

On the semantics of the *izyoo*-comparative

Synopsis. While there is extensive discussion on comparative constructions in general, comparison of deviation (CoD) constructions like (1) (Kennedy 1999) have received relatively little attention:

(1) This bay is more shallow than that bay is deep.

This paper focuses on *izyoo*-comparatives in Japanese shown in (2), which have been argued to be CoDs by Hayashishita (2007, 2017):

- (2)a. Bill-izyoo-ni John-wa kasikoi. b. [Bill-ga kasikoi izyoo-ni] John-wa kasikoi.
 Bill-IZYOO-DAT John-TOP smart Bill-NOM smart IZYOO-DAT John-TOP smart
 ‘John is smarter than Bill.’ lit. ‘John is smarter than Bill is smart.’

Contrary to existing proposals where extents of deviation are differences between an individual’s degree and a value of a contextual standard (Kennedy 1999, Hayashishita 2007), I propose that they are calculated proportionally within a comparison class, and show that this proposal gives a unified account for facts newly reported here.

The *izyoo*-comparative as a CoD. Kennedy (1999) notes two semantic properties that distinguish CoDs from standard comparatives. First, CoDs entail that the positive form of adjectives is true of the contrasted phrases. For (1) to be true, ‘this bay’ and ‘that bay’ have to be shallow and deep, respectively (this property also distinguishes CoDs from metalinguistic comparatives discussed in Morzycki 2011). Second, they compare extents by which two contrasted objects exceed relevant standard values of adjectives. (1) is paraphrased as ‘the extent by which this bay exceeds a standard of shallowness is greater than the extent by which that bay exceeds a standard of depth.’ Hayashishita (2007, 2017) shows the *izyoo*-comparative also has these properties. When (2a,b) are true, John and Bill need to be smart. The second point is confirmed by (3), where the first sentence is an *izyoo*-comparative and the second is a *yor*i-comparative, a standard comparative in Japanese:

- (3) John-wa [[Bill-ga zibun-no kurasu-no naka-de kasikoi] izyoo-ni] John-no kurasu-no
 John-TOP Bill-NOM self-GEN class-GEN inside-at smart IZYOO-DAT John-GEN class-GEN
 naka-de kasikoi. To-wa-it-temo, John-yori Bill-no hoo-ga kasikoi.
 inside-at smart COMP-TOP-say-although John-YORI Bill-GEN side-NOM smart
 lit. ‘John is smarter in John’s class than Bill is smart in his (= Bill’s) class. Although I am
 saying that, Bill is smarter than John.’ (Adapted from Hayashishita:2017:180)

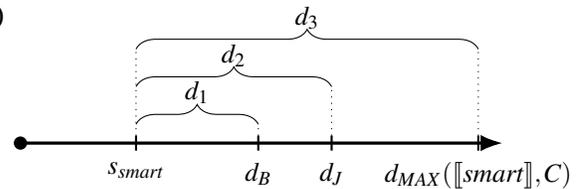
The phrases “in John’s/his class” in the first sentence invoke different comparison classes, which lead to different contextual standards. The first sentence compares extents of John’s deviance from a standard of smartness in John’s class and extents of Bill’s deviance from a standard of smartness in Bill’s class. The second sentence with *yor*i compares Bill’s and John’s smartness. Since the truth of the first sentence does not require that John is smarter than Bill, (3) is coherent. If the *izyoo*-comparative directly compared John’s and Bill’s smartness, as in the standard comparative, (3) would be contradictory. There are thus good reasons to analyze the *izyoo*-comparative as a CoD.

Proposal: Comparison of proportional deviation. Relative adjectives in the positive form depend on a contextual standard that is calculated with respect to a comparison class. I argue that for CoDs, the comparison class is also employed to determine extents of deviation from the contextual standard. I adopt a relational analysis of adjectives as expressing relations between degrees and individuals (type $\langle d, et \rangle$). I define $d_{MAX}(P, C)$ as the greatest degree associated with an adjective P that some member of the comparison class C has:

$$(4) \llbracket Adj \rrbracket = \lambda d \lambda x_e. [\delta_{Adj}(x) = d] \quad (5) d_{MAX}(P, C) := \text{Max}\{d \mid \exists x \in C [P_{\langle d, et \rangle}(d)(x)]\}$$

I propose extents of deviation from a contextual standard are proportionally calculated based on $d_{MAX}(P, C)$ and the contextual standard. (6)

Consider (2a,b) with (6), where s_{smart} is a contextual standard for smartness, d_B Bill’s smartness, and d_J John’s smartness. I argue that John’s deviation from the standard is $\frac{d_J - s_{smart}}{d_{MAX}(\llbracket smart \rrbracket, C) - s_{smart}}$ ($= \frac{d_2}{d_3}$) and Bill’s deviation from the standard is $\frac{d_B - s_{smart}}{d_{MAX}(\llbracket smart \rrbracket, C) - s_{smart}}$ ($= \frac{d_1}{d_3}$), and that (2a,b) are true iff the former is greater than the latter.



and that (2a,b) are true iff the former is greater than the latter.

To get the proposed meaning compositionally, I propose the following denotation of *pos*:

$$(7) \llbracket pos \rrbracket = \lambda d_2 \lambda P_{\langle d, et \rangle} \lambda x_e. \exists d_1 \left[\frac{d_1 - s_P}{d_{MAX}(P, C) - s_P} = d_2 \wedge d_2 \geq 0 \wedge P(d_1)(x) \right]$$

In line with Hayashishita (2007), *pos* takes an adjective *P* and an argument *x* as well as a degree d_2 that measures the extent of deviance, which is assumed to be greater than or equal to zero. (8a) is the syntactic structure for the sentences in (2), assuming phrasal comparatives like (2a) to be derived from clausal comparatives via deletion. In the *izyoo*-comparative, the position of d_2 taken by *pos* is occupied by a degree operator which undergoes movement to form a degree predicate via degree abstraction. *Izyoo* takes and compares two such degree predicates:

$$(8)a. \llbracket IP_1 \llbracket YP \llbracket IP_3 \text{ Op}_3 \llbracket IP \text{ Bill-ga} \llbracket AdjP \llbracket XP \text{ t}_3 \llbracket X \text{ pos} \rrbracket \rrbracket \llbracket Adj \text{ kasikoi} \rrbracket \rrbracket \rrbracket \llbracket Y \text{ izyoo-ni} \rrbracket \rrbracket$$

$$\llbracket IP_2 \text{ Op}_2 \llbracket IP \text{ John-ga} \llbracket AdjP \llbracket XP \text{ t}_2 \llbracket X \text{ pos} \rrbracket \rrbracket \llbracket Adj \text{ kasikoi} \rrbracket \rrbracket \rrbracket$$

$$b. \llbracket IP_2 \rrbracket = \lambda d_2. \exists d_1 \left[\frac{d_1 - s_{smart}}{d_{MAX}(\llbracket smart \rrbracket, C) - s_{smart}} = d_2 \wedge d_2 \geq 0 \wedge \delta_{smart}(j) = d_1 \right]$$

$$\llbracket IP_3 \rrbracket = \lambda d_3. \exists d_1 \left[\frac{d_1 - s_{smart}}{d_{MAX}(\llbracket smart \rrbracket, C) - s_{smart}} = d_3 \wedge d_3 \geq 0 \wedge \delta_{smart}(b) = d_1 \right]$$

$$\llbracket Y \rrbracket = \llbracket izyoo \rrbracket = \lambda P_{\langle dt \rangle} \lambda Q_{\langle dt \rangle}. \exists d_4 [Q(d_4) \wedge d_4 > Max(P)]$$

$$\llbracket IP_1 \rrbracket = 1 \text{ iff } \exists d_4 [\exists d_1 \left[\frac{d_1 - s_{smart}}{d_{MAX}(\llbracket smart \rrbracket, C) - s_{smart}} = d_4 \wedge d_4 \geq 0 \wedge \delta_{smart}(j) = d_1 \right] \wedge d_4 >$$

$$Max(\lambda d_3. \exists d_1 \left[\frac{d_1 - s_{smart}}{d_{MAX}(\llbracket smart \rrbracket, C) - s_{smart}} = d_3 \wedge d_3 \geq 0 \wedge \delta_{smart}(b) = d_1 \right])]$$

Consequences. This proposal has a consequence for the dimensional information associated with adjectives. Degrees like d_B and d_1 in (6) are defined on the scale and are associated with dimensional information provided by adjectives. They are thus comparable only when sharing the dimensional parameter (Kennedy 1999). Fractions like $\frac{d_2}{d_3}$, on the other hand, express proportional information between two degrees and dimensional information associated with them is neutralized. Thus, we can say 2cm is to 4cm what 2kg is to 4kg in terms of proportion. This explains the acceptability of (9), where incommensurable adjectives are used:

(9) [Context: Talking about an instant noodle] (from <http://junjun2310.bunj.in/?p=1957>)

[Sono nedan-ga takai izyoo-ni] oisikatta.
its price-NOM expensive IZYOO-DAT delicious

‘How delicious it was exceeded how expensive its price was.’

Moreover, in *yor*-, but not *izyoo*-comparatives, the difference between what is compared can be measured by measure phrases: since measure phrases are sensitive to a dimensional parameter of an adjective as shown in (11), they cannot be used in the *izyoo*-comparative, where the dimensional information provided by adjectives is neutralized:

(10) John-wa Bill-{*izyoo-ni/✓yor} 3kg omoi. (11) John-wa Bill-yori {✓2kg/*2cm} omoi.
John-TOP Bill-{\text{IZYOO-DAT/YORI}} 3kg heavy John-TOP Bill-YORI {2kg/2cm} heavy
‘John is 3kg heavier than Bill.’ ‘John is 2kg/*2cm heavier than Bill.’

Since *izyoo* combines with a degree predicate (type $\langle d, t \rangle$), it follows it cannot have a measure phrase (type d) as its argument (see Sudo 2015 for the claim that *yor* can take elements of type d).

(12) John-wa 60kg-{*izyoo-ni/✓yor} omoi.

John-TOP 60kg-{\text{IZYOO-DAT/YORI}} heavy

‘John is heavier than 60kg.’

Conclusion. I have proposed a proportional analysis of CoDs, as a consequence of which dimensional information provided by adjectives is neutralized. I have shown that this analysis accounts for a number of properties of the *izyoo*-comparative.

References: Hayashishita, J.-R. 2007. *Izyoo(ni)*- and *gurai*-comparatives: Comparisons of deviation in Japanese. *Gengo Kenkyu*. • Hayashishita, J.-R. 2017. Reconfirming *izyoo(ni)*- and *gurai*-comparatives as comparisons of deviation. *JEAL*. • Kennedy, C. 1999. *Projecting the adjective: The syntax and semantics of gradability and comparison*. Garland. • Morzycki, M. 2011. Metalinguistic comparison in an alternative semantics for imprecision. *NLS*. • Sudo, Y. 2015. Hidden nominal structures in Japanese clausal comparatives. *JEAL*.