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RECONSIDERING THE DEGREE ABSTRACTION PARAMETER IN JAPANESE: NEGATIVE ISLAND EFFECTS IN COMPARATIVES AND EQUATIVES*

1 Introduction

It has been noted that comparative constructions in English and Japanese differ in several respects: English comparatives are marked by a comparative marker and a standard marker *than*, while Japanese lacks a morpheme that corresponds to *-er* and a morpheme apparently equivalent to *than*, *yori*, marks comparatives, as shown in (1).

- (1) a. John is taller than Bill.
 - b. John-wa Bill-yori se-ga takai. John-TOP Bill-yori height-NOM tall "John is taller than Bill."

In recent years, a semantic typology has been intensively discussed beyond syntactic or morphological differences. Beck et al. (2004) is a significant contribution to this research in the realm of comparatives. They propose that languages may differ in whether degree abstraction is available:

(2) Degree Abstraction Parameter (DAP)
A language {does/does not} have binding of degree variables in the syntax.

They claim that Japanese is a language that sets its DAP to negative, while English has the positive value of the parameter, which explains the differences between these languages. One of these is the so-called negative island effect (NIE, henceforth), where a complement clause of *than* (= a standard clause) rejects "negative" or downward

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entailing elements, as shown in (3):

- (3) a. *John is taller than nobody is.

 b. *John ran faster than nobody di
 - b. *John ran faster than nobody did.

The anomaly of (3)a-b has been reduced to the maximality operator that applies to the set of degrees that the standard clause denotes. If we assume, following a standard degree semantic analysis of comparatives, that the maximality is incorporated by the semantics of -er; as shown in (4), the set of degrees that the standard clause in (3)a denotes is an infinitely large set, which leads to the undefinedness of the maximal degree:

(4)
$$[er] = \lambda D1$$
. $\lambda D2$. $max(D2) > max(D1)$, where $max(D) = \iota d$. $d \in D \land \forall d' \in D \rightarrow d' \leq d$.

If the DAP setting is negative in Japanese, as Beck et al. (2004) argues, the language should not exhibit NIE, because there is nothing for the maximality operator to apply to.

In this paper we show that Japanese does exhibit NIE, and the alleged lack of NIE is not evidence for the DAP in Japanese.

2 NEGATIVE ISLAND EFFECTS IN YORI-COMPARATIVES

Beck et al. (2004) claim that the complement clause of *yori* in *yori*-comparatives in Japanese may be either a nominalization or a relative clause, and semantically it does not denote a degree but an individual.

- (5) Taroo-wa [daremo kawa-nakatta-*(no)]-yori takai
 Taro-TOP [wh-mo buy-neg.Past-(NOMINAL)]-than expensive
 hon-o katta
 book-ACCbought
 - (*) "Taro bought a more expensive book than nobody bought."
 (OK) "Taro bought a more expensive book than the one nobody bought."
 Beck et al. (2004)

In (5), the presence of nominalizer no is crucial to grammaticality. In the complement clause, a relativization (internally or externally) of an individual argument proceeds in either case, but with no the set can be bound by the λ operator. Without it, it is bound by the maximality operator, which yields a NIE (on degrees)-like effect.

(6) a. dare-mo kawa-nakatta-no

LF: [[OP1 [dare-mo t1 kawa-nakatta] no] Semantics: THEc [λx . nobody bought x]

"the one that nobody bought"

b. dare-mo kawa-nakatta-Ø

Semantics: $max(\lambda x. nobody bought x)$

the maximal individual that nobody bought

This argument, however, does not seem to be a fair argument, because if what matters is no, then the data in (5) do not have any relevance to the negative island effect in Japanese, as Hayashishita (2004) notes.

We thus adopt a different frame to test the availability of NIE in Japanese. Consider the following:

- (7) a. Taroo-wa [Jiroo-ga se-ga takaku-nai yori]
 Taro-TOP Jiro-NOM height-NOM tall-Neg yori
 se-ga ??takai/takaku-nai
 height-NOM tall/tall-Neg
 "Taro has more 'non-tallness' than Jiro does."
 - b. Taroo-wa Jiroo-ga hutottei-nai yori ??hutottei-nai Taro-TOP Jiro-NOM fat-Neg yori fat/fat-Neg "Taro has more 'non-fatness' than Jiro does."
- (8) a. *Taroo-wa [dare-mo se-ga takaku-nai yori]
 Taro-TOP [who-mo height-NOM tall-Neg than]
 se-ga takai/takaku-nai.

(Intended) "Taro has more 'non-tallness' than no one does."

b. *Taroo-wa Jiroo-ga hutottei-ta-koto-ga nai yori] Taro-TOP Jiro-NOM fat-Past-fact-NOM Neg yori hutotteiru/hutottei-nai.

fat/fat-Neg

(Intended) "Taro has more 'non-fatness' than Jiro never has had."

Both of these examples contain negation but no individual gap in the complement clause. In (7), the affirmative in the matrix is reported to be worse than its negative counterpart by our informants (including the authors themselves). To some speakers, even the "good" sentences in (7) might sound somewhat awkward, but their grammaticality sharply contrasts with that of (8). All the informants (six Japanese native speakers) found that (7) with negation in the matrix is much better than (8), which were judged to be totally bizarre.

If we follow Beck et al. (2004), the grammatical contrast between (7) and (8) should reduce to the availability of (internally-headed) relativization or nominalization. This rationale, however, is not supported by the facts. Both of the complement clauses of *yori* in (7) and (8) show the same grammaticality with respect to relativization and nominalization:

(9) Taroo-wa [{ Jiroo-ga/dono gakusei-mo} se-ga
Taro-TOP Jiro-NOM/dono student-mo} height-NOM
takaku-nai]-no-ni {??atta/odoroita}
tall-Neg]-no-DAT met/was-surprised
(Unavailable) "Taro met {Jiro, who is not tall / no student who is tall}."
"Taro was surprised by the fact that {Jiro is not tall / no student is tall}."

Moreover, if the complement clause in (7) is nominalized or relativized, ga/no conversion in the subjects should be available (cf. Sudo (2014)). In Japanese, subjects bear the nominative marker -ga when they are not topics, but in relative clauses, they can optionally appear with the genitive marker -no:

- (10)a. Taroo-{ga/*no} hon-o kaita. Taro-{NOM/GEN} book-ACC wrote "Taro wrote a book."
 - b. Jiroo-wa Taroo-{ga/no} kaita hon-o yonda.

 Jiro-TOP Taro-{NOM/GEN} book-ACC read

 "Jiro read a book that Taro wrote."
 - c. Jiroo-wa Taroo-{ga/no} se-ga takai/hutotteiru Jiro-TOP Taro-{NOM/GEN}height-NOM tall/fat koto-o sitteiru fact-ACC know

"Jiro knows that Taro is tall/fat."

Beck et al. (2004) observe that the subjects of clausal comparatives in Japanese can undergo *ga/no*-conversion, as illustrated in (10).

(11) Taroo-wa Jiroo-{ga/no} kitai-sita-yori
Taroo-TOP Jiroo-NOM/GEN expect-Past-yori
nagai hon-o kai-ta.
long book-ACC write-Past
"Taro wrote a longer book than Jiro expected."

These data may suggest that the comparative clause of (11) is in fact a relative clause, but the embedded subject in (7) does not undergo ga/no conversion, as evidenced by (12). Thus the complement of yori does not undergo relativization/nominalization in this type of clausal comparatives, and thus we cannot reduce the (un)grammaticality of (7)–(8) to the availability of relativization/nominalization.

(12) a. Taroo-wa [Jiroo-{ga/*no} se-ga takaku-naiyori]
Taro-TOP Jiro-NOM height-NOM tall-Neg yori
se-ga ??takai/takaku-nai
height-NOM tall/tall-Neg

"Taro has more 'non-tallness' than Jiro does."

b. Taroo-wa Jiroo-{ga/*no} hutottei-nai yori Taro-TOP Jiro-NOM fat-Neg yori ??hutotte-iru/hutottei-nai. fat/fat-Neg
 "Taro has more 'non-fatness' than Jiro does."

The maximality semantics given in (4) has been extended to equatives (with an obvious modification of the semantics). Thus the DAP should apply to the equatives. In spite of the ungrammaticality of (8), minimally different sentences with the equative marker *kurai* (= (13)a) are fully acceptable, as in (13)b–c. If the DAP applied, the

marker kurai (= (13)a) are fully acceptable, as in (13)b–c. If the DAP applied, the affirmative versions of (13)b–c would not be mysterious, but we do not know why (8) should be ungrammatical. Note also that (13)b–c do not allow negated matrix predicates.

- (13)a. Taroo-wa Jiroo-kurai {se-ga takai / (takusan) tabe-ta}.

 Taro-TOP Jiro-as {height-NOM tall/ (a lot) eat-Past}

 "Taro is as tall as Jiro. / Taro ate as much as Jiro did."
 - b. Taroo-wa [dare-mo hutottei-nai kurai] hutotteiru/*hutottei-nai.
 Taro-TOP who-mo fat-Neg as fat/fat-Neg
 "Taro is fatter than anyone else is."
 - c. Taroo-wa [Jiroo-ga (imamade) hutottei-ta-koto-ga nai Taro-TOP Jiro-NOM (ever) fat-Past-fact -NOM Neg kurai] hutotteiru/*hutottei-nai. as] fat/fat-Neg "Taro is fatter than Jiro has ever been."

In sum, the grammatical contrasts in (7)–(8) and (13)b–c vs. (8) do not follow from the negative setting of the DAP, because in one case the DAP seemingly applies, while in the other it does not.

3 ANALYSIS

The analysis we will pursue is a traditional one: The complement clause of *yori* may have a degree abstraction that is the target of the maximality operator.

3.1 Scope of negation

Let us first examine the contrast between (7) and (8). As indicated in the translations, the interpretations of (7) are very similar to those of so-called comparisons of deviation

observed in *The Brothers Karamazov is more long than The Dream of a Ridiculous Man is short*, an example from Kennedy (1999) (see also Hayashishita (2007)). Here, what is compared is how far the heights of Taro or Jiro are away from what is considered to be a contextually determined standard degree.

Furthermore, the negations in these examples scope differently: That in (7) takes an internal scope, in the same way as *little* (Heim (2006), von Stechow (2007)), while that in (8) takes scope over the clause to license the indeterminate (= *dare* "who")-based NPI *dare-mo* or temporal existential marker V-*ta-koto-ga*, as in (14):

```
(14)a. Taroo-wa America-ni itta-koto-ga {aru/nai}.
Taro-TOP America-to went-fact-NOM {be/be.Neg}
"Taro has been to the U.S./Taro has never been to the U.S."
b. ∃t. t ≤t₀ ∧ Taro visits the US at t
¬∃t. t ≤t₀ ∧ Taro visits the US at t
```

Given that gradable adjectives denote relations between degrees and individuals (of type <d, et>, (15)), the internal negation is defined as in (16)a, following von Stechow (2007). When applied to a gradable adjective, the internal negation yields the same meaning as its antonym, (16)b.

```
(15) [tall] = \lambda d.\lambda x. height(x) \geq d
(16) a. [\neg_{internal}] = \lambda P_{<d,et>}. \lambda d. \lambda x. \neg P(x)(d)
b. [\neg tall] = \lambda d.\lambda x. \neg height(x) \geq d = \lambda d. \lambda x. height(x) < d
```

That *nai* in the *yori*-clause in (7) is indeed an internal negation is evidenced by the contrast given in (17), where Ikeno Medaka, who is a 149-cm-tall adult man, is acceptable as the subject, while a man with average height is not:

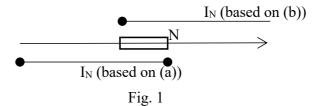
```
(17)Taroo-wa [{Ikeno Medaka/#ano heikin shinchoo-no dansei}-ga Taro-TOP Ikeno Medaka/that average height-GEN man}-NOM se-ga takaku-nai yori] se-ga takaku-nai. height-NOM tall-Neg yori height-NOM tall-neg "Taro is as short as {Ikeno Medaka/that man in average height}."
```

3.2 Max-analysis of yori

We propose that *yori* has a meaning equivalent to -*er*, (4), crucially incorporating the maximality operator. The comparison of deviation interpretations comes from the *pos*-operator defined in (18). Following Heim (2006) and von Stechow (2007), I assume that a contextually given standard is understood as an interval that is neutral as to whether the respective individual counts as positive regarding the gradable property or

not (= N). I_N is defined based on this neutral area, and it may denote either an interval that starts from the bottom of the scale (= 0) to the maximal degree of N or one that starts from the minimum of N to infinity. The *pos* ensures that I_N should be a subset of the set of degrees to which an individual pertains. This move is added to give us the difference between the maximum/minimum degree of N and the maximum degree that an individual reaches. We illustrate the two possible ways of giving I_N in Fig. 1.

(18) a.
$$[[pos]] = \lambda d$$
. $\lambda D_{\leq d,t>}$. $I_N \subset D \wedge D(d) \wedge \neg (I_N)(d)$.
b. I_N denotes either of
(a) $\{ d \mid 0 \leq d \leq \max(N) \}$ or
(b) $\{ d \mid \min(N) \leq d \}$.



We assume that pos has been moved from a position internal to AP, and then another degree operator is moved to a higher position, as in (19)b. With this set-up, for a sentence like (19)a, the pos operator yields the set of degrees that fall within Taro's height but not within I_N (see Fig. 2a). We assume that the set is existentially closed at the end in this case. Where possible, we will refer to " λd . height (Taro) \geq d" and " λd . height (Taro) \leq d" as "HEIGHT_{Taro}" and "¬HEIGHT_{Taro}," respectively, to enhance readability. It should be noted that the last part of (19)c (= (there is a degree such that) ¬ $I_N(d)$) is redundant in this case, because " $I_N \subset$ HEIGHT_{Taro}" entails the existence of such a degree. This part, however, plays a crucial role for comparatives, as we will see below.

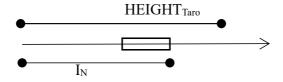


Fig. 2. Positives

For comparatives, *yori*-clauses are taken to be a degree quantifier. When negation takes an internal scope within a *yori*-clause, the sentence will have the following structure:

```
(20) LF:

[[Op<sub>1</sub> [t<sub>1</sub> pos] 2 [Jiro-ga t<sub>2</sub> [neg [se-ga takai]]]] yori] [3 [4 [t<sub>4</sub> pos] Taro-wa t<sub>3</sub> neg [se-ga takai]]]]
```

The compositional steps are given below. The LF in (20) results in what we want: The max of the difference of Taro's height and I_N is greater than that of Jiro's (see Fig. 3 below). The crucial step in (20) is that the degree argument introduced by *pos* is abstracted by the operator movement (Op1) and gives a set of degrees to which an individual's height differs from a contextually determined standard. Here, the maximal degree of such a "difference" will be defined, as desired.

```
(21) a. [the complement of yori]
= \lambda d. [pos] (d)(\lambda d'. \neg [tall] (Jiro))
= \lambda d. I_N \subset \neg HEIGHT_{Jiro} \land \neg HEIGHT_{Jiro}(d) \land \neg I_N (d)
b. [matrix] = \lambda d. I_N \subset \neg HEIGHT_{Taro} \land \neg HEIGHT_{Taro} (d) \land \neg I_N (d)
c. [(20)]
= max(\lambda d. I_N \subset \neg HEIGHT_{Taro} \land \neg HEIGHT_{Taro}(d) \land \neg I_N (d))
> max(\lambda d. I_N \subset \neg HEIGHT_{Jiro} \land \neg HEIGHT_{Jiro}(d) \land \neg I_N (d))
max is defined.
```

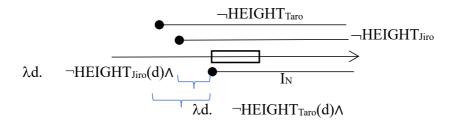


Fig. 3

(22)a, where negation takes scope over pos, on the other hand, does not yield a coherent interpretation, because there will be infinitely many degrees that nobody reaches and are not in I_N . The maximality operator fails here.

```
(22)a. LF: [[Op<sub>1</sub> [neg [t<sub>1</sub> pos] 2 [dare-mo [t<sub>2</sub> se-ga takai]]]] yori] ... b. [[the complement]] = \lambda d. \neg [I<sub>N</sub> \subset (\lambda d'. \exists x. height(x) \geq d') \wedge \exists x. x is d-tall \wedge \negI<sub>N</sub> (d)] c. [[ (17a) ]] = .... > max(\lambda d. \neg [I<sub>N</sub> \subset (\lambda d'. \exists x. height(x) \geq d') \wedge \exists x. x is d-tall \wedge \negI<sub>N</sub> (d)]) max is not defined.
```

(8)b is analyzed in the same way: The complement clause of *yori* denotes a set of degrees such that Jiro's weight has never reached it and it is not in I_N.

We claim that the contrast between the positive and negative versions of (7) is due to the non-uniformity of the predicates in the matrix and the *yori*-complement clause. The positive version of (7) yields the comparison between the difference from a contextual standard for *tall* and Taro's height and the one from a contextual standard for *not tall =short* and Jiro's height. This is not impossible, but it seems to require more effort to compare these than their respective differences from the same contextual standard.

Hayashishita (2007) argues that Japanese has a comparative marker, *izyoo-ni*, which is lexically dedicated to the comparison of deviation. With this comparative marker, (23) seems to sound better than its *yori* counterpart. Our conjecture is that *izyoo-ni* is a genuine comparison of deviation marker, while *yori* requires the two comparisons to refer to the same contextual standard: Taro, as an adult, is usually understood to be taller than his 3-year-old son.

(23)Taroo-wa san-sai-no musuko-ga se-ga
Taro-TOP 3-year.old-GEN son-NOM height-NOM
hukui-izyooni/??yori se-ga hikui.
short-izyooni/yori height-NOM short
"Taro is shorter than his 3-year-old son."

In summary: We claim that the crucial difference between (7) and (8) rests on the scope of negation. For (7), internal negation is a possible option, which makes a comparison of deviation interpretation possible, while for (8), it is not a choice due to the presence of an item that has to be taken scope over by negation. Note at this point that we are not claiming that the "wide" scope negation is impossible for (7); it just does not yield a possible interpretation due to the undefined maximality.

3.3 Equatives

Let us turn to equatives. The insensitivity of equatives to the NIE is not unknown in the literature. Crnič and Fox (2019), for example, show that the Slovenian equative marker *kot* allows a DE environment in its complement, unlike its English counterpart, as in (24)b.

(24) a. *John drove as fast as Mary didn't. b. Janez peljal tako se je hitro [kot Marija se John aux drive dem self fast [than self Maria ni]. neg.aux]

Crnič and Fox (2019) argue that equatives may consist of existential quantification over degrees, but this yields a trivial proposition, as in (25)a. The maximality operator (in the standard) is the operator needed to avoid this:

```
(25) a. ∃d. John drove d-fast ∧ Mary drove d-fast. trivial
b. ∃d. John drove d-fast ∧ d = max(λd. Mary drove d-fast)
non-trivial, equative interpretation
```

This means that the maximality operator is not a mandatory component of the meaning of an equative marker. Rather, it is a parametric option: In a language like Slovenian, it is optional, while English-type languages require it. With this hypothesis, Crnič and Fox (2019) explain the contrast in (24)a—b in terms of the availability of the maximality operator. Since in English-type languages, the standard clause is always quantified by the maximality operator, the negation (or DE context) leads to an undefined maximum. In Slovenian-type languages, on the other hand, the lack of the maximality operator results in a coherent interpretation equivalent to a comparative interpretation (see Schwarzschild (2008)).

```
(26) a. English-type languages: max is obligatory
∃d. speed(john) ≥ d ∧ d = max(λd. ¬ speed(bill) ≥ d) ← undefined
b. Slovenian-type languages: max is optional
∃d. speed(john) ≥ d ∧ ¬ speed(bill) ≥ d ≈ Bill's speed > John's speed
```

Given the observation in Section 2, Examples (13)b–c, we claim that Japanese is a Slovenian-type language with respect to the optionality of the max-operator in equatives. With (13)a, *kurai* has an interpretation equivalent to that of its English counterpart. With (13)b–c, on the other hand, it just has existential semantics. Applying the existential semantics to *kurai*-equatives, we obtain the following result of a coherent meaning where Taro's fatness reaches a degree that no one reaches (we omit an irrelevant part for the sake of readability), namely, a meaning where Taro is the fattest of all.

(27)
$$\exists d. \neg \exists x. \ FAT_{Taro}(d) \land fat(x) \ge d \land \neg(I_N)(d).$$

 $\approx Taro \ is the fattest of all.$

This reasoning explains why the negation in the matrix is not allowed. We attribute the ungrammaticality to its triviality. If the matrix predicate is negated, the whole sentence would mean that there is a degree among the set of "fat" degrees that nobody's weight, including Taro's, has reached. This is too weak and trivially true, so it does not give us any clue to Taro's weight.

(28)
$$\exists d. \neg \exists x. \neg FAT_{Taro}(d) \land fat(x) \ge d \land \neg(I_N)(d)$$
.

We finally would like to mention an additional aspect of *kurai* argued by Hayashishita (2007, 2017) (see also Kubota (2012)). As mentioned above, these works claim that *kurai* is an equative marker that lexically encodes a comparison of deviation, just like *izyoo-(ni)*. This effect is clearly observable in a case like (13)a: the sentence denotes the equivalence between the gaps from the contextual standard of height for Taro and Jiro. Thus, in (29)a, the norm-relatedness cannot be cancelled. In the case of a negated-complement *kurai*, the judgment does not seem to be as clear as in (29)a:

(29) a. Taroo-wa Jiroo-kurai se-ga takai ga, Taro-TOP Jiro-kurai height-NOM tall but #dochira-mo se-ga hikui. which-mo height-NOM short "Taro is as tall as Jiro, but both of them are short." (imamade) hutottei-ta-koto-ga nai b. Taroo-wa [Jiroo-ga Taro-TOP Jiro-NOM (ever) fat-PAST-fact NOM neg kurai] hutotteiru ga, (?)soredemo dochira-mo yaseteiru. kurai fat but still which-mo skinny (Lit.) "Taro is as fat as Jiro has never been, but both of them are skinny."

We suspect that this could be due to the different roles that I_N plays in the semantics. With (13)a, the difference in the gaps from the I_N crucially determines the truth conditions of the sentence. In (13)b, on the other hand, someone's weight may or may not exceed I_N in order to satisfy the truth condition in (28). In other words, the deviation from the standard is not crucial in this case.

4 Conclusion

We argue that the alleged evidence for the DAP in Japanese, NIE, may not serve as the evidence for that parameter. The internal and external negation cases exhibit a clear contrast, which is explained in terms of the maximality operator in the semantics of *yori*, thus indicating that the irrelevance of the DAP to Japanese comparatives. Our conclusion is consonant with Hayashishita (2007, 2009), who also argues for the maximality operator in the semantics of comparatives in Japanese.

We would like to mention other pieces of evidence that Beck et al. (2004) present for the negative setting of DAP in Japanese. One is a lack of subcomparatives, (30)a. We find, however, that the grammaticality is greatly improved when we use adjectives that both refer to the vertical dimension, as in (30)a:

(30) a. *Kono doa-wa [ano teeburu-ga nagai-yori] takai. this door-TOP [that table-NOM long-than] high "This door is higher than that table is long."

b. Kono suisoo-wa [ano doa-ga takai-yori] hukai. Dakara, this fish.tank-ACC that door-NOM high-than deep. so kono suisoo-o ano heya-ni ireru koto-wa dekinai. this fish.tank-ACC that room-to put.in fact-NOM cannot "This fish tank is deeper than that door is high. So you cannot carry it into that room."

What we suspect is that the alleged ungrammaticality of (30)a comes from the comparing two different dimensions.

The present paper thus contributes to the body of debate over the status of Japanese with respect to the DAP and possible cross-linguistic degree-related parameters in general.

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