

## Be positive! Norm-related implications and beyond

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Statements with ‘negative’ adjectives trigger norm-related implications. For example, the question *how short is Bill* and equative *Bill is as short as Mary* imply that *Bill is short*, while the question *how tall is Bill* and equative *Bill is as tall as Mary* do not imply *Bill is tall*. Furthermore, negative (‘marked’) antonyms have a narrower distribution (cf. *two meters tall/\*short; twice as tall/#short*, etc.) Rett (2007) argues that negative adjectives are banned from linguistic contexts in which their substitution with the positive (‘unmarked’) antonym preserves truth conditions. For ex., the neutral (not norm-related) reading of *as short as* is banned since individuals are equally tall iff they are equally short.

However, in many pairs of antonyms, both the negative and the positive member are norm-related (1-2) and none licenses measure phrases (3) (none is ‘unmarked’):

- (1) [Bill and Mary are skinny] #Bill is as fat as Mary; #How fat is Bill?
- (2) ??This ice-cream is as warm as that one; ??How warm is the ice-cream?
- (3) \*Bill is 150kgs fat /\*1,000\$ rich /\*20° warm (Schwarzschild, 2005).

Such pairs appear in languages as diverse as English, German, Chinese and Hebrew (Bierwisch 1989; Breakstone 2009; Kennedy 2009). Moreover, in languages like Russian, *all* adjectives not morphologically marked for comparison (unlike, e.g., ‘taller’) are norm-related and do not license measure phrases (Krasikova 2009). These cross-linguistic generalizations call for a unified account of norm-relatedness in natural language and its interactions with polarity and measure phrases.

**Proposal 1.** Let contexts  $c$  be represented via a context-set  $T_c$ , s.t. a statement  $S$  is true in  $c$  iff  $\forall t \in T_c$ ,  $S$  is true in  $t$ ;  $S$  is false in  $c$  iff  $\forall t \in T_c$ ,  $S$  is false in  $t$ ;  $S$  is undetermined in  $c$ , otherwise (Kamp 1975; Stalnaker 1978). Let  $D_x$  and  $D_r$  be the domain of possible individuals  $x$  and degrees  $r$ , respectively, with  $0 \in D_r$ , s.t. gradable predicates denote in indices  $t$  measure functions,  $f(P,t): D_x \rightarrow D_r$ ;  $x$  is  $P$  is true in  $t$  iff  $f(P,t)(x)$  exceeds  $P$ ’s standard in  $t$ ,  $\text{standard}(P,t)$  (Kennedy, 1999). Importantly, let adjectival interpretations include, besides a cutoff point, also a zero point. Like the former, also the latter can be either semantically determined or context relative. Formally, let  **$P$ ’s zero in  $t$**  be the set of entities whose  $P$  value in  $t$  is 0:  $\text{zero}(P,t) = \{x \in D_x: f(P,t)(x) = 0\}$ .  $P$ ’s zero is **absolute** in  $c$  iff it is index invariant ( $\forall t_1, t_2 \in T_c$ ,  $\text{zero}(P,t_1) = \text{zero}(P,t_2)$ ) and marks absence of  $P$ -hood, by constituting  $P$ ’s absolute lower bound ( $\forall t \in T_c, \forall x \notin \text{zero}(P,t), f(P,t)(x) > 0$ ); Otherwise,  $P$ ’s zero is **relative**.

**Main consequences.** What, then, distinguishes neutral adjectives (like *tall*, *wide* and *old* in English) from norm-related ones (like *fat*, *rich*, *warm*, *cold* and negative antonyms in general)? In the former, the zero is absolute. It marks complete absence of height, width, age, etc. Conversely, in the latter, the zero is relative. The ‘out of the blue’ context fails to determine precisely which entities cease to have any amount of the measured properties. Which entities are minimally fat? Rich? Short? At which point on the warm-cold scale are entities not even somewhat cold? Warm? Our linguistic capacity is as indeterminate with regard to the zero (or minimum) of these adjectives as it is with regard to the cutoff point of *tall*. Some of them (e.g., *short*) have no minimum at all (because there is no maximal height). Others (e.g., *fat*) could have had an absolute zero (0 weight), but in actuality, *fat* doesn’t appear to measure mere weight, but rather – overweight. The points at which entities begin to have a noticeable amount of overweight (‘minimum fatness’) is context relative. So is the point at which entities begin to have noticeable deficits compared to the average height (‘shortness’), etc.

**Proposal 2.** Denotation members always have positive degrees ( $\forall t \in T_c$ ,  $\text{standard}(P,t) \geq 0$ ), but non-members may have negative degrees. In each context, entities' value fails to exceed 0 iff they fail to have a contextually noticeable or significant amount of the measured property. Thus, adjectives cannot be used to rank these entities:

(4) *Be positive! Use adjectives P to rank entities whose value in P exceeds zero.*

Formally, then, *x is P* is felicitous in *c* iff  $\forall t \in T_c$ ,  $f(P,t)(x) > 0$  (cf., Heim and Kratzer's 1998 and Kennedy's 2007 claims for various sorts of adjectival domain restrictions). The maxim in (4) can only be violated when, in denying *P*, its application turns *P*'s negation unusable; i.e., it makes sense to apply *not P* of entities whose *P* value fails to exceed 0 in *c* iff *all* non *Ps* fail to do so ( $\forall t \in T_c$ ,  $\text{standard}(P,t) \leq 0$ ), namely in minimum standard adjectives (cf. *the door isn't open* vs. *#the surface isn't tall*).

**Main consequences.** First, by (4), *tall*, whose zero is absolute (marks complete absence of height), can be used to rank entities iff they have some height, but not necessarily much height. Hence, *tall* is neutral. Conversely, almost only fat entities are surely 'somewhat fat' (have a noticeable overweight and so a positive degree). So we can only use *fat* 'safely' to rank denotation members (or 'somewhat fat' entities).

Second, the strength of an evaluative implication varies with the location of the zero. For example, soon after switching on a slow oven to warm up some cold bread, one can ask *how warm is the bread?* In this context, soon after the oven is switched on, some heat is added to the bread, rendering it at least 'somewhat warm' (more than 'zero' warm), which is all that is required for an appropriate use of *warm* by (4). Likewise, *how red* only implies *somewhat red*, even out of the blue. Stronger constraints, directly relating to cutoff points, fail here (cf. Rett 2007; Kennedy 2007).

Third, languages like Russian provide additional evidence for relative zeros even for, e.g., *tall*. Combinations like '*entirely short*', whereby a maximizer modifies a relative adjective, are just fine in Russian. Yet they do not refer to *tall*'s absolute zero, but to some context dependent minimum height (Tribushinina 2009), namely *tall*'s relative zero. Again, contra Kennedy (2007) this zero is not the standard of *tall /short*.

Fourth, (4) is a restriction on the use of adjectives *P*, but not of other lexical items, including ones decomposed of *P*, like *unP* or *Per*. In fact, although the interpretation of the latter is mediated by *P*'s degree function, they can be used without implying *P*-hood. Thus, (4) captures the fact that, for instance, *unhappy* doesn't imply *happy*, and *shorter* doesn't imply being *short*. Conversely, *less short*, *as short* and *how short* are correctly predicted to imply *short*. The Russian data is similarly captured.

Also, for Bierwisch (1989), Krasikova (2009) and Kennedy (2001), *more P* differs from *Per* in being norm-related, as predicted. Notice, however, that *er*-comparatives, being lexical entries in their own right, may have either an absolute or a relative zero. If *Per* has a relative zero, then only entity pairs whose values in *P* differ to a contextually noticeable/ significant extent, count as somewhat *Per*. This explains why sometimes *Per* implies (somewhat) *P*; e.g. *??this feather is heavier* is odd, because differences in weight between feathers (unlike, say, bags) are too fine grained for *heavier* to capture, rendering *heavier* semi norm-related. The sentence improves if, say, a wet feather is compared to a dry one, since their weights differ more notably.

Fifth, *it weighs* conveys *It weighs a lot*, rather than *It weighs something* (Bierwisch 1989) perhaps due to the triviality of the latter, which, by (4), holds true of all *weigh*'s domain. Perhaps the meaning of adjectival positive forms (e.g. *x is tall*) can also derive from triviality (cf., Gajewsky 2009; Heim 2009; Rett 2007).

In sum, if an adjective has a relative zero, it is norm-related (or 'zero-related'). This is probably also why it bans measure phrases (e.g. (3)), as extensively argued in Krantz et al (1971) and van Rooij (2009).