

Phrasal comparatives in Japanese: A measure function-based analysis

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0 Outline

Goals

- Propose an explicit compositional analysis of phrasal comparatives in Japanese in terms of ‘DERIVED’ MEASURE FUNCTIONS (Kennedy and McNally 2005; Kennedy and Levin 2008).
- Compare the proposed analysis with a more standard, ‘direct’ analysis of comparatives.

Plan

1. Data
2. Measure function-based analysis of Japanese comparatives
3. Comparison with the ‘direct’ analysis of comparatives
4. Conclusion

1 Data

1.1 Relative and absolute gradable adjectives

Positive forms

- (1) a. **relative adjectives**
 - i. Kono tana-wa **takai**.
this shelf-TOP **tall**
‘This shelf is tall.’
 - ii. Kono sao-wa **nagai**.
this rod-TOP **long**
‘This rod is long.’
 - iii. Kono heya-wa **ataakai**.
this room-TOP **warm**
‘This room is warm.’
- b. **absolute adjectives**¹
 - i. Kono sao-wa **magat-te iru**.
this rod-TOP **bent**
‘This rod is bent.’
 - ii. Kono mado-wa **ai-te iru**.
this window-TOP **open**
‘This window is open.’
 - iii. Kono tokei-wa **susun-de iru**.
this watch-TOP **fast**
‘This watch is fast.’

Modification with *wazukani* ‘slightly’

- (2) a.??Kono tana-wa **wazukani takai**.
this shelf-TOP **slightly tall**
intended: ‘This shelf is slightly tall(er than average).’
- b. Kono sao-wa **wazukani magat-te iru**.
this rod-TOP **slightly bent**
‘This rod is slightly bent.’

¹To keep the exposition simple, I consider here minimally closed scale adjectives only. But maximally closed scale adjectives also exhibit patterns that are consistent with their own properties.

Measure phrases

Sawada and Grano (2009) note that relative and absolute adjectives induce different kinds of interpretations when they cooccur with measure phrases.

- (3) a. Kono tana-wa **20-senti-meetoru** takai.
this shelf-TOP **20-centimeter** tall
'This shelf is 20 centimeters taller (than some contextually salient shelf).'
NOT: 'This shelf is 20 centimeters tall.'
- b. Kono sao-wa **5-do** magat-te iru.
this rod-TOP **5-degree** bent
'This rod is 5 degrees bent.'
NOT: 'This rod is 5 degrees MORE bent (than some contextually salient rod).'
- Relative adjectives allow for **differential** measurement interpretations only.
 - Absolute adjectives allow for **direct** measurement interpretations only.

1.2 *Yori* ('than') phrases

When there is a *yori* ('than') phrase ...

Both relative and absolute adjectives unambiguously exhibit context-independent interpretations:

- (4) a. Kono tana-wa **ano tana-yori** takai.
this shelf-TOP **that shelf-than** tall
'This shelf is taller than that shelf.'
- b. Kono sao-wa **ano sao-yori** magat-te iru.
this rod-TOP **that rod-than** bent
'This rod is more bent than that rod.'

Both relative and absolute adjectives can occur with *wazukani* 'slightly':

- (5) a. Kono tana-wa ano tana-yori **wazukani** takai.
this shelf-TOP that shelf-than **slightly** tall
'This shelf is slightly taller than that shelf.'
- b. Kono sao-wa ano sao-yori **wazukani** magat-te iru.
this rod-TOP that shelf-than **slightly** bent
'This rod is slightly more bent than that rod.'

Both relative and absolute adjectives exhibit (what seem to be) differential measurement interpretations:

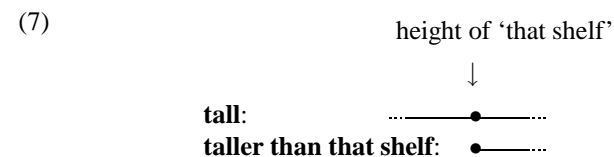
- (6) a. Kono tana-wa ano tana-yori **20-senti-meetoru** takai.
this shelf-TOP that shelf-than **20-centimeter** tall
'This shelf is 20 centimeters taller than that shelf.'
- b. Kono sao-wa ano sao-yori **5-do** magat-te iru.
This rod-TOP that shelf-than **5-degree** bent
'This rod is 5 degrees more bent than that rod.'

2 Measure function-based analysis of Japanese comparatives

Basic idea

Building on the analysis of comparatives in terms of 'derived' measure functions (Kennedy and McNally 2005; Kennedy and Levin 2008), I propose that:

- The function of the *yori* phrase is to RESET the scale for comparison.
- The *yori* phrase takes a (potentially open-ended) scale and returns a derived MINIMALLY CLOSED scale.
- The minimum endpoint of this derived scale is defined by the degree that the object denoted by the *yori* phrase possesses on the original scale.



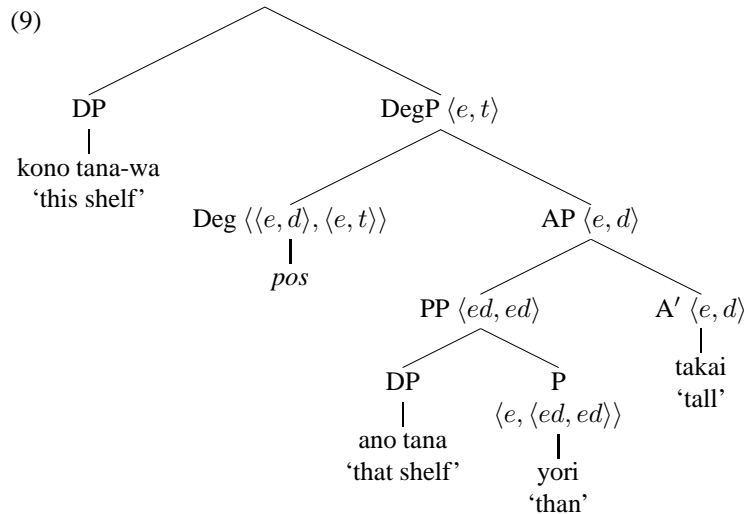
Formalization

Employing the notation of Kennedy and Levin (2008), we can write the relevant lexical meaning of *yori* as follows:

$$(8) \llbracket \text{yori} \rrbracket = \lambda y \lambda g \lambda x . g \uparrow_{g(y)}(x)$$

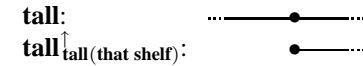
- *Yori* takes an entity y and an adjective g as arguments and returns a measure function $\lambda x . g \uparrow_{g(y)}(x)$ of type $\langle e, d \rangle$.
- Note that this measure function is of the same type as a bare adjective, so an adjective modified by a *yori* phrase can be thought of as a derived adjective.
- Semantically, this measure function (or derived adjective) maps entities to a derived scale $g \uparrow_{g(y)}$.
- This derived scale is the scale denoted by the original adjective g except that the minimum endpoint is redefined as $g(y)$, that is, the degree of g -ness that y has on the original scale.

I further assume that the syntactic structure of sentences containing *yori* phrases is as follows:



With this, the following meaning is assigned to the phrase *ano tana-yori takai* 'tall(er) than that shelf' (the AP node in the above tree):

$$(10) \llbracket \text{ano tana-yori takai} \rrbracket = \llbracket \text{yori} \rrbracket(\llbracket \text{ano tana} \rrbracket)(\llbracket \text{takai} \rrbracket) \\ = \lambda y \lambda g \lambda x . [g \uparrow_{g(y)}(x)](\text{that shelf})(\text{tall}) = \lambda x . \text{tall} \uparrow_{\text{tall}(\text{that shelf})}(x)$$



- This is a measure function of type $\langle e, d \rangle$ (same type as lexical adjectives).
- This measure function:
 - uses the same scale as the original adjective
 except that
 - the minimum endpoint is (re)defined by the degree of tallness of the object designated by the *yori* phrase.

This analysis predicts that adjectives with *yori* phrases will function exactly like lexically minimally closed scale adjectives.

⇒ Explains the neutralization effects observed in section 1.2.

Simple comparative forms

- (4) a. Kono tana-wa **ano tana-yori** takai.
 this shelf-TOP **that shelf-than** tall
 'This shelf is taller than that shelf.'
- b. Kono sao-wa **ano sao-yori** magat-te iru.
 this rod-TOP **that rod-than** bent
 'This rod is more bent than that rod.'

$$(11) \llbracket \text{pos} \rrbracket = \lambda g \lambda x . g(x) \geq \text{stnd}(g)$$

- (12) a. $\llbracket (4a) \rrbracket = \text{tall} \uparrow_{\text{tall}(\text{that shelf})}(\text{this shelf}) \geq \text{stnd}(\text{tall} \uparrow_{\text{tall}(\text{that shelf})})$
 b. $\llbracket (4b) \rrbracket = \text{bent} \uparrow_{\text{bent}(\text{that rod})}(\text{this rod}) \geq \text{stnd}(\text{bent} \uparrow_{\text{bent}(\text{that rod})})$

- In both cases, the sentence is asserting that the object in question has a degree of A -ness exceeding the standard set by the other object (i.e. the one introduced by the *yori* phrase).
- Thus, in both cases, the interpretation is CONTEXT INDEPENDENT.

Cooccurrence with *wazukani* ('slightly')

- (2/5a) Kono tana-wa ??(ano tana-*yor*i) **wazukani** takai.
This shelf-TOP that shelf-*than* **slightly** tall
'This shelf is slightly taller than that shelf.'

The fact that relative adjectives become compatible with *wazukani* in the presence of a *yor*i phrase also immediately follows from the proposed analysis where a relative adjective is converted into a derived, minimally closed scale one.

Analysis of *wazukani*:

- (13) $[[wazukani]] = \lambda g \lambda x. g(x) \gtrsim \mathbf{min}(g)$
- *Wazukani* *A* is well-defined only if the scale associated with *A* has a minimum endpoint.
 - Thus:
 - relative adjectives are by themselves incompatible with *wazukani*, but
 - when they are converted to minimally closed scale predicates with the help of *yor*i, they can cooccur with *wazukani*.

Interaction of measure phrases and *yor*i phrases

I assume that the measure phrase construction involves the following null degree head which takes a gradable adjective and a degree phrase as arguments and returns a property of individuals:

- (14) $[[\delta]] = \lambda g \lambda d \lambda x. g(x) - \mathbf{stnd}(g) \geq d$

Then, (3a) and (6a) are analyzed as in (15).

- (3a) Kono tana-wa **20-senti-meetoru** takai.
this shelf-TOP **20-centimeter** tall
'This shelf is 20 centimeters taller (than some contextually salient shelf)
- (6a) Kono tana-wa ano tana-*yor*i **20-senti-meetoru** takai.
this shelf-TOP that shelf-*than* **20-centimeter** tall
'This shelf is 20 centimeters taller than that shelf.'

- (15) a. $[[3a]] = \mathbf{tall}(\mathbf{this\ shelf}) - \mathbf{stnd}(\mathbf{tall}) \geq \mathbf{20cm}$
'This shelf is 20 cm taller than the contextually determined standard (e.g. the height of some other shelf that is salient).'
- b. $[[6a]] = \mathbf{tall}^{\uparrow}_{\mathbf{tall}(\mathbf{that\ shelf})}(\mathbf{this\ shelf}) - \mathbf{stnd}(\mathbf{tall}^{\uparrow}_{\mathbf{tall}(\mathbf{that\ shelf})}) \geq \mathbf{20cm}$
'The height of this shelf exceeds the height of that shelf by 20 cm.'

3 Comparison with the 'direct' analysis of comparatives

The proposed analysis of comparatives involves RESETTING of the scale. An alternative, more conservative analysis would be to simply say that the function of the comparative phrase is to explicitly specify the standard of comparison WITHOUT CHANGING THE SCALE STRUCTURE (cf., e.g., Heim 1985; Kennedy 1999, to appear).²

One way to implement this direct analysis of comparatives is to posit the following null degree head:

- (16) $[[\delta]] = \lambda g \lambda y \lambda d \lambda x. g(x) - g(y) > d$

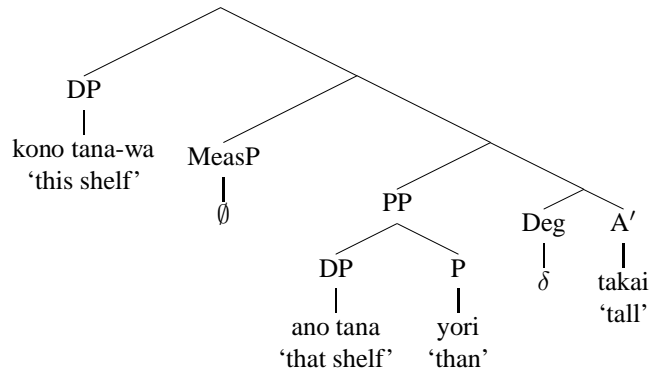
Here, *d* is the degree provided by the measure phrase (if there is one); when left implicit, it defaults to the value 0.

With these assumptions, the simple comparative sentence (4a) can be analyzed as in (18) (here *d* = 0 since there is no overt measure phrase).

- (4a) Kono tana-wa **ano tana-*yor*i** takai.
this shelf-TOP **that shelf-*than*** tall
'This shelf is taller than that shelf.'

²Yet another (and well-established) approach to comparatives is one involving quantification over degrees. Beck et al. (2004) point out that the kind of scope interaction that most strongly motivates the quantificational treatment is not found in Japanese comparatives. I won't discuss the quantificational approach in what follows since, as far as the phenomena considered below are concerned, the quantificational approach essentially shares the same property as the direct analysis that the function of the comparative phrase is to set the standard without modifying the scale structure.

(17)



(18) $\llbracket(4a)\rrbracket = \text{tall}(\text{this shelf}) - \text{tall}(\text{that shelf}) > 0$

Question:

Are there any empirical/theoretical arguments for favoring either of the two analyses of comparatives?

(Tentative) answer:

- The proposed measure function-based analysis interacts straightforwardly with other phenomena (specifically, degree modifiers, measure phrases and resultatives) to yield the right predictions, whereas the situation is not so straightforward in the direct analysis.
- But it remains to be seen whether this can really be taken as an argument for the measure function-based analysis over the direct analysis, since the conclusion drawn in each case depends on the specific analysis assumed for the construction involved.

3.1 Degree modifier *maamaa*

The degree modifier *maamaa* ‘more or less’ is incompatible only with minimally closed scale predicates.

(19) a. Kono tana-wa **maamaa** takai.
 this shelf-TOP more or less tall
 ‘This shelf is more or less tall.’

b. #Kono sao-wa **maamaa** magat-te iru.
 this rod-TOP more or less bent
 ‘This rod is more or less bent.’

c. Kono koppu-wa **maamaa** manpai-da.
 This glass-TOP more or less full
 intended: ‘This glass is more or less full.’

Comparative sentences with *yor*i behave like minimally closed scale predicates in their compatibility with *maamaa*:

(20) #Kono tana-wa ano tana-yori **maamaa** takai.
 This shelf-TOP that shelf-than more or less tall
 intended: ‘This shelf is more or less taller than that shelf.’

Measure function-based analysis

This pattern is totally expected in the measure function-based analysis. Specifically, the distribution and meaning of *maamaa* can be accounted for by positing the following lexical entry for *maamaa*:

(21) $\llbracket\text{maamaa}\rrbracket = \lambda g \lambda x . g(x) \lesssim \text{std}(g)$

(21) leads to anomaly only with minimally closed scale predicates: when the standard is the minimum endpoint, nothing can have a degree that is slightly BELOW that standard.

Direct analysis

Things are not so straightforward with the direct analysis. If scale resetting is not involved, it is not clear why attaching a *yor*i phrase makes a relative adjective behave like minimally closed scale adjectives.

Specifically, if the meaning of *maamaa* is to say that the relevant degree falls short of the standard by a slight amount, there doesn’t seem to be any principled reason why the comparative (20) is anomalous.

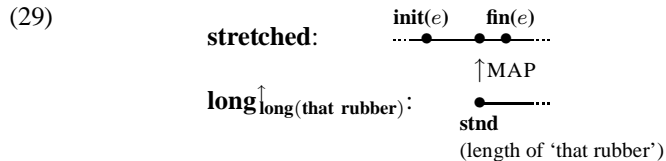
(20) #Kono tana-wa ano tana-yori **maamaa** takai.
 This shelf-TOP that shelf-than more or less tall
 intended: ‘This shelf is more or less taller than that shelf.’

Measure function-based analysis

The measure function-based analysis of comparatives proposed above interacts straightforwardly with the analysis of resultatives by Uegaki (2009) to yield the correct truth conditions for (28).

Specifically:

- Since the scale associated with the resultative phrase is minimally closed, its standard is the minimum endpoint corresponding to the length of ‘that rubber’.
- Then, (28) is predicted to be true just in case the resultant length of ‘this rubber’ exceeds that standard (i.e. the length of ‘that rubber’).



Direct analysis

It is not clear how sentences like (28) are accounted for in the direct analysis of comparatives.

- In Uegaki’s (2009) analysis, the adverbializer takes a measure function denoted by the resultative phrase and converts it to a verbal degree modifier. (This assumption is motivated by the fact that a certain SCALE COMPATIBILITY requirement exists in the Japanese resultative construction between the scale associated with the resultative phrase and that associated with the verb .)
- But this assumption seems to be incompatible with the direct analysis of comparatives wherein the function of the *yori* phrase is to supply an explicit standard value (and thereby convert the semantic type of the predicate) rather than to produce a derived measure function (which is semantically of the same type as the originate resultative phrase).

4 Conclusion

- The proposed analysis of phrasal comparatives in Japanese treats the comparative construction as a special case of minimally closed absolute predicates.
- This analysis captures the semantic properties of phrasal comparatives in Japanese in a simple and principled manner.
- I have discussed cases in which the comparative interacts with other phenomena and where:
 - the measure function-based analysis straightforwardly yields the correct predictions and
 - the alternative, direct analysis does not seem to make such straightforward predictions.

I tentatively take these as (potential) arguments for the measure function-based analysis.

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A Explicit vs. implicit comparison in Japanese (Sawada 2009)

Two modes of comparison (Kennedy 2007):

- (30) a. Tom is taller **than** Bill. (EXPLICIT COMPARISON)
 b. **As compared to** Bill, Tom is tall. (IMPLICIT COMPARISON)

As pointed out by Kennedy (to appear) and Sawada (2009), the Japanese *yori* construction is a case of EXPLICIT COMPARISON (contra Beck et al. 2004).

Crisp judgments

- (31) (Comparing two papers, one being 20 pages long, the other 19 pages long:)
- a. Kono peepaa-wa ano peepaa-**yori** nagai.
 this paper-TOP that paper-than long
 ‘This paper is longer than that one.’
- b. #Kono peepaa-wa ano peepaa-**ni kurabe-*{tara/reba}*** nagai.
 this paper-TOP that paper-DAT compare-if long
 intended: ‘This paper is long compared to that one.’

Compatibility with measure phrases

- (32) a. Taroo-wa Ziroo-yori **5 senti** se-ga takai.
 Taro-TOP Ziroo-than 5 cm height-NOM tall
 ‘Taro is 5 cm taller than Jiro.’
- b. #Taroo-wa Ziroo-ni kurabe-*{tara/reba}* **5 senti** se-ga takai.
 Taro-TOP Ziroo-DAT compare-if 5 cm height-NOM tall
 intended: ‘Taro is 5 cm taller than Jiro.’

Compatibility with minimally closed scale predicates

- (33) a. Kono sao-wa ano sao-yori **magat-te iru**.
 this rod-TOP that rod-than bent
 ‘This rod is more bent than that rod.’
- b. ??Kono sao-wa ano sao-ni kurabe-*{tara/reba}* **magat-te iru**.
 this rod-TOP that rod-DAT compare-if bent
 intended: ‘This rod is bent compared to that rod.’

These facts provide further evidence that the *yori* construction involves context-independent, ‘crisp’ judgments (which is typical of absolute adjectives) rather than context-dependent, vague judgments (which is typical of relative adjectives).