

A pair-based semantics for the internal reading

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Overview. I explore a pair-based semantics of comparatives in getting the so-called internal reading in (1); I argue the proposal combines the different advantages of previous theories on the internal reading.

(1) Every year more people get vaccinated.

Background. Like singular *different*, asymmetrical comparatives like *more* can have a sentence-internal reading when, and only when, in the scope of a lexicalized universal (Beck 2000). In this reading, (1) can be true so long as a growing number of people get vaccinated each year. I argue that the only proposal deriving the internal readings of both *more* and singular *different* from the same compositional process can still be improved. This is Bumford (2015); in his proposal *Every boy recited a different poem* is reduced to the following iterated dynamic conjunctions: \llbracket Boy 1 recited a different poem \rrbracket ; \llbracket Boy 2 recited a different poem \rrbracket ; ... so that the internal reading of all comparatives are reduced to incremental comparisons to the prior discourse. There is a subtle concern: the first loop requires comparing to things external to the distributive quantification, but empirically these things should be ignored by the internal comparison (Bumford 2015: page 38) – *every boy in my class recited a different poem* is intuitively true even if some other boy recited the same poems. This is the problem we set out to solve.

Proposal. In a nutshell, we treat a context as a pair of information states, the top and the bottom; the pair-based approach to comparatives in Li (2021) can be extended to these internal readings (see also Brasoveanu 2007, Barker & Bumford 2013 for similar perspectives employing more than one information channel in the comparative meaning), provided with a pair-based meaning for lexicalized universals. Eventually, we'll let boy 1 to serve only as a comparison standard in the bottom, rather than comparing to anything external to the distributive quantification.

ENRICHMENT TO PAIRS. Sentence meanings are relations between contexts. A context – normally modeled as a plural info state – can be enriched to be a *pair* of info states $\langle \top G, \perp G \rangle$, the top $\top G$ and the bottom $\perp G$ (symbols borrowed from Bittner 2001, 2014). Note that the composition is not upgraded wholesale: normal semantic values can be freely lifted (using \uparrow , see all formal definitions in Figure 1b) to compose with this enriched type (cf. Charlow 2014). The meaning of lexicalized universals and comparatives are irreducibly pair-based.

COMPARATIVES. Following the standard practice in degree semantics, a comparative adjective is decomposed into a gradable adjective (e.g. *many*) and a scope-taking comparative morpheme (i.e. *-er*). The rest is Li (2021): *-er* has a pair-based meaning; after existentially introducing degrees that satisfy its scope property, it requires the maximal (plural) degree stored in the top state to be bigger than that stored in the the bottom. (The ontology and ordering relation for degree pluralities in Dotlačil & Nouwen 2016 can be adopted to work with plural degree drefs, although it isn't central to the analysis).

DISTRIBUTIVE QUANTIFIER. I propose to add pair-based dynamicity into the meaning of lexicalized universals like *every year*. Essentially, this means \llbracket every boy recited a poem \rrbracket is interpreted as the following sequence of updates: just like boy 1, boy 2 recited a poem; just like boy 1 and 2,

boy 3 recited a poem

The formal implementation comes with two parts. One is iterated dynamic conjunctions using pairs: given a contextually-determined ordering, lexicalized universals iteratively *propose* the next thing in the quantification domain to be in the top state, demote the earlier assignments into the bottom state, ensure top state has the nuclear scope property just as the bottom, and finally collect all the assignments into one output set. The other is a null operator located above the quantifier's scope that introduces some wiggle room: while the default interpretation operator (\sim) commits us to accept the proposal as is, we can have another, additive interpretation **ADD** that updates the top dref to be the sum of the proposed next thing and the backgrounded ones.

Putting these pieces together through the derivation in Figure 1a, we arrive at the sequence of updates roughly sketched in Figure 2: it compares the second year to the first year, and then every later year to the previous years. The reason we complicate the meaning of *every year* to allow for a possible additive operator is empirical: replacing \sim with **ADD** gives us a different type of updates where the value assigned to $\top u$ is always the summation of $\top u'$ (i.e. the proposed top dref) and the $\top u'$ (i.e. the bottom dref). This evaluates to the attested additive reading of (1), true when the *total* number of vaccinated people accumulated over the years keeps increasing.

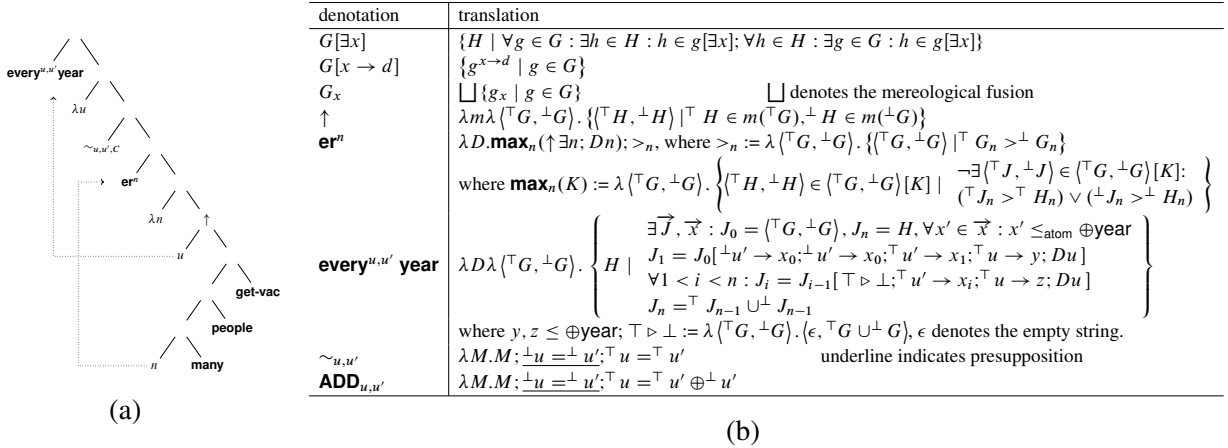


Figure 1

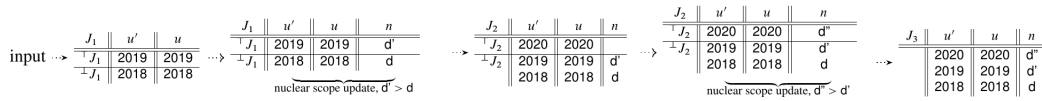


Figure 2: Updates in the default, comparative reading of (1)

Benefits. UNIFYING INTERNAL READINGS. The internal reading of all comparatives can be treated in the same way: *different* in *Every boy read a different poem* simply reduces to an incremental comparison to all previous boys we've looked at. Combining the core ideas in Bumford (2015) and Brasoveanu (2007) is the key to this success: because the background is the extra information channel internal to the distributive quantification, we successfully restrict the comparison to things internal to the distributive quantification; the use of dynamic conjunctions makes sure we never

lose information stored in the bottom of the pair (pace Brasoveanu 2007) and that's why we can store the first member in the domain into the bottom and collect it in the output.

SCOPE FACTS. The proposal lets the comparative take scope independent of the hosting noun phrase (cf. Barker 2007 for *same*). This is a desired feature for at least two reasons. First, previous literature (Dowty 1985, Carlson 1987, Moltmann 1992) has shown that the internal reading of comparatives require its licenser to be in the same scope domain (e.g. no internal reading in *Everyone rejected the claim that Mary read a different book/Every year we hang out with the boy she gave two more books to*). Second, it directly explains sentences like *Every day we are told that every^x girl gets one more picture of herself_x/Every photographer claimed that each^x woman preferred a different picture of herself_x*, where the comparative can associate with the higher licenser despite the noun phrase being bound into by the lower universal.

UNIFYING COMPARISONS. The meaning assigned to the comparative is not a special one: Li (2021) provides independent evidence that the meaning of comparatives should be based on pairs, though it only deals with the external reading. Together with this analysis, the pair-based semantics provides a truly uniformed theory for comparatives.

Selected References. **Barker, C.** (2007). Parasitic scope. *Linguistics and Philosophy*, 30(4), 407-444. **Beck, S.** (2000). The semantics of different: Comparison operator and relational adjective. *Linguistics and Philosophy*, 23(2), 101-139. **Bumford, D.** (2015). Incremental quantification and the dynamics of pair-list phenomena. *Semantics and Pragmatics*, 8, 91. **Bumford, D & Barker, C.** (2013). Association with distributivity and the problem of multiple antecedents for singular different. *Linguistics and Philosophy*, 36(5), 355-369. **Brasoveanu, A.** (2011). Sentence-internal different as quantifier-internal anaphora. *Linguistics and philosophy*, 34(2), 93-168. **Bittner, M.** (2014). *Temporality: Universals and variation*. John Wiley & Sons.. **Charlow, S.** (2014). *On the semantics of exceptional scope*. PhD diss., New York University. **Dotlačil, J., & Nouwen, R.** (2016). The comparative and degree pluralities. *Natural Language Semantics*, 24(1), 45-78. **Li, A.** (2021). Anaphora in Comparison: comparing alternatives. Presented at SALT 31, Retrieved from osf.io/en32z . **Thomas, G.** (2018). Underspecification in degree operators. *Journal of Semantics*, 35(1), 43-93.