When warmer is less hot: Thai inchoatives in defense of Horn's children

Empirical observations Degree-based semantics (Kennedy and McNally, 2005; Kennedy, 2007) associates gradable predicates like *warm* with an oriented scale, making it easy to derive the low-to-high change in temperatures expressed by *get warmer* directly from applying ⟦*-er*⟧ to the scale of *warm*. This fits nicely with the intuitions of speakers of English: semantic accounts making it possible to derive another meaning from these ingredients, e.g. 'of a more moderate temperature,' would seem to be missing core properties of the meanings of *warm* and *-er*. This is what Horn (1989, p. 240) expresses when he says that "it is only for children who have not yet acquired the subtleties of full scalar competence that *warmer* can denote 'less hot', 'closer to (exactly) warm'." Speakers of Thai, however, may disagree, for the inchoative construction *ʔùn kʰɯ̂n* (literally 'warm ascend') can describe not only the same situations as English *get warmer*, but also changes from high to moderate temperatures [1a]. The same observations hold for *sa-lǔːa kʰɯ̂n* ('dim ascend') which can describe not only increases in darkness but also changes from highly to moderately dark [1b], and *cʰúːn kʰɯ̂n* ('damp ascend') which can describe not only increases in wetness but also changes from highly to moderately wet [1c].

Orthodox objections Horn-minded semanticists may want to argue that what the data show is that these adjectives are centrally oriented in the way that *neutral* is oriented toward the center of the pH scale (acidic < 7, neutral = 7, basic > 7). We can reject this analysis by comparing the intensive constructions *too neutral* to *ʔùn kɤːn* ('warm too'): while the former can mean that the pH is either too high *or* not high enough (i.e. too close to the central value 7) [2], the latter can only mean that the temperature is too high, never that it is not high enough [3].

Another option would be to argue that the analogy with English comparatives is fallacious. The English positive construction *turn dim* for instance can describe changes in either direction [4]. We defend the comparative analogy by observing that, regardless of the direction of the change, *sa-lǔːa kʰɯ̂n* ('dim ascend') can be modified by a measure phrase referring to the *difference* in illuminance [5], in the same way that *get 50 lux **dimmer*** describes a 50 lux *difference* whereas *turn 50 lux **dim*** describes a *final* illuminance of 50 lux.

The only option left is to give a semantic account where *kʰɯ̂n* ('ascend'), unlike *(get) -er*, can either follow or *reverse* scalar orientations. Horn's intuition may be able to make do with a neutral inchoative marker whose semantics expresses a change in either direction on whatever scale it combines with, but it turns out that when it combines with more extreme scalemates like *hot*, *cold*, *wet*, *dry*, *dark* or *bright*, *kʰɯ̂n* in fact always describes changes that follow the direction of the scale, much like English *(get) -er* does with any adjective. Empirical evidence from adult Thai grammar suggests that Horn's children may really have been more subtle than he thought.

Analysis We offer an analysis where *kʰɯ̂n* comes with a secondary meaning, in addition to a first meaning equivalent to the contribution of English *get -er* accounting for all uses where the change is directed according to the scale's orientation. This leaves us with the task of defining a secondary meaning that can account for the Thai-specific observations above. Taking these observations at face value, one could propose a semantic entry that somehow reverses the scale and whose application is stipulatively restricted to a list of adjectives. However, a simple enumeration seems to be missing a property shared by the adjectives we are concerned with, namely that they all come along with a stronger scalemate (which exhibits no counter-directional interpretation) and the idea of a reversal seems at odds with the very identity of *kʰɯ̂n* ('ascend'). As a first attempt to depart from stipulation, we can define a partial function which i. only has *weaker* scalemates in its domain and ii. characterizes any change oriented *towards the adjective's threshold* on its scale [6].

In an effort to further minimize stipulation, we offer an alternative solution unifying (i) and (ii). We propose that under its secondary meaning, *kʰɯ̂n* describes changes whose initial state satisfies

the adjective's scalemate and whose final state satisfies the adjective itself *instead* [7]. In the case of *warm*, the result could be paraphrased as *warm but no longer hot* and in the case of *hot*, # *hot but no longer warm*. Since it is impossible to satisfy a stronger scalemate without at the same time satisfying the weaker scalemate literally, we get the desired restrictions for free: the secondary meaning necessarily describes a contradictory final state when combined with a stronger scalemate, leaving only the first meaning available for a viable composition with *hot*, *dark*, or *wet*.

Our semantic entries need two final refinements. For one, native judgments suggest that counter-directional changes need not land outside the stronger scalemate's extension, as long as the change *initiates* a move in that direction [1a]. Second, we need a semantic value that can combine with a measure phrase [5]. We give our final proposal in [8] where we address the first issue by considering alternative $standard$ functions (a method reminiscent of delineation semantics (Klein, 1980)) and the second issue by changing the type of the semantic value so that it denotes a degree corresponding to the difference between the degrees at the initial and at the final states.

Discussion Both solutions in our analysis make reference to scalemates, a notion that is usually found in pragmatic analyses of scalar implicatures, such as Horn's. The solution we considered first explicitly singles out *weaker* scalemates. Positing such a selection at the lexical level assumes that grammar has a way to identify which scalemates are the weaker ones and which are the stronger ones. One way to model this selection would be to assume that scalemates are lexically marked as weak or strong, but it is unclear whether the empirical observations from Thai that we report ultimately call for making their relative strength a semantically encoded property of scalemates in this way. After all, relative strength can independently be derived from comparing the thresholds of the scalemates, a process which is arguably also at play in the derivation of scalar implicatures. Our second, more explanatory solution, however, requires access to the predicate's *alternatives* at the semantic level. This, to our knowledge, is a new proposal in the literature on scalar semantics. We decided to model this using Alt, which is conventionally used in the semantics of focus, questions, or free choice items. We do not necessarily want to commit to the idea that our Alt is the same, but we note that if one were to take this idea seriously, one would expect contextual effects on the availability of such counter-directional interpretations. Further empirical observations (not included in this abstract) suggest that the availability of contextual alternatives may indeed influence the availability of counter-directional interpretations.

Conclusions It is striking how hard it is for adult English speakers to imagine an alternative meaning for *warmer* along the lines of 'closer to typically warm,' when, on the other hand, anecdotal evidence suggests that children readily access such a meaning and a very closely related meaning appears to be available in Thai inchoative constructions. It seems like a perfectly logical possibility that the comparative morpheme *more/-er* would denote greater appropriateness of predication, and it seems to be a legitimate description of its contribution in cases of coercion like '2.2 is more *even* than 3.33 or 1.25.' All these observations call for further work investigating the range of possible meanings of scalar expressions across languages and in language development.

References

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Kennedy, C. (2007). Vagueness and grammar: the semantics of relative and absolute gradable adjectives. *Linguistics and Philosophy*, 30(1):1–45.

Kennedy, C. and McNally, L. (2005). Scale structure, degree modification, and the semantics of gradable predicates. *Language*, 81(2):345–381.

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Data

[1] *Note: all judgments attested; variation by predicate and by speaker*

a. tɔːn-níː man kôː jaŋ **jen/rɔ́ːn** jùː náʔ tʰɯ̆ŋ man càʔ **ʔùn kʰɯ̂ːn** nít-nɯɯŋ
now it EMP still **cool/hot** ASP FP although it AUX **warm ascend** a little

kɔ̂ː-tʰɤ̀ʔ
despite

'It is still **cool/hot**, although it got slightly closer to a moderate temperature.'

b. tɔːn-níː man kôː jaŋ **mɯ̂ːt/sa-wàːŋ** jùː náʔ tʰɯ̆ŋ man càʔ **sa-lɯ̆ːa kʰɯ̂ːn**
now it EMP still **dark/bright** ASP FP although it AUX **dim ascend**

nít-nɯɯŋ kɔ̂ː-tʰɤ̀ʔ
a little despite

'It is still **dark/bright**, although it got slightly closer to a moderate brightness.'

c. tɔːn-níː man kôː jaŋ **hêːŋ/pìːak** jùː náʔ tʰɯ̆ŋ man càʔ **cʰúːn kʰɯ̂ːn** nít-nɯɯŋ
now it EMP still **dry/wet** ASP FP although it AUX **damp ascend** a little

kɔ̂ː-tʰɤ̀ʔ
despite

'It is still **dry/wet**, although it got slightly closer to a moderate wetness.'

[2] "we cannot make the solution too acidic or too basic, but on the other hand we cannot make it too neutral either..." (https://chemistry.mdma.ch/hiveboard/methods/000380412)

[3] náːm kɛ̂ːw níː man ʔùn kɤːn náʔ
water CLS-glass this it warm too FP

'This glass of water is too warm' / # 'This glass of water is not hot enough.'

[4] The experiment room was very {dark / bright} at first, but then the light turned dim.

[5] mɯ̂ːa-kíː man **mɯ̂ːt** mâːk lɤːj tɔːn-níː **sa-lɯ̆ːa kʰɯ̂ːn** maː hâː-sip lák lɛ́ːw
just now it **dark** very EMP now **dim ascend** DEI 50 lux already

'It was very bright before. Now it has become 50 lux lower in brightness.'

Analyses

- std, s': returns the standard threshold of a gradable predicate
- diff: returns the difference between two degrees
- Alt: set of alternative predicates for a gradable predicate (scalemates)
- $s' \sim std$ iff $s'(A) < s'(B) \leftrightarrow std(A) < std(B)$

[6] $\lambda A : \text{weak}(A). \lambda x. \lambda e. \text{diff}(A(x, e_{end}), \text{std}(A)) < \text{diff}(A(x, e_{start}), \text{std}(A)).$
$\approx$ final degree is closer to A's threshold than initial degree was

[7] $\lambda A. \lambda x. \lambda e. \exists B \in \text{Alt}(A) [B(x, e_{start}) > \text{std}(B) > B(x, e_{end})] \wedge A(x, e_{end}) > \text{std}(A).$
$\approx x$ no longer meets A's **alternative**'s standard, but still meets that of A itself

[8] $\lambda A. \lambda x. \lambda e. \lambda d. d = \text{diff}(A(x, e_{end}), A(x, e_{start})) \wedge$
$\exists s' \sim std, B \in \text{Alt}(A) [B(x, e_{start}) > s'(B) > B(x, e_{end}) \wedge A(x, e_{end}) > s'(A)] \wedge$
$A(x, e_{end}) > \text{std}(A).$
$\approx$ degrees representing the amplitude of the change such that x:
- no longer meets B's standard but still meets A's for some **consistent** shift of standards
- still meets A's actual standard