Toyuu-reduplication and the Structure of Extended Nominal Projections in Japanese

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Synopsis: In many languages, distributive-universal quantifiers and non-distributive quantifiers are expressed in a different way (Gil 1995). In this paper, I show that non-distributive universal quantification can be expressed in Japanese by using reduplication. My proposal crucially relies on two assumptions. One is that Japanese bare common nouns denote a kind, and they are all mass nouns (Chierchia 1998). The other is that Japanese common nouns can be a complement of the head of a classifier phrase (Watanabe 2006). I propose that Japanese *toyuu*-reduplication, which functions as a non-distributive universal quantifier, is best analyzed based on these two assumptions.

Data: I refer to the underlined expressions in (1) as a *toyuu*-reduplication. In (1), a noun phrase is reduplicated around the particle *toyuu*. As shown in the interpretations of each sentence, the *toyuu*-reduplication introduces universal quantification into the sentence.

(1) a. *Taro-ga* [[NP *mado*]-*toyuu* [NP *mado*]]-*o* *aketa*.
 Taro-NOM window-TOYUU window-ACC opened
 'Taro opened all windows.'

 b. [[NP *gakusei*]-*toyuu* [NP *gakusei*]]-*ga* *ronbun-o* *kaita*.
 student-TOYUU student-NOM paper-ACC wrote
 'All students wrote a paper.'

That the *toyuu*-reduplication introduces universal quantification is supported by the fact that it cannot be used as a predicate of a predicational copular sentence, as shown in (2b). As shown in (2c), non-distributive universal quantifiers also cannot appear in this position.

(2) a. [*sono gakkai-no* *happyoosya*]-*wa* [NP *gakusei*] *da*.
 that conference-GEN presenter-TOP student COP
 'The presenter of that conference is a student.'

 b. * [*sono gakkai-no* *happyoosya*]-*wa* [[NP *gakusei*]-*toyuu* [NP *gakusei*]] *da*.
 that conference-GEN presenter-TOP student-TOYUU student COP
 'The presenter of that conference is all students.'

 c. * [*sono gakkai-no* *happyoosya*]-*wa* [*subete-no* [NP *gakusei*]] *da*.
 that conference-GEN presenter-TOP all-GEN student COP
 'The presenter of that conference is all students.'

There is ample evidence that the universal quantificational interpretation of the *toyuu*-reduplication is a non-distributive one. First, the *toyuu*-reduplication is compatible with a collective predicate. (3a) shows that distributive universal quantifiers cannot appear with this kind of predicate. On the other hand, non-distributive universal quantifiers as in (3b) are compatible with this predicate. As shown in (3c), the *toyuu*-reduplication is similar to a non-distributive universal quantifier in this respect.
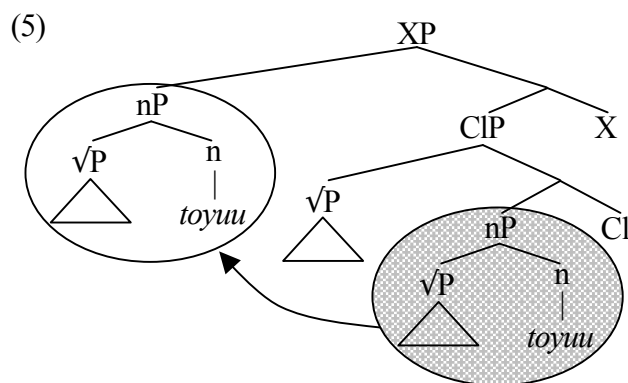
(3) a. * [*dono* *kankyaku*]-*mo* *kare-o* *torikakonda*.
 INDET audience-Q he-ACC surrounded
 'All audience surrounded him.'

 b. [*subete-no kankyaku*]-*ga* *kare-o* *torikakonda*.
 all-GEN audience-NOM he-ACC surrounded
 'All audience surrounded him.'

 c. [*kankyaku-toyuu* *kankyaku*]-*ga* *kare-o* *torikakonda*.
 audience-TOYUU audience-NOM he-ACC surrounded

Second, the *toyuu*-reduplication shows selectional restriction on the distributive key. It is well-known that non-distributive quantifiers can take a mass noun as its distributive key, whereas distributive universal quantifiers cannot. Again, the *toyuu*-reduplication is similar to non-distributive universal quantifier in this respect, as shown in (4). Note that (4a) is acceptable only with a kind interpretation of the common noun.

(4) a. # *Taro-wa* [NP *dono* *kin*]-*mo* *katta*. b. *Taro-wa* [NP *subete-no kin*]-*o* *katta*.
 Taro-TOP INDET gold-Q bought Taro-TOP all-GEN gold-ACC bought
 'lit. Taro bought every gold.' 'Taro bought all gold.'

 c. *Taro-wa* [NP *kin-toyuu* *kin*]-*o* *katta*.
 Taro-TOP gold-TOYUU gold-ACC bought
 'Taro bought all gold.'

These data show that the *toyuu*-reduplication should be classified as a non-distributive quantifier. Given this, I propose that the quantificational interpretation in the *toyuu*-reduplication is derived from the property denoting common noun in the specifier of a classifier phrase.

Proposal: My proposal is summarized in (5). I assume that *toyuu* is a nominalizer, and it takes a root as its complement. The whole noun phrase is a complement of the head of a classifier phrase (ClP). This kind of structure of the extended nominal domain is proposed by Watanabe (2006), and supported by Huang and Ochi (2014). Following these previous studies, I assume that the whole noun phrase moves to a specifier position of the higher functional projection, which I represent as an XP. The most important point of the proposed analysis is that the root phrase, which must be identical with the root of the moved noun phrase, is located in Spec,ClP. In a postnominal numeral classifier, previous studies assume that this position is occupied by a numeral phrase. I propose that in addition to numerals, bare common nouns can appear in Spce,ClP in the *toyuu*-reduplication. I assume that numerals (at least in Japanese) is of type <e,t> (Krifka 1995, Landmann 2004, Bale and Coon 2014). Thus, one simple way to express the denotation of numerals is (6a). Given that Japanese bare common nouns can be turned into <e,t> by the predicavizer operator $^\cup$ (Chierchia 1998), I propose that the denotation of the bare common noun *gakusei* 'student' in Spec,ClP can be represented as in (6b).

(6) a. $[\![$three$]\!] = \lambda x \in D_e . |x| = 3$ b. $[\![$student$]\!] = \lambda x \in D_e . |x| = |\mathrm{STUDENT_s}|$

Chierchia (1998) proposes that Japanese bare common nouns are lexically pluralized in the sense that they inherently have a semi-lattice structure. I assume that the cardinality of a semi-lattice contains all instances of a given kind. This gives us an apparent universal quantificational interpretation of the *toyuu*-reduplication. The proposed analysis predicts that the second noun phrase in the *toyuu*-reduplication must be bare since it is a root. This prediction is borne out as shown in (7). (7) shows that a common noun in the second NP position in the *toyuu*-reduplication cannot be modified by a prenominal modifier.

(7) a. *sono gakusei-wa   [Taro-no   ronbun-toyuu   ronbun]-o   yonda.*
        that student-TOP   Taro-GEN   paper-TOYUU   paper-ACC   read
        'The student read all Taro's papers.'

    b. * *sono gakusei-wa   [Taro-no   ronbun-toyuu   [Taro-no   ronbun]]-o   yonda.*
        that student-TOP   Taro-GEN   paper-TOYUU   Taro-GEN   paper-ACC   read
        'The student read all Taro's papers.'

In addition, the proposed analysis can offer the answer to the question why a root in Spec,ClP must be identical to a root of the base noun. This is because if we put a bare common noun that is not identical with a root of the base noun phrase, it is no longer guaranteed that the cardinality of the semi-lattice denoted by a root in Spec,ClP is in the domain of the semi-lattice denoted by a base noun phrase. Thus, we obtain the non-distributive universal quantificational reading only when a reduplicant and its base are the same root. Moreover, the proposed analysis predicts that the *toyuu*-reduplication should be similar to postnominal numeral classifiers because the structure (5) is originally proposed as a structure of postnominal numeral classifiers. This prediction is also borne out. Following Kishimoto's (2000) observation, Huang and Ochi (2014) pointed out that Japanese postnominal numeral classifiers cannot be used as a nominative object in the possessive construction as in (8b). The *toyuu*-reduplication shows similar behavior, as shown in (8c).

(8) a. Taro-ni   kodomo-ga   iru.   b. ??Taro-ni   [kodomo san-nin]-ga   iru.
        Taro-DAT   children-NOM   be   Taro-DAT   children 3-CL-NOM   be
        'Taro has children.'   'Taro has three children.'

    c. * Taro-ni   [kodomo-tyuu   kodomo]-ga   iru.
        Taro-DAT   children-TOYUU   children-NOM   be
        'lit. Taro has all children.'

Selected References: Chierchia, G. 1998. Reference to kinds across languages. *NLS* 6: 339–405. Huang, C.-T. and Masao O. 2014. Remarks on classifiers and nominal structure in East Asian. *Peaches and Plums*: 53-74. Watanabe, A. 2006. Functional projections of nominals in Japanese: syntax of classifiers. *Natural Language and Linguistic Theory* 24: 241-306.