Weak and Strong Epistemic Operators
in Assertions, Polar Questions and Declarative Questions

In assertions, subjective epistemic operators (like *certainly, presumably, must*) serve to fine-tune the level of commitment of the speaker to a proposition (cf. Palmer 1986, McDowell 1987, Sbisà 2001, Caffi 2013, Greenberg & Wolf 2018, van Elswyck 2024). But what role do they play in questions – are they licit at all, and are they interpreted with reference to the speaker or the addressee (cf. Bellert 1977, Woods 2014 and literature on the interrogative flip for evidentials, cf. San Rocque et al. 2017, Eckardt & Beltrama 2019, Bhadra 2020, Faller 2024).

We investigated this issue experimentally, paying attention to two factors: (A) The type of questions, comparing polar questions (PQU) with declarative questions (DQU) that are assumed to have a speaker bias (Gunlogson 2008) and with assertions (ASS) as a baseline. (B) The strength of the subjective epistemic operators (comparing weak vs. strong operators, realized by adverbs and modal verbs). Our object language was German; we investigated the epistemic operators in (1). Based on informal naturalness judgments as in (2), we arrived at the two hypotheses in (3).
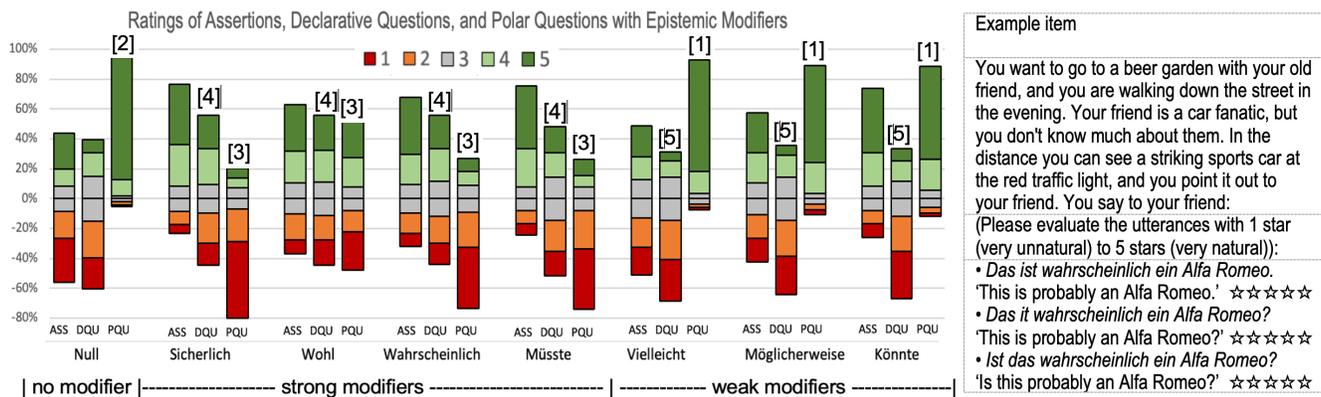
(1) strong: *sicherlich* 'certainly', *wahrscheinlich* 'probably', *wohl* 'presumably', *müsste* 'should'
     weak: *vielleicht* 'perhaps', *möglicherweise* 'possibly', *könnte* 'could'

(2) [When looking at a photograph in a friend's apartment:]
     H1: *Ist das vielleicht ein Falke?*   better than *Ist das sicherlich ein Falke?*   (PQU)
          'Is this possibly a falcon?'   'Is this certainly a falcon?'
     H2: *Das ist sicherlich ein Falke?*   better than *Das ist vielleicht ein Falke?*   (DQU)
          'This is certainly a falcon?'   'This is possibly a falcon?'

(3) **H1:** In PQUs, weak epistemic operators occur more naturally than strong ones.
     H2: In DQUs, strong epistemic operators occur more naturally than weak ones.

The rationale for **H1** is this: With a regular PQU, a speaker S requests information from the addressee A that resolves the issue whether a proposition under discussion φ is true. S expects that optimally, A should provide a strong truth commitment towards φ or towards ¬φ. Epistemic operators, even "strong" ones like *must*, reduce the strength of an assertion, by making the commitment easier to defend in case it turns out to be false (Yatsushiro et al. 2021). While A might actually choose to answer a question under epistemic weakening, this is not the initial goal of S when asking the question. However, if S reckons that A might have insufficient information, or wants to be polite by not putting pressure on A, S may suggest epistemic operators in the question that A may use in the answer (cf. Bhadra 2020 for evidentials). E.g., if S asks *Is possibly φ the case?*, S signals to A that assertions like *Possibly φ* would be acceptable answers, flipping the subjective epistemic to A. In this pragmatic constellation, we expect S to use weak epistemic operators rather than strong ones. The motivation for this pragmatic move is related to the use of negative polarity items like *any* that broaden the proposition in polar questions (van Rooij 2004).

The rationale for **H2** is this (focusing on confirmative DQUs, disregarding incredulous ones, cf. Goodhue 2021): DQUs differ from PQUs as they show an epistemic bias of the speaker S towards the core proposition φ. The origin of this bias can be explained as follows (cf. Gunlogson 2008, Malamud & Stephenson 2015): In a PQU, S checks whether A commits to the proposition, whereas in a DQU, it is S who proposes to commit to φ, but makes this commitment dependent on whether A commits to φ as well. Hence, subjective epistemics are interpreted with respect to S, and are not flipped to A. The typical pragmatic constellation in which S asks a confirmative DQU is when S has rather good (but not perfect) evidence for the proposition φ. Consequently, we should expect that DQUs naturally combine with strong epistemics, but not with weak ones.

We tested **H1** and **H2** in an online experiment in which participants (N = 280, verified German native speakers on the platform Clickworker, paid 1.50 €) had to rate assertions and corresponding DQUs and PQUs on a scale from ★ (very unnatural) to ★★★★★ (completely natural) in scenarios in which S has less information than A, where unmodified assertions would be inappropriate (see example item below). The participants rated sentences without epistemic modifiers and with the 7 modifiers mentioned in (1); each participant rated 8 scenarios, and each scenario for ASS, DQU and PQU. The epistemic modifiers were presented in a pseudo-randomized order, see below for an example item. The scenarios and the three sentences were presented in writing; we trusted that the participants paid attention to the exclusively prosodic marking of DQUs marked by "?" as ASSs and DQUs were presented next to each other.

The ratings are presented below. **H1** was confirmed: All PQUs with weak epistemics [1] were rated similar to PQUs with no operator [2] (means around 4.5), and much better than all PQUs with strong epistemics [3] (means around 2, with the exception of 3 for *wohl*). **H2** was also confirmed, but the effect was weaker: All DQUs with strong epistemics [4] were rated higher (means ~3.2) than all DQUs with weak epistemics [5] (~2.4). As for *wohl* (cf. conflicting analyses by Doherty 1985 and Zimmermann 2004), we propose that the epistemic authority of *wohl* includes S even in PQUs, forming conjectural question, cf. Eckardt (2020).

Ratings of Assertions, Declarative Questions, and Polar Questions with Epistemic Modifiers

Example item

You want to go to a beer garden with your old friend, and you are walking down the street in the evening. Your friend is a car fanatic, but you don't know much about them. In the distance you can see a striking sports car at the red traffic light, and you point it out to your friend. You say to your friend:
(Please evaluate the utterances with 1 star (very unnatural) to 5 stars (very natural)):
• *Das ist wahrscheinlich ein Alfa Romeo.* 'This is probably an Alfa Romeo.' ☆☆☆☆☆
• *Das it wahrscheinlich ein Alfa Romeo?* 'This is probably an Alfa Romeo?' ☆☆☆☆☆
• *Ist das wahrscheinlich ein Alfa Romeo?* 'Is this probably an Alfa Romeo?' ☆☆☆☆☆

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