable nouns like *gakusei* ‘student’ will have quite the same derivation, with additional [±plural] specification.

(61) a.



b.



These four structures are representative and assumed to be uniform to the other languages as well. NLS will have structures (60) for their #P, CLs will have (61).

5.3. Singular and Plural Distinction

Compare (62) with (63).

(62) a. There is a student in the library. (English)

b. There are students in the library.

(63) Tosyokan-ni gakusei-ga ita. (Japanese)

library-DAT student-NOM be.there.PAST

“There is a student in the library/ There are some students in the library.”

It is presumably clear that the denotation of Japanese countable nouns are neutralized

with respect to singular/plural. That is, their extension contains both singular individuals and the pluralities (sets) of those individuals. If the three students, named Taro, Jiro, and Hanako, are the all students in the world, the Japanese bare noun *gakusei* ‘student’ will be true of Taro and other individual students, as well as of Taro and Hanako, of Jiro and Hanako, of Taro, Jiro and Hanako, and of all the other possible groups of individual students. The English bare singular count noun *student* is, on the other hand, only true of individual students, Taro, Jiro, or Hanako. Its plural counterpart is, as is assumed by Landman (1989a, 1989b, 1996), Link (1983), Chierchia (1998a, 1998b) and many others, derived from the singular form by the function pluralization (PL). This situation is schematized as follows, where the pluralization function is defined, for example, as (66), following Chierchia (1998a).

$$(64) \quad \text{gakusei} = \left[\begin{array}{ccc} & \{t, j, h\} & \\ \{t, j\} & \{t, h\} & \{j, h\} \\ & t \quad j \quad h & \end{array} \right]$$

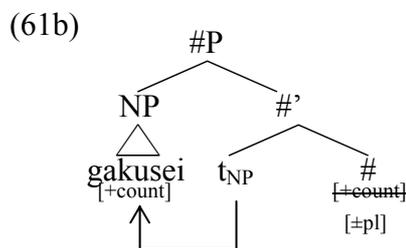
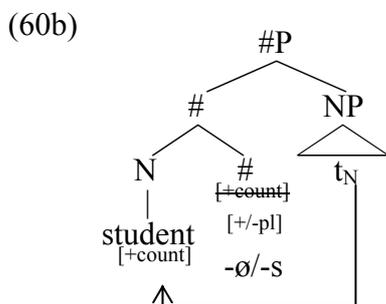
$$(65) \quad \begin{array}{l} \text{students} = \\ \text{PL} \curvearrowright \\ \text{student} = \end{array} \left[\begin{array}{ccc} & \{t, j, h\} & \\ \{t, j\} & \{t, h\} & \{j, h\} \\ & t \quad j \quad h & \end{array} \right]$$

where t = Taro, j = Jiro, and h = Hanako

(Characteristic functions are represented by enclosing their extensions in square brackets.)

$$(66) \quad \text{PL}(F) = \lambda x [-F(x) \wedge \forall y[y \leq x \wedge \text{At}(y) \rightarrow F(y)]]$$

Now, compare the proposed structure of English count nouns with that of Japanese countable nouns ((60b) and (61b) repeated here).



The difference between (60b) and (61b) lies in the way the agreement of # with N is realized. In the former, this agreement induces the head incorporation of N to #. In the latter, it results in the phrasal movement of NP into #P Spec.

Note that in the English case the head incorporation results in the complex head $[N-\#]^0$, but Japanese # remains intact. To put it in the other way, Japanese Ns cannot incorporate into #. I assume this is presumably the factor of the neutralized denotation of (64). In order to receive the $[\pm\text{plural}]$ specification, N must reach #, but this incorporation is not allowed in Japanese and other CLs, because of the obligatory phrasal movement of NP. Specifically, I assume (67).

6 7

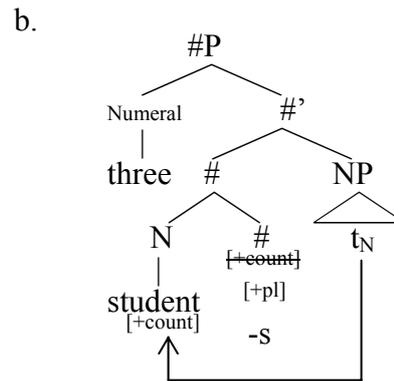
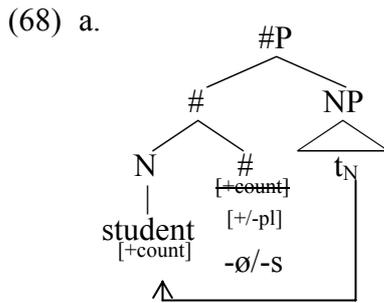
(67) The feature specification of $[\pm\text{plural}]$ on # is only available when N is incorporated into # to form complex head $[N-\#]^0$.

Now, the neutralized denotation of countable nouns in CLs are readily explained by (67). In there languages the NP is obligatory moved to #P Spec, and therefore N cannot reach # to form $[N-\#]^0$. The plurality feature $[\pm\text{plural}]$ remains unspecified, thus it can be construed either as singular or as plural.

6. Visibility Requirement

6.1. Classifier as a Last Resort

In §6 we will investigate numeral construction across languages. First let us focus on the cases of NLs. Compare (60b) with (51), repeated here as (68a) and (68b). As for English, there is no significant difference between the structure of bare count nouns ((68a)) and that of numeral construction ((68b)).



In numeral construction of NLs, the value of $[\pm\text{plural}]$ is determined by the quantity that numeral indicates. Thus if the numeral is *one*, # will be singular or $[-\text{plural}]$, and if the numeral is bigger than *one*, # will be plural or $[\text{+plural}]$.¹²

¹² In this regard, the following Turkish example is of curious importance. Turkish has subject-verb agreement in its morphological system. Grammatical number is active, and normally bare nouns are inflected in terms of singular/plural distinction, so Turkish is a good example of NLs, satisfying the taxonomic properties presented above. As (ia) shows, a plural nominal is regularly marked by the plural suffix *-ler*. Interestingly, numerals are incompatible with plural marking in Turkish, as (ib) shows (The following Turkish examples are from Kornfilt 1996).

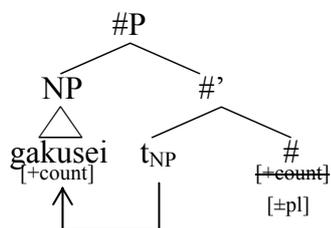
- (i) a. öğrenci-ler (Turkish)
 student-PL
 'students'
 b. iki öğrenci-(*ler)
 two student-(*PL)
 'two students'

When numeral appears to modify the nouns, the resulting nominal phrase systematically drops its plural inflection, even if the number represented by that numeral is bigger than one. Moreover, Turkish nominals counted by numerals are in fact grammatically singular, and subjects in such a status requires singular number agreement on verbs as (iia), contrary to the fact that subject nominals with ordinary quantifier such as *bazı* 'some' are marked as plural in the exactly same syntactic environment (see (iib)).

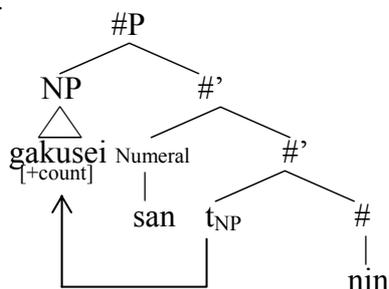
- (ii) a. İki öğrenci ben-im-le gör-üs-mek iste-di-(*ler).
 two student I-GEN-INSTR see-RECIPR-INFIN want-PAST-3PL
 'Two students wanted to meet with me.'
 b. Bazı öğrenci-ler ben-im-le gör-üs-mek iste-di-ler.
 some student-PL I-GEN-INSTR see-RECIPR-INFIN want-PAST-3PL

On the other hand, Japanese bare nouns ((61b), repeated here as (69a)) and numeral construction ((54) = (69b)) differs in one crucial point; that # must be manifested as classifier in the latter, but it remains silent in the former.

(69) a.



b.



Throughout this thesis, I have argued that classifiers occupies the head of #P in CLs. Indeed, I have suggested that the # is morphologically realized as classifier if numeral is present in the Specifier position of #P. However, to the contrary, # must be empty in the absence of numeral, which holds quite generally across CLs. Why does the presence of numeral have influence on the morphological shape of # in CLs? Why does the head of #P in CLs host classifier in the presence of numeral, and why does it remain empty in the absence of numeral?

The Doetjes' (1996, 1997) proposal, which is referred to in §2.2, is of particular importance on this matter. Though presented in a somewhat different context, his claim is essentially that some syntactically visible marker of countability must be present in order to be counted by numeral. He argues that in some languages like English the number marking serves for that purpose, whereas in some languages like Chinese the classifiers do. It is intuitively quite convincing to suppose that numeral counting requires the countability of nouns. In our theory, the countability of nouns is indicated by the [\pm countable] feature on #, and numerals are base-generated in the Specifier position of #P. Then, it is natural to suppose that numeral requires the specification of [+countable] on #. This requirement is stated as (70).

(70) Numeral occupying #P Spec requires the [+countable] feature on #.

We can see this requirement is quite generally satisfied in the numeral construction of NLs. See (68b) again. The agreement of # with N induces the incorporation of N to #, resulting in the complex head [N-#]⁰. Here, the incorporated N bears the interpretable [+countable] feature, and therefore the whole [N-#]⁰ is presumably assumed to be [+countable] as well, satisfying (70).

Note that the interpretable [+countable] feature is supplied by N, not # itself. The

‘Some students wanted to meet with me.’

This fact quite plausibly suggests that the Turkish numerals actually require the singular #. Then, the specification of [\pm plural] in the numeral construction is parametrized across NLs. For some NLs, the numeral construction requires uniform singular # as in Turkish, and for others singular/plural distinction on # in terms of the denoting quantity is required as in English.

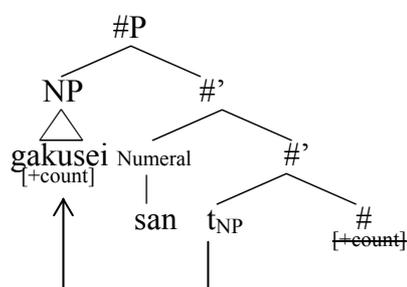
countability feature on # is uninterpretable, as assumed by (58), repeated here.

- (58) # bears an uninterpretable feature [\emptyset countable], which need to be checked by the interpretable counterpart on the agreeing Ns.

This uninterpretable feature is valued by the agreement with the interpretable counterpart on N, and this valuation will immediately cause the subsequent feature deletion (that is, spelling-out to PF component; cf. Chomsky 2000, 2001), so the valued countability feature on # will be invisible to the syntactic computation. Nevertheless, the head of #P will act as [+countable], because interpretable countability is still provided by the incorporated N.

However, the picture will be radically different in the case of CLs. As discussed, N does not incorporate into # in CLs, because the agreement of # with N will cause the phrasal NP-movement into #P Spec. After valued and checked out, the countability feature on # will be no longer visible, as (71) shows.

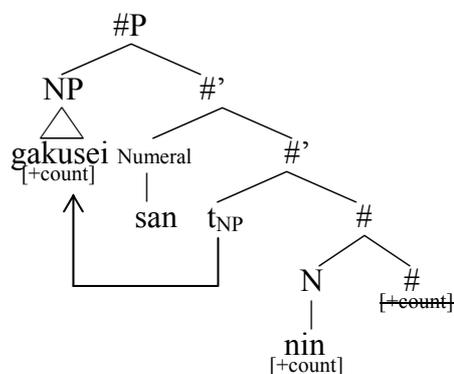
- (71)



If this structure is sent to LF, the requirement of (70) is necessarily violated, and hence the derivation will crash, or converged as deviant. In order to salvage the structure (72), some additional operation must be executed to provide the visible [+countable] feature on #.

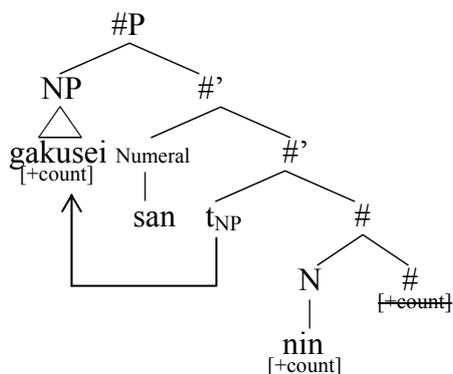
I propose that this operation is the lexical insertion of classifier into #. I assume that classifier is in itself [+countable] N, with additional affixation feature [-#] to necessary attached to #. This class of Ns are inserted to # by base-adjunction, in order to satisfy the visibility requirement of [+countable] feature on #. For example, if the person classifier *nin* is inserted into the # in (72), the resulting # is [+countable] complex [N-#]⁰, which is quite parallel to that of (68b).

- (72)

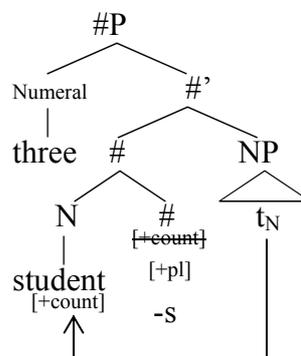


Quite generally, classifiers do not bear any singular/plural marking in CLs. However, it seems a kind of mystery, in the proposed structure conforming the Uniformity Principle. The # of the numeral construction of CLs ((72)) is virtually identical to that of NLs ((68b)).

(72)



(68b)



Then, why doesn't the # in (72) have further specification of [\pm plural], even though the English counterpart in (68b) does?

In this regard, we must revise (67) as (75).

(75) The feature specification of [\pm plural] on # is only available when the N which agreed with # is incorporated into # to form complex head [N-#]⁰.

By this revision, the [\pm plural] specification is now restricted to the # that are incorporated into by the agreeing N, not the # that are base-adjoined by classifier Ns.

However, it is not the case that classifier in any CLs cannot bear singular/plural distinction. In §2.3, I introduce the Cheng and Sybesma's observation that unlike other CLs, Chinese grammar allows numeral-less classifier to occur, and that the Cantonese classifier system employs the plural classifier *di*.

- (76) a. Go leotsi jiu hou lek sin dak. (Cantonese)
 CLA lawyer need very smart only-okay
 "The lawyer had better be very smart."
 b. Di leotsi jiu hou lek sin dak.
 CLA.PL lawyer need very smart only-okay
 "The lawyers had better be very smart."

Cheng and Sybesma (1998) argue that in Chinese the singular/plural distinction is not realized at the level of nouns, but at the level of classifier by the contrast of ordinary classifier and the plural counterpart like *di*. Similar plural classifier can be found in the other dialects of Chinese, like Mandarin *xie* (from Cheng and Sybesma to appear).

- (77) a. Wo xiang mai ben shu (Mandarin)
 I want buy CLA book
 "I would like to buy a book."
 b. Wo xiang mai xie shu

I want buy CLA.PL book
“I would like to buy some books.”

Then, why can Chinese classifier have the further specification of [\pm plural]?

Chinese classifiers must be considered to be exceptional. Quite generally, the presence of classifier requires some numeral or some other quantifiers. In our theory, this is due to the last resort nature of classifier. Classifiers have been assumed to be lexically inserted to # only when required by the numerals' visible countability requirement. However, Cheng and Sybesma (1998) argue that the #P of Chinese can, unlike those of other CLs, appear without numeral. If their proposal is correct, Chinese turns out to be a remarkable language that allows numeral-less classifier, which is, after all, a very marked option for natural languages. Chinese classifiers should be then considered to have lost its inherent last resort nature.¹³ They are now exploit the otherwise unaccessible [\pm plural] specification of the adjacent #, and serves as the singularizer/individualizer, as Cheng and Sybesma (1998) proposes.

I left the question why such peculiarity arise in Chinese for the future research.

¹³ Indeed, the plural classifier *di* cannot occur with any numeral, as (i) shows.

- (i) a. sahp bun syu (Cantonese)
ten CLA book
“ten books”
b. * sahp di syu
ten CLA.PL book
“ten books”

The only one exception is the numeral *yat* ‘one’, which can occur with *di* to mean ‘one or more.’

7. Concluding Remarks

Now, things turn out to be perfectly favorable, fully conforming to the Uniformity Principle (Chomsky 2001) and even to the Silent Principle (Sigurdsson 2003), both repeated here.

(3) the Uniformity Principle (Chomsky 2001; (2))

In the absence of compelling evidence to the contrary, assume languages to be uniform, with variety restricted to easily detectable properties of utterances.

(4) the Silent Principle (Sigurdsson 2003)

All languages share the same set of features; some are not pronounced.

The crosslinguistic existence of #P is virtually guaranteed by our typological investigation of cases in CLs and NLs. The feature on N are assumed to be uniform, at least in terms of their countability. Count nouns in NLs and countable nouns in CLs share the [+countable] feature with each other, and mass nouns in NLs and uncountable nouns in CLs are equivalently specified as [-countable]. Moreover, the feature composition of the head # is asserted to be uniform across languages; they bear an uninterpretable feature [\emptyset countable] to be checked by N, and optional [\pm plural] specification is available on # when it forms the complex [N-#]⁰ with the agreeing N. The agreement relation between # and N is uniformly found in all languages, with the two options of N⁰- or NP-movement. Furthermore, The numeral constructions are quite uniform across languages. Classifiers as a last resort are inserted into # in demand of the visibility requirement of countability on #.

The Uniformity Principle set the dawn of the new age for the study of human languages. The notion of parameter is under critical restraint, on this strongest minimalist research agenda. The investigation of #P in this thesis is a quite small branch of this ongoing research.

Appendix: Japanese *-tati*

Consider again (5), repeated here.

- (5) a. Kooen-ni inu-ga ita. (Japanese)
park-DAT dog-NOM be.there.PAST
“There is a dog in the park/ There are some dogs in the park.”

I argued that Japanese common nouns are neutralized with respect to singular/plural opposition. Japanese nominals’ plural statuses are, instead of plural inflection on nouns, indicated in various ways other than number inflection. Some of these pluralizing methods are illustrated below.

(78) quantifiers

- a. oozei-no seito
many-GEN student
“many students”
b. ikutsuka-no hon
some-GEN book
“some books”

(79) demonstratives

- a. ko-no hon
this-GEN book
“this book”
b. korera-no hon
those-GEN book
“these books”

(80) group markers (restricted to the [+human] nouns, cf. Martin 1975)

- a. seito-tati
student-TATI
“students/ a group of students”
b. doroboo-domo
thief-DOMO
“thieves/ a group of thieves”

(81) reduplication (restricted to a certain classes of nouns)

- a. hito-bito
person-person
“people”
b. hi-bi
day-day

“days”

Let me investigate the group marker *-tati* in (80). While bare nouns can be interpreted either as singular or as plural, an optional plural marker, *-tati*, *-ra* and *-domo*¹⁴, sometimes added to [+human] nouns to indicate its plural status (Martin 1975).

- (82) Kodomo-tati-ga kooen-de asondeiru.
 child-TATI-NOM park-at playing
 “Some children/the children is playing in the park.”

As is shown in (82), the singular/plural ambiguity is disappeared when *-tati* attaches to the noun, and the *N-tati* expressions consistently refer to plural entities. In this regard, it is expected that *-tati* is a plural morpheme like *-s* of English, though its presence to the plural nominal is optional. Nakanishi and Tomioka (2004) proposes that this morpheme is Japanese plural, in spite of their strange denotations.

In this thesis I proposed that # is occupied by classifiers in Japanese. If this conception of # is on the right track, we must assume that *-tati* is not the grammatical plural marker occupying the #⁰ position. In this appendix I argue for this point.

Indeed, the *-tati*’s behavior is somewhat idiosyncratic, which makes us reluctant to treat *-tati* simply as a optional plural marker. The most salient disparity for our concern is that *-tati* is not fully compatible with the numeral construction.

- (83) a. Taroo-wa san-nin gakusei-(??tati)-o mita.
 Taro-TOP three-CLA student-TATI-ACC saw
 “Taro saw three students.”
 b. Taroo-wa san-nin-no gakusei-(??tati)-o mita.
 Taro-TOP three-CLA-GEN student-TATI-ACC saw
 c. Taroo-wa gakusei-(tati) san-nin-o mita.
 Taro-TOP student-TATI three-CLA-ACC saw
 d. Taroo-wa gakusei-(??tati)-o san-nin mita.
 Taro-TOP student-TATI-ACC three-CLA saw

Apart from (83c), numeral construction with *-tati* is marginal. Though the judgments are controversial, there exist a certain contrast in acceptability between (83c) and others¹⁵.

¹⁴ The behavior of *-ra* and *-domo* is essentially the same as *-tati*, I will take *-tati* as the representative example for these optional human/animate plural markers.

¹⁵ As for numeral construction, Nakanishi and Tomioka argue that when the number of the numeral is big and not so exact, the acceptability will be improved, as in (i).

- (i) a. ?? san-nin-no gakusei-tati
 three-CLA-GEN student-tati
 “three students”
 b. nihyaku-nin-izyoo-no gakusei-tati
 200-CLA-or.more-GEN student-tati
 “200 or more students”

Nakanishi and Tomioka (2004) closely observes *-tati*'s idiosyncratic behavior, mainly focusing on the following three puzzles. First, when *-tati* is present, the whole sentence cannot be read as generic, as is shown (84).

- (84) a. Itariajin-wa yooki-da.
 Italian-TOP cheerful-COPULA
 ok. generic: "Italians are cheerful."
 b. Itariajin-tati-wa yooki-da
 Italian-TATI-TOP cheerful-COPULA
 ??? generic: "Italians are cheerful."
 ok. "Some group of Italians are cheerful."

The same point is illustrated by the fact that *-tati* plural cannot refer to kinds. Thus kind-taking predicate is hardly compatible with *-tati*, as is shown in (85).

- (85) zyosei-tantei-(?*tati)-wa mezurashii.
 female-detective-TATI-TOP rare
 "Female detectives are rare."

Second, *-tati* nominals cannot take narrow scope with respect to intentional verbs.

- (86) a. Sono byooin-wa kangohu-o sagasi-teiru
 that hospital-TOP nurse-ACC look.for-PROG
 ok. "That hospital is looking for a nurse/nurses (to hire)."
 ?? "There is a group of nurses that hospital is looking for."
 b. Sono byooin-wa kangohu-tati-o sagasi-teiru
 that hospital-TOP nurse-TATI-ACC look.for-PROG
 *? "That hospital is looking for nurses (to hire)."
 ok. "There is a group of nurses that hospital is looking for."

The third puzzle is that N-*tati* cannot be an internal argument of the possession verb *aru/iru* 'to have, to exist.'

- (87) a. Inoue-san-ni-wa kodomo-ga aru/iru

However, according to my and many of my informants' judgement, this improvement is not so significant. Evidently the contrast between (iic) and the other examples of (ii) is still maintained, to essentially the same degree as of (83).

- (ii) a. Taroo-wa nihyaku-nin-izyoo gakusei-(??tati)-o mita.
 Taro-TOP 200-CLA-or.more student-TATI-ACC saw
 "Taro saw 200 or more students."
 b. Taroo-wa nihyaku-nin-izyoo-no gakusei-(??tati)-o mita.
 Taro-TOP 200-CLA-or.more-GEN student-TATI-ACC saw
 c. Taroo-wa gakusei-(tati) nihyaku-nin-izyoo-o mita.
 Taro-TOP student-TATI 200-CLA-or.more-ACC saw
 d. Taroo-wa gakusei-(??tati)-o nihyaku-nin-izyoo mita.
 Taro-TOP student-TATI-ACC 200-CLA-or.more saw

- Inoue-Mrs.-DAT-TOP child-NOM exist
 ‘Mrs. Inoue has a child/children (*It asserts that Mrs. Inoue is a mother*).’
 b. *? Inoue-san-ni-wa kodomo-tati-ga aru/iru
 Inoue-Mrs.-DAT-TOP child-TATI-NOM exist

These data suggests that *-tati* is not a simple plural morpheme like English *-s*, in the sense that the attachment of it induces some “extra” semantic effect to the noun, other than plurality.

These three puzzles, at first sight, seem to be diagnoses of definiteness. Indeed, the English examples (88)-(90) approximately correlate to the paradigm (85)-(87).

- (88) a. Italians are cheerful. (ok. generic)
 b. The Italians are cheerful. (* generic)
- (89) a. That hospital is looking for nurses. (* nurses > look for)
 (look for > nurses)
 b. That hospital is looking for the nurses. (the nurses > look for)
 (* look for > the nurses)
- (90) a. Mrs. Inoue has children. (asserts Mrs. Inoue’s motherhood)
 b. Mrs. Inoue has the children. (does not asserts Mrs. Inoue’s motherhood)

Then the analogy that *-tati* have both the denotation of pluralizer and that of definite determiner (*the* and *-s* in English) may well arise. Kurafuji (1999, 2003) elaborates this line of approach, positing the semantics of *-tati* to be essentially a definite determiner with additional pluralizing denotation.

- (91) a. $\sigma x [PL(P_i)(x)]$
 b. $[[\sigma_u \phi]]^g$ denotes the greatest element v which satisfies $[[\phi]]^{g[u/v]}$

Kurafuji’s treatment of *-tati* can explain not only these three puzzles, but also its marginal status in the numeral construction (shown in (83)), by the natural assumption that numeral counting cannot apply to definite nominals.

Nakanishi and Tomioka (2004), however, argue that *-tati* is not always definite. They propose (92) for the semantics of *-tati*.¹⁶

¹⁶ Note that *-tati* also can be attached to proper names, whose denotation will be the group containing the person that the proper name indicates.

- (i) Taroo-tati
 Taro-TATI
 “Taro and the others/ the group represented by Taro”

Nakanishi and Tomioka (2004) propose the semantics of *-tati* in [Proper Name + *-tati*] as (ii), essentially the meaning equivalent to (92).

- (ii) $[[\mathbf{tati}]] \in D_{\langle e, \langle e, t \rangle \rangle} = \lambda x_e. \lambda Y_e. x \leq Y \ \& \ |Y| \geq 2 \ \& \ x \text{ represents } Y$

$$(92) \quad \llbracket \text{tati} \rrbracket \in D_{\langle \langle e, t \rangle, \langle e, t \rangle \rangle} = \lambda P_{\langle e, t \rangle} \dots \lambda Y_e. |Y| \geq 2 \ \& \ x \text{ represents } Y$$

The crucial difference between Kurafuji's (91) and Nakanishi and Tomioka's (92) is that while *N-tati* will denote an individual of type *e* by the former semantics, that remains to be a function of type $\langle e, t \rangle$ by the latter semantics, which saves *N-tati* from invariant definite interpretation, which is imposed from Kurafuji's semantics.

Nakanishi and Tomioka (2004) finally conclude that Japanese *N-tati* is plural after all, though *-tati* has the additional non-uniform denotation that sometimes evokes some marked interpretation. However, this conclusion is not fully maintained, unless some explanation is provided to account for the unnaturalness of *tati* within numeral construction. Consider again (83). In the previous discussion I have argued that grammatical number marker is required to be present in the numeral counting in English and other NLs. In our conception of countability, this point is stated by the assumption that there must be some visible [+countable] feature on # in numeral construction. Here, it is clearly shown that the presence of *-tati* marking is far from needed in Japanese numeral construction. Rather, numeral counting on *-tati* nominals, apart from the word order (83c), is in fact deviant to a certain degree. *-tati* is not at all equivalent to English *-s*, in that it is not a prerequisite for numeral counting.

Why is the example (c) in (83) distinguished in acceptability from the other (a), (b) and (d) examples? The answer lies in the peculiar semantic effect of the (c) construction. Consider (93).

- (93) a. *? Taroo-wa go-nin SMAP-o mita.
 Taro-TOP five-CLA SMAP-ACC saw
 b. *? Taroo-wa go-nin-no SMAP-o mita.
 Taro-TOP five-CLA-GEN SMAP-ACC saw
 c. Taroo-wa SMAP go-nin-o mita.
 Taro-TOP SMAP five-CLA-ACC saw
 “Taro saw SMAP, the five members.”
 d. *? Taroo-wa SMAP-o go-nin mita.
 Taro-TOP SMAP-ACC five-CLA saw

SMAP is a famous Japanese pop idol group, which consists of five male vocals. Thus the copula sentence like (94) is grammatical and true.

- (94) SMAP-wa go-nin da.
 SMAP-TOP five-CLA COPULA
 “SMAP consists of five persons.” (lit: “SMAP is five persons.”)

But apart from this fact, the examples like (93) are quite deviant, with only one exception of (93c). (93c) is, on the other hand, quite acceptable, but only with reading essentially similar

I will put aside the [Proper Name + *-tati*] construction and focus on the ordinary [Common Noun + *-tati*] one.

to the non-restrictive relative, indicated by the English translation. Similar effect is found also in cases where the numeral counting applies to the indefinite common group nouns, as is illustrated by (96).

- (95) Furyoo-gruupu-wa (taitei) go-nin da.
 hooligan-group-TOP usually five-CLA COPULA
 “A group of hooligans (usually) consists of five persons.”
- (96) a. *? Sensei-ga go-nin furyoo-gruupu-o yobidashita.
 teacher-NOM five-CLA hooligan-group-ACC called
 b. *? Sensei-ga go-nin-no furyoo-gruupu-o yobidashita.
 teacher-NOM five-CLA-GEN hooligan-group-ACC called
 c. Sensei-ga furyoo-gruupu go-nin-o yobidashita.
 teacher-NOM hooligan-group five-CLA-ACC called
 “The teacher called a certain group of hooligans, the five members.”
 d. *? Sensei-ga furyoo-gruupu-o go-nin yobidashita.
 teacher-NOM hooligan-group-ACC five-CLA called

Then, it is clear that the word order (c) is somewhat different from the ordinary numeral construction. Such a [N-Numeral-Cl-CaseMarker] sequence is somehow allowed to receive a particular type of interpretation; namely the counting of members of the group that the N refers to. Bearing this in mind, consider again (83). The appearance of *-tati* makes these numeral construction marginal, and the sole grammatical form of (83c) contains exactly the same word order which allows the member-counting of certain groups. So the N-*tati* is conceivably supposed to denote some entities with a group status. That is why I dubbed *-tati* as a group marker, not a plural marker.

It is quite clear that *-tati* have some plural meaning in some way. However, it has a peculiar denotation of the groupness, as well as the representivity discussed in Nakanishi and Tomioka (2004). Above all things, it is usually incompatible with the numeral construction, with exception of enforced group reading like (93c) and (96c). Therefore, it is quite unlikely that *-tati* occupies the position of #⁰, because our investigation of # reveals that this functional category is not only the locus of singular/plural opposition but also the indicator of the nominal’s countability.

This appendix discussed that the group marker *-tati* is not the candidate for #, in spite of its quasi-pluralizing function, so it will serve as an indirect support the view that the position of # is exploited by classifiers in Japanese (and other CLs).

ABSTRACT IN JAPANESE (和文抄訳)

日本語などの CL (Classifier Language) では数詞が名詞を修飾するときに冊、個、匹などの助数詞が必要とされるのに対して (例、三冊の本)、英語などの NL (Number Language) では数詞は直接名詞を修飾することができる (例、three books)。この論文では CL と NL の文法的特徴の比較を通して、特に名詞の意味の差異、助数詞の性質、数詞構文の内実などが中心に議論される。そして、これらの言語の背後には共通の統語的構造が存在し、さらに N や Number (#) という範疇のもつ素性構成およびその機能はすべての言語に共通・普遍的であるという結論が導かれる。これらの結論は近年提案され目覚ましい注目を浴びている均一性仮説 (the Uniformity Principle) を支持するものである。

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