

Deriving the evidence asymmetry in positive polar questions

Polar interrogatives are standardly treated as having a *symmetric* denotation in terms of how the positive and negative resolution relate to each other (Hamblin 1973, Karttunen 1977, Groenendijk & Stokhof 1984, etc):

- (1) a. *Symmetric polar questions (Hamblin ver.):* $\llbracket \text{PolarQ } \phi \rrbracket = \{ \lambda w . \llbracket \phi \rrbracket^w , \lambda w . \neg \llbracket \phi \rrbracket^w \}$
 b. $\llbracket \text{Is it raining?} \rrbracket = \{ \lambda w . \text{raining}'(w) , \lambda w . \neg \text{raining}'(w) \}$

Almost as long this approach has been the “standard”, it has also been known (Bolinger 1978, Büring & Gunlogson 2000, van Rooy & Safarova 2003, Han & Romero 2004) that positive polar questions (PPQs) do not behave symmetrically. The contrasting pair (2) vs. (3) led Büring & Gunlogson (2000) to propose the influential principle in (4).

- (2) *Scenario (neutral context):* S and A are talking long-distance on the phone.
 a. S: What’s the weather like out there? Is it raining?
 b. S: What’s the weather like out there? Is it sunny?
- (3) *Scenario (contextual evidence for $p = \text{‘it is raining’}$):* A enters S’s windowless computer room wearing a dripping wet raincoat.
 a. S: What’s the weather like out there? Is it raining?
 b. #S: What’s the weather like out there? Is it sunny?
- (4) *B&G’s evidence condition on PPQs:* [a PPQ “ p ?” is felicitous when] there is no compelling contextual evidence against p (i.e. there is either no evidence or evidence *for* p).

The puzzle There is little consensus on *what (if anything) the evidence condition might follow from*. One major challenge is exactly the asymmetry: because PPQs are compatible with neutral evidence, any account that tries to directly derive the oddness of (3)-b by requiring evidence for the positive proposition – a natural idea from (3) in isolation – is doomed to fail on examples like (2). Furthermore, given a standard treatment like (1) the denotation alone cannot derive any asymmetry. One prior proposal that directly targets the evidence condition is Farkas & Bruce (2010), Roelofsen & Farkas (2015), who suggest that agents prefer to avoid marked REVERSE responses, which would be more likely if there is evidence against the content proposition. My proposal builds on this idea, providing a direct explanation as to *why* REVERSE responses might be marked. (See van Rooy & Safarova 2003 and AnderBois 2011 ch. 4 for proposals that derive a ‘weak’ bias for the positive alternative, but don’t specifically derive an evidence condition; I will not have space here to address these adequately.) A major takeaway from this body of prior work is that the strength of the evidence condition is context-sensitive (see Roelofsen et al. 2013 for experimental work), something my proposal addresses.

Deriving the evidence condition I propose that the evidence condition follows from a ‘mono-polar’ account of polar questions, as in (5), together with Maximize Presupposition-style reasoning about competition between a mono-polar and relevant exhaustive question alternatives in context. A mono-polar question denotation is in competition (at least) with the bi-polar alternative question containing a negative alternative shown in (6). The evidence condition is derived from the interaction of their felicity conditions, developed below in (8).

- (5) *Mono-polar questions* (Roberts 1996, Biezma & Rawlins 2012, 2017; a.o.)
 $\llbracket \text{PolarQ } \phi \rrbracket = \{ \lambda w . \llbracket \phi \rrbracket^w \}$
- (6) *Bi-polar alternative questions* (Karttunen 1977, Larson 1985, Krifka 2001 a.o.)
 $\llbracket [\text{AltQ } [\phi \text{ or not } \phi]] \rrbracket = \{ \lambda w . \llbracket \phi \rrbracket^w , \lambda w . \neg \llbracket \phi \rrbracket^w \}$

Background: Following Roberts (1996), I pair the semantics in (5) with a response-licensing prag-

matics in (7) that leads to bi-polarity in the set of possible responses. For the sake of space I focus on bi-polar ‘ ϕ or not ϕ ’ alternative questions as competitors, but the derivation works as long as the alternative set includes the mono-polar alternative and exhausts the context set, e.g. relevant constituent questions. I also fix a specific mono-polar analysis here, but the derivation is extendable to related accounts, including Krifka (2017), as well as inquisitive semantics approaches where *highlighted* meaning is mono-polar (Roelofsen & van Gool 2009, Ciardelli et al. 2019, etc).

(7) *Response-licensing* (after Roberts 1996, Simons 2001)

- a. A response settles a proposition p if it entails either p or $\neg p$.
- b. An interrogative denoting some alternative set α , when used to ask an information-seeking question, licenses responses that settle at least one proposition in α .
- c. (Note: a-b amount to exhaustification strategy: $\text{ExhR}(\alpha) = \bigcup_{p \in \alpha} (\{p\}^\downarrow \cup \{\neg p\}^\downarrow)$, where \downarrow is inquisitive semantics downward closure; Roelofsen & van Gool 2009 et seq.)

To get the inference going, we need one more piece. I assume that a question is only appropriate if it provides (semantic) alternatives that the speaker thinks are at least possible. To handle the answerhood constraints in neutral contexts, the sense of possibility here needs to be quite weak; I take it in particular to be a weak contextual possibility operator:

(8) *Felicity condition for questions*. Where X denotes an alternative set α , and X is used as an information-seeking question in context c , X is felicitous only if:

$\forall p \in \alpha : \diamond_c p$, where $\diamond_c p = 1$ in world w iff $cs_{w,c} \cap p \neq \emptyset$; $cs_{w,c}$ is the context set in c at w .

The core of the proposal can now be stated: **the evidence condition follows from the interaction of felicity conditions in competition between mono-polar and exhaustive questions**, in contexts where the exhaustive alternative set is relevant. I take felicity conditions to contribute presuppositions for the purposes of Maximize Presupposition (Heim 1990 etc.); the presupposition that follows from (8) for bi-polar questions is stronger than the presupposition for mono-polar questions, and therefore a hearer will reason via Maximize Presupposition about why the speaker did not choose a stronger form. I implement reasoning of this kind using a standard epistemic necessity operator K_A relative to an agent A . That is, a hearer of a polar question denoting $\{p\}$ asked by A , if $\{p, \neg p\}$ is relevant will conclude from Maximize Presupposition that:

(9) $K_A \diamond_c p \wedge \neg K_A (\diamond_c p \wedge \diamond_c \neg p)$... which reduces to: $K_A \diamond_c p \wedge \neg K_A \diamond_c \neg p$

\Rightarrow “it’s not the case that A is in a position to take for granted that $\neg p$ is possible in c .”

(10) “A: Is it sunny?” is felicitous in c only if: $K_A \diamond_c \text{sunny}' \wedge \neg K_A \diamond_c \neg \text{sunny}'$

There are two main cases where the conjunct $\neg K_A \diamond_c \neg \text{sunny}'$ could be satisfied: either A believes that $\neg p$ is *not* possible, or A ’s epistemically accessible worlds differ as to whether $\neg p$ is contextually possible. This, I argue, is what derives the infelicity in the windowless-office example in (3)-b. The positive conjunct is satisfied, because of the weakness of \diamond_c : indirect evidence is still compatible with there being at least one sunny world in the context. However, the second conjunct cannot be satisfied in this context, because given the evidence A *should* be able to be certain that it is at least contextually possible that it is not sunny; the move would force an accepting hearer to act as if the evidence doesn’t exist. In an aligned example like (3)-a or either way in a neutral context like (2), both conjuncts are satisfied. In general, my claim is that the presence of some evidence (that is salient enough that an agent will expect others to have noticed it) is not compatible with meta-uncertainty about whether an alternative is even contextually possible. As long as an exhaustive (e.g. bi-polar) alternative set is potentially relevant to the discourse (the source of contextual variability), the **evidence condition therefore emerges** from a set of independently motivated assumptions about positive polar questions and presuppositional inference.

References

- AnderBois, Scott. 2011. *Issues and alternatives*: UC Santa Cruz Ph.D. dissertation.
- Biezma, María & Kyle Rawlins. 2012. Responding to alternative and polar questions. *Linguistics and Philosophy* 35. 261–406.
- Biezma, María & Kyle Rawlins. 2017. Or what? *Semantics & Pragmatics* 10 (early access).
- Bolinger, Dwight. 1978. Yes-no questions are not alternative questions. In Henry Hiz (ed.), *Questions*, 87–105. D. Reidel Publishing Company.
- Büring, Daniel & Christine Gunlogson. 2000. Aren't positive and negative polar questions the same? Manuscript, UCSC/UCLA. https://semanticsarchive.net/Archive/mYwOGNh0/polar_questions.pdf.
- Ciardelli, Ivano, Jeroen Groenendijk & Floris Roelofsen. 2019. *Inquisitive semantics*. Oxford University Press.
- Farkas, Donka & Kim Bruce. 2010. On reacting to assertions and polar questions. *Journal of Semantics* 27. 81–118.
- Groenendijk, Jeroen & Martin Stokhof. 1984. *Studies in the semantics of questions and the pragmatics of answers*: University of Amsterdam Ph.D. dissertation.
- Hamblin, C. L. 1973. Questions in Montague English. *Foundations of Language* 10. 41–53.
- Han, Chung-hye & Maribel Romero. 2004. The syntax of *whether/Q...or* questions: ellipsis combined with movement. *Natural Language and Linguistic Theory* 22. 527–564.
- Heim, Irene. 1990. Artikel und Definitheit. In A. von Stechow & D. Wunderlich (eds.), *Handbuch der semantik*, 487–535. de Gruyter.
- Karttunen, Lauri. 1977. Syntax and semantics of questions. *Linguistics and Philosophy* 1. 3–44.
- Krifka, Manfred. 2001. For a structured meaning account of questions and answers. In C. Fery & W. Sternefeld (eds.), *Audiatur vox sapientia, a festschrift for Arnim von Stechow*, 287–319. Akademie Verlag.
- Krifka, Manfred. 2017. Negated polarity questions as denegations of assertions. In Chungmin Lee, Ferenc Kiefer & Manfred Krifka (eds.), *Contrastiveness and scalar implicatures*, Springer.
- Larson, Richard. 1985. On the syntax of disjunction scope. *Natural Language and Linguistic Theory* 3. 217–264.
- Roberts, Craige. 1996. Information structure in discourse: Towards an integrated formal theory of pragmatics, 1998 revision. In Jae Hak Yoon & Andreas Kathol (eds.), *OSUWPL vol. 49: Papers in semantics*, The Ohio State University, Department of Linguistics.
- Roelofsen, Floris & Donka Farkas. 2015. Polarity particle responses as a window onto the interpretation of questions and assertions. *Language* 91(2). 359–414.
- Roelofsen, Floris & Sam van Gool. 2009. Disjunctive questions, intonation, and highlighting. In *Amsterdam colloquium 10*, .
- Roelofsen, Floris, Noortje Joost Venhuizen & Galit Weidman Sassoon. 2013. Positive and negative questions in discourse. In Emmanuel Chemla, Vincent Homer & Grégoire Winterstein (eds.), *Proceedings of Sinn und Bedeutung 17*, 455–472. Paris.
- van Rooy, Robert & Marie Safarova. 2003. On polar questions. In Robert B. Young & Yuping Zhou (eds.), *Proceedings of SALT 13*, 292–309. CLC Publications.
- Simons, Mandy. 2001. Disjunction and alternativeness. *Linguistics and Philosophy* 24.