

What a modal superlative is anchored to

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Intuitively, sentences containing a superlative of quality assert that an entity is top ranked along the relevant dimension. For instance, the standard superlative in (1) identifies an entity in a group as the one that uniquely shows the highest degree of the ‘height’ quality, either because i) it directly displays the quality, e.g. being a mountain and comparing the height of mountains in the absolute reading of (1), or ii) it shows a derived quality, e.g. being a mountain climber and ranking climbers using the height of the mountains they climbed in the relative reading of (1). Formal analyses implicitly agree that ultimately one is comparing entities, both for absolute and relative readings. Thus, individuals play the role of ‘single anchor’ in standard superlatives. On the contrary, more discussion is often assumed to be needed as to how the property used in the comparison is constructed and what it contains. In this abstract we pick up the former point, because we are concerned with modal superlatives (2). The issue is whether the single anchoring is the right one. Our proposal is to explore the possibility of using world+individual pairs instead.

(1) She climbed the highest mountain.

(2) Lia era il più serena possibile (Italian)

(Lia was the calmest possible)

Modal superlatives A wellknown peculiarity distinguishes modal superlatives from standard ones, namely Lia comes out as displaying the highest amount of calm, not as being ‘the’ calmest in (2), which is paraphrased as ‘Lia kept as much calm as possible’ (Larson 2000, Schwarz 2005, Romero 2013, Loccioni 2019). This goes under the name of ‘equative reading’. Lia’s calm is compared to that of individuals x' who are in possible worlds. A modal base can encode (modal) dimensions (circumstantial, deontic, etc.) and restrict the possible worlds (e.g. the scene takes place in a shop, or employees must comply with a minimum set of rules, etc.). These are dimensions that are ‘independent’ of x' , who does not necessarily have a counterpart in the real world. However, additional information about x' and the situation in which it finds itself must be taken into account and cannot be fully expressed in a modal base. We capture the consistency of situations considered across accessible worlds by assuming that the predicative modal superlative presupposes that there is a relation Q selecting a type of situation to be verified in the worlds. Let us assume that a situation in a world is (merely) a part of this world (Barwise and Perry 1980 and subsequent work), just as an event in a world is a part of the world, implying a temporal dimension. Q is applied to an individual x' , an amount q' , in a world w' , and describes a situation involving these three components. Q is a predication extracted from the linguistic material of the sentence, substantiated by the context, plus an attribution of an amount q' to x' in the world w' , namely x' was q' -calm in the world w' , (which is the minimum that Q is asked to do). Its role is also to describe additional features that constitute the right content of the situation and engage x' in the world w' (e.g. there is a certain unpleasant person opposite x').

Stage-level only A less discussed peculiarity of modal superlatives is that they only admit a stage-level interpretation of the adjective, cf (2) vs (3), in contrast with standard superlatives, where both interpretations are available, cf (4) and (5).

(3) #Questo bimbo è il più intelligente possibile (Italian) (This child is the most intelligent possible)

(4) Lia era la più arrabbiata (stage-level) (Italian)

(Lia was the angriest)

(5) Lia era la più intelligente (individual-level) (Italian)

(Lia was the most intelligent)

In the modal superlative in (2), the calmness of individuals x' , to which Lia’s is compared, is relative to a situation Q , and the adjective can hardly be interpreted as individual-level. If calmness were individual-level, it could not vary according to the situation and would be independent of it. On the contrary, interpreting the adjective with a similar situation dependence is impossible

in (3), as intelligence is individual-level. Example (3) is difficult to interpret out of context, in the absence of a very specific modal base, which is indicated by the hash sign. The restriction behind the data in (2)–(5) is intuitively clear. We propose to take account of it in formal terms by intervening on the single anchoring strategy with a modification.

Working out what a predicative modal superlative is anchored to In modal superlatives, the variables of individual x' and world w' are closely connected. First, it is not possible to identify an individual x' independently of the world w' that hosts it. Since the individual x' does not necessarily have a counterpart in the real world, its identification crucially rests on the characterisation of the situation in which it is found in the host world, more precisely on the verification of certain properties of degree and certain properties related to the type of situation, captured by the predicate Q . Second, an accessible world w' is determined relative to an individual x' . One cannot select a world w' independently of an individual x' hosted by it. Ultimately, the pair (w', x') is inseparably determined by applying the predicate Q . In addition, amounts can be associated neither with given individuals x' nor with given worlds w' , but with pairs (w', x') of individuals and worlds, which are organised in equivalence classes, according to their amount. A world w' can be in several equivalence classes. The same is true for an individual x' . In our proposal, the modality based on the accessibility relation does not apply to a complete proposition. It appears to be one of the components of the word *possible* which is understood as a mixed modal operator that conveys both the restriction of accessible possible worlds and the type of situation.

The pairs (w', x') are collected into a set called S by going through all individuals x' and accessible worlds w' so that x' is in w' , and x' and w' verify predicate Q for some amount q' —possibly also with a presupposition of homogeneity for individuals x' and the homogeneity of situations via Q . The definition is in (6). For each pair (w', x') in S , there is a unique amount q' verifying $Q(w')(x')(q')$. We say that the amount q' is associated to (w', x') , and define an equivalence relation $\sim$ on S as in (7). Partitioning S yields the set C , made up of all the equivalence classes defined on amounts. Set C works as the comparison class for the modal superlative. Comparison is done between the equivalence class of (w_0, x_1) and all the other classes in C , where w_0 is the real world and x_1 is Lia in (2). Function f allows us to associate to each equivalence class $c' \in C$, the unique amount q' associated to the elements of the class c' , written $f(c')=q'$.

$$(6) S = \lambda x' \lambda w' [\exists q' [w' \in Acc(w) \wedge Q(w')(x')(q')]]$$

$$(7) (w_1, x_1) \sim (w_2, x_2) \text{ iff } \lambda q' [Q(w_1)(x_1)(q')] = \lambda q' [Q(w_2)(x_2)(q')]$$

Finally, the superlative operator, defined as in (8), is a function that applies to a partition and returns True iff the amount of the class c , e.g. the class of Lia in (2), is the largest amount among all the cells of the partition. Leaving the semantic type of at least C , f and c underspecified, enables the operator to work for modal and standard superlatives.

$$(8) \lambda C [\exists q [f(c)=q \wedge \forall c' \in C [f(c') \leq f(c)]]]$$

A ‘fake’ overt comparison class The idea that modal superlatives handle pairs (w', x') and not individuals allows us to deal with another empirical fact, represented by the contrast in (9). The group of individuals to which Lia belongs can be overtly expressed in an ordinary superlative clause (9a), but the sentence is perceived as incoherent when the superlative is a modal one (9b).

(9) a. Lia è la più calma di tutti (Italian)

(Lia is the calmest of all)

b. *Lia è il più calma possibile di tutti (Italian)

(Lia is the calmest possible of all)

The contrast is no longer surprising if we observe that a comparison class consisting of individual-world pairs is difficult to express. These pairs are not in the real world, so to speak. It is difficult to characterise the individuals at stake. The only way to (partially) characterise them indirectly is to make explicit the type of situation concerned.

References Barwise and Perry, 1980, *The situation underground* • Larson, 2000, *WCCFL19* • Loccioni, 2019, *SALT29* • Romero, 2013, *NLS 21* • Schwarz, 2005, *SALT15*