

Lexical Decomposition and Comparative Structures for Japanese Determiners

Introduction: There are two Japanese lexical items – *ooku-no* and *takusan-no* – whose English translation depends on where they appear. In non-comparative constructions they mean “many”; in comparative constructions they mean “more.” They are often interchangeable, but sometimes, a comparative sentence allows only one of them. This paper aims to account for these facts.

Data: The English non-comparative sentence in (1) is translated as either one of the options in (2) in Japanese, and the comparative in (3) is translated as either one of the options in (4).

(1) In University F, many students receive financial aid (henceforth, FA).

(2) F-daigaku dewa {*ooku-no* / *takusan-no*} gakusei-ga FA-wo moratteiru
 Univ.F in many students.NOM FA.ACC receive

(3) More students receive FA in University E than in University F.

(4) E-daigaku dewa F-daigaku yorimo {*ooku-no* / *takusan-no*} gakusei-ga FA-wo moratteiru
 Univ.E in Univ.F than more students.NOM FA.ACC receive

In English the non-comparative determiner *many* in (1) should be replaced by the comparative degree operator *more* in (3). In Japanese, however, *ooku-no* and *takusan-no* appear in the non-comparative (2) and in the comparative (4), and they both seem to have the same interpretation (“many” in (2); “more” in (4)). In comparatives, however, *ooku-no* and *takusan-no* give rise to different interpretations in particular contexts. Firstly, consider (5), which lists the numbers of students who receive FA in 6 Universities; 111 students receive FA in University A, 92 students receive FA in University B, and so on. In a comparative sentence comparing University E and F under this situation, *ooku-no* is allowed but *takusan-no* sounds awkward as in (6).

(5) Univ.A (111), Univ.B (92), Univ.C (74), Univ.D (67), **Univ.E (51), Univ.F (45)**

(6) E-daigaku dewa F-daigaku yorimo {*ooku-no* / #*takusan-no*} gakusei-ga FA-wo moratteiru
 Univ.E in Univ.F than more students.NOM FA.ACC receive

However, in another situation (7) where the difference between University E and University F is relatively large, *takusan-no* sounds fine in a comparative sentence (6).

(7) Univ.A (1140), Univ.B (820) Univ.C (680), Univ.D (520), **Univ.E (480), Univ.F (45)**

In other words, cardinal comparative in Japanese requires the following constraint in (8)

(8) Cardinal comparative with *takusan-no* requires that the difference of two compared numbers should be relatively “large” in a given context.

Next, suppose another situation (9) where only 15% students receive FA in University E but no less than 90% students receive FA in University F.

(9) 51 students receive FA out of total 350 students in University E (**15%** students receive FA)
 45 students receive FA out of total 52 students in University F (**90%** students receive FA)

Given this situation, both *ooku-no* and *takusan-no* in (2) bring out a proportional reading (Partee (1988), a.o.). In the comparative sentence in (10), however, only *takusan-no* permits proportional comparative.

(10) E-daigaku dewa F-daigaku yorimo {#*ooku-no* / *takusan-no*} gakusei-ga FA-wo moratteiru
 Univ.E in Univ.F than more students.NOM FA.ACC receive

“More students receive FA in University E than in University F.” (Proportional reading)

In other words, Japanese proportional comparative is subject to the following constraint.

(11) *Ooku-no* is not compatible with proportional comparative.

I will explain where the restrictions in (8) and (11) come from.

Analysis: In previous literature several kinds of abstract *more*’s and *many*’s have been suggested. *More* is lexically decomposed into two abstract lexical items: *-er* and *many* (Ross (1967), a.o.). As for comparative morphemes, two *-er*’s in (12) have been suggested (von Stechow (1984), Heim (2000), a.o.). Let us call them as *-er*₁ and *-er*₂, respectively.

(12) a. $\llbracket -er_1 \rrbracket := \lambda D'_{dt} \lambda D_{dt} . \max(D) > \max(D')$ (ordinal comparative morpheme)

b. $\llbracket -er_2 \rrbracket := \lambda D'_{dt} \lambda d_d \lambda D_{dt} . \max(D) - \max(D') = d$ (differential comparative morpheme)
 $-er_1$ is for an ordinal comparative as in *John is taller than 6 inch*, and $-er_2$ is for differential comparative as in *John is one inch taller than Mary*. Besides, two kinds of abstract *many* have been suggested: (i) Barwise & Cooper (1981)'s style $\langle et, \langle et, t \rangle \rangle$ determiner and (ii) comparative “d-many” (cf. Hackl (2000)). Here I argue that in Japanese there is no Barwise & Cooper's $\langle et, \langle et, t \rangle \rangle$ *many* at all and only comparative “d-many” is available. In the previous literature the “d-many” is just for cardinal reading as in (13). I call it $many_C$ here.

$$(13) \quad \llbracket many_C \rrbracket := \lambda d_d \lambda P_{et} \lambda Q_{et} . |P \cap Q| = d \quad (\langle d, \langle et, \langle et, t \rangle \rangle, \text{cardinal})$$

Here I suggest that comparative “d-many” also takes proportional reading in (14). I call it $many_P$

$$(14) \quad \llbracket many_P \rrbracket := \lambda d_d \lambda P_{et} \lambda Q_{et} . \frac{|P \cap Q|}{|P|} = d \quad (\langle d, \langle et, \langle et, t \rangle \rangle, \text{proportional})$$

I also suggest a ‘default’ degree morpheme *LARGE* to satisfy the requirement of (8). This is a phonologically covert morpheme to represent that a degree is “large” in a given context.

$$(15) \quad \llbracket LARGE \rrbracket^{C, g} := \lambda d_d . d \text{ is “large” in } C$$

(12)-(15) are the building blocks with which *ooku-no* and *takusan-no* are formed. *Ooku-no* and *takusan-no* are lexically decomposed into some morphemes depending on the construction. Here I propose the restriction for lexical decomposition for *ooku-no* and *takusan-no* as in (16).

(16) a. *Ooku-no* shows up only in cardinal comparative structure with $many_C$.

b. Lexical decomposition of *takusan-no* must involve *LARGE* with $many_C$ or $many_P$.

(16a) means *ooku-no* requires that LF structure should be cardinal comparative even in non-comparative sentences. (16b) means that comparatives with *takusan-no* are always differential comparative. Following (16), lexical decomposition of *ooku-no* and *takusan-no* is shown below.

	(a) <i>Ooku-no</i>	(b) <i>Takusan-no</i>
Cardinal Non-Comparative	$Many_C + LARGE + -er_1$	$Many_C + LARGE$
Cardinal Comparative	$Many_C + -er_1$	$Many_C + LARGE + -er_2$
Proportional Non-Comparative	$Many_C + LARGE + -er_1$	$Many_P + LARGE$
Proportional Comparative	*	$Many_P + LARGE + -er_2$

Following the lexical decomposition, the LFs of non-comparative sentences in (2) under cardinal reading, for example, are shown in (17). (2) is a non-comparative sentence, but *ooku-no* should show up in comparative structure in (17a) because of the restriction in (16).

(17) a. $\llbracket -er_1 LARGE \ 1 \ d_1 \ many_C \ \text{students in Univ.F receive FA} \rrbracket$ (*ooku-no*, cardinal)

b. $\llbracket LARGE \ many_C \ \text{students in Univ.F receive FA} \rrbracket$ (*takusan-no*, cardinal)

I also show that a proportional reading with *ooku-no* is a special case of the cardinal reading.

As for comparative sentences, (18) is the LF and truth conditions of a cardinal comparative sentence in (6) with *takusan-no* under situation (5). These truth conditions say that the difference between two cardinal numbers should be “large”, but actually the difference is not large in the situation (5). It is why (6) with *takusan-no* sounds awkward in the situation (5).

$$(18) \quad \llbracket LARGE -er_1 \ 2 \ d_2 \ many_C \ \text{stdt in Univ.F rcv FA} \ 1 \ d_1 \ many_C \ \text{stdts in Univ.E rcv FA} \rrbracket \\ = 1 \text{ iff } \max\{d:d=|\text{stdts with FA in Univ.E}|\} - \max\{d:d=|\text{stdts with FA in Univ.F}|\} = \text{“large”}$$

Next, (19) is supposed to be LF for a proportional comparative with *ooku-no* in (10) under the situation (9). Proportional reading of *ooku-no* is indirectly given with the combination of $many_C$ and comparative structure with $-er_1$. Hence proportional comparative with *ooku-no* requires one more $-er$, but this configuration should be disallowed because of “double standards” for comparative. It is why *ooku-no* does not permit proportional comparative reading.

(19) * $\llbracket -er_1 \ 1 \ d_1 \ many_C \ \text{stdts in Univ.E rcv FA} \ -er_1 \ LARGE \ 2 \ d_2 \ many_C \ \text{stdts in Univ.F rcv FA} \rrbracket$

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