Remarks on Labels, Agreement, and Pro-form *no* in Japanese*

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1. Introduction

This short paper contains some remarks on the pro-form *no* in Japanese. Focusing on the interaction of *no* and adnominal quantifiers, especially pre-nominal quantifiers, it deals with the following observation. The pro-form *no* needs to be associated with at least one modifier within its domain, but an adnominal quantifier does not contribute to this requirement under a 'numeral' reading as opposed to the 'property' reading. The paper will consider if a labeling approach to syntax (Chomsky 2013, 2015) can shed some new light on this phenomenon.

2. On the distribution of the pro-form *no*

As pointed out by Kamio (1983) and others, the pro-form *no* cannot occur on its own (1) and needs to occur with some modifier, such as a relative clause and a postpositional phrase (2).

(1) a. (ookina) ie
big house
'a/the big house'

b. *(ookina) no
big one
'a/the big one'

(2) a. Hanako ga tukutta no
Hanako NOM made one
'the one that Hanako made'

b. Nihon kara no
Japan from one
'the one from Japan'

The following descriptive statement is taken from Murasugi (1991: 61), which is based on Kamio's (1983: 85) original statement.

(3) Where *no* appears as a head nominal, it has to be associated with at least one modifier under NP'(= N').

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The particular formulation given in (3) is based on the observation that not all pre-nominal elements can 'license' *no*. In particular, quantifiers do not 'license' *no*.

(4) Kinoo-wa san-ko-no nimotsu-ga todoita.
Yesterday-TOP three-CL-GEN package arrived
*Kyoo-wa {takusan/go-ko} no-ga todoita.
Today-TOP many/5-CL} one-NOM arrived
'Yesterday, three packaged arrived. Today, many/five arrived.'

Based on Kamio's insight (1983), Murasugi (1991) (see also Hiraiwa (2016)) argues that a pre-nominal quantifier is always base-generated in the domain of QP, which occurs on top of NP, and hence is located 'too high' to qualify as a licensor of the pro-form *no*.

However, some data casts doubt on such a supposition. Let us first confirm that when an ordinal numeral and a cardinal numeral co-occur in the same nominal domain, the former must precede the latter.

(5) a. kono basu-wa saisyo-no mit-tu no teiryuujyo-o sugiru to garagara da.
this bus-TOP first-GEN three-CL-GEN bus stop-o pass if empty be
'This bus becomes empty after it goes through the first three bus stops.'
b. *kono basu-wa mit-tu no saisyo-no teiryuujyo-o sugiru to garagara da.
this bus-TOP three-CL-GEN first-GEN bus stop-o pass if empty be
'This bus will be empty after it goes through the first three bus stops.'

This indicates that ordinal numerals necessarily occur higher than cardinal numerals. If a structural position of a modifier is all that matters for the 'licensing' of *no*, we may expect ordinal numerals, similarly to cardinal numerals, to fail to license *no*. This expectation is not fulfilled, however.

(6) Kyoo-no konsaato-wa dono kyoku-mo yokatta kedo, ...
Today-GEN concert which tune-all good.was though
'Although each and every tune in yesterday's concert was good, ...'
a. saisyo-no kyoku-ga tokuni yokatta desu.
first-GEN tune-NOM particularly good-was be
'the first tune was particularly good.'
a'. saisyo no-ga tokuni yokatta desu.
first one-NOM particularly good-was be
'the first one was particularly good.'

b. mit-tsu-no kyoku-ga tokuni yokatta desu.
three-CL-GEN tune-NOM particularly good-was be
'three tunes were particularly good.'

b'. *mit-tsu no-ga tokuni yokatta desu.
three-CL one-NOM particularly good-was be
'three tunes were particularly good.'

Although one may say that an ordinal numeral and a cardinal numeral form a constituent on their own, Hebrew provides evidence to the contrary, as the two types of numerals do not always appear adjacent to each other. An example like the following is analyzed by Shlonsky (2004) as being derived by a leftward movement of *šaloš simfoniot* 'three symphonies.'

(7) šaloš simfoniot rišonot
three symphonies first
'the first three symphonies' (Shlonsky 2004: 1478)

But if the exceptional behavior of pre-nominal quantifiers shown in (4) is not a matter of their structural position, what makes them exceptional?

There is another puzzle to be considered. The combination of a pre-nominal quantifier and the pro-form *no* does not always lead to ungrammaticality. It is fine under what Hiraiwa (2016) dubs the 'property' reading. For example, the following example has the reading in which Taro bought a set of 5 books, typically a five-volume set of books.

(8) Taro-wa go-satsu no-o katta.
Taro-TOP 5-CL one-ACC bought
*'Taro bought 5 books.' ('numeral' interpretation)
'Taro bought a 5-volume set.' ('property' interpretation)

We would like to know why the reading matters here. In what follows, I would like to consider if the recent label-based syntax (Chomsky 2013, 2015 etc.) can shed some light on these questions.

3. Pro-form and labels

Let us outline the labeling system to be entertained below. The operation Merge essentially yields two configurations.[1] For SO = {X, YP}, where X is a head (lexical item, or LI) and YP is a non-head,

[1] I will set aside the case where SO = {X, Y} where both are heads.

labeling algorithm (LA) in the form of minimal search trivially determines X as the label of SO. For SO = {XP, YP} where neither is a head, minimal search fails to identify label, and the configuration needs to be somehow "modified" to avoid labeling failure. For example, if one of them, say, XP, moves out, its copy becomes invisible for LA, and the label of SO becomes that of YP. However, movement of XP into the domain of Z would create another configuration of the same kind (see (9)), where, again, minimal search fails to identify a head. Chomsky argues that if XP and ZP share a prominent feature F, then the label of SO is determined as <F, F>. For cases where this prominent feature is φ-feature, we can say that the label of SO is <φ, φ>.

(9) SO = {XP {Z, {XP, YP}}}

For languages without φ-agreement (such as Japanese), Saito (2016) argues that some properties such as suffixal case and inflection on predicate play a role similar to that of φ-features. Suppose that XP but not YP of an XP-YP configuration bears suffixal Case or inflection on predicate. Saito argues that it renders XP "opaque" for minimal search and consequently it is YP that "projects." I will slightly modify Saito's implementation of the "anti-labeling" device. Instead of saying that suffixal case on XP renders it opaque (invisible for LA), I will assume that it instructs LA to determine a label on the basis of the other member, Y(P).

Turning now to the pro-form *no*, I will stipulate the following, based on (3).

(10) Pro-form *no* cannot provide a label on its own.

Perhaps this restriction can be tied to the idea that the pro-form *no* is a light noun (Hiraiwa 2016) and thus lacks a fair amount of substance. Note in this connection that Chomsky (2015) suggests that a root is too weak to serve as a label because it lacks certain properties such as categorial information, and thus needs to be supplemented (or enriched) with an agreeing element. We might be able to apply a similar logic here and say that the pro-form *no* is too weak (or 'defective') to provide a label on its own and needs to be supplemented with a modifier. I will leave the precise nature of (10) open here.

When *no* is combined with a modifier, which I take to be always phrasal (cf. the idea expressed by the X-bar schema of the form X' → X YP), we get {*no*, YP}.[2] In (11a), we have an X-YP configuration, and minimal search can determine its label (also, the inflection on *chiisai* 'small' serves as an anti-labeling device). When another modifier, such as *ano kodomo-no*, 'that child-GEN' of (11b), is additionally merged, we obtain an XP-YP configuration where minimal search fails to find a head, but the genitive marker *-no*

[2] It is sometimes suggested that a modifier (or an adjunct) is introduced by an operation called pair merge. Postulation of such an extra device should be avoided if possible.

on *ano kodomo* renders it opaque and a labeling problem is circumvented.

(11) a. [[totemo chiisai] kaban]
very small bag
'a very small bag'
b. [[ano kodomo-no] [[totemo chiisai] kaban]]
that child-GEN very small bag
'That child's very small bag'

Let us return now to the question of why pre-nominal quantifiers fail to 'license' *no*. Given the earlier discussion of (5) and (6), I assume, following Saito et al. (2008) (see also Huang and Ochi (2014)), that they occur within NP, just like other adnominal modifiers. But if structural height does not distinguish pre-nominal quantifiers from other modifiers, what does? I would like to argue that it is their agreement properties. Although the standard view in the literature about Japanese is that it lacks φ-features altogether (Fukui 1988, Saito 2016), pre-nominal quantifiers (in contrast to post-nominal and floating quantifiers) are exceptional in this regard. As Sauerland and Yatsushiro (2004, 2017) and Watanabe (2017) point out, while a post-nominal quantifier (12b) and a floating quantifier (12c) are insensitive to the singular/plural distinction of the denotation of the noun (*hon* 'book' in this case), a pre-nominal quantifier (12a) only permits the 'plural' reading and excludes the singular interpretation.

(12) a. Boku-wa subete-no hon-o yonda.
I-TOP all-GEN book-ACC read
'*I read all of the book.
'I read all of the books.'
b. Boku-wa hon subete-o yonda.
I-TOP book all-ACC read
'I read all of the book.
'I read all of the books.'
c. Boku-wa hon-o subete yonda.
I-TOP book-ACC all read
'I read all of the book.'
'I read all of the books.'

Following Watanabe (2017), I take this point to mean that a pre-nominal quantifier and a noun must establish some agreement relationship with respect to (but perhaps not limited to) number (i.e., [+ plural]).

The idea that pre-nominal quantifiers in Japanese bear φ-features helps us explain the curious fact,

noted by Ochi (2012) and Huang and Ochi (2014), that they cannot be stacked up within a single nominal domain.

(13) a. *subete-no hyaku-satsu-no hon
all-GEN 100-CL-GEN book
'all 100 books'

b. hyaku-satsu-no hon subete
100-CL-GEN book all
'all 100 books'

In order to express the relevant reading, a post-nominal quantifier has to be employed, as in (13b).[3] Now the ungrammaticality of (13a) falls out rather naturally if merge of a prenominal adnominal quantifier, because of its agreement properties, has to resort to labeling via feature sharing.[4]

(14) *[$_{\beta}$ subete-no [$_{\alpha}$ hyaku-satsu-no hon]]

When *hyaku-satsu* '100-CL' and *hon* 'book' are merged, they undergo feature sharing. Hence, α is labeled <F, F>. But then β cannot be labeled because *hon* has already gone through feature sharing at the derivational stage α.

Such considerations raise an interesting question. Take *hyaku-satsu-no hon* '100-CL-GEN book' as an example. According to Saito, Japanese lets suffixal case (and inflection on predicate) on XP to serve as an anti-labeling device, thereby providing the instruction to the system that the other member of the pair "projects." Yet the preceding discussion suggests that we find in the same language a small set of elements that inherently possess agreement properties. So, LA has a decision to make upon facing a configuration where both an anti-labeling device (*-no* attached to *hyaku-satu* '100-CL') and an agreement property ([+ plural] feature) are detected. Which one does LA resort to in such a case? Assuming that the former is the unmarked option for Japanese, I would like to suggest that LA goes with the marked option here: LA automatically resorts to the agreement-based strategy when a pre-nominal quantifier and a nominal head are combined.[5]

Now, according to Chomsky, labeling via feature sharing requires an XP-YP configuration. The idea is that the two elements that share a prominent property, such as agreement, have to stand in a symmetrical

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[3] Post-nominal quantifiers can be stacked. see Huang and Ochi (2014).

(i) hon hyaku-satsu subete
book 100-CL all
'all 100 books'

[4] The discussion here is inspired by Saito's (2016) proposal concerning the lack of argument stacking in languages such as English.

[5] Alternatively, LA has to consider both options.

relation. An XP-YP configuration fits this description, but not an X-YP configuration. Accordingly, I assume that pre-nominal quantifiers (unlike other, non-agreeing pre-nominal elements in Japanese) undergo local movement to create the required XP-YP configuration:

(15) [$_{\beta}$ 100-CL [$_{\alpha}$ <100-CL> hon]]

The quantifier *hyaku-satsu* '100-CL' moves and remerges with α (= N' in the traditional sense), giving rise to β (= NP).

Now let us return to the question of why pre-nominal quantifiers fail to 'license' *no*. In order to establish a possible link between the agreement property of pre-nominal quantifiers and their inability to license *no*, we might say that *no* has no agreement property. Things are not so simple, however. First, although the pro-form *one* in English also cannot be 'licensed' by a quantifier (e.g., **two ones*), it inflects for plural (e.g., *these ones*), suggesting that nominal pro-forms are in principle capable of establishing the number agreement. Second, as noted by Murasugi (1991), a pre-nominal quantifier and *no* do co-occur as long as another modifier merges with *no* first: observe the contrast between (16a) and (16b).

(16) a. yon-ko-no marui no
four-CL-GEN round one
'four round ones'

b. *marui yon-ko no
round four-CL one
'(lit.) round four ones'

Let us therefore assume that the pro-form *no* can participate in feature sharing as long as it is part of an XP-YP configuration. In (16a), the sister of *yon-ko* 'four-CL' is a phrasal element, *marui no* 'round one.' We thus have an XP-YP configuration, and labeling via agreement sharing can proceed successfully. In (16b), the sister of *yon-ko* 'four-CL' is *no*, a head. We thus have an X-YP configuration, which needs to be "modified" via movement of YP (= *yon-ko* 'four-CL'): see (15). The ungrammaticality of this example suggests that this movement creates a problem. Perhaps the defective character of *no* stated in (10) helps us understand this point. As shown in (17), α remains unlabeled even after the movement of the quantifier, because the copy of *yon-ko* 'four-CL' is invisible for LA and *no* cannot provide a label on its own.[6]

(17) [$_{\beta}$ 4-CL [$_{\alpha}$ <4-CL> *no*]]

All in all, (16b) is bad because of (i) the requirement that a label be determined via agreement sharing upon the introduction of a pre-nominal quantifier, and (ii) the defective character of *no* stated in (10).[7]

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[6] Obviously this raises a question of whether intermediate projections (in the traditional sense) need labels.

[7] The distribution of the English pro-form *one* (e.g., *two *(red) ones)* may be analyzable in the same spirit, assuming that cardinals in this language are also modifiers within NP (see Giusti 1991).

Now let us turn to the fact, shown by (8), that the pre-nominal quantifier does not have such complications on the 'property' reading. Extending Miyamoto's (2009) analysis of the nominal-internal distributive reading of numeral classifiers, which I think is closely related to the 'property' reading under discussion, I would like to propose that the 'property' reading is obtained from the structure in which a pre-nominal quantifier is embedded inside a relative clause that functions as a prenominal modifier. Furthermore, following Nishiyama (1999), I assume that *no* attached to *go-satsu* in the case of the 'property' reading is a contracted form of *de aru*, which consists of the predicative copular *de* and the dummy copular *aru*, as shown in (18a). After the contraction takes place, the resulting form *no*, though visible in syntax, is deleted in the PF component via haplology (18b). Since *go-satsu* 'five-CL' and the pro-form *no* are not directly merged in this derivation, no need for labeling via agreement sharing arises.

(18) a. [[$_{\text{relative clause}}$ .... [five-CL] de aru] no]
5-CL pred. cop dum. cop one
b. [[$_{\text{relative clause}}$ .... [five-CL] ~~no~~] no]
5-CL one

4. Concluding remarks

I have proposed in this paper that the inability of a pre-nominal quantifier to serve as a legitimate 'licensor' of the pro-form *no* follows from the following points. First, unlike other adnominal modifiers, pre-nominal modifiers bear some agreement properties. Second, because of the defective nature of *no*, local movement of its dependent results in labeling failure. Third, while labeling via anti-labeling device in the sense of Saito (2016) is the norm for Japanese, LA resorts to the more marked option (i.e., labeling via agreement sharing) upon facing an XP-YP configuration where both an anti-labeling device and an agreement property are detected at the same derivational stage. As a result, when a pre-nominal quantifier is the sole element (or the first element) to merge with *no* in the nominal domain, labeling failure ensues because LA in such cases automatically resorts to labeling via agreement sharing, which requires that a pre-nominal quantifier and *no* stand in a symmetrical relation of XP-YP, which leads to labeling failure because of the defectiveness of *no*.

While many questions need to be addressed and resolved, the idea entertained in this paper has some theoretical consequences. In particular, although we have focused on number agreement here, classifiers may be an instantiation of another type of agreement. After all, the selection of one classifier as opposed to others depends on the type (or "classification") of the noun that it accompanies. Interestingly, Corbett (1991) reports that classifiers and genders (part of the φ-agreement system) are found in language of different morphological types. Isolating languages, which lack agreement, typically have classifiers but lack genders. Fusional types (such as those in the Indo-European family) tend to have gender systems but lack classifiers. Agglutinating languages fall between these two ends, with some of them possessing

classifiers and some genders. As Corbett (1991: 137) suggests, classifier systems and gender systems "may perform similar roles in languages of different morphological types." If so, merge of numeral classifiers and a noun may also involve an additional agreement relation.[8]

This conception of classifier may have an implication for an analysis of the post-nominal numeral classifier. According to Watanabe (2006) (see also Huang and Ochi (2014)), this construction has as its head a classifier (CL), which takes an NP and a numeral as its complement and specifier, respectively. Furthermore, it involves obligatory movement of this NP-complement to the edge of the nominal domain. The driving force of this nominal-internal movement has been unclear, but the current perspective on labeling may provide a clue. As before, let us suppose that LA is automatically geared toward the labeling-via-agreement option upon detecting an element with some agreement properties, and that includes a classifier.

(19) a. hon hyaku-satsu
book 100-CL
'100 books'
b. [$_{\beta}$ 100 [$_{\alpha}$ hon satsu]]
c. [$_{\delta}$ hon [$_{\beta}$ 100 [$_{\alpha}$ ~~hon~~ satsu]]]

Here *hon* 'book' and the CL *satsu* need to enter into an agreement relationship. As shown in (19c), movement of *hon* 'book' creates an XP-YP configuration, and δ is labeled <F, F>.[9,10] We could thus say that this movement is triggered for providing a label. Hence it is obligatory.

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[8] As Kamio (1983) points out, demonstratives also do not license *no*. Note in this connection that Chinese demonstratives are accompanied by a classifier. If Japanese demonstratives turned out to be accompanied by a classifier (a phonetically null classifier, in this case), we would have an explanation for this restriction.

(i) *Ano hon-wa takai ga, kono wa yasui.
that book-TOP expensive but this TOP cheap
'That book is expensive but this one is cheap.'

[9] Here, the label of α is *satsu* after the movement of *hon*. Questions arise as to the label of β, which has an XP-YP configuration. I must leave the question open.

[10] We also have an explanation of why the post-nominal classifier fails to 'license' *no*, a fact noted as a problem by Murasugi (1991: 92).

(i) Taro-ga *(takai) no futa-tsu-o katta.
Taro-NOM expensive one two-CL-ACC bought
'Taro bought two *(expensive) ones.'

According to Bošković (2018), an unlabeled constituent cannot undergo movement.

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