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FUNCTIONAL PROJECTIONS OF NOMINALS IN JAPANESE: SYNTAX OF CLASSIFIERS★

ABSTRACT. Japanese allows the numeral + classifier combination to appear in a variety of positions in relation to the head noun. This paper argues that it is necessary to posit at least four functional projections above NP (#P, CaseP, QP, and DP) and massive phrasal movement of such functional projections in order to provide a principled account for the structural diversity of the numeral + classifier combination in Japanese. New evidence from minimizer expressions and pseudo-partitives, which have not been systematically investigated before, is brought to bear on details of the analysis. Japanese is an excellent testing ground for exploring the nature of the noun-related functional projections, because some of them, such as #° and Case°, are argued to be overtly realized (#° as a classifier and Case° as a case particle).

1. Introduction

This paper looks into the detailed structure of nominal projections in Japanese. Research based on Romance, Germanic, and Semitic languages has revealed the existence of various functional projections between NP and DP (see Bernstein 2001a and Longobardi 2001 for

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an overview). The arguments for such projections come from the relative position of the head noun with respect to other elements within a nominal projection. Schematically, such arguments look at the configuration shown in (1).

(1) D ... F... X ... N

If the head noun appears after X (an adjective, for example) in one language (or construction) but appears in front of X but below D in another, then it is concluded that the head noun undergoes head movement across X to the functional head F in the latter language (or construction). The issue is whether such intermediate functional projections can be motivated in strictly head-final languages like Japanese, where no reference point can be established between N and F, even if functional projections are posited above NP as in (2).

(2) $[_{DP}\ [_{FP}\ [_{NP}\ \ldots\ N]\ F]\ D]$

The worry is that without a reference point that helps determine the surface position of the head noun in terms of head movement in such a structure, it may not be obvious whether functional heads like F exist after all. In this paper, I would like to argue that a unified analysis of various structures in which a numeral classifier can appear in Japanese should presuppose the existence of functional projections above NP. The upshot of the analysis is that massive phrasal movement takes place within a nominal projection in Japanese, so that it is not necessary to rely on evidence based on head movement in order to justify functional projections. Since the theoretical status of head movement is controversial (Chomsky 2000, 2001), the results in this paper provide more robust evidence for the existence of, and about the nature of, functional projections above NP.

A related issue is the existence of the head D in Japanese. Fukui (1986) and Fukui and Takano (2000) claim that the existence of D is subject to parametrization and that Japanese lacks D (see also Fukui and Sakai 2003 for discussion of functional categories in general). The question is whether D is needed for argument expressions. The first claim by Fukui and Takano denies the universality of the relation between argumenthood and D. This issue has been sharpened by Chierchia's (1998a,b) recent proposal, which attempts to connect the absence of overt definite and indefinite determiners, the absence of plural morphology, and the obligatory use of a classifier in the presence of a numeral in languages like Chinese and Japanese.

Chierchia's idea is that the NP denotation is parametrized in terms of the features [±arg, ±pred]. Languages with [+arg, −pred] NP allow bare NPs to appear as arguments. These bare NP arguments denote kinds, which are converted to mass properties for the purposes of quantification. Being mass, nouns in [+arg, −pred] languages resist plural morphology and require a classifier as the counting unit. Chierchia examines Chinese as a representative of this type. Japanese seems to belong to the same type at first sight. I will demonstrate, however, that the classifier is a parametric manifestation of number morphology which is sensitive to the mass/count distinction in the same way that plural morphology is in Germanic and Romance languages. I will also claim that D exists in Japanese after all, on the basis of the correlation of non-specificity with the form of the classifier construction.

Thus, the discussion in this paper centers around the syntax of classifiers in Japanese in relation to the structure and nature of functional projections above NP. Phenomena and structures in which classifiers do not appear are also taken into account to the extent that their analysis sheds light on the nature of classifiers.

In the following section, I will present basic data about the distribution of numerals and classifiers to point out that one peculiarity of the numeral in Japanese is that it can appear in multiple positions within a nominal projection, in contrast to its counterpart in languages like English, which can be placed only in a single position in relation to the head noun. It will also be shown that in order to provide a principled account of numeral classifiers in Japanese, the problem of how to treat case particles cannot be avoided. A brief look at simple data on classifiers shows that the proper treatment of case particles is essential for the analysis of classifiers. These two points are quite elementary and straightforward, but have eluded a principled account in the past.

In section 3, by positing various functional projections above NP, I outline the analysis which accounts for why Japanese allows a wide variety of structures in which a numeral + classifier combination can appear. The subsequent sections discuss these projections in turn. Section 4 takes up the projection headed by a classifier. Here, I will provide an analysis for the pseudopartitive construction in Japanese, which has received very little attention in the literature so far. A detailed examination of this construction forms the basis of the demonstration in this section that the classifier is a parametric manifestation of number morphology. Section 5 compares numerals

with other quantifiers. It will be shown that the sensitivity of quantifiers to the mass/count distinction, discussed in detail in Chierchia (1998b), is also found in Japanese. I will put forth a very specific proposal about how this sensitivity should be handled. Chierchia's proposed parametrization of NP denotation is discussed at relevant points of the discussion in sections 4 and 5. Crucial to the discussion of Chierchia's proposal is the generalization that a classifier can be used only in the presence of a numeral in Japanese.

Section 6 turns to the semantic property of case particles. I will show that the projection headed by a case particle participates in the mechanism that regulates specificity, in collaboration with a higher functional projection which will be identified as DP. Section 7 concludes the paper.

2. Basic Data: Distribution of Numerals and Indeterminates

Let us review the basic data which any adequate account of Japanese classifiers should be responsible for. There are four types of structures in which a numeral + classifier combination can appear in the vicinity of the head noun, as illustrated in (3).

(3)a. John-wa hon **san-satsu**-o katta.
John-top book 3-cl-acc bought
'John bought three books.'

b. John wa **san-satsu**-no hon-o katta.

c. John-wa hon-o **san-satsu** katta.

d. John-wa **san-satsu** hon-o katta.

In the 70's (see Kamio 1977, 1983 for a review), the structure in (3b), in which the numeral + classifier combination is linked to the following nominal projection by a genitive-like element *no*, was considered to be (closer to) the underlying structure, from which (3c) is derived by a movement rule that postposes the numeral + classifier combination. A somewhat different postposing operation was posited for (3a). (3d) was analyzed as resulting from scrambling of (3c).

Such an attempt to provide a unified account of the entire range of constructions in (3) has been abandoned since Inoue (1978), on the grounds that there are syntactic and semantic differences among these

types of structure. This position is still maintained in recent works such as Kawashima (1998: note 2), who simply assumes that (3b) is not transformationally related to (3c), and Nakanishi (2003), who bases an argument against a unified account on the erroneous assumption that transformation preserves meaning, an assumption which has been defunct since the 70's.[1]

The very fact that there are differences among the constructions in (3) does not rule out the possibility that they are derivationally related. As long as they have different derived structures, it is not surprising to find some concomitant semantic differences. The question to be addressed, though, is why a numeral + classifier combination can show up in such a variety of structures in Japanese. It is fairly uncontroversial that the numeral + classifier combination is part of the nominal projection in (3a,b). In (3a), it is sandwiched between the head noun and the case particle. In (3b), it is linked to the head noun by *no*. Thus, the numeral can appear on either side of the head noun in some functional projection related to the noun in Japanese, while the position of a numeral is fixed, always prenominal, in languages like English. What kind of parameter differentiates Japanese from languages like English with respect to the placement of the numeral?

It may not be impossible to provide an answer to that question by positing different underlying structures for the constructions in (3), but no principled account along that line has yet been provided. Terada's (1990) work, which is a very rare case that discusses all the four types in (3) in some detail, ends up positing different underlying structures without explaining why Japanese, in contrast to English, allows such a variety. The question is simple and straightforward, but it has eluded us so far. In fact, no serious attempt has been made to tackle the question since the uniform account of the 70's was abandoned, to the best of my knowledge. One major goal of this paper is to take up this neglected elementary question.

The effort to find connections among the structures for (3) will be rewarding for advancing our understanding of the nature of case particles. Observe that the difference between (3a) and (3c) lies in the placement of the case particle. The nature of case particles in Japanese is a controversial topic (see Fukui and Takano 1998; Fukui and

[1] (3a) is not even mentioned by Kawashima (1994, 1998), who tries to relate (3c) and (3d), nor by Muromatsu (1998), who derives (3b) and (3c) from the same structural source. Kitahara (1993) does not deal with (3b) at all.

Sakai 2003; and the references cited there). By looking at the behavior of case particles in the presence of a numeral + classifier combination, one can hope to clarify their theoretical status. Let us consider the behavior of indeterminates, as shown below, in order to see how significant it is to pay attention to the position of case particles.

(4)a. *Sono purojekuto-wa seika **nani-mo**-o
that project-top achievement what-MO-acc
age-nakat-ta.
raise-neg-past
'That project didn't produce any result.'

a′. *Sono purojekuto-wa seika-**nani**-o-**mo** age-nakat-ta.

b. Sono purojekuto-wa **nan**-no seika-**mo** age-nakat-ta.

c. Sono purojekuto-wa seika-o **nani-mo** age-nakat-ta.

d. Sono purojekuto-wa **nani-mo** seika-o age-nakat-ta.

In (4), a *wh*-expression *nani* is turned into a non-*wh* quantifier by adding a particle *mo*. Let us call the *wh*-part an indeterminate. Comparison of (4c,d) with (3c,d) above leads one at first to expect that the indeterminate-particle expression behaves in the same way as the numeral + classifier combination, but that naïve prediction is not borne out. The *wh*-particle combination cannot appear between the head noun and a case particle, as shown in (4a). One might consider splitting the indeterminate-particle sequence, since only the indeterminate part appears in front of the head noun in (4b).[2] Still, the indeterminate cannot appear between the head noun and a case particle, as shown in (4a′).

[2] Note also that the final vowel of the indeterminate is truncated in (4b). The structure for (4b) seems to become deviant when the head noun denotes a concrete entity. Compare (i) below to (4b).

(i) ??John-wa **nan**-no hon-**mo** yoma-nakat-ta.
John-top what-gen book-MO read-neg-past
'John didn't read any book.'

A reviewer finds this example acceptable. The same reviewer remarks that 'book' in (i) is abstract. It is possible that this reviewer has a different notion of book-reading. For me, a book has to be visible (and hence concrete) when I read it.

Another pattern appears when we combine an indeterminate and a numeral as in (5).

(5)a. *Sono purojekuto-wa seika **nani-hito-tsu**-o
that project-top achievement what-1-cl-acc
age-nakat-ta.
raise-neg-past
'That project didn't produce even a single result.'

b. ??Sono purojekuto-wa **nani-hito-tsu**-no seika-o age-nakat-ta.

c. Sono purojekuto-wa seika-o **nani-hito-tsu** age-nakat-ta.

d. Sono purojekuto-wa **nani-hito-tsu** seika-o age-nakat-ta.

Note that (5a) is ill-formed, despite the presence of a numeral + classifier combination. Thus, the unacceptability of (4a) is not simply due to the absence of a numeral + classifier combination. Furthermore, the prenominal position linked by *no* now becomes deviant, as in (5b).[3] The paradigm in (5) illustrates a minimizer expression, which has received little attention in the literature. The general classifier for inanimates must be used here, as shown in (6).

(6)a. John-wa hon-o **nani-hito-tsu** yoma-nakat-ta.
John-top book-acc what-1-cl read-neg-past
'John didn't read a single book.'

b. *John-wa hon-o **nani-is-satsu** yoma-nakat-ta.
John-top book-acc what-1-cl read-neg-past

[3] The (b) example seems to improve when the accusative marker is replaced by *mo*, as in (i).

(i) Sono purojekuto-wa **nani-hito-tsu**-no seika-**mo** age-nakat-ta.

Again, a concrete head noun seems to resist this structure.

(ii)a. *John-wa **nani-hito-tsu**-no hon-o yoma-nakat-ta.
John-top what-1-cl-gen book-acc read-neg-past
'John didn't read a single book.'
b. *John-wa **nani-hito-tsu**-no hon-**mo** yoma-nakat-ta.

I leave the concrete/abstract contrast to future research. The nature of *mo* will be taken up in section 5.3.

The classifier for books is *satsu*, as in (3), but it cannot be used here. Instead, *tsu* must be used.[4]

The summary of the data so far is given in (7), where the positions indicated by ∧ and marked as (a,b,c,d) correspond to examples (a,b,c,d) in (3)–(5) and the square brackets indicate constituency.

(7) summary of Japanese data

	∧ [(d)	∧ -no N° (b)	∧ case (a)	∧] (c)
numeral + cl	ok	ok	ok	ok
nani-mo	ok	ok	*	ok
nani-hitotsu	ok	??	*	ok

The important point for us is that the position between the head noun and the case particle is available for the numeral + classifier combination, but not for the indeterminate *nani* (either in combination with the particle *mo* or as part of a minimizer). So the syntax of case particles plays an important role.

Note that position (c), but not (d), appears inside the square brackets. As noted above, the idea that the numeral + classifier combination is part of a nominal projection in examples (3a) and (3b) is fairly uncontroversial. The status of (3c) is more tricky. It has been argued since Kamio (1983) that the numeral + classifier combination in (3c) forms a constituent with a nominal projection on the basis of the possibility of clefting as in (8).

(8) John-ga katta-no-wa hon-o **san-satsu** da.
John-nom bought-C-top book-acc 3-cl. copula
'It is three books that John bought.'

This constituency test is questioned by Koizumi (1995, 2000), who observes that multiple constituents can apparently occupy the focus position of a cleft sentence, as illustrated in (9).

[4] The noun *seika* always requires this general classifier, as in *futa-tsu-no seika* '2-cl-gen-achievement'. Nouns like *hon* 'book', therefore, must be used to illustrate the point. Note also that the pronunciation of numerals changes depending on the accompanying classifier.

When the head noun is [+human], the minimizer of this type takes the form *dare-hito-ri* 'who-1-cl', where the ordinary classifier for humans is used. The distributional pattern is the same as in (5). Needless to say, only the numeral meaning 'one' can be used in minimizers.

(9) Mary-ga ageta no-wa John-ni ringo-o mit-tsu da.
Mary-nom gave C-top John-dat apple-acc 3-cl copula
'(Lit.) It is three apples to John that Mary gave.'

Koizumi claims that the focus position in (9) is in fact occupied by VP, whose head has moved out. Thus, (9) is analyzed as having the structure in (10a).

(10)a. Mary-ga ageta no-wa [$_{VP}$ John-ni ringo-o mit-tsu t_V] da.

b. John-ga katta-no-wa [$_{VP}$ hon-o **san-satsu** t_V] da.

Likewise, (8) can be analyzed as (10b). Under alternative accounts of multiple foci in (9) proposed by Fukui and Sakai (2003) and Takano (2002), the details of which I will not go into, (8) cannot be taken as evidence that *hon-o san-satsu* 'book-acc 3-cl.' forms a constituent, either, since these accounts are also intended to allow multiple foci.

Note, however, that the contrast between (8) and (11), attributed by Ishii (1999) to Fujita (1994),[5] remains to be accounted for under Koizumi's account as well as under the other alternatives.

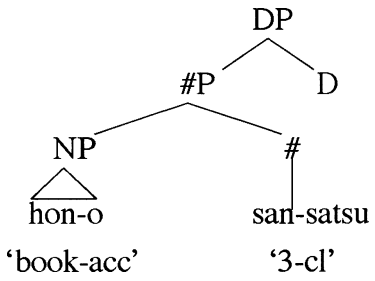
(11) *John-ga katta-no-wa **san-satsu** hon-o da.
John-nom bought-C-top 3-cl. book-acc copula
'It is three books that John bought.'

Koizumi's account, for example, allows (11), to the extent that the numeral + classifier combination stays within VP. If it turns out that a numeral + classifier combination and its associated nominal projection cannot occupy the focus position(s) in a cleft as separate constituents, the contrast between (8) and (11) can be taken as solid evidence that the numeral + classifier combination is part of a nominal projection in (3c), but not in (3d). It goes well beyond the purposes of this paper, however, to determine whether such an assumption is tenable, let alone to evaluate the various accounts by Koizumi, Fukui and Sakai, and Takano in light of the data in (8), (9), and (11). Instead, in section 4.1, I will provide a completely different perspective which suggests that *hon-o san-satsu* should be treated as a constituent in (3c).

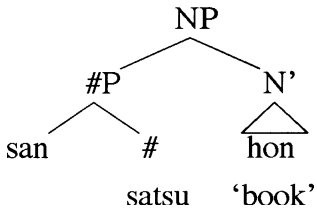
[5] Takano (1984) observes a similar contrast with the clefted nominative subject. There is a complicating factor, however, because the nominative case particle cannot appear in the focus position of the cleft.

Let us review some recent proposals concerning the structure containing a numeral + classifier combination, listed in (12) below.

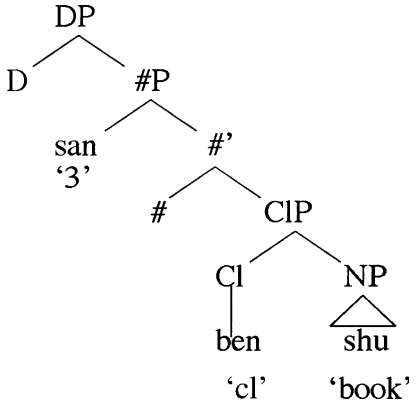
(12)a. Tang (1990), Kawashima (1994, 1998)



b. Fukui and Takano (2000)



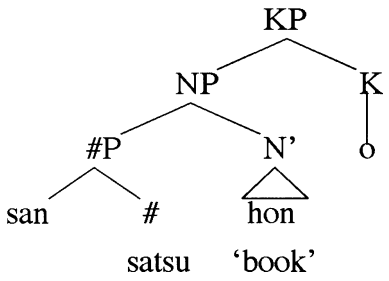
c. Li (1999), Borer (2005), Cheng and Sybesma (1999)



Let me note at the outset that none of them is intended to give a uniform analysis of (3a,b). This is a serious drawback that must be overcome. Below, I will mostly concentrate on the problem of case particles.

Kawashima (1994, 1998) adopts the structure proposed for Chinese by Tang (1990). No provision is made for the placement of case particles. This is understandable for an account of Chinese, which lacks case particles, but it is a serious limitation for an account of Japanese. Kawashima simply puts a case particle together with the head noun as in (12a), which only takes care of (3c).[6] Fukui and Takano (2000) propose the structure in (12b), which corresponds to (3b). Fukui and Takano (1998) hypothesize that a case particle heads its own projection KP on top of NP. Combining these two proposals gives the tree in (13).

(13)



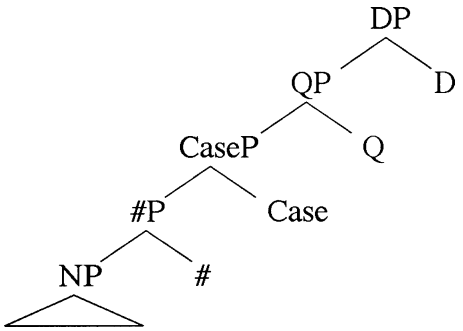
This still falls short of accounting for (3a), however. Yet another proposal is made by Li (1999) and Borer (2005), who posit separate projections for a numeral and a classifier as in (12c). Cheng and Sybesma (1999) propose the same structure, except that they do not posit DP and that the number information is located not in #P (their NumeralP) but in ClP. Again, this proposal is based on Chinese, hence no provision for case particles. Perhaps the only serious attempt to handle case particles is Kitahara's (1993) analysis, which says, adopting the structure in (12a), that the case particle is attached to the head noun when NP is raised to DP whereas it is attached to the classifier when #P is raised to Spec of DP. But as mentioned in note 1, Kitahara does not discuss the structure for (3b). In the unified analysis to be developed in the subsequent sections, a rather specific proposal is going to be provided for the position of case particles.

[6] Kawashima posits QP on top of DP to host the universal quantifier *subete* 'all', on the model of Shlonsky's (1991) analysis of the collective use of the Hebrew *kol* 'all', which appears higher than the definite article. This instance of *kol* will be briefly contrasted to its distributive use in section 5.1. Treatment of this kind of universal quantifiers, however, is put aside in this paper because of their crosslinguistic peculiarities. See Partee's (1995: 582–584) remarks.

3. An Outline of the Analysis

I propose that Japanese nominals have at least three layers of functional projections above NP and below DP, as shown in (14).

(14)



Movement of various projections within DP will be shown to give rise to a host of structures in which a numeral can appear. In this section, I will outline the analysis. The properties of the relevant functional categories in (14) must be properly identified; that is the task of the subsequent sections. Section 4 will focus on #P, QP will be taken up in detail in section 5, and CaseP and DP will be discussed in section 6.

3.1. *Movement and Agreement*

Before presenting the analysis, let me spell out some basic assumptions about movement adopted in this paper. First, I adopt the multiple Spec system of the bare phrase structure theory (Chomsky 1995). Second, I assume that agreement lies behind movement. For concrete implementation, I adopt the conception of movement proposed in Chomsky (2000), where movement comes about through the sequence of operations Agree, pied-piping, and Merge. Pied-piping and Merge, which are responsible for phrasal displacement, apply when the functional head that acts as the probe for Agree has an EPP feature. In the absence of an EPP feature, Agree takes place without phrasal displacement. It is quite possible that the presence or absence of an EPP feature is correlated to other differences in featural content of the head in question.

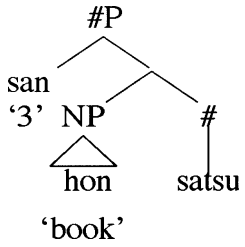
These are the minimal assumptions directly relevant for the purposes of this paper, which tries to provide a sufficient (and unified)

structural basis for the variety of positions in which the numeral + classifier combination can appear.

3.2. *Phrasal Movement Within DP*

Let me outline the analysis that relates the various construction types in (3) next. I will assume that a numeral occupies Spec of #P, as in (15), following Li (1999).

(15)



(15) differs from (12c), however, in not positing ClP, whose head hosts a classifier. (15) adopts Fukui and Takano's (2000) proposal that a classifier occupies the head of #P, though I follow the studies based on Romance and Semitic languages (Bernstein 1991, Ritter 1991, Valois 1991, among others) in placing #P on top of NP. The key idea is that a classifier is a manifestation of number morphology in Japanese. This explains the fact that Japanese lacks genuine plural morphology, because the # head is also the locus of plural morphology. This idea will be defended and explored further in section 4.2. It should also be noted that a classifier appears only when Spec of #P is occupied by a numeral. This point is illustrated in sections 4 and 5.

The motivation for placing a numeral in Spec of #P comes from the treatment of modified numerals as illustrated in (16) for English.

(16)a. at least 3 books

b. more than 3 books

Modified numerals should occupy Spec because of their phrasal status. Beghelli and Stowell (1997) and Szabolcsi (1997) argue that modified numerals belong to the class of Counting Quantifiers. They also exist in Japanese, with essentially the same scope properties as their English counterparts, as shown in Watanabe (2000). Examples are given in (17) and (18).

(17)a. John-wa **sukunakutomo san-satsu-no** hon-o katta.
John-top at.least 3-cl-gen book-acc bought
'John bought at least three books.'

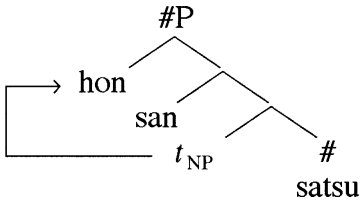
b. John-wa hon-o **sukunakutomo san-satsu** katta.

(18)a. John-wa **san-satsu-ijou**-no hon-o katta.
John-top 3-cl-more.than-gen book-acc bought
'John bought more than three books.'

b. John-wa hon-o **san-satsu-ijou** katta.

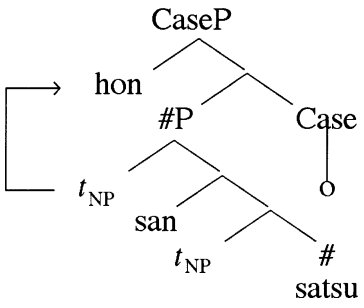
Let us now consider how the derivation proceeds after the structure in (15) is constructed. First, the # head undergoes number agreement with the head N, one of the topics of section 4. If the # head has an EPP feature, NP gets raised to another Spec of #P as in (19).

(19)



There is no way of telling whether this phrasal movement takes place or not, because I claim that NP undergoes obligatory phrasal movement to Spec of CaseP as in (20), which is triggered by an EPP feature of the Case head.

(20)



In the subsequent discussion, I will posit only a single trace within #P. I will turn to agreement between NP and the Case head that lies behind this movement in section 6.[7]

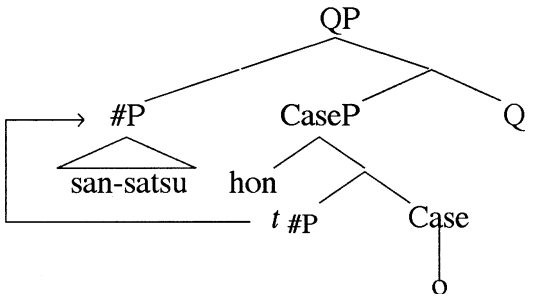
If no further movement takes place when higher functional categories such as Q and D are merged, the structure for (3a), repeated below, is obtained.

(3)a. John-wa hon **san-satsu**-o katta.
John-top book 3-cl-acc bought
'John bought three books.'

In (20), the numeral + classifier combination correctly surfaces between the head noun and the case particle.

The next step is optional raising of #P to Spec of QPs, as in (21).

(21)



[7] Ionin and Matushansky (2004), whose work was brought to my attention by Marcel den Dikken, argue against placing numerals in Spec, pointing to the fact that the numerals appear to assign case to the following NP in various languages including Slavic (Franks 1994), as in the Russian example in (i).

(i) pjat' knig
five-acc book-gen-pl

Their idea is that numeral are nouns that take an NP complement and assign it genitive case.

This argument is weakened, however, by the fact that oblique case obliterates genitive marking, as in (ii), where the head noun exhibits the case assigned from outside the DP.

(ii) pjati kingax
five-loc book-loc-pl

A natural way of capturing this case behavior is to say that a feature of these numerals affects the morphological shape of the noun through agreement with the Case head, which lies above.

I will speculate in section 5 that features having to do with mass/count encoding lie behind this movement. (21) is the structure for (3b), modulo the merger of D.

(3)b. John wa **san-satsu**-no hon-o katta.

I assume that insertion of *no* after the classifier is a matter of morphology and is not represented structurally, even though it will be glossed as 'gen' throughout this paper. It is inserted after the derivation is handed over to the PF branch. The reason for this morphological treatment is that, as is well-known (Kitagawa and Ross 1982), this linker *no* is attached to a non-clausal prenominal element of any kind. In (4b), it is attached to an indeterminate *nani*, which is taken up in section 5.2. It can even iterate after every such non-clausal element, as in (22).

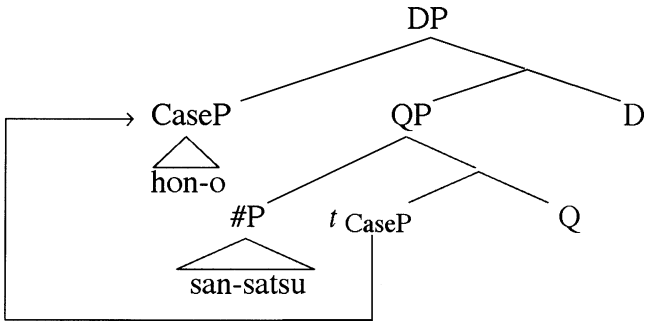
(22)a. san-satsu-**no** Chomsky-nitsuite-**no** hon
3-cl-gen *Chomsky-about-gen* *book*
'three books about Chomsky'

b. tsugi-**no** suugaku-**no** mondai
next-gen *math-gen* *problem*
'(the) next math problem'

Since it is impossible to assign it a unique structural position, the morphological treatment seems to be appropriate.

Going back to the derivational steps in DP, CaseP can be raised to Spec of DP next, as in (23).

(23)



This raising gets us the structure for (3c).

(3)c. John-wa hon-o **san-satsu** katta.

Section 6 elaborates on the semantic property of this structure that sets it apart from the preceding two. The basic claim there is that CaseP and D undergo checking of the feature related to specificity. This in turn constitutes evidence that the functional projection above QP is indeed headed by D, which is an appropriate label for the category that regulates specificity.

For (3d), there are two options. One is to assume that CaseP can move out of DP, adapting the analysis of Kawashima (1994, 1998), who works on the basis of the more impoverished structure in (12a). Kawashima claims that NP can move out of DP via scrambling as in (24) through Spec of DP, which acts as an escape hatch.

(24) John-wa hon-o [$_{DP}$ *t* **san-satsu**] katta.

Under the proposal in this paper, what moves out of DP is CaseP, which can be raised to Spec of DP as in (23). Once scrambling applies to DP in (24), (3d) can be derived.

(3)d. John-wa **san-satsu** hon-o katta.

The other option is to base-generate the numeral-classifier combination outside DP, either as a secondary predicate (Miyagawa 1989) or as an adverb (Terada 1990 and subsequent work).

Both the Kawashima-style analysis and the base generation analysis agree that the numeral + classifier combination in (3d) does not form a constituent with a nominal projection. This is why position (d) is placed outside the brackets in the data summary in (7). (3d) and (24) are instances of so-called floating quantifiers, for which this paper has nothing to add to the vast literature. Ishii's very careful (1999) analysis indicates that both options are available. See also Simpson (2005) for the diachronic relation between the DP-internal positioning of the numeral + classifier sequence and its DP-external appearance as a floating adverbial in Southeast Asian languages. Since the major concern of this paper is DP-internal syntax, the DP-external classifier will generally be put aside.

Lastly, remarks are in order about the morphological details of modified numerals. In (17) and (18), of which (a) examples are repeated below, the modifier of a numeral appears in different positions.

(17)a. John-wa **sukunakutomo** **san-satsu**-no hon-o katta.
John-top at least 3-cl-gen book-acc bought
'John bought at least three books.'

(18)a. John-wa **san-satsu-ijou**-no hon-o katta.
John-top 3-cl-more.than-gen book-acc bought
'John bought more than three books.'

(17a), where the modifier comes in front of the numeral, is expected. (18a) is not, since the modifier appears after the classifier. I would like to suggest that the placement of *ijou* in (18a) is due to its suffixal status. Note that a classifier is also a suffix which obligatorily attaches to a numeral. I assume that affixation of these suffixes takes place after Spell-Out. The numeral and the classifier are adjacent, once NP moves out in the narrow syntax, so they are put together first. The suffix *ijou* is then put together with the numeral + classifier combination already formed through affix hopping under adjacency (Halle and Marantz 1993).

To summarize, the primary reason why Japanese allows a wide variety of structures for the placement of a numeral + classifier combination is that massive phrasal movement of intermediate functional projections takes place within DP. Its syntax is straightforward, determined by the presence or absence of an EPP feature in the functional heads. In fact, the presence or absence of movement is a well-established source of parametric variation, whatever is the technical implementation of movement. The rest of the paper explores the properties of the relevant functional heads in detail.

4. Numerals and Classifiers

This section investigates the nature of #P. The discussion starts by analyzing the pseudopartitive construction, first, to establish that the structure in (23) is independently needed, and second, to lay the ground for considering the nature of a classifier as the head of #P in some detail. Section 4.2 examines Chierchia's (1998a,b) proposed parametrization of NP denotation in this light. Section 4.3 takes up agreement between # and NP. Section 4.4 returns to the pseudopartitive construction and analyzes its agreement patterns in terms of the feature system put forth in section 4.2.

4.1. *The Pseudopartitive Construction*

4.1.1. *The Shape of the Complex Classifier*
The pseudopartitive construction is exemplified for English below.

(25)a. Two bottles of wine were/*was thrown into the soup. (Corver 1998)

b. An assortment of responses was/were considered to those questions of yours. (Selkirk 1977)

This construction is often analogized to the classifier construction discussed above. Chierchia (1998a,b), for example, regards cases like (25) as instances of the classifier construction. This analogy, however, is misguided, in view of the complex classifier construction in Japanese, illustrated in (26).

(26)a. Roger-wa gohan **donburi(**??**-ni) yon-hai**-o tabeta.
Roger-top rice big.bowl-dat 4-cl-acc ate
'Roger ate four big bowls of rice.'

b. Roger-wa **donburi(-ni) yon-hai**-no gohan-o tabeta.

c. Roger-wa gohan-o **donburi(-ni) yon-hai** tabeta.

d. Roger-wa **donburi(-ni) yon-hai** gohan-o tabeta.

Let us call the bold-faced part a complex classifier. The complex classifier is phrasal. It contains a noun *donburi* 'big bowl' in (26) as well as other material. It seems fair to say that the examples in (26) are comparable to the English examples in (25). This Japanese construction was briefly mentioned by Kamio (1977) but has never been taken up in detail since then in the literature, to the best of my knowledge. Notice that the counter noun *donburi* 'big bowl' is itself accompanied by the numeral + classifier combination, serving as the unit for measuring the amount of rice eaten. The analogy between counter nouns like *bottles* in (25) and ordinary classifiers cannot be correct, since the counter noun itself requires a classifier in Japanese.

When the counter noun is a container used for serving food and drinks, a specialized classifier *hai* is used as in (26), instead of an ordinary classifier, which is *ko* for bowls. Otherwise, an ordinary classifier is used, as in (27).

(27) John-wa **botoru(-ni)** **yon-hon**-no wain-o nomihoshita.
John-top bottle-dat 4-cl-gen wine-acc drank.up
'John drank up four bottles of wine.'

There are three important things to observe in (26). First, the complex classifier appears in exactly the same positions with respect to the head noun as the simple numeral + classifier combination. Second, the dative case particle is attached to the head noun of the complex classifier.[8] Third, the structure in (23) is repeated as the complex classifier itself inside the Japanese pseudopartitive construction.

To capture these properties, I would like to claim that the pseudopartitive construction has the underlying structure in (28).[9]

[8] It is not clear why the presence of the case particle is highly marginal in (26a). This is left as a problem for future research. Henk van Riemsdijk (personal communication) suggests that case agreement may be relevant. Significantly, the complex classifier is contained within CaseP only in (26a).

A reviewer finds cases like (26a) unacceptable even without the dative marker. There is such a tendency when the head noun is light in comparison with the complex classifier. Unacceptability disappears when the NP which precedes the complex classifier is made heavy as in (31a) below.

[9] Corver (1998) proposes the following derived structure for the pseudopartitive:

(i) $[_{QP}$ two $[_{FP}$ bottles $[_{F+X}$ of$]$ $[_{XP}$ wine t_X t $]]]$

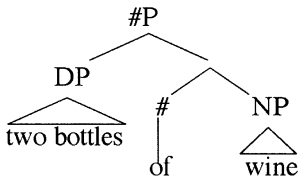
XP is a small clause, of which *wine* is the NP subject. The predicate is raised to Spec of FP, and the head X to F. Castillo's (2001) proposal for Spanish is essentially the same.

The structure in (i) is similar to (28) if F is identified as the # head, though there are important differences. One of them is whether the complement of # is an NP or a small clause. Another is whether the numeral and the counter noun form a phrase of their own. As can be seen by the ill-formedness of (ii), the counter noun goes with the numeral in Japanese.

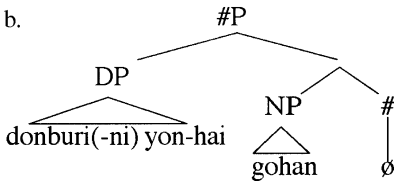
(ii) *Roger-wa **yon-hai**-no gohan-o **donburi(-ni)** tabeta.
Roger-top 4-cl-gen rice-acc big.bowl-dat ate

See also Doetjes and Rooryck (2003) for evidence from French that the counter noun and the numeral form a constituent of their own.

(28)a.

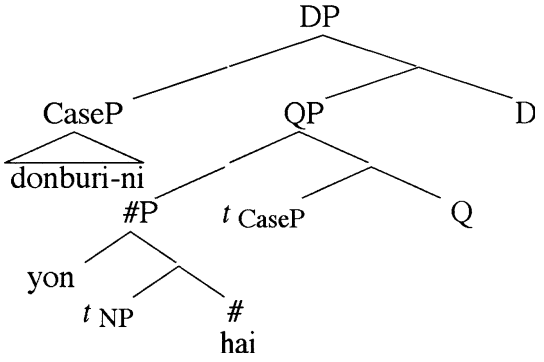


b.



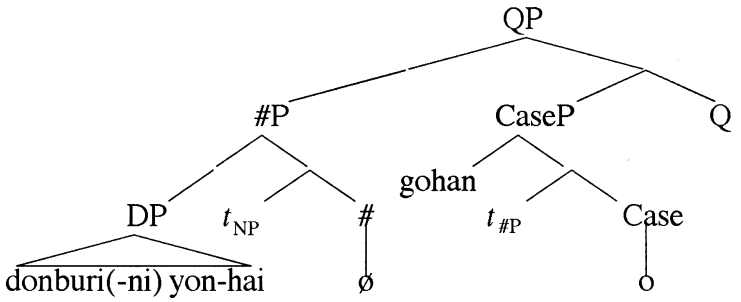
DP in Spec of #P in (28b) is the complex classifier and can be assumed to have the following internal structure:

(29)



This structure is essentially the same as (23). The only significant difference is that the Case head in (29) is *ni*, which is apparently not forced by an external structural context, unlike the accusative case particle in (23), which is required by the verb. I simply assume that *ni* is the default realization of the Case head, in view of the fact that it has multifarious uses (see Sadakane and Koizumi 1995). I will come back to CaseP in section 5. The structure in (28b) undergoes the same derivational processes as (19)–(21) and (23), giving rise to (26a–c). (26b) is formed when D is merged with the structure in (30) and no further movement takes place.

(30)



(26d) is derived from (26c) if CaseP moves out of DP and the remnant DP is scrambled.

If this analysis is on the right track, it is justified to assume that the numeral + classifier combination forms a constituent with the nominal projection even when it appears after the case particle. (23) is the structure proposed for that expression. Crucially, the same structure shows up in Spec of #P in (28b). The simplest analysis is to treat the complex classifier *donburi(-ni) yon-hai* as a constituent which has the structure in (29).

As shown by Jackendoff (1977) and Selkirk (1977), only mass nouns or bare plurals can appear in the English pseudopartitive construction. The situation seems similar in Japanese. In (26), we apparently have a mass noun. A count noun is also possible, as in (31).

(31)a. Gengogaku-no hon **danbooru-bako**(??-**ni**) **yon-hako**-o
linguistics-gen book cardboard-box dat 4-cl-acc
ofisu-ni hakobikonda.
office-to brought.in
'I brought four cardboard boxes of linguistics books into my office.'

b. **Danbooru-bako**(-**ni**) **yon-hako**-no gengogaku-no hon-o ofisu-ni hakobikonda.

c. Gengogaku-no hon-o **danbooru-bako**(-**ni**) **yon-hako** ofisu-ni hakobikonda.

d. **Danbooru-bako**(-**ni**) **yon-hako** gengogaku-no hon-o ofisu-ni hakobikonda.

Note that the classifier is the one specifically used for boxes.

4.1.2. *Comparison with Chinese*

Comparison with what Cheng and Sybesma (1998, 1999) call massifiers in Chinese, the bold-faced part in (32), is helpful in identifying further properties of the pseudopartitive construction in Japanese.

(32)a. san da **wan** (de) tang
3 big cl-bowl DE soup
'three big bowls of soup'

b. liang **xiang** (de) shu
2 cl-box DE book
'two boxes of books'

In fact, I would like to claim that the massifier forms the Chinese pseudopartitive.

Cheng and Sybesma point out two significant differences between massifiers and ordinary classifiers in Chinese. One is that massifiers allow modification by an adjective, while ordinary classifiers do not (but see Cheng and Sybesma 1998, note 4). Adjectival modification of a massifier can be seen in (32a) above. The impossibility of such modification in the case of ordinary classifiers is shown in (33).

(33)a. *san da ge ren
3 big cl people

b. *yi da zhi gou
1 big cl dog

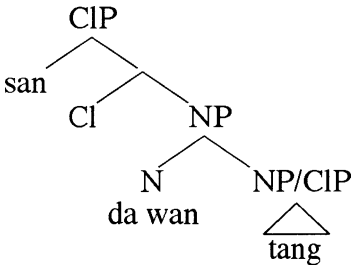
The other is that the particle *de*, which Cheng and Sybesma refer to as the modification marker, can appear only after a massifier. Ordinary classifiers are incompatible with it, as shown in (34). Massifier cases are given in (32) above.

(34)a. san ge (*de) ren
3 cl DE people

b. ba tou (*de) niu
8 cl DE cow

Cheng and Sybesma (1998) analyze the version of (32a) without *de* as in (35), where the massifier, generated as N, will be raised to the empty position of the classifier.

(35)



At the same time, Cheng and Sybesma claim that the massifier construction with *de* involves a relative clause in which the massifier itself functions as a predicate. So, the version with *de* has a structure radically different from (35) under their analysis.

The complex classifier in Japanese seems to be quite similar to the Chinese massifier construction. It allows modification, for example, as illustrated in (36).

(36)a. Gengogaku-no hon ookina danbooru-bako
linguistics-gen book big cardboard-box
(??-ni) yon-hako-o ofisu-ni hakobikonda.
dat 4-cl-acc office-to brought.in
'I brought four big cardboard boxes of linguistics books into my office.'

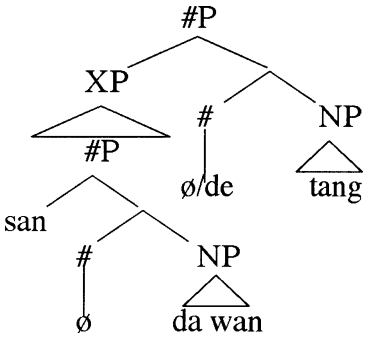
b. Ookina danbooru-bako(-ni) yon-hako-no gengogaku-no hon-o ofisu-ni hakobikonda.

c. Gengogaku-no hon-o ookina danbooru-bako(-ni) yon-hako ofisu-ni hakobikonda.

d. Ookina danbooru-bako(-ni) yon-hako gengogaku-no hon-o ofisu-ni hakobikonda.

The recognition of the Chinese massifier construction as the complex classifier in the pseudopartitive construction makes it possible to give a unified analysis of the versions with and without *de*, which are given rather different structural representations under Cheng and Sybesma's analysis. I propose that (32a), for example, has the same hierarchical structure as (28), as shown in (37).[10]

(37)



[10] XP in Spec of the topmost #P is not DP, since there is reason to believe that Chinese lacks D. See Watanabe (2004a). Cheng and Sybesma do not posit DP for Chinese, either.

Note that the classifier is missing from the NP *da wan*, in contrast to Japanese. Adjectival modification is possible for massifiers, because they are nouns after all, as claimed by Cheng and Sybesma (1998). Being functional heads, ordinary classifiers resist adjectival modification.

In addition to unifying the two structures in Chinese, the analysis in (37) brings out a further parallelism between the complex classifier (= massifier construction) in Chinese and the Japanese counterpart. Cheng and Sybesma observe that the presence of *de* in (32) makes a difference in semantic interpretation. The version of (32a) without *de*, for example, has the default interpretation where soup is in the bowl(s). When *de* is present, however, a bowl does not have to exist. See also Sybesma (1992: 106–108). A similar, perhaps the same, semantic difference is produced by the presence of *bun* in Japanese. All the four structures in (26) have a version with *bun*, which is glossed as 'amount', as shown in (38).

(38)a. Roger-wa gohan donburi(??-ni) yon-hai-**bun**-o tabeta.
Roger-top rice big.bowl-dat 4-cl-amount-acc ate
'Roger ate four big bowls of rice.'

b. Roger-wa donburi(-ni) yon-hai-**bun**-no gohan-o tabeta.

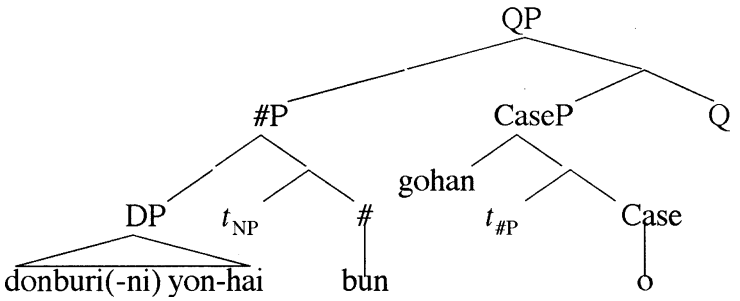
c. Roger-wa gohan-o donburi(-ni) yon-hai-**bun** tabeta.

d. Roger-wa donburi(-ni) yon-hai-**bun** gohan-o tabeta.

For these sentences to be true, it does not have to be the case that Roger ate from a big bowl. *Donburi* is just used as an expression which measures the amount of rice eaten. So, (38) means that Roger ate the amount of rice which would fill four big bowls. Similarly, *bun* can be added to the complex classifier in all the examples in (31). When *bun* is present, cardboard boxes do not have to be used to carry the books. Let us call this the pure measure interpretation.

The analysis proposed earlier in section 4.1.1 has a convenient slot in which to place *bun*. (38b) has the following structure (the top DP omitted):

(39)



Recall that the # head in (28b) is not occupied by any lexical material. Now, that position is occupied by *bun* in (39). The Chinese particle *de* occupies the same position; thus, it is not a coincidence that *de* and *bun* have the same semantic function.

Note that it does not make any sense within the grammatical system of Japanese to try to give a relative clause analysis of the examples in (38). In (38c), the complex classifier follows the sequence of the head noun and the case particle. The relative clause does not follow the sequence of the head noun and the case particle in Japanese. Rather, *de* in Chinese and *bun* in Japanese should be analyzed as the # heads which dictate the pure measure interpretation for the quantity expression in Spec of #P.[11]

From this perspective, the incompatibility of *de* with an ordinary classifier in Chinese follows quite naturally because they compete for the same position. Note that the same holds in Japanese, as shown in (40).

(40)a. *John-wa hon san-satsu-**bun**-o katta.
John-top book 3-cl-amount-acc bought
'John bought three books.'

b. *John-wa san-satsu-**bun**-no hon-o katta.

c. *John-wa hon-o san-satsu-**bun** katta.

d. *John-wa san-satsu-**bun** hon-o katta.

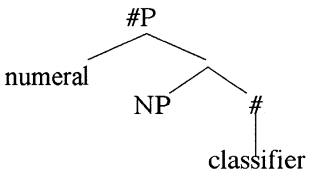
[11] It will not do to treat *bun* as attached directly to the classifier *hai* within the DP in (38). This alternative fails to capture the parallelism between the Chinese *de* and the Japanese *bun*, because *de* follows the counter noun in Chinese.

A classifier and *de*/*bun* are in complementary distribution because they occupy the same position, playing a different role in expressing the quantity of the entity represented by NP depending on the nature of the expression that occupies Spec of #P. There is no point in using a special head *bun* to force the pure measure reading in (40), since Spec of #P is occupied by a numeral in these cases. Numerals always denote pure quantity. In (38), the classifier *hai* appears in addition to *bun*, but crucially, *hai* is buried inside the complex classifier that occupies Spec of the #P headed by *bun*, as shown in (39). There is no such additional position available in (40).

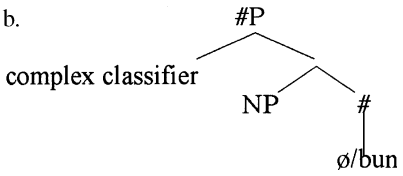
4.2. *No Semantic Parameter for Classifiers*

Now, we are ready to discuss the nature of the # head in Japanese. The discussion so far has indicated that the # head in Japanese can be realized as a classifier, as *bun*, or as zero. Here is the summary of the underlying structures of #P.

(41)a.



b.



(41a) is the structure for the ordinary numeral classifier, and (41b) for the pseudopartitive construction. Note that an ordinary classifier appears only when a numeral is in Spec of #P. This is a general pattern in Japanese. Section 5 will show that other quantifiers are not accompanied by a classifier, either.

An interesting question is whether there is any restriction on the kind of nouns that can appear together with a classifier in the presence of a numeral. Muromatsu (1998) claims that only count nouns can be combined with a classifier, distinguishing classifiers and measure expressions in terms of their semantic functions. The measure expressions are exemplified in (42).

(42)a. Kenkou-no-tame-ni-wa mainichi vitamin C **600mg**-o
health-gen-sake-dat-top everyday vitamin C 600mg-acc
tora-nakerebanaranai.
take-must
'One must take 600mg of vitamin C everyday for the sake of good health.'

b. Kenkou-no-tame-ni-wa mainichi **600mg**-no vitamin C-o tora-nakerebanaranai.

c. Kenkou-no-tame-ni-wa mainichi vitamin C-o **600mg** tora-nakerebanaranai.

d. Kenkou-no-tame-ni-wa mainichi **600mg** vitamin C-o tora-nakerebanaranai.

Muromatsu also points to a syntactic difference between classifiers and measures, using examples from Chinese, but not from Japanese. We can reinforce Muromatsu's claim by building on the results of section 4.1.2.

The Chinese examples discussed by Muromatsu belong to one type of massifiers in the sense of Cheng and Sybesma (1998, 1999), illustrated in (43).

(43) san bang (de) rou
3 pound DE meat
'three pounds of meat'

Crucially, *de* can appear with measure expressions (but not with ordinary classifiers), an observation also made by Cheng and Sybesma. The Japanese *bun*, discussed in section 4.1.2, behaves in a similar way. Consider (44).

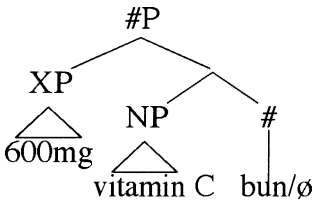
(44)a. ?Kenkou-no-tame-ni-wa mainichi vitamin C
health-gen-sake-dat-top everyday vitamin C
600mg-bun-o tora-nakerebanaranai.
600mg-amount-acc take-must
'One must take 600mg of vitamin C everyday for the sake of good health.'

b. Kenkou-no-tame-ni-wa mainichi **600mg-bun**-no vitamin C-o tora-nakerebanaranai.

c.??Kenkou-no-tame-ni-wa mainichi vitamin C-o **600mg-bun** tora-nakerebanaranai.

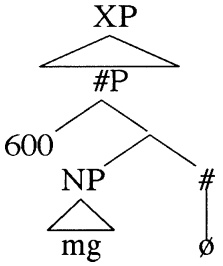
Though (44a) and (44c) are marginal to varying degrees for reasons not clear to me, (44b) indicates that *bun* can be attached to the measure expression in Japanese as well. For this reason, it is reasonable to assign the following underlying structure to the measure expression:

(45)



Compare (28b), which can also host *bun* at the head of #P, and (45). It is not a coincidence that the English measure expression, exemplified by the translation in (43), has also been analyzed as belonging to the pseudopartitive construction. Note also that the weight unit *pound* is pluralized in the English translation in (43), suggesting that it is a noun. If the same is true in Japanese, XP in (45) should be assigned the structure in (46), where the identity of XP is left open.

(46)

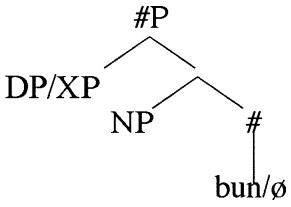


This is the general underlying structure for directly combining a numeral and an NP headed by a count noun. Compare it to (41a). The only difference is that the # head is not occupied by a classifier in (46). It is possible that *mg* as a noun undergoes head movement to # in (46). Perhaps it is for this reason that *mg* feels like a classifier, as noted by a reviewer. It should be emphasized, however, that *mg* can

cooccur with *bun*. The unit noun for weight must use the structure for the pseudopartitive to be combined with a mass noun.[12]

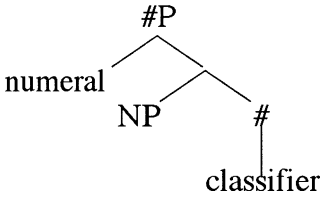
I would like to claim that (28b) and (45) exhaust the structural possibilities for a mass noun to combine with a numeral. Thus, (47) is the only structure in which a mass noun is allowed to cooccur with a numeral at all.

(47)



The numeral itself is buried inside DP/XP in (47). On the other hand, (48) is the structure in which a count noun cooccurs with a numeral.

(48)



[12] A reviewer asks why measure terms like *mg* do not allow modification, unlike complex classifiers. Note that the structure in (46) is rather different from the structure for complex classifiers in (29). XP in (46) is not a full-fledged DP, as can be seen from the absence of CaseP. The source of the modifiability difference should be sought in this structural difference.

The same reviewer also notes that measure terms in English can be modified by an adjective as in (i), contrary to Chierchia's (1998b) observation.

(i) John bought three heavy/hefty/juicy pounds of hamburger meat.

If this is true, English and Japanese contrast in this respect. It is premature, however, to conclude that the Japanese measure term does not form an NP, unlike the English counterpart, since there are other differences between the two languages. First, Japanese adjectives that modify nouns take the same form as the main predicate in finite clauses, so it is possible that they are relative clauses (but see Yamakido 2000 for a cautionary note). Second, if the measure term undergoes head movement to the # head, that may block modification. Simpson (2005) proposes that movement of the head noun to the classifier position accounts for the fact that in a wide range of languages, certain nouns that express units of time such as 'year' and 'day' do not take a classifier. This analysis is applicable to Japanese nouns such as *nen* 'year'. And indeed *nen* cannot take a modifier when accompanied by a numeral.

In contrast to the ordinary classifier construction, where the classifier itself occupies the head of #P as in (48), there is no classifier occupying the head of #P in (47). There is no sense in which the Japanese *bun* is a classifier. The same is probably more obvious for the Chinese *de*. The only property that they share with classifiers is that they occupy the same position, namely the # head.

Under this paper's analysis, Muromatsu's (1998) claim amounts to saying that a mass noun cannot appear in (48). It is indeed impossible to come up with an example of what appears to be a mass noun occurring in the structure in (48).[13] In this sense, classifiers are equivalent to number morphology, a view also espoused by Doetjes (1997) and Cheng and Sybesma (1999). Borer's (2005) proposal is even closer to my view in placing plural marking and classifiers in the same structural position, namely the Classifier Phrase of (12c), which is held responsible for divisions of stuff.

My specific implementation of the idea is that the # head is the locus of number specification, which is subject to parametrization. I assume that the mass/count distinction is universally represented by the [±number] feature on the # head, as in (49).

(49) Mass/Count Universal
The # head is [+number] in the case of count nouns, whereas it is [–number] in the case of mass nouns.

In the English type, the [+number] # head has a further specification, namely, [+number, +singular] and [+number, –singular], reflecting the singular/plural distinction.[14] If N is not raised to the # head in English (see Longobardi 2001 for head movement within DP), plural marking must be mediated by feature checking between N and #. I will return to this point in section 4.3 below.

In the Japanese type, the classifier does not reflect the singular/plural distinction morphologically. Thus, the same form is used for the singular and the plural, as in (50).

(50)a. is-**satsu**-no hon
1-cl-gen *book*
'one book'

[13] Except for the cases of coercion, which will be taken up in section 5.1.

[14] [±singular] also plays a vital role in Harbour's (2003) analysis of Kiowa, which has a far more complicated number system than English does. Castillo (2001) proposes [±number] for the mass/count distinction.

b. ni-**satsu**-no hon
2-cl-gen book
'two books'

I am inclined to take the absence of the singular/plural distinction in the classifier system as just a matter of morphology, because the singular specification is needed for distributive universal quantification in Japanese, as we will see in section 5.1. But it is possible that the [±singular] specification is actually missing in the presence of a numeral, even though quantifiers other than numerals are sensitive to it. One consideration in favor of this latter option comes from Turkish, where a numeral is incompatible with plural marking on the noun, as shown in (51), taken from Kornfilt (1996).

(51) iki öğrenci-(*ler)
2 student-pl
'two students'

Significantly, such an NP cannot trigger plural agreement on the verb, as illustrated by (52a), again from Kornfilt (1996).

(52)a. Iki öğrenci ben-im-le gör-üş-mek iste-di-(*ler).
2 student I-gen-instr see-recipr-infin want-past-3.pl
'Two students wanted to meet with me.'

b. Bazî öğrenci-ler ben-im-le gör-üş-mek iste-di-ler.
some student-pl I-gen-instr see-recipr-infin want-past-3.pl
'Some students wanted to meet with me.'

Other quantifiers are not subject to such restrictions, as can be seen from (52b). Since the absence of plural morphology in (52a) affects subject-verb agreement, it cannot be handled as a simple matter of morphology. The impossibility of plural agreement on the verb does not follow unless it is assumed that the subject in (52a) lacks the [–singular] specification, marked only as [+number, øsingular]. In fact, it makes sense to omit the [±singular] specification on the # head in the presence of a numeral, because the information is directly provided by the numeral itself.[15] Mechanically, we can say that the

[15] This does not mean that a numeral comes with the [±singular] specification. It does not, since otherwise the numeral itself would trigger agreement in (52a). I am talking about the redundancy at the level of semantic interpretation.

[+number] head without a [±singular] specification selects a numeral as its Spec. Since the classifier in Japanese always requires a numeral, it is a good candidate for the [+number, øsingular] head.[16] From this perspective, the English system can be regarded as redundant.

Pending further crosslinguistic investigation, I leave open whether the absence of the singular/plural distinction in the form of classifiers in Japanese is simply morphological or is a reflection of the correlated absence of a feature specification. The answer may differ from one classifier language to another.

The proposed analysis of the pseudopartitive has significant implications for Chierchia's (1998a,b) theory of the semantic parameter. Chierchia proposes that languages differ in how NP is semantically mapped and that this difference is defined by [±arg] and [±pred] features. In general, NP is used either as a predicate in quantification and predication or as an argument in the form of kind reference. The [±arg] and [±pred] features determine which of these uses is available for each language. In a [+arg, –pred] language, NP refers to a kind, so that it can appear as an argument without the help of a determiner. A quantificational determiner, therefore, must apply to a kind. Chierchia claims that such a quantifier DET' can be defined in terms of an ordinary determiner meaning DET as in (53).

(53) DET' (x)(p) = DET ($^{\cup}$x)(p), where $^{\cup}$ assigns a mass denotation to the predicative counterpart of a kind.

Note that the the operator $^{\cup}$ creates a mass predicate. In this sense, all nouns are mass in a [+arg, −pred] language, resisting plural marking. Furthermore, combination with a numeral requires a classifier to provide a counting unit. The clustering of properties summarized in (54) thus characterizes an [+arg, −pred] language.

(54) i. Generalized bare arguments
ii. The extension of all nouns is mass
iii. No PL
iv. Generalized classifier system

[16] The Chinese classifier is different in this respect, because it can occur without a numeral, unlike the Japanese counterpart. See Cheng and Sybesma (1999) for a detailed discussion, comparing Cantonese and Mandarin. This difference between Chinese and Japanese may be related to the presence of a special plural classifier in Chinese.

Chierchia's claim is that Chinese and Japanese are examples of this type.

I have shown, however, strengthening the arguments by Cheng and Sybesma (1999) and Muromatsu (1998), that the mass/count distinction exists in these languages and further that a classifier occupies the # head, the locus of number specification, combining only with a count noun. Classifiers, therefore, should not exist in a [+arg, −pred] language defined by Chierchia. The clustering of properties that we would expect to find in such a language should be (55), instead of (54).

(55) i. Generalized bare arguments
ii. The extension of all nouns is mass
iii. No PL
iv. No classifier system

To use a numeral in such a language, probably the pseudopartitive construction is recruited. It is a question for future crosslinguistic research whether we can find a language that fits the characterization in (55). What is certain is that Chinese and Japanese are not examples of that kind. I will also point out in section 5.1 that there is a quantifier in Japanese which cannot be handled by the definition in (53). Under this paper's analysis, the difference between classifier languages like Chinese and Japanese on the one hand and languages like English on the other lies in the morphological realization of the # head.

4.3. *Agreement between # and NP*

So far, the discussion has been framed in terms of mass nouns and count nouns. Borer (2005), however, argues that the mass/count distinction is not lexically specified on individual nouns but arises through the feature specification of the functional projections that come on top of NP. The proposal in this paper is compatible with Borer's position, to the extent that the [±number] feature, responsible for the mass/count distinction, appears on the # head, but not on the noun.

One can go one step further to shed some new light on the treatment of number morphology on nouns in languages like English. Chomsky (1995) distinguishes formal features in terms of LF interpretability. This distinction is introduced to explain why some

features continue to be available to the syntactic computation even after checking while others do not. Those which continue to be available do so because they are needed for LF interpretation. Those which are uninterpretable must be eliminated before the end of the derivation to ensure LF convergence. Chomsky (2000) suggests that uninterpretable formal features are not eliminated, strictly speaking, but are sent to the PF branch of computation after checking. Under this conception of formal features, the behavior of number morphology on nouns is quite puzzling. The plural-singular distinction is certainly associated with semantic interpretation, indicating that the number feature is available for LF, but it is overtly realized, meaning that the relevant feature is sent to PF.

This puzzle disappears once DP-internal agreement is taken into account. Suppose that the noun has a [±singular] specification as an uninterpretable formal feature which is matched up with the interpretable counterpart of the # head. From this perspective, it is possible to assume that a noun is also provided with an uninterpretable [±number] feature which undergoes agreement with its interpretable counterpart on the # head. If so, the interpretation of mass and count arises at the #P level, in a way consistent with Borer's proposal.

4.4. *Number Agreement with Pseudopartitives*

The analysis of the mass/count distinction in section 4.2 has some consequences for the agreement pattern found with the pseudopartitive construction as well. Consider (25) again.

(25)a. Two bottles of wine were/*was thrown into the soup.

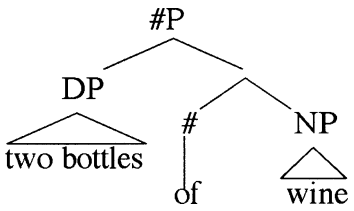
b. An assortment of responses was/were considered to those questions of yours.

Corver (1998) asserts on the basis of examples like (25a) that the container noun *bottles* is the syntactic head. He ignores the fact, however, that there is a significant difference between (25a) and the example discussed by Selkirk (1977), namely (25b). In the latter, the noun that appears after *of* is a count noun, in contrast to (25a). Judging from the data presented in Löbel (1989), the same contrast in agreement between count and mass nouns is found in the German pseudopartitive construction, though Löbel dismisses the data by invoking semantic agreement. Doetjes and Rooryck (2003), however,

point out that the mass/count status of the main noun determines the agreement pattern. If the contrast between (25a) and (25b) is real, what is going on?

I would like to suggest that our number feature system can handle it without much ado. In (25a), whose structure (28a) is repeated below, the # head *of* is specified only as [−number].

(28)a.



There is a more specific specification [+number, −singular] on the # head associated with *bottles*. The more specific one wins, assuming that the external functional head responsible for verbal agreement has a [±singular] as well and seeks a feature that matches it. Therefore, only the plural form is possible.

In (25b), on the other hand, the two # heads are equally specific. The one associated with *assortment* is [+number, +singular], while *of* is [+number, −singular]. Note that neither # head c-commands the other. Hence the two possibilities for verbal agreement. Interestingly, Doetjes and Rooryck (2003) claim that the two agreement possibilities differentiate the pure degree reading and the comparative reading. The latter retains the lexical meaning of the counter noun, while the former does not. Discussing the French counterpart of (25b), they observe that the pure degree reading triggers plural agreement, whereas singular agreement arises under the comparative reading. Their French examples are:

(56)a. Une foule d'étudiants est dans le couloir.
a crowd of students is in the hallway

b. Une foule d'étudiants se sont succédé.
a crowd of students have.pl come in one after another

(56a) forces the interpretation where the students form a crowd. This is the comparative reading. In (56b), the distributive predicate excludes the mass character of the lexical meaning of *foule* 'crowd' and only allows the pure degree interpretation.

What is significant is that the Japanese and Chinese pseudopartitive constructions make a similar distinction marked by the presence/absence of *bun* (Japanese) and *de* (Chinese), as we have seen in section 4.1.2. Though detailed comparison of classifier languages and non-classifier languages with respect to this interpretive difference goes beyond the scope of this paper, the similarity of Japanese/Chinese and English/French in this regard reinforces the claim that the structure analyzed in section 4.1 is the Japanese (and Chinese) counterpart of the pseudopartitive construction.

5. Indeterminates and Other Quantifiers

Let us now turn to the nature of QP in the structure posited in (14). I have analyzed the prenominal numeral + classifier combination as arising from movement of #P to Spec of QP in section 3, suggesting that features related to the mass/count coding lie behind this movement. Evidence for this claim will be presented in this section. Furthermore, the behavior of numerals will be contrasted to that of other quantifiers to justify the structure in (14).

5.1. *Distributive Universal Quantification and Classifiers*

I will start with where the mass/count distinction and distributivity meet, namely in distributive universal quantification. Gil (1995) observes that a distributive universal quantifier is associated with singular morphology. In Modern Hebrew, for example, the universal quantifier *kol* is incompatible with a collective predicate in singular agreement, as shown in (57).

(57)a. Kol haʔanašim hitʔasfu ʕim šaħar.
∀ *the-man-pl. refl-gathered-3pl with dawn*
'All the men gathered at dawn.'

b. *Kol iš hitʔasef ʕim šaħar.
∀ *man refl-gathered-3sg with dawn*
'*Every man gathered at dawn.'

Singular morphology also forces the distributive reading in (58b), while (58a) can receive the collective interpretation or the distributive interpretation.

(58)a. Kol haʔanašim saħvu šaloš mizvadot.
∀ *the-man-pl. carried-3pl three suitcases*
'All the men carried three suitcases.'

b. Kol iš saħav šaloš mizvadot.
∀ *man carried-3sg three suitcases*
'Every man carried three suitcases.'

It is also significant to note that the distributive universal quantifier *every* in English requires singular agreement.

Chierchia (1998b) provides a semantic basis for the working of mass and count quantification. An important observation in this connection is that *every*, which requires singular morphology, only combines with a count noun, as illustrated in (59).

(59)a. every book

b. *every water

Chierchia defines the function S which only lets through the denotation of singular predicates, that is, a set of atomic individuals, as in (60).

(60) $S(X) = X$, if $X \subseteq At$, undefined otherwise

Every only takes singularities for its domain, so that it is undefined for mass nouns, which are semantically plural under Chierchia's theory.[17] Given Gil's (1995) generalization that distributive universal quantification requires singularities, it is predicted that [+arg, −pred] languages in Chierchia's sense do not allow distributive universal quantifiers like *every*, since quantification must be based on a mass denotation in such languages as required by (54)/(55).

Japanese has a distributive universal quantifier *mo*, as in (61).

(61)a. John-wa dono hon-mo yonda.
John-top which book-MO read
'John read every book.'

b. *John-wa dono mizu-mo nonda.
John-top which water-MO drank
'John drank all the water.'

[17] This conception is not incompatible with my claim that mass nouns are syntactically [−number].

Mo distinguishes between count and mass nouns, as the ill-formedness of (61b) indicates. (61b) is acceptable on the reading that John drank every kind of water, but this reading comes from coercion of mass into count, which is available for mass nouns in general; the following example comes from Chierchia (1998b).

(62) In this lab, we store three bloods.
⇒ In this lab, we store three blood types.

(61b) cannot have the non-distributive reading indicated by the translation. The contrast in (61) thus shows that Japanese is not a [+arg, –pred] language.

Note also that a classifier is not used in (61a). It cannot be, as demonstrated by (63).

(63) *John-wa dono-**satsu**-no hon-mo yonda.
John-top which-cl-gen book-MO read

This property of distributive universal quantification in Japanese suggests that a classifier is not needed to provide a countable unit. It is not the case that distributive universal quantification is inherently incompatible with a classifier. The Chinese distributive universal quantifier is accompanied by a numeral meaning 'one' and a classifier, as in (64).

(64) Wo mei-**yi-ben** shu dou kan-le.
I every-one-cl book all read-asp
'I read every book.'

Lin (1998a) argues that distributivity itself is achieved by *dou*, but it is significant that singularity is explicitly expressed in accordance with Gil's generalization.[18]

The absence of a classifier in Japanese is not due to the fact that the Japanese distributive universal quantifier in (61) is based on a *wh*-phrase, either. A classifier can cooccur with a *wh*-phrase used as a non-*wh* expression in Chinese, as the following example from Lin (1998b) shows:

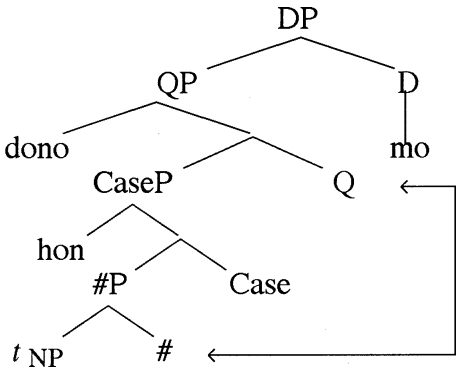
[18] Lin (1998a) claims, though, that the entire expression *mei-yi*-classifier-NP denotes a plurality, over which *dou* operates.

(65) Wo xiawu dasuan qu mai **ben** shenme shu lai kan.
I this-afternoon plan go buy cl what book come read
'I plan to buy some book to read this afternoon.'

One is led to conclude that singularity can be expressed without an overt classifier in Japanese. It is necessary to assume that the number information is present even when a classifier is missing. Quite generally, quantifiers other than a numeral do not allow a classifier to appear in Japanese. More examples of these quantifiers will be presented below.

How should the incompatibility between a classifier and a quantifier other than a numeral be captured? For the distributive universal quantifier in (61), I would like to suggest the following structure:[19]

(66)



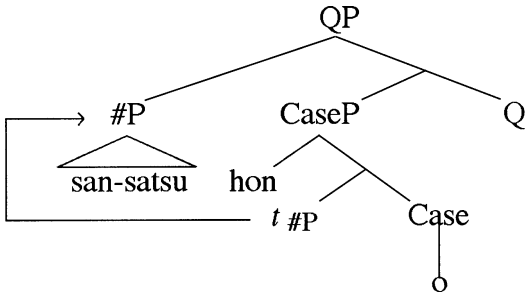
The indeterminate part *dono* occupies Spec of QP, selected by the Q head, which in turn enters into the Agree relation with #P. This Agree relation checks the [±number] and [±singular] features, the features relevant for the mass/count distinction and the singular/plural morphology. This relation should hold not only in Japanese but universally, since quantifiers in general are choosy about whether they combine with a count or a mass noun, and if count, whether they take a singular or a plural noun, as discussed in detail by Chierchia (1998b). For (61), the value of the relevant features must be [+number, +singular], reflecting the fact that a singular count noun

[19] The placement of *mo* under D, which follows Watanabe's (1992) proposal, will be taken up in section 5.3 below, and the absence of an overt case particle in section 5.5.

must be used. It is plausible to assume that whether the # head is realized as a classifier or not is also determined by the agreement relation between Q and #P.

Recall that the prenominal numeral + classifier combination has the structure in (21), repeated below.

(21)



The crucial step in the derivation is raising of #P to Spec of QP. Now we have evidence that this movement is mediated by the Agree relation between Q and #P.

5.2. *Other Quantifiers in Spec of QP*

Let us next examine the behavior of some other quantifiers in Japanese. In section 2, we have seen that quantifiers other than numerals have a different set of structural possibilities from those allowed for numerals. One such example is illustrated by (4), repeated below as (67).[20]

(67)a. *Sono purojekuto-wa seika **nani-mo**-o
that project-top achievement what-MO-acc
age-nakat-ta.
raise-neg-past
'That project didn't produce any results.'

a′.*Sono purojekuto-wa seika **nani**-o-**mo** age-nakat-ta.

b. Sono purojekuto-wa **nan**-no seika-**mo** age-nakat-ta.

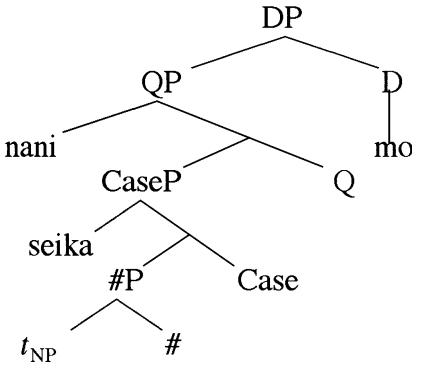
c. Sono purojekuto-wa seika-o **nani-mo** age-nakat-ta.

d. Sono purojekuto-wa **nani-mo** seika-o age-nakat-ta.

[20] In section 5.5 I will come back to the reason for displaying (a) and (a′), which differ in the relative order of the case particle and *mo*.

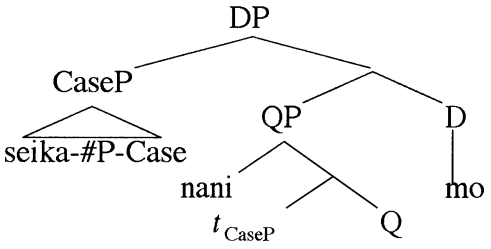
Here we have a negative concord item created out of an indeterminate.[21] The important observation for the DP-internal syntax, remember, is that the indeterminate part *nani* cannot appear between the head noun and the case particle, unlike the numeral + classifier combination. The simplest way of capturing this fact is to base-generate it in Spec of QP. The placement of *dono* in Spec of QP in (66), I assume, is no different. (67b) is assigned the following structure under this analysis:[22]

(68)



The genitive-like linker *no* is morphologically inserted, as in the analysis of numeral classifiers, and the vowel *i* of the indeterminate *nani* is truncated. The indeterminate is too high to come between the head noun and the case particle. The next step of the derivation is raising of CaseP to Spec of DP, giving (67c). Its structure is shown in (69).

(69)



[21] See Watanabe (2004b) for an analysis of its external syntax, which will be taken up in section 5.3, albeit briefly.

[22] The absence of the accusative case particle in (67b) will be taken up in section 5.5. Dropping the accusative case particle from (67a,a′) does not lead to improvement.

(67d) can be derived when CaseP moves out of DP and the remnant DP is scrambled, as before.

The same pattern is observed for *takusan* 'many, much', as illustrated in (70).

(70)a. *John-wa hon **takusan**-o katta.
John-top book many-acc bought
'John bought many books.'

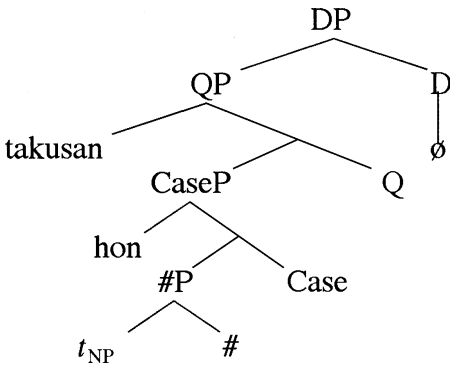
b. John-wa **takusan**-no hon-o katta.

c. John-wa hon-o **takusan** katta.

d. John-wa **takusan** hon-o katta.

Again, it cannot come between the head noun and the case particle.[23] The same structural analysis should therefore be adopted, as shown in (71) for (70b).

(71)



Note also the insertion of the linker *no* in the prenominal position.

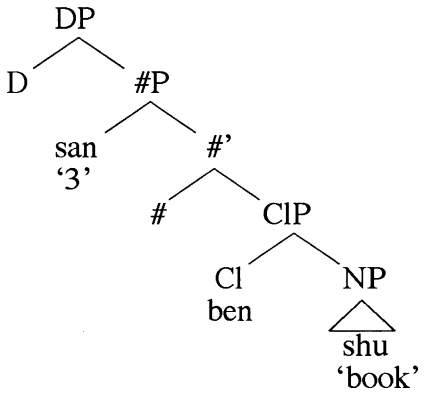
[23] The observation goes back to Ishii (1991), at least.

Quite generally, quantifiers in Japanese other than a numeral cannot intervene between the head noun and the case particle.[24] So, it is reasonable to regard Spec of QP as the place for the non-numeral quantifiers. Note also that classifiers are absent in these quantified expressions.[25] This should be captured by the Agree relation between Q and #P.

A reviewer asks whether placement of non-numeral quantifiers in Spec of QP is universal or is a characteristic of Japanese. I leave the question open. It is possible that some languages place quantifiers at the Q head, but exploration of the issue goes way beyond the scope of this paper. It should be noted, however, that Borer (2005) also places them in Spec. I turn to her proposal next.

Apart from the missing CaseP, the hierarchical organization of DP in (12c), proposed by Li (1999) and Borer (2005) and repeated below, is quite similar to the structure proposed in this paper, if their #P is taken to be our QP and their ClP our #P.

(12)c.



[24] One potential exception is *shoushou* 'a little'. But the placement of *shoushou* between the head noun and the case particle as in (i) seems to be limited to the recipe context.

(i) shio shoushou-o
salt a.little-acc

And even in that context, expressions like (i) sound stilted.

Another potential problem is raised by *zen'in* 'all (human)', *zenbu* 'all (non-human)', and *subete* 'all'. Notice, though, that *zen* is followed by what looks like a classifier. Exploration of this problem lies outside the scope of this paper.

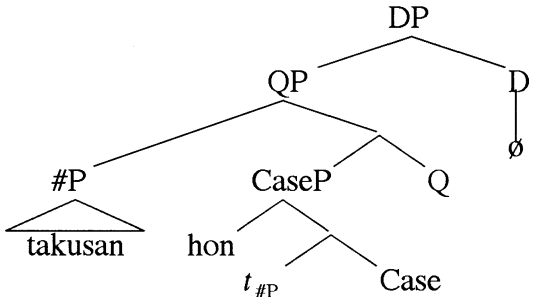
It is possible to let narrow syntax place these exceptional quantifiers after the case particle and derive the surface positioning through morphological cliticization, as an instance of readjustment of the sort to be discussed in section 5.5.

[25] Minimizers, to be discussed in section 5.3, are accompanied by a classifier, but that is because they have a numeral meaning 'one'.

One significant difference, however, is that quantifiers including numerals are all placed in Spec of the higher projection under Borer's account, where ClP creates divisions of stuff and #P is invested with the function of counting quantity.[26] Since Jackendoff (1977), numerals and weak quantifiers like *many* have been placed in the same structural position. Borer's proposal follows this tradition under her new theory about division and counting. This paper's analysis of Japanese numerals and weak quantifiers like *takusan* 'many, much' has shown that the traditional conception must be revised and that numerals must be treated differently from other quantifiers.

At this point, one might say that quantifiers like *takusan*, indeterminates, and numerals are uniformly generated in Spec of #P, but that raising of #P to Spec of QP is obligatory for *takusan* and indeterminates, though not for numerals. Under this alternative, the structure for (70b) is (72) instead of (71).

(72)



Setting aside the question of why raising of #P is obligatory for these cases, this alternative can deal with the difference in the placement of numerals on the one hand and quantifiers like *takusan* and indeterminates on the other. The fact still remains, however, that the syntax of numerals is different from that of non-numeral quantifiers. Moreover, the uniform original position of quantifiers is Spec of the lower projection, not the higher one. At any rate, one is led to conclude that the structural analysis in (12c) cannot handle the Japanese data.

The next question is the choice between (71) and (72). The analysis of minimizer expressions, taken up in the next subsection, seems to

[26] Li discusses only numerals. Borer claims that a singular count quantifier is generated in Spec of the lower projection and then is raised to Spec of #P, thus playing the double role of dividing and counting.

favor the base generation of indeterminates and non-numeral quantifiers in Spec of QP.

5.3. *Minimizers*

Japanese has multiple types of minimizers. We have seen one type in (5). Its expanded paradigm is given in (73), where the numeral for 'one' is combined with an indeterminate to form a minimizer.

(73)a. *Sono purojekuto-wa seika **nani-hito-tsu**-o
that project-top achievement what-1-cl-acc
age-nakat-ta.
raise-neg-past
'That project didn't produce even a single result.'

a′. Sono purojekuto-wa **nan-**no seika **hito-tsu(*-o)**
that project-top what-gen achievement 1-cl-acc
age-nakat-ta.
raise-neg-past

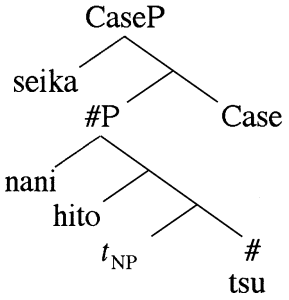
b. ??Sono purojekuto-wa **nani-hito-tsu**-no seika-o age-nakat-ta.

c. Sono purojekuto-wa seika-o **nani-hito-tsu** age-nakat-ta.

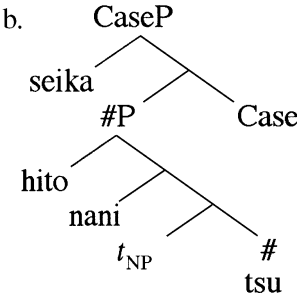
d. Sono purojekuto-wa **nani-hito-tsu** seika-o age-nakat-ta.

The added example is (73a′), which is crucial in distinguishing between (71) and (72). If we take the analysis in which *nani* is generated in Spec of #P along the lines of (72), two orderings of *nani* and the numeral as in (74) are logically possible.

(74)a.



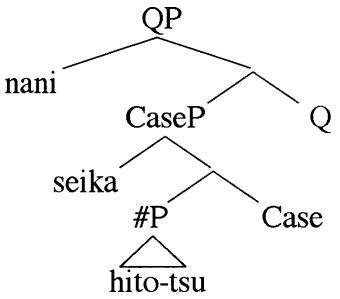
b.



In order to derive (73a′), *nani* must be raised to Spec of QP, no matter which order in (74) is adopted. This movement is nowhere motivated in the analysis of the Japanese nominal system discussed so far. Further-

more, this movement must be assumed to be obligatory in order to rule out (73a). Base generation of the indeterminate in Spec of QP along the lines of (71), on the other hand, accounts for (73a) and (73a′) straightforwardly. The structure below D under this analysis is given in (75).

(75)



This analysis correctly rules out (73a).[27] The version of (73a′) with a case particle is ill-formed for a reason to which I turn below, but the well-formedness of the version without a case particle speaks in favor of base generating indeterminates and so on in Spec of QP.

A slightly different paradigm is obtained when the particle *mo* is used, as in (76).

(76)a. *Sono purojekuto-wa seika **nani-hito-tsu**-o-**mo**
that project-top achievement what-1-cl-acc-MO
age-nakat-ta.
raise-neg-past
'That project didn't produce even a single result.'

[27] Jun Abe (personal communication) observes that (73a) improves when the case particle is dropped. He suggests that the version of (73a) without a case particle has an entirely different structure derived by topic marker drop from (i).

(i) Sono purojekuto-wa seika-wa **nani-hito-tsu**
that project-top achievement-top what-1-cl
age-nakat-ta.
raise-neg-past

A similar remark applies to (76a,a′) and (80a,a′) below, though improvement seems to be quite limited in these examples.

No such analysis is possible for the version of (73a′) without a case particle, since (ii) is completely unacceptable.

(ii) *Sono purojekuto-wa **nan-no** seika-wa
that project-top what-gen achievement-top
hito-tsu age-nakat-ta.
1-cl raise-neg-past

a′.*Sono purojekuto-wa seika **nani-hito-tsu-mo-**o age-nakat-ta.

a″. Sono purojekuto-wa **nan-**no seika**-hito-tsu-mo** age-nakat-ta.

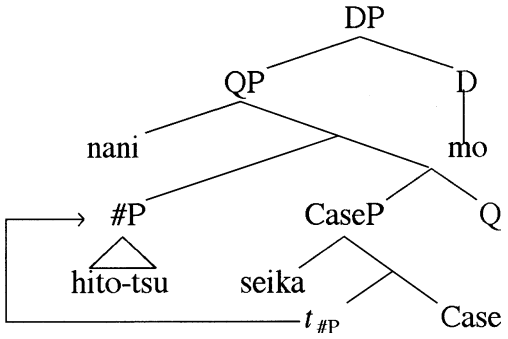
b. Sono purojekuto-wa **nani-hito-tsu**-no seika-**mo** age-nakat-ta.

c. Sono purojekuto-wa seika-o **nani-hito-tsu-mo** age-nakat-ta.

d. Sono purojekuto-wa **nani-hito-tsu-mo** seika-o age-nakat-ta.

The difference lies in the acceptability of the (b) pattern. In order to derive (76b), #P must be raised and land in the inner Spec of QP as in (77) to ensure the correct ordering.

(77)



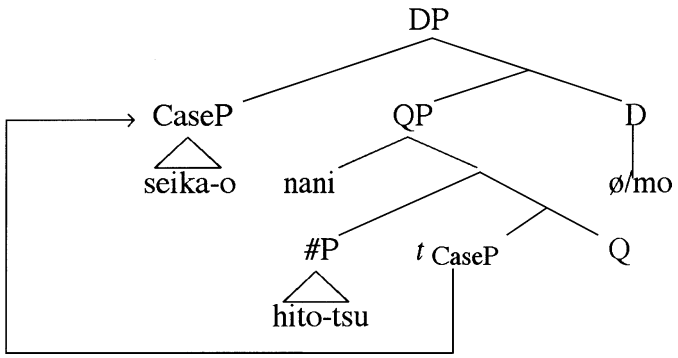
The opposite ordering is completely impossible, as in (78).

(78) *Sono purojekuto-wa **hito-tsu-nan-no** seika-**mo**
that project-top 1-cl-what-gen achievement-MO
age-nakat-ta.
raise-neg-past

This result follows if Richards's (1997, 2001) theory of multiple specifier creation is adopted. Richards proposes that when a movement operation creates a second Spec, it must always be the innermost Spec, because a shorter movement can achieve that. Creation of an outer Spec takes a longer movement. In (77), *nani* is merged first as in (75), because Merge is a simpler operation than Move and therefore is more economical (Chomsky 1995 and subsequent work). Movement of #P takes place next, tucking it in under *nani* and deriving the correct order.

Let us now take up the contrast between (73b) and (76b). This contrast indicates that raising of CaseP, as depicted in (79), is forced when *mo* is not present, but is not obligatory when *mo* is present.

(79)



This generalization about *mo* covers another type of minimizer as well. Consider (80).

(80)a. *John-wa hon **is-satsu**-o-**mo** yoma-nakat-ta.
John-top book 1-cl-acc-MO read-neg-past
'John didn't read a single book.'

a′. *John-wa hon **is-satsu-mo**-o yoma-nakat-ta.

b. John-wa **is-satsu**-no hon-**mo** yoma-nakat-ta.

c. John-wa hon-o **is-satsu-mo** yoma-nakat-ta.

d. John-wa **is-satsu-mo** hon-o yoma-nakat-ta.

(80b) patterns with (76b). Again, raising of CaseP to Spec of DP is optional in the presence of *mo*. Why does the presence or absence of *mo* make such a difference?

My speculation is that the answer to that question is related to the fact that the particle *mo* in these minimizer expressions is deeply involved in the syntax of negative concord. Note first of all that the three types of minimizers as well as the quantifier in (67) all require negation, as shown in (81).

(81)a. Sono purojekuto-wa seika-o **nani-hito-tsu**
that project-top achievement-acc what-1-cl
age-*(nakat)-ta.
raise-neg-past
'That project didn't produce even a single result.'

b. Sono purojekuto-wa seika-o **nani-hito-tsu-mo** age-*(nakat)-ta.

c. Sono purojekuto-wa seika-o **hito-tsu-mo** age-*(nakat)-ta.

d. Sono purojekuto-wa seika-o **nani-mo** age-*(nakat)-ta.

Here, I only give the version in which they appear after the case particle. The *mo* particle used in these examples is different from the universal quantifier *mo* discussed in section 5.1, since the latter does not require negation.[28]

Watanabe (2004b) takes up the types represented by (81c,d) in detail and argues that they have to undergo agreement with negation. Watanabe further shows, on the basis of extensive crosslinguistic data, that this negative concord qua agreement is prompted by an uninterpretable focus feature which is realized as *mo* in Japanese. Without agreement, the uninterpretable focus feature cannot be handed over to the PF branch of computation and leads to a crash at LF. (Cf. the discussion of the uninterpretable [±singular] feature in section 4.3.) This is why negation is obligatory in (81c,d).

The same analysis carries over to the types corresponding to (81a,b), except that *mo* is missing in (81a). The absence of *mo* in (81a) should not mean the absence of the uninterpretable focus feature, however, since (81a) also requires negation. I would like to suggest that CaseP is raised obligatorily in the absence of *mo* to compensate for the lack of morphological realization of the uninterpretable focus feature. From this perspective, the surprising impossibility of the case particle in (73a′) also falls into place. As will be argued in section 6, the Case head and D are related by agreement. The obligatory

[28] This difference is reflected in tone. In (i), low tone is indicated by underlining, where (ia) illustrates a universal quantifier, and (ib) a negative concord item.

(i)a. dare-mo 'everyone'
b. dare-mo 'anyone/no one'
who-MO

absence of the case particle in (73a′) signals, so to speak, that an uninterpretable focus feature is present in D despite the lack of morphological realization.

It is a topic for future research to consider how these ideas are to be cashed out in terms of formal analysis. What matters here is that for this suggestion to make sense, it is necessary to assume that the uninterpretable focus feature resides in D and that raising of CaseP is to Spec of DP. Once this assumption is made, the two peculiarities of minimizers without *mo* are reduced to the D-Case relation. It is therefore reasonable to place *mo* under D and take it to regulate movement to Spec of DP.

5.4. *Chinese Again*

Our analysis has implications for the typology of indeterminates as well. It has been shown (Aoun and Li 1993; Tsai 1994, 1999; Watanabe 2001, 2004a) that the Chinese indeterminate is somewhat different in nature from the Japanese counterpart. Specifically, the Chinese indeterminate needs to be unselectively bound by a DP-external operator, whereas the Japanese counterpart has a DP-internal particle such as *mo* which determines its quantificational force. Interestingly, they also differ in the position they occupy within nominals. The Japanese indeterminate is placed in Spec of QP, as we have just seen. Chinese is different. Consider (65), repeated below as (82).

(82) Wo xiawu dasuan qu mai **ben** shenme shu lai kan.
I this-afternoon plan go buy cl what book come read
'I plan to buy some book to read this afternoon.'

The classifier is higher than the indeterminate in Chinese. The situation is the opposite in Japanese. We can interpret this contrast as indicating that the variable for unselective binding is introduced together with the descriptive content provided by NP. The indeterminate, which explicitly signals the introduction of a variable in Chinese, should therefore be part of NP. The Japanese indeterminate, on the other hand, performs the quantificational job without a DP-external operator, so that it should be placed where an ordinary quantifier is placed, namely in Spec of QP.

5.5. *Some Morphology*

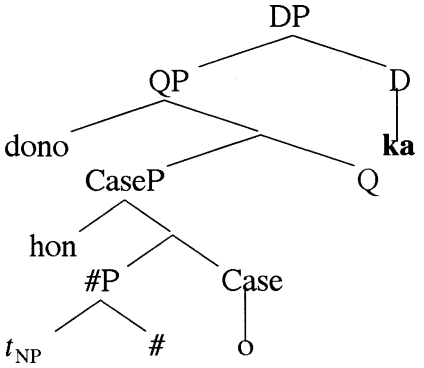
Before moving on to the syntactic and semantic nature of CaseP, let us tie up some loose morphological ends. Recall that the case particle is missing from the example of distributive universal quantification in (61a). Something strange also happens with the existential quantifier particle *ka*. These two examples are illustrated in (83).

(83)a. John-wa dono hon-ø-**mo** yonda.
John-top which book-MO read
'John read every book.'

b. John-wa dono hon-**ka-o** yonda.
John-top which book-KA-acc read
'John read some book.'

In (83b), the relative order of the case particle and *ka* is the opposite of what we expect from this paper's structural analysis, which is shown in (84).

(84)



Note that the case particle should precede *ka* in (83b), if (84) is mapped to PF without modification. The same problem of the positioning of the case particle occurs when the indeterminate is used without an overt NP, as in (85).

(85)a. Dare-**mo-ga** kita.
who-MO-nom came
'Everyone came.'

b. Dare-**ka-ga** kita.
who-KA-nom came
'Someone came.'

It is for this reason that the two relative orderings of the case particle and the quantificational particle are provided in (67), (76), and (80). Data of this kind are noted in Nishigauchi (1990), for example, but the phenomenon itself has not been given a satisfactory account.

To start with *mo*, the proper generalization is that the case particle is overtly realized only when CaseP is raised to Spec of DP, if D is *mo*. The relevant part of the paradigm in (67) is given below for illustration.

(86)a. *Sono purojekuto-wa seika-**nani-mo**
that project-top achievement-what-MO
age-nakat-ta.
raise-neg-past
'That project didn't produce any result.'

b. Sono purojekuto-wa **nan**-no seika-**mo** age-nakat-ta.

c. Sono purojekuto-wa seika-o **nani-mo** age-nakat-ta.

This time, the (a) sentence is a version without a case particle, which is also unacceptable. Since *mo* is located under D, it seems plausible to assume that the Agree relation between D and CaseP, one of the topics for the next section, determines the morphological realization of the Case head.[29]

The treatment of (83b) and (85) requires something different. I suggest that the order of the case particle and the quantificational particle is flipped under adjacency in the morphology component. This flipping arises from morphological merger in the sense of Marantz (1988), Halle and Marantz (1993), and Embick and Noyer (2001). Assume that *mo* and *ka* are suffixes that must be attached to an item with lexical-conceptual content.[30] Since a case particle does not have such content, this requirement is not satisfied if nothing

[29] There are further details which I put aside about whether the case particle is realized or not. The negative concord item, for example, does not take a case particle even when an overt NP is missing, as illustrated in (i).

(i) Dare-mo ko-nakat-ta
who-MO come-neg-past
'No one came.'

These are language-particular morphological details that have to be learned.

[30] This notion of "lexical" should not be confused with the notion of "lexical" involved in the distinction between functional and lexical categories. Classifiers have lexical-conceptual content even though they are functional categories, since they select nouns that can be combined with them in terms of various conceptual categories.

happens to (84). Once the order is flipped, however, *mo* and *ka* come right after a lexical element.[31]

A similar but not identical flipping is needed to account for the ordering of P and the quantificational particle, if it is assumed that D cannot be generated outside PP. Consider (87) and (88).

(87)a. *Dono gakusei-**mo**-kara nengajou-o moratta.
which student-MO-from new.year.card-acc received

b. Dono gakusei-kara-**mo** nengajou-o moratta.
which student-from-MO new.year.card-acc received
'I received a new year's card from every student.'

(88)a. Dono gakusei-**ka**-kara nengajou-o moratta.
which student-KA-from new.year.card-acc received

b. Dono gakusei-kara-**ka** nengajou-o moratta.
which student-from-KA new.year.card-acc received
'I received a new year's card from some student.'

This time, flipping is obligatory for *mo*, and optional for *ka*. Their special suffixal property is not relevant, if P is lexical. What I would like to suggest is the special morphological relation between D and P (Marantz 1984). D and P are sometimes fused in Romance and Germanic languages. Examples from French and German are given in (89).

(89)a. Jean a parlé au garçon. (au = à + le, French)
Jean has talked to-the boy.
'Jean talked to the boy.'

b. Hans war am Schalter. (am = an + dem, German)
Hans was by-the counter
'Hans was by the counter.'

[31] It is interesting to observe that Malayalam places the case particle between the indeterminate and the disjunction particle *(y)oo*, which more or less corresponds to the Japanese *ka*, as noted by Jayaseelan (2001). An illustrative example is given in (i).

(i) aar-e-(y)oo
who-acc-disj
'someone (acc)'

Thus, the structure proposed in this paper is transparently observable in Malayalam, which in turn suggests the idiosyncratic morphological character of the flipping operative in Japanese.

Law (1998) analyzes this phenomenon as arising from incorporation of D to P. Although what is going on in Japanese is not fusion of two items but the change in order, it similarly involves D and P. Interestingly, Takahashi (2002) appeals to head movement of D to P to account for cases like (87) and (88). Takahashi also places the particles *ka* and *mo* in the D position, though this is the only functional head posited above NP in his analysis. I adopt Takahashi's analysis in its essence here. I refer the reader to Takahashi's paper for details. See also Yatsushiro (2001) for factors that may be relevant for the applicability of head movement of D, though she remains silent on the categorial identity of quantificational particles and is not committed to movement of D.

6. Semantics of Case

One significant feature of this paper's analysis is that the projection that hosts Case is buried inside DP, contrary to the view that posits the projection in question above DP (Bittner and Hale 1996).[32] Recall that in the proposed account of Japanese nominals, there are two processes in which CaseP plays a crucial role. In one of them, NP is obligatorily raised to Spec of CaseP. In the other, CaseP itself is raised to Spec of DP.

Placement of CaseP inside DP is proposed by Sigurðsson (1993), who suggests that the head noun is raised to the Case head (his K) below D over the genitive possessor in Icelandic to check its Case feature, while the same checking is done without overt N raising in German. This difference between German and Icelandic in the position of N with respect to possessors is illustrated in (90).

(90)a. Peters Vorlesung (German)
Peter's lecture

b. Fyrirlesture Péturs (Icelandic)
lecture Peter's

[32] Tateishi (1989) proposes to place the case particle at the position of the D head in Japanese.

Sigurðsson claims that the difference in N raising is due to the richer case morphology displayed by Icelandic nouns. It is not the purpose of this paper to take up complexities of the phenomenon in these two languages, some of which are mentioned in Sigurðsson's paper (see Julien 2002 for further discussion of Icelandic). But if Sigurðsson's suggestion is on the right track, the phrasal movement of NP to Spec of CaseP in Japanese can be regarded as driven by the same Case consideration.

At this point, we must be cautious, if Chomsky's (1995) argument for eliminating Agr is to be taken seriously. The gist of his argument is that categories that consist solely of [−Interpretable] features are quite dubious from the minimalist viewpoint and should be eliminated, Agr being one such example. If the Case head is just a realization of structural Case, the same argument applies to it. So, the question is whether the Case head is invested with some LF interface properties. I would like to argue that the answer is quite positive. I will show that my analysis not only illuminates the nature of Japanese nominals but also points to crosslinguistic connections which have not been considered in the past literature.

6.1. *Case Agreement within DP*

Let us take up the Case-N relation first. So far, I have assumed that raising of NP to Spec of CaseP is motivated by the case concord relation, which is abstract in Japanese. But there are languages where nouns inflect for case. As mentioned just before, Icelandic nouns have rich case morphology. Here is the paradigm for the noun 'day', taken from Sigurðsson (1993).

(91)
Nom	dagur
Acc	dag
Dat	degi
Gen	dags

From the assumption that CaseP also exists in Icelandic and that its head has a Case feature, which is quite reasonable, it follows that the Case head enters into the agreement relation with the Case feature of NP.

This agreement relation does not lead to elimination of the two Case features, however. Since the actual shape of case is determined by DP-external factors, the Case features are not yet sent to PF after

DP-internal agreement. Phi-feature agreement with T or *v* takes care of structural Case (Chomsky 2000, 2001). Since there are at least two Case features within DP, the Multiple Agree system of Hiraiwa (2001) becomes necessary here. Inherent Case is ''assigned'' together with theta role assignment.

Details of implementation do not concern us here. What matters is that there is good reason to believe that DP-internal agreement of Case features takes place. German is interesting in this respect. Consider the the paradigm for the noun 'day' together with the definite article, again from Sigurðsson (1993).

(92) Nom der Tag
Acc den Tag
Dat dem Tag
Gen des Tages

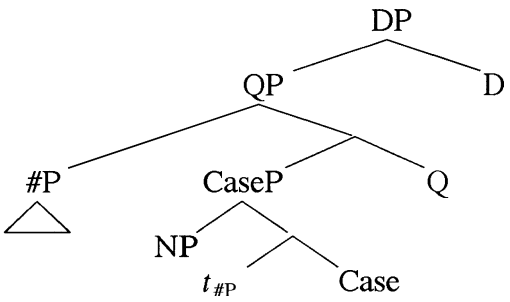
Note that the definite article changes shape according to Case. In fact, the case morphology of the article is stronger than that of nouns in German. Giusti (1995) analyzes this case concord as agreement between the article and the noun, but from the perspective of this paper, it should be interpreted as a reflection of agreement between D and CaseP, which is the topic of the next subsection.

6.2. *The Case-D Relation: Specificity*

Case agreement between D and the Case head still falls short of establishing that the Case head has semantic content. It is now time to turn to semantic differences among the various forms that DP takes in Japanese.

Raising of CaseP to Spec of DP derives the NP-Case-numeral-classifier order when it is applied to the structure in (93).

(93)



It has been observed since Kamio (1977) that the NP-Case-numeral-classifier order forces the non-specific interpretation. The incompatibility of that structure with an individual-level predicate, as observed by Tateishi (1989) and Ishii (1991)[33] and illustrated in (94), can be taken as a natural consequence of the non-specific reading being forced.[34]

(94)a. Gakusei **san-nin**-ga eigo-ga umai.
students 3-cl-nom English-nom good
'Three students are good at English.'

b. **San-nin**-no gakusei-ga eigo-ga umai.

c. *?Gakusei-ga **san-nin** eigo-ga umai.

As is well known (Diesing 1992), individual-level predicates cannot take a non-specific indefinite subject. The raising of CaseP to Spec of DP itself is possible with a nominative subject, as shown by the acceptability of (95).[35]

(95) Gakusei-ga **san-nin** eigo-o hanashita.
students-nom 3-cl English-acc spoke
'Three students spoke English.'

The obligatoriness of the non-specific reading can be seen in the intentional context as well. While (96a,b) are ambiguous, the object in (96c) must be interpreted as non-specific.

(96)a. John-wa piano **ni-dai**-o kai-tagatta.
John-top piano 2-cl-acc buy-wanted
'John wanted to buy two pianos.'

b. John-wa **ni-dai**-no piano-o kai-tagatta.

c. John-wa piano-o **ni-dai** kai-tagatta.

[33] The observation goes back to Harada (1976), who stated the generalization in terms of the distinction between stative and eventive predicates.

[34] See Nakanishi (2003) for an alternative semantic characterization.

[35] Terada (1990) observes that in the Akita dialect, the external argument cannot appear in the NP-Case-numeral-classifier order. It is an interesting question for future research to address why raising to Spec of DP is limited to internal arguments in this dialect.

In (96c), there is no particular piano that is the target of desire. Any two pianos will do. This is not necessarily the case in (96a,b).

Thus, it seems reasonable to posit the Case-D agreement relation which is responsible for specificity and which lies behind the raising of CaseP to Spec of DP. In other words, the information about specificity is associated with the Case head as well as with D. Note also that the observation about specificity provides a very strong argument that the functional projection above QP, the specifier of which is the landing site of CaseP movement, should be identified as DP, since D is the appropriate place to encode information about things like specificity. What is really surprising and interesting is the idea that Case is also closely related to D with respect to this property. The idea that Case and determiners are intimately related and in fact located in the same functional head is proposed by Giusti (1995) on entirely different grounds. The analysis of Japanese shows that they belong to distinct functional projections, and are related through the Agree relation.

This analysis makes it possible to treat specificity in Japanese and Turkish in a uniform fashion. Enç (1991) observes that the specificity of the accusative object is indicated by the presence of an overt case particle in Turkish. In (97), for example, the specific interpretation is assigned to the accusative object in the (a) sentence, whereas it must be interpreted as non-specific in (b).

(97)a. Ali bir piyano-**yu** kiralamak istiyor.
Ali one piano-acc rent wants
'Ali wants to rent a certain piano.'

b. Ali bir piyano kiralamak istiyor.
Ali one piano rent wants
'Ali wants to rent a (nonspecific) piano.'

Here, it is quite obvious that the information about specificity is carried by the Case head. This paper's analysis of Japanese nominals has shown that this is not an isolated phenomenon in Turkish. In fact, on the basis of the Turkish and other data, de Hoop (1992) develops a theory of structural Case where the distinction between strong Case and weak Case is directly linked to interpretive differences having to do with specificity and quantification in general. One weakness of de Hoop's original idea from the current perspective, however, is that structural Case itself is a feature that is

uninterpretable at the LF interface, so that it is a category mistake to talk about its direct interpretive content. By definition, it has none. If this paper's analysis of Japanese is on the right track, the distinction between strong Case and weak Case is not a classification of structural Case, as originally conceived by de Hoop, but a feature on the Case head, a rationalization which removes the conceptual problem. In this respect, it may be a little misleading to call the functional projection in question CaseP, but since this is the locus of case particles in Japanese, let us retain the name for the sake of convenience. What matters is that it now turns out that the Case head has semantic content.

The obligatory non-specific reading associated with the raising of CaseP to Spec of DP helps us understand one interesting aspect of the Japanese pseudopartitive construction discussed above, an example of which is given below again.

(98) Roger-wa **donburi(-ni) yon-hai**-no gohan-o tabeta.
Roger-top big.bowl-dat 4-cl-gen rice-acc ate
'Roger ate four big bowls of rice.'

Remember that the bold-faced part has the structure which arises from raising CaseP to Spec of DP, as in (29). The other structural possibilities produce completely unacceptable sentences, as in (99).

(99)a. *Roger-wa **yon-hai-no donburi**(**-e**/**-ni**)-no gohan-o tabeta.

b. *Roger-wa **donburi yon-hai-e**/**-ni**-no gohan-o tabeta.

The option with the particle *e* is also included here, because *ni* generally cannot appear immediately before the genitive-like linker *no* and *e* is used instead in such a context. Nevertheless, (99a,b) are unacceptable even with *e*. The question is why only (98) is acceptable. The answer is that the pseudopartitive construction necessarily involves the non-specific interpretation of the counting object. For (98) to be true, there do not have to be four big bowls. The natural interpretation is that the same single bowl is filled with rice four times to satisfy Roger's appetite. The failure to raise CaseP leads to the ambiguity between the specific and non-specific readings, as in (96a,b). Now, if the ambiguity in question comes from the possibility of two kinds of feature specification about specificity, we only have a partial answer for why (98) is the only possible form. The other two

forms would allow the non-specific reading required for the pseudopartitive construction and therefore should fit the construction. The fact that only (98) is possible suggests that the ambiguity comes from underspecification of the relevant feature (let us call it F). In other words, F can be [+F], [−F], or [øF]. The + and − values are necessary because there is no ambiguity in Turkish. For Japanese, I would like to say that only [øF] and [−F] are available, if [−F] is intended to yield the non-specific reading, assuming that there is no form which unambiguously leads to the specific interpretation in Japanese. The underspecified version, where CaseP is not raised to Spec of DP, does not fit the meaning of the pseudopartitive construction and therefore is ruled out. We are left with (98) only.

7. Conclusion

I have shown that Japanese nominals have a rich layer of functional projections above NP. These projections are headed by classifiers, case particles, quantificational particles, and so on. The numeral classifier construction in Japanese is an excellent testing ground for exploring the nature of these projections, because of its unusually diverse structural possibilities. This diversity is created by massive phrasal movement that takes place within DP, driven by feature checking motivations. Phrasal movement within DP is also proposed by Bernstein (1997, 2001b) for Romance, but the landing site is more transparently identifiable in Japanese due to the existence of overt functional heads. Interestingly, Simpson (2005) argues that phrasal movement within DP can account for the placement of the numeral + classifier sequence in various Southeast Asian languages. The results in this paper are expected to extend to these languages as well.

The agreement relations that lie behind the posited phrasal movement within DP hold between N and Case, Case and D, and # and Q. The N and Case heads agree in the Case feature. The Case and D heads agree in the feature related to specificity as well as in the Case feature. The # and Q heads agree in the feature related to the mass/count distinction.

Of course, there remain many questions that cannot be addressed at this point. The partitive construction, which also involves the numeral + classifier combination, is put aside for future research. See Kawashima (1994) and Sauerland and Yatsushiro (2004) for some discussion. The interaction with a demonstrative, discussed

extensively in the literature, is not taken up here. I hope, nevertheless, that this paper is a step toward a better understanding of the DP-internal syntactic mechanism that regulates referentiality and quantification, providing a solid basis for the future by unifying the wide variety of structures in which a numeral + classifier combination can appear in Japanese.

References

Aoun, Joseph and Y.-H. Audrey Li. 1993. 'On Some Differences between Chinese and Japanese *Wh*-elements', *Linguistic Inquiry* **24**, 365–372.

Beghelli, Filippo and Tim Stowell. 1997. 'Distributivity and Negation', in A. Szabolcsi (ed.), *Ways of Scope Taking*, Kluwer, Dordrecht, pp. 71–107.

Bernstein, Judy. 1991. 'DPs in French and Walloon: Evidence for Parametric Variation in Nominal Head Movement', *Probus* **3**, 101–126.

Bernstein, Judy. 1997. 'Demonstratives and Reinforcers in Romance and Germanic Languages', *Lingua* **102**, 87–113.

Bernstein, Judy. 2001a. 'The DP Hypothesis: Identifying Clausal Properties in the Nominal Domain', in M. Baltin and C. Collins (eds.), *The Handbook of Contemporary Syntactic Theory*, Blackwell, Oxford, pp. 536–561.

Bernstein, Judy. 2001b. 'Focusing the "Right" Way in Romance Determiner Phrases', *Probus* **13**, 1–29.

Bittner, Maria and Ken Hale. 1996. 'The Structural Determination of Case and Agreement', *Linguistic Inquiry* **27**, 1–68.

Borer, Hagit. 2005. *Structuring Sense* vol. I, Oxford University Press, Oxford.

Castillo, Juan Carlos. 2001. *Thematic Relations between Nouns*, unpublished Ph.D. dissertation, University of Maryland, College Park.

Cheng, Lisa Lai-Shen and Rint Sybesma. 1998. 'Yi-wan Tang, Yi-ge Tang: Classifiers and Massifiers', *The Tsing Hua Journal of Chinese Studies, New Series* **28**, 385–412.

Cheng, Lisa Lai-Shen and Rint Sybesma. 1999. 'Bare and Not-So-Bare Nouns and the Structure of NP', *Linguistic Inquiry* **30**, 509–542.

Chierchia, Gennaro. 1998a. 'Reference to Kinds across Languages', *Natural Language Semantics* **6**, 339–405.

Chierchia, Gennaro. 1998b. 'Plurality of Mass Nouns and the Notion of "Semantic Parameter"', in S. Rothstein (ed.), *Events and Grammar*, Kluwer, Dordrecht, pp. 53–103.

Chomsky, Noam. 1995. 'Categories and Transformations', in N. Chomsky (ed.), *The Minimalist Program*, MIT Press, Cambridge, MA, pp. 219–394

Chomsky, Noam. 2000. 'Minimalist Inquiries', in R. Martin, D. Michaels and J. Uriagereka (eds.), *Step by Step: Essays on Minimalist Syntax in Honor of Howard Lasnik*, MIT Press, Cambridge, MA, pp. 89–155.

Chomsky, Noam. 2001. 'Derivation by Phase', in M. Kenstowicz (ed.), *Ken Hale: A Life in Language*, MIT Press, Cambridge, MA, pp. 1–52.

Corver, Nobert. 1998. 'Predicate Movement in Pseudopartitive Constructions', in A. Alexiadou and C. Wilder (eds.), *Possessors, Predicates and Movement in the Determiner Phrase*, John Benjamins, Amsterdam, pp. 215–257.

Diesing, Molly. 1992. *Indefinites*, MIT Press, Cambridge, MA.
Doetjes, Jenny. 1997. *Quantifiers and Selection: On the Distribution of Quantifying Expressions in French, Dutch and English*, unpublished Ph.D. dissertation, Leiden University, Leiden.
Doetjes, Jenny and Johan Rooryck. 2003. 'Generalizing over Quantitative and Qualitative Constructions', in M. Coene and Y. D'hulst (eds.), *From NP to DP* vol. 1., John Benjamins, Amsterdam, pp. 277–295.
Embick, David and Rolf Noyer. 2001. 'Movement Operations after Syntax', *Linguistic Inquiry* **32**, 555–595.
Enç, Mürvet. 1991. 'The Semantics of Specificity', *Linguistic Inquiry* **22**, 1–25.
Franks, Steven. 1994. 'Parametric Properties of Numeral Phrases in Slavic', *Natural Language and Linguistic Theory* **12**, 597–674.
Fujita, Naoya. 1994. *On the Nature of Modification: A Study of Floating Quantifiers and Related Constructions*, unpublished Ph.D. dissertation, University of Rochester, Rochester.
Fukui, Naoki. 1986. *A Theory of Category Projection and its Applications*, unpublished Ph.D. dissertation, MIT, Cambridge, MA.
Fukui, Naoki and Hiromu Sakai. 2003. 'The Visibility Guideline for Functional Categories: Verb Raising in Japanese and Related Issues', *Lingua* **113**, 321–375.
Fukui, Naoki and Yuji Takano. 1998. 'Symmetry in Syntax: Merge and Demerge', *Journal of East Asian Linguistics* **7**, 27–86.
Fukui, Naoki and Yuji Takano. 2000. 'Nominal Structure: An Extension of the Symmetry Principle', in P. Svenonius (ed.), *The Derivation of VO and OV*, John Benjamins, Amsterdam, pp. 219–254.
Gil, David. 1995. 'Universal Quantifiers and Distributivity', in E. Bach, E. Jelinek, A. Kratzer, and B.H. Partee (eds.), *Quantification in Natural Languages*, Kluwer, Dordrecht, pp. 321–362.
Giusti, Giuliana. 1995. 'A Unified Structural Representation of (Abstract) Case and Article: Evidence from Germanic', in H. Haider, S. Olsen and S. Vikner (eds.), *Studies in Comparative Germanic Syntax*, Kluwer, Dordrecht, pp. 77–93.
Halle, Morris and Alec Marantz. 1993. 'Distributed Morphology and Pieces of Inflection', in K. Hale and S. J. Keyser (eds.), *The View from Building 20*, MIT Press, Cambridge, MA., pp. 111–176.
Harada, Shin-Ichi. 1976. 'Quantifier Float as a Relational Rule', *Metropolitan Linguistics* **1**, 44–49. Reprinted in N. Fukui (ed.), *Syntax and Meaning: S. I. Harada Collected Works in Linguistics*, Taishuukan, Tokyo, 2000, pp. 339–345.
Harbour, Daniel. 2003. *Elements of Number Theory*, unpublished Ph.D. dissertation, MIT, Cambridge, MA.
Hiraiwa, Ken. 2001. 'Multiple Agree and the Defective Intervention Constraint', in O. Matushansky and E. Gurzoni (eds.), *The Proceedings of the HUMIT 2000*, *MIT Working Papers in Linguistics 40*, MIT, Cambridge, MA, pp. 67–80.
Hoop, Helen de. 1992. *Case Configuration and Noun Phrase Interpretation*, unpublished Ph.D. dissertation, University of Groningen, Groningen.
Inoue, Kazuko. 1978. *Nihongo-no Bunpou Kisoku*, Taishuukan, Tokyo.
Ionin, Tania and Ora Matushansky. 2004. 'The Non-Existence, Syntax, and Semantics of Numerals', handout of a paper presented at Nouns and Pronouns, Free University, Berlin.

Ishii, Yasuo. 1991. *Operators and Empty Categories in Japanese*, unpublished Ph.D. dissertation, University of Connecticut, Storrs.
Ishii, Yasuo. 1999. 'A Note on Floating Quantifiers in Japanese', in M. Muraki and E. Iwamoto (eds.), *Linguistics: In Search of the Human Mind*, Kaitakusha, Tokyo, pp. 236–267.
Jackendoff, Ray. 1977, *X-bar Syntax*, MIT Press, Cambridge, MA.
Jayaseelan, K.A. 2001. 'Questions and Question-word Incorporating Quantifiers in Malayalam', *Syntax* **4**, 63–93.
Julien, Marit. 2002. 'Determiners and Word Order in Scandinavian DPs', *Studia Linguistica* **56**, 264–314.
Kamio, Akira. 1977. 'Suuryoushi-no Shintakkusu', *Gengo* **6**(8), 83–91.
Kamio, Akira. 1983. 'Meishiku-no Kouzou', in K. Inoue (ed.), *Nihongo-no Kihon Kouzou*, Sanseidou, Tokyo, pp. 77–126.
Kawashima, Ruriko. 1994. *The Structure of Noun Phrases and the Interpretation of Quantificational NPs in Japanese*, unpublished Ph.D. dissertation, Cornell University, Ithaca.
Kawashima, Ruriko. 1998. 'The Structure of Extended Nominal Phrases: The Scrambling of Numerals, Approximate Numerals, and Quantifiers in Japanese', *Journal of East Asian Linguistics* **7**, 1–26.
Kitagawa, Chisato and Claudia N.G. Ross. 1982. 'Prenominal Modification in Chinese and Japanese', *Linguistic Analysis* **9**, 19–53.
Kitahara, Hisatsugu. 1993. 'Numeral Classifier Phrases inside DP and the Specificity Effect', in S. Choi (ed.), *Japanese/Korean Linguistics* 3, CSLI Publications, Stanford, pp. 171–186.
Koizumi, Masatoshi. 1995. *Phrase Structure in Minimalist Syntax*, unpublished Ph.D. dissertation, MIT, Cambridge, MA.
Koizumi, Masatoshi. 2000. 'String Vacuous Overt Verb Raising', *Journal of East Asian Linguistics* **9**, 227–285.
Kornfilt, Jaklin. 1996. 'Naked Partitive Phrases in Turkish', in J. Hoeksma (ed.), *Partitives*, Mouton de Gruyter, Berlin, pp. 107–142.
Law, Paul. 1998. 'A Unified Analysis of P-stranding in Romance and Germanic', in *Proceedings of NELS* 28, GLSA, University of Massachusetts, Amherst, pp. 219–234.
Li, Yen-Hui Audrey. 1999. 'Plurality in a Classifier Language', *Journal of East Asian Linguistics* **8**, 75–99.
Lin, Jo-Wan. 1998a. 'Distributivity in Chinese and its Implications', *Natural Language Semantics* **6**, 201–243.
Lin, Jo-Wan. 1998b. 'On Existential Polarity *Wh*-phrases in Chinese', *Journal of East Asian Linguistics* **7**, 219–255.
Löbel, Elisabeth. 1989. 'Q as a Functional Category', in C. Bhatt, E. Löbel and C. Schmidt (eds.), *Syntactic Phrase Structure Phenomena*, John Benjamins, Amsterdam, pp. 133–187.
Longobardi, Giuseppe. 2001. 'The Structure of DPs: Some Principles, Parameters, and Problems', in M. Baltin and C. Collins (eds.), *The Handbook of Contemporary Syntactic Theory*, Blackwell, Oxford, pp. 562–603.
Marantz, Alec. 1984. *On the Nature of Grammatical Relations*, MIT Press, Cambridge, MA.

Marantz, Alec. 1988. 'Clitics, Morphological Merger, and the Mapping to Phonological Structure', in M. Hammond and M. Noonan (eds.), *Theoretical Morphology*, Academic Press, San Diego, pp. 253–270.

Miyagawa, Shigeru. 1989. *Structure and Case Marking in Japanese*, Syntax and Semantics 22, Academic Press, San Diego.

Muromatsu, Keiko. 1998. *On the Syntax of Classifiers*, unpublished Ph.D. dissertation, University of Maryland, College Park.

Nakanishi, Kimiko. 2003. 'Semantic Properties of (Non-)Floating Quantifiers and their Syntactic Implications', in W. McClure (ed.), *Japanese/Korean Linguistics* vol. 12, CSLI Publications, Stanford, pp. 365–376.

Nishigauchi, Taisuke. 1990. *Quantification in the Theory of Grammar*, Kluwer, Dordrecht.

Partee, Barbara. 1995. 'Quantificational Structures and Compositionality', in E. Bach, E. Jelinek, A. Kratzer, and B. Partee (eds.), *Quantification in Natural Languages*, Kluwer, Dordrecht, pp. 541–601.

Richards, Norvin. 1997. *What Moves Where When in Which Language?*, unpublished Ph.D. dissertation, MIT, Cambridge, MA.

Richards, Norvin. 2001. *Movement in Language: Interactions and Architectures*, Oxford University Press, Oxford.

Ritter, Elizabeth. 1991. 'Two Functional Categories in Noun Phrases: Evidence from Modern Hebrew', in S. Rothstein (ed.), *Perspectives on phrase structure: heads and licensing*, Syntax and Semantics 25, Academic Press, New York, pp. 37–62.

Sadakane, Kumi, and Masatoshi Koizumi. 1995. 'On the Nature of the ''Dative'' Particle *Ni* in Japanese', *Linguistics* **33**, 5–33.

Sauerland, Uli, and Kazuko Yatsushiro. 2004. 'A Silent Noun in Partitives', in *Proceedings of NELS 34*, GLSA, University of Massachusetts, Amherst, pp. 101–112.

Selkirk, Elisabeth. 1977. 'Some Remarks on Noun Phrase Structure', in P. Culicover, T. Wasow, and A. Akmajian (eds.), *Formal Syntax*, Academic Press, New York, pp. 285–316.

Shlonsky, Ur. 1991. 'Quantifiers as Functional Heads: A Study of Quantifier Float in Hebrew', *Lingua* **84**, 159–180.

Sigurðsson, Halldór Ármann. 1993. 'The Structure of the Icelandic NP', *Studia Linguistica* **47**, 178–197.

Simpson, Andrew. 2005. 'Classifiers and DP Structure in South East Asia', in G. Cinque and R. Kayne (eds.), *Handbook of Comparative Syntax*, Oxford University Press, Oxford, pp. 806–838.

Sybesma, Rint. 1992. *Causatives and Accomplishments*, unpublished Ph.D. dissertation, Leiden University, Leiden.

Szabolcsi, Anna. 1997. 'Strategies for Scope Taking', in A. Szabolcsi (ed.), *Ways of Scope Taking*, Kluwer, Dordrecht, pp. 109–154.

Takahashi, Daiko. 2002. 'Determiner Raising and Scope Shift', *Linguistic Inquiry* **33**, 575–615.

Takano, Yasukuni. 1984. 'The Lexical Nature of Quantifiers in Japanese', *Linguistic Analysis* **14**, 289–311.

Takano, Yuji. 2002. 'Surprising Constituents', *Journal of East Asian Linguistics* **11**, 243–301.

Tang, Jane. 1990. 'A Note on the DP analysis of Chinese Noun Phrase', *Linguistics* **28**, 337–354.
Tateishi, Koichi. 1989. 'Subjects, SPEC, and DP in Japanese', in *Proceedings of NELS 19*, GLSA, University of Massachusetts, Amherst, pp. 405–418.
Terada, Michiko. 1990. *Incorporation and Argument Structure in Japanese*, unpublished Ph.D. dissertation, University of Massachusetts, Amherst.
Tsai, W.-T. Dylan. 1994. *On Economizing the Theory of A-bar Dependencies*. unpublished Ph.D. dissertation, MIT, Cambridge, MA.
Tsai, W.-T. Dylan. 1999. 'On Lexical Courtesy', *Journal of East Asian Linguistics* **8**, 39–73.
Valois, Daniel. 1991. *The Internal Syntax of DP*, unpublished Ph.D. dissertation, UCLA, Los Angeles.
Watanabe, Akira. 1992. *Wh-in-situ, Subjacency, and Chain Formation*, MIT Occasional Papers in Linguistics 2, MIT, Cambridge, MA.
Watanabe, Akira. 2000. 'Absorption: Interpretability and Feature Strength', in K. Inoue (ed.), *Report (4): Researching and Verifying an Advanced Theory of Human Language*, Kanda University of Internaitonal Studies, Chiba, pp. 253–296.
Watanabe, Akira. 2001. 'Wh-in-situ Languages', in M. Baltin and C. Collins (eds.), *The Handbook of Contemporary Syntactic Theory*, Blackwell, Oxford, pp. 203–225.
Watanabe, Akira. 2004a. 'Parametrization of Quantificational Determiners and Head-Internal Relatives', *Language and Linguistics* **5**, 59–97.
Watanabe, Akira. 2004b. 'The Genesis of Negative Concord: Syntax and Morphology of Negative Doubling', *Linguistic Inquiry* **35**, 559–612.
Yamakido, Hiroko. 2000. 'Japanese Attributive Adjectives are not (All) Relative Caluses', *Proceedings of WCCFL 19*, CSLI Publications, Stanford, pp. 588–602.
Yatsushiro, Kazuko. 2001. 'The Distribution of *Mo* and *Ka* and its Implications', in M.C. Cuervo, D. Harbour, K. Hiraiwa and S. Ishihara (eds.), *Formal Approaches to Japanese Linguistics 3*, MIT, Cambridge, MA, pp. 181–198.

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