How the symmetry problem solves the symmetry problem

1. The symmetry problem: In (1), B's answer can be interpreted exhaustively:

(1) A: Who (among John, Mary, Bill and Sue) were at the party?
B: John was there, and Bill was there. (A: Wow, only two!)

The standard pragmatic recipe for exhaustivity is: B didn't assert that Mary or Sue was at the party, so she must not have been able to (maxim of Quantity), and hence (if she is opinionated/competent) she must believe that they were not there. The standard recipe is known to face several problems (Chierchia, Fox, & Spector, 2012; Fox, 2014), one of which is the following (for an early statement see Kroch, 1972):

- *Symmetry problem:* if relevance is symmetrical (closed under negation), then B's response will imply not just her inability to assert that Mary or Sue was there, but also her inability to assert that they *weren't* there, and the latter contradicts exhaustivity.

However, what exactly makes this a problem can be understood in two ways:

I. *Foundational:* Relevance is necessarily, fundamentally symmetrical.
II. *Empirical:* Relevance is symmetrical in some cases where exhaustivity is implied.

The first understanding is more common. We will argue that the symmetry problem is probably not a foundational problem, and solve it as an empirical problem.

2. Not a foundational problem: Chierchia et al. assume that relevance is necessarily symmetrical, on grounds that it is (i) a "natural" assumption to make, (ii) supported by the notion of relevance in Carnap, 1950, and (iii) inevitable if we define relevance in terms of answerhood Groenendijk & Stokhof, 1984. But these grounds fall short. Against (i): this finds an adversary in Horn's (1989) "asymmetry thesis", that relevance is typically asymmetrical, and it seems to us unnatural in light of (2), where only (a) is helpful:

(2) *(B sees A confidently leaving the house without an umbrella.)*
a. B: It's going to rain.
b. ? B: It will stay dry.

Against (ii): Carnap's notion of relevance is motivated from the perspective of an agent who is testing a hypothesis, but conversational agents need not be like that. Against (iii): this may hold if we define relevance in terms of *complete* answerhood, but Groenendijk and Stokhof themselves also distinguish positive from negative partial answers (p.528).

3. As an empirical puzzle: If it is not a foundational problem, then (1) does not make a strong case that the symmetry problem even exists, since A's question is positive. The following example is more convincing, because A's initiative is explicitly symmetrical:

(3) A: I need to know for all five people on this list (John, Mary, Bill, Sue, and Chris) whether they were present or absent.
B: John was there, and Bill was there. (A: Wow, only two!)

We find that B's response can imply exhaustivity (depending on intonation, but likewise for (1)), so we take the symmetry problem to exist as an empirical puzzle, and seek a solution.

4. Assumptions: We adopt 3 assumptions from the QUD-literature (e.g., Roberts, 1996):

i. relevant pieces of information are grouped into QUDs (questions under discussion);
ii. as a *strategy*, speakers may split up a prior QUD into several smaller QUDs;
iii. a single utterance may serve to address multiple QUDs, each by means of a separate communicative intent (e.g., explicit intent and implicated intent).

We adopt two assumptions from Westera (2013), who invokes these to solve several other problems for the standard recipe for exhaustivity:

iv. utterances have not only informational intents, but also *attentional intents*, each a set of propositions to which the speaker intends to draw the addressee's attention;

v. attentional maxim of Quantity: an attentional intent should contain all propositions in the QUD that the speaker considers independently possible.

And to this we add that attentional intents too can be explicitly conveyed or implicated.

5. Solution: Suppose that the QUD of (3A) is indeed symmetrical, and that (3B) explicitly draws attention to John's presence and Bill's presence. Now, A's QUD contains both Mary's presence and Mary's absence, B necessarily considers (at least) one of these to be possible, but B's explicit attentional intent contains neither (intuitively: B should have added "I don't know about Mary", and likewise for Sue and Chris). It follows that B's explicit attentional intent cannot comply with the attentional maxim of Quantity relative to A's QUD – it must be aimed at a different QUD, and one that we (as an audience) must be able to accommodate.

To explain which QUD this is, we may plausibly (or even *must*, if intonation is taken into account) accommodate the following strategy: B must have split A's symmetrical QUD into "who was present?" and "who was absent?", and addressed the former explicitly and the latter implicitly (implicature). Relative to the positive, explicitly addressed QUD, exhaustivity can now be derived as usual – the symmetry problem is overcome. Moreover, this exhaustivity implication is what enables the clear communication of the implicit intents.

B's strategy is justified by brevity: since an asymmetrical theme enables an exhaustivity implication, it lets part of the information be conveyed implicitly, unlike the symmetrical theme. In this sense the symmetry problem solves the symmetry problem.

6. Discussion: Unlike previous work we do not rely on lexical scales or on a stipulated complexity measure ("present" would have to be less complex than "absent"), and this avoids certain problems (noted by Matsumoto, 1995; Russell, 2006). E.g., our solution applies unchanged to the mirror image of (3), unlike existing complexity-based accounts:

(4) A: *(as in (3))*

B: John was absent, and Bill was absent. (A: Wow, so three were there!)

The only difference is which of the two QUDs is addressed explicitly. Lastly, our solution supports the more general stance that discourse coherence must be evaluated not at the level of literal semantic contents, but (primarily) at the level of speaker intentions.

7. References: • Carnap, R. (1950). *Logical foundations of probability.* U. of Chicago Press. • Chierchia, G., Fox, D., & Spector, B. (2012). The grammatical view of scalar [...]. In Maienborn et al. (eds.), 2:2297-2332. Mouton de Gruyter. • Fox, D. (2014). Cancelling the Maxim of Quantity: [...]. *Sem&Prag.* • Groenendijk, J., & Stokhof, M. (1984). *Studies on the semantics of questions* [...]. Uni. of Amsterdam. • Horn, L. R. (1989). *A natural history of negation.* U. of Chicago Press. • Kroch, A. (1972). Lexical and inferred meanings [...]. *Quarterly Progress Reports of RLE* 104:260-267. • Matsumoto, Y. (1995). The conversational conditions [...]. *Ling&Phil* 18:21-60. • Roberts, C. (1996). Information structure in discourse. In Yoon & Kathol (eds.), *OSU WPL* 49:91-136. • Russell, B. (2006). Against grammatical computation [...]. *J. of Semantics* 23:361-382. • Westera, M. (2013). Where the air is thin [...]. In Aloni & Roelofsen (eds.). *The dynamic, inquisitive,* [...], 300-316.