

Force and Order: Lessons from Thai Scalar Predicates

Empirical observations It is standard in degree semantics to assume that scalar antonyms (*hot/cold*) define opposite ordering relations on their degrees (Kennedy 2001). It follows, then, that scalemates (*hot/warm*) should share the same ordering relation. The Thai predicates *rɔ:n*, *?ùn*, *jen*, and *nǎ:w* respectively stand in the same scalar relations as English *hot*, *warm*, *cool*, and *cold*, but when they are combined with the inchoative markers *k^hûm* (UP) and *loŋ* (DOWN) (Iwasaki and Ingkapirom 2009), something unexpected happens. While the changes described by (1-3) all go in the direction defined by the scalar predicate, (4) can be used to describe counter-oriented changes, as in (5). Despite *?ùn* (\approx *warm*) being oriented towards *higher* temperatures, *?ùn loŋ* describes *decreasing* temperatures, and *?ùn k^hûm* can describe either an increase *or a decrease*, as long as the new temperature is closer to what is typically described as *?ùn*, e.g., 50°C to 35°C or 10°C to 25°C.

- | | |
|--|---|
| <p>(1) <i>nǎ:w k^hûm</i> / ?? <i>nǎ:w loŋ</i>
 cold UP / ?? cold DOWN
 <i>temperature decreased</i></p> | <p>(3) <i>rɔ:n k^hûm</i> / * <i>rɔ:n loŋ</i>
 hot UP / * hot DOWN
 <i>temperature increased</i></p> |
| <p>(2) <i>jen k^hûm</i> / <i>jen loŋ</i>
 cool UP / cool DOWN
 <i>temperature decreased</i></p> | <p>(4) <i>?ùn k^hûm</i> / <i>?ùn loŋ</i>
 warm UP / warm DOWN
 <i>temp.</i> { <i>decreased</i> } / <i>decreased</i>
 <i>increased</i></p> |
| <p>(5) <i>mû:a-kí: man rɔ:n/jen/nǎ:w mâ:k lɔ:j tɔ:n-ní: ?ùn k^hûm (kwà: dɔ:m) lé:w</i>
 a moment ago it hot/cool/cold very EMP now warm UP (than before) already
 ‘A moment ago, it was very hot/cool/cold. Now it has become a moderate temperature.’</p> | |

The same pattern arises along the dimensions of humidity and brightness, where only the weaker scalemates *c^hú:n* (\approx *damp*) and *sa-lǔ:a* (\approx *dim*) give rise to an ambiguity in the direction of change when combined with *k^hûm*. If scalar predicates encode only a set of degrees, an ordering relation, and a dimension (Kennedy and McNally 2005), the systematic ambiguity restricted to the weaker scalemates cannot be explained.

Formal proposal We argue that scalar predicates also encode *force* (*weaker vs stronger*), which constrains their combination with the inchoative markers *k^hûm* and *loŋ*. The counter-oriented uses of the weaker scalemates then result from the semantics of the markers (rather than from the weaker scalemates defining an alternative orientation). First, we define a function PMON describing *pseudomonotonic* changes of degree with respect to a scalar predicate *S*. It states that there should be a degree in the direction of the change that meets the standard associated with *S*. We then define the semantics of the Thai inchoative markers.

$$\begin{aligned} \text{PMON}(S, x, e) &= 1 \text{ iff } \exists d, d', d'' \text{ standard}(d)(S) \ \& \ S(d')(x)(e_{\text{start}}) \ \& \ S(d'')(x)(e_{\text{end}}) \ \& \ [d > d'' \leftrightarrow d'' > d'] \\ \llbracket k^h\hat{u}m_1 \rrbracket &= \lambda S. \lambda x. \lambda e. \exists d, d' S(x)(d)(e_{\text{start}}) \ \& \ S(x)(d')(e_{\text{end}}) \ \& \ d < d'. \\ \llbracket k^h\hat{u}m_2 \rrbracket &= \lambda S. \lambda x. \lambda e. \text{PMON}(S, x, e) \ \& \ \exists d, d' S(x)(d)(e_{\text{start}}) \ \& \ S(x)(d')(e_{\text{end}}) \ \& \ d \neq d'. \\ \llbracket loŋ \rrbracket &= \lambda S. \lambda x. \lambda e. \text{PMON}(S, x, e) \ \& \ \exists d, d' S^{\prec}(x)(d)(e_{\text{start}}) \ \& \ S^{\prec}(x)(d')(e_{\text{end}}) \ \& \ d < d'. \end{aligned}$$

We posit an ambiguity for *k^hûm*: *k^hûm₁* expresses a change in the direction provided by the predicate’s ordering relation, but *k^hûm₂*—only attested in combination with weaker scalemates—simply states that a change has happened. *loŋ* overrides (*S^ˆ*) the ordering relation lexically specified by the predicate to express a negative change of degree—unattested for stronger positive scalemates. Finally, pseudomonotonicity accounts for the closer-to-typicality inferences associated with counter-oriented uses.

Cross-linguistic implications That the orientation of weaker scalemates can be (superficially) reversed in Thai raises questions about the semantic role of *force* cross-linguistically. For one, the semantics of the scalemates must return the right threshold and make possible to draw the right scalar implicatures. Relatedly, it appears to have been known since at least Horn (1989, p. 240) that English-speaking children exhibit counter-oriented uses of ‘warmer,’ denoting the meaning of ‘less hot’ (also Gareth Roberts, p.c., 2018 and Zehr 2016 for French). While Horn analyzed such cases as non-mature representations of orderings, our analysis suggests that they reveal an underlying property of the semantics of weaker scalemates.

References

- Horn, L. R. (1989). *A natural history of negation*. Chicago: University of Chicago Press.
- Iwasaki, S. & Ingkapirom, P. (2009). *A reference grammar of thai*. Cambridge: Cambridge University Press.
- Kennedy, C. (2001). Polar opposition and the ontology of ‘degrees’. *Linguistics and Philosophy*, 24(1), 33–70.
- Kennedy, C. & McNally, L. (2005). Scale structure, degree modification, and the semantics of gradable predicates. *Language*, 81(2), 345–381.
- Zehr, J. (2016). *Tiède in the middle: A formalization of a centrally-oriented gradable adjective*. Logic and Language in Conversation Workshop in Utrecht. Retrieved from <https://sites.google.com/site/jeremyzehr/talks-and-posters>