

Composing attitude reports: why knowing people is not believing them
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Summary. We show that *know* and *believe* differ fundamentally at the level of argument structure and internal semantic composition, and that this split tracks a semantic contrast between doxastic and epistemic attitude verbs more generally: whereas doxastics describe fundamentally private relations to propositions, epistemics describe relations anchored in the subject’s acquaintance with (abstract or concrete) individuals in the world. Evidence comes from new and previously discussed data regarding the availability and interpretation of nominal and clausal complements of doxastics and epistemics in English and German. We propose a new analysis of the two verb-types and the way in which they compose with clauses and DPs.

Background: In the Hintikkan tradition, attitude verbs are standardly analyzed as quantifiers over worlds. On this approach, the primary semantic difference between *know* and *believe* is the type of *accessibility relation* that determines the set of worlds quantified over, as illustrated in (1)–(2). They differ additionally in that *know*, and other factives, presuppose that the embedded proposition (p) is true in w. This is in line with the philosophical perspective on knowledge as ‘justified true belief’ (cf. Gettier 1963).

- (1) a. $[[\text{believe}]]^w = [\lambda p_{\langle st \rangle} . [\lambda x_e . \forall w' \in \text{DOX}_x(w) \rightarrow p(w') = 1]]$
b. $\text{DOX}_x(w) = \{w' \in W : w' \text{ conforms to what } x \text{ believes in } w\}$
- (2) a. $[[\text{know}]]^w = [\lambda p_{\langle st \rangle} . [\lambda x_e : \underline{p(w) = 1} . \forall w' \in \text{EPIST}_x(w) \rightarrow p(w') = 1]]$
b. $\text{EPIST}_x(w) = \{w' \in W : w' \text{ conforms to what } x \text{ knows in } w\}$

In terms of the compositional semantics, this suggests that both types of verbs combine with propositions. Considering only cases where these verbs take declarative complements, this approach nicely captures the intuition that the main difference between (3-a) and (3-b) is that with *know*, unlike with *believe*, the speaker assumes that Anna has reason to believe p, and additionally takes p to be true.

- (3) a. Anna believes [_P that Sue called].
b. Anna knows [_P that Sue called].

Data. This picture is challenged by cases where these verbs combine with DPs. We first observe, following Djärv (2019), that verbs like *believe*, unlike verbs like *know*, allow for a special kind of DP, describing the SOURCE of the information provided by the embedded clause (4). (Hence, this Source DP is neither the topic of the attitude, the *res*, nor the content of the belief.)

- (4) a. I {believe, trust} **you** [_P that Anna is to blame]. (doxastics)
b. *I {know, realized} **you** [_P that Anna is to blame]. (epistemics)

Secondly, we observe a similar contrast in cases when these verbs take *only* a DP complement. With doxastics, the DP is understood as the source of some contextually provided proposition, just as in (4-a). For epistemics, there is no inference of a relation to propositional content. Here, the DP is understood to denote an ordinary individual, which the subject is acquainted or familiar with:

- (5) a. I believe Mary/the report. \approx I believe that Mary/the report is right about p_c.
b. I know Mary/the report. \approx I am familiar/acquainted with Mary/the report.

Analysis. The fact that this is found across verbs (4) (and languages) shows that this is not a lexical quirk of English *believe*. I propose an analysis of this contrast in terms of the internal semantic composition of doxastics vs. epistemics; the consequence of which is that they combine with DPs via different routes, and thus end up describing different kinds of relations to individuals. Whereas doxastic predicates are internally simple and combine only with propositional content (6) (either with a clause or with a content DP via a generalized content retrieval function), epistemics are internally complex: they involve an acquaintance-denoting root (7) ($\langle e, \langle e, vt \rangle \rangle$), which introduces the object of acquaintance and produces a predicate of acquaintance-events, and a θ_{EPIST} head ($\langle \langle e, \langle e, vt \rangle \rangle, \langle \langle st, t \rangle, \langle et \rangle \rangle \rangle$), which introduces the propositional content of the belief and any propositional presuppositions of the resulting knowledge state. This allows us to derive both acquaintance *know* and epistemic *know*, without having to appeal to polysemy (see arguments in the talk). $know_{AQ}$ is derived by saturating the internal argument slot of \sqrt{AQ} with a DP, thus producing a predicate of acquaintance-events. $know_{EPIST}$ is derived by θ_{EPIST} taking \sqrt{AQ} as

its argument, in which case the internal argument slot of \sqrt{AQ} is saturated with a situation pronoun (the *res*); thus producing a predicate of states of knowing p or knowing the answer to the question of p.

$$(6) \quad [[\text{believe that Sue called}]]^w = [\lambda P_{\langle st,t \rangle}. [\lambda x_e. \text{DOX}_x^w \in P]](\{\lambda w. \text{Sue called in } w\})$$

$$(7) \quad [[\sqrt{AQ}]]^w = [\lambda y_e. [\lambda x_e. [\lambda e_v. \text{AQ}_w(y)(x)(e)]]]$$

Thus, epistemics describe complex relations, anchored in the attitude holder’s acquaintance with (abstract or concrete) individuals in the world. Doxastics on the other hand describe fundamentally private relations to propositions, anchored in reason or emotion. Evidence for this claim comes from the observation from Djärv (2019) that *believe* is modified by *why*, and *know* by *how*:

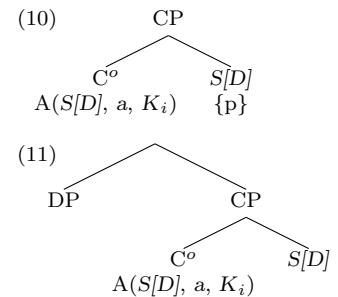
- (8) a. I don’t know why/#how she **believes** me/[that Anna is to blame].
 b. I don’t know how/#why she **knows** me/[that Anna is to blame]. (Djärv 2019, 246)

Our analysis of *believe* + Source DP, however, requires a few more steps. We have seen that sentences like (4-a)–(5-a) both express the attitude holder’s belief that p, and imply that p has been claimed or proffered by the Source DP. To this, we add the observation that when *believe* takes a Source DP, p can no longer be part of the asserted or *at issue* content of the sentence. Rather *believe* takes on a response stance interpretation (Cattell 1978, Bogal-Allbritten and Moulton 2018). In short, the availability of the Source DP is in complementary distribution with the ability of the *speaker* to assert p.

- (9) a. I believe that Anna is to blame. / No, she’s not! CP-complement only
 b. I believe you that Anna is to blame. / #No, she’s not! Source DP + CP

To account for the licensing and interpretation of the Source DP, and its complementarity with the speaker asserting p, we propose, following Djärv (forthcoming), that complex assertions as in (9-a) can be modelled using the table model of Farkas and Bruce (2010). On this model, assertions are derived via the assert operator $A()$, which takes as its input a context K , an *author* a (the speaker, in unembedded sentences), and a declarative sentence $S[D]$ (denoting the singleton (Hamblin) set containing the proposition p denoted by S , and is a function from input contexts K_i to output contexts K_o). Its effect is to add p to the author’s list of public discourse commitments (DC_a), and to make a proposal to add p to the common ground. Djärv proposes that in complex assertions like (9-a), the sentence has two $A()$ operators, both speaker-oriented: one in the CP of the matrix clause and one in the CP of the embedded clause. This allows the speaker to assert both the whole sentence, and the embedded clause. For us, what’s crucial is that in a complex assertion like (9-a), the embedded $A()$ operator takes the *speaker* as its *author* argument.

To account for the interpretation and licensing of Source DPs (in English), and their complementary distribution with complex *speaker* assertions like (9-a), we propose that they are *both* licensed by the embedded $A()$ operator. If the DP saturates the a argument, as in (11), then the assertion of p becomes obligatorily anchored to that individual, and is no longer available to be asserted by the speaker; as in (10). We show that both the Source DP and $A()$ operate at the *non-at issue* level (e.g. Potts 2005, Woods 2016). This ensures that semantically, at the level of *at issue* content, *believe* combines directly with the denotation of the embedded clause, as in (6), and further ensures that complex assertions like (9-a) are not interpreted semantically as ‘I believe that I assert p’.



In the talk, we show that our analysis also captures a previously observed contrast between *know* and *believe* in terms of entailments from content DPs to CP-complements (e.g. Uegaki 2016, Elliott 2016). Focusing on German, we also discuss cross-linguistic differences in the derivation of the Source DP construction.

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