Exactly one theory of multiplicity inferences

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Spector (2007) observes that an utterance of (1) gives rise to the inferences in (1a) and (1b), in which the plural nominal *difficult problems* is interpreted exclusively and inclusively respectively.

(1) Exactly one of my students has solved difficult problems.
   a. one of my students has solved *more than one* difficult problem
   b. none of my other students have solved *one or more* difficult problems

To account for these cases, Spector (2007) proposes that the literal meaning of (1) is inclusive, but pragmatically strengthened relative to an alternative equivalent to (2). As the reader can verify, conjoining the literal meaning of (1) with the negation of (2) entails both (1a) and (1b).

(2) There is a unique student who has solved exactly one difficult problem.

While the details of Spector's analysis are unimportant here, we note that his account is incompatible with a principled theory of alternatives (e.g., Katzir 2008; Fox and Katzir 2011) and requires in particular that alternativehood (or Horn-mateness) be non-transitive.

In this snippet, we aim to improve upon Spector's analysis by offering an implicature-based account of (1) that retains a principled theory of alternativehood. In line with Spector (2007), we adopt the view that the exlusive interpretation of the plural is an *implicature*. For concreteness, we follow Mayr's (2015) account, framed in terms of *predicate-level exhaustification*: singular NPs, which range over atoms, are *scalar alternatives* to plural NPs, which range over atoms and groups. Applying EXH to a plural NP yields a multiplicity implicature by winnowing out the atoms, (3).

(3) A student has solved EXH [difficult problems]
   $\Rightarrow$ a student has solved *more than one* difficult problem

Second, we draw on Sauerland's (2013, p. 159) analysis of *exactly* as a focus sensitive expression: much like *only*, *exactly* takes a proposition p that contains a focused element (i.e., a numeral) and returns that (i) p is true and (ii) for every $q \in ALT(p)$ that is not entailed by p, $\neg q$ is true, (4).

(4) Exactly/Only [ONE_F student came to the meeting]
   a. one student came to the meeting
   b. $\neg$[n students came to the meeting], for any numeral $n >$ *one*

Third, we rely on previous findings (a.o., Gajewski and Sharvit, 2012; Alxatib, 2014; Bar-Lev, 2018) showing that, in the scope of expressions like *only*, implicatures are generated in the upward-entailing (UE) component (e.g., in the prejacent), yet disappear in the downard-entailing (DE)

component (e.g., in the negated alternatives). We illustrate this for *exactly/only* below, using the *not-all* implicature associated with *some*.

(5) Exactly/Only [ONE$_F$ student ate some of the cookies]
   a. UE component: implicature
   one student ate some *but not all* of the cookies
   b. DE component: no implicature
   ¬[*n* students ate some of the cookies], for any numeral $n > one$

We propose that the case in (1) is another instance of the above phenomenon: a multiplicity implicature is generated in the UE-prejacent of *exactly*, delivering (1a), but not in its DE-alternatives, hence (1b). The intuition here is that EXH can be rendered vacuous in these DE-alternatives as its working would otherwise weaken their meaning, (6). This should ultimately follow from the Economy condition constraining the distribution of EXH (a.o., Fox and Spector, 2018).

(6) Exactly [ONE$_F$ student solved EXH [difficult problems]]
   a. one student solved EXH [difficult problems]
   $\Rightarrow$ one student solved *more than one* difficult problems
   b. ¬[*n* student solved ~~EXH~~ [difficult problems]], for any numeral $n > one$
   $\Rightarrow$ none of the other students have solved *one or more* difficult problems

To close, our account relies on decomposing an apparently non-monotonic operator into a UE and a DE component. Hence, we predict that if a non-monotonic operator *cannot* be analyzed in this way, the implicatures should be distinct. We leave a thorough exploration of this to future work.

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