

# Suppose Epistemic Contradictions Might Not Be Contradictions

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**Introduction.** In the recent literature, many semanticists working on epistemic modals have turned their backs on relational semantics. In this paper, we argue that this tendency is neither conceptually desirable nor empirically necessary. The central argument against relational semantics comes from Yalcin (2007), who argues that it cannot account for the fact that *epistemic contradictions* (EC's) like (1a) remain infelicitous when embedded as shown in (1b).

- (1)    a.    #It's raining and it might not be raining.  
      b.    #Suppose it's raining and it might not be raining.

Yalcin concludes from (1) that EC's are not merely pragmatically misformed but are in fact bona fide contradictions. Given this diagnosis, it follows that a relational semantics cannot yield an adequate solution since it would assign  $\phi \wedge \Diamond \neg \phi$  nonempty truth conditions. To sort this out, Yalcin proposes a novel *domain semantics* in which formulas are evaluated relative to both a world  $w$  and an *information parameter*  $s$ . In this semantics, both modals and attitude verbs quantify over the worlds provided by the information parameter, but attitude verbs also shift the information parameter used for evaluating items in its scope. This move captures the data in (1), since it gives that  $\phi \wedge \Diamond \neg \phi$  cannot be *accepted* by any state  $s$  (i.e. be true in  $\langle s, w \rangle$  for all  $w \in s$ ) in any model.

**Conceptual motivation.** While Yalcin's data serves as a prima facie argument in favor of domain semantics over relational semantics, conceptual considerations push the other way. For instance, because  $s$  is not determined by  $w$  and modals are only sensitive to the former, domain semantics makes the meanings of modal claims independent of the world of evaluation. This is a problem since it undermines the status of possible worlds as complete depictions of reality. If establishing whether one is in  $w$  or  $v$  is not sufficient to resolve whether an agent regards  $\phi$  as possible, then  $w$  and  $v$  cannot be seen as complete descriptions of reality. An additional issue arises from the fact that domain semantics multiplies our parameters of evaluation. Parameters of evaluation are finicky and come with a host of conceptual problems. We accept the problems possible worlds raise for us only because they have proven indispensable. Domain semantics would have to show significant empirical advantages in order to justify doubling these problems.

**'Might' as a suppositional modal.** Yalcin's argument for abandoning relational semantics hinges on the tacit assumption that EC's retain their semantic content when embedded under attitude verbs. In this section, we give some empirical arguments showing that even aside from the puzzle of EC's, a relational semanticist would have motivation for assuming that this is not the case. Specifically, we argue that 'might' is not always epistemic, but rather has a *suppositional flavor* in embedded contexts. This fact can be seen clearly in (2).

- (2)    Suppose the ground is wet and that everybody believes it rained. However, it might be that someone left the sprinkler on.

If we took 'might' to be epistemic or doxastic in (2), we would not be able to explain why the possibility of the sprinkler having been left on is compatible with every agent believing otherwise. However, this compatibility falls out easily if we assume that 'might' has a *suppositional flavor*, asserting that its prejacent is compatible with what is being supposed. This idea is supported by a more careful examination of EC's. For instance, consider (3), where we insert language which would be assumed within the framework of Kratzer (1977) to force an epistemic reading.

- (3)    Suppose it's raining but for all anyone knows, it might not be raining.

The fact that (3) is not contradictory is hard to explain if one thinks that 'might' already has an epistemic

reading in (1a). The upshot of this example is that a proponent of a relational semantics need not, and in fact *should not* assume that Yalcin’s examples show what happens when one embeds the semantic content of an EC in a suppositional context. This result opens the door to an analysis of EC’s in which they are not true contradictions.

**A relational semantics.** We capture this data using a standard modal logic language with two modal operators,  $\diamond_e$  and  $\diamond_s$ . A model for this language is a tuple  $\mathfrak{M} = \langle W, R_e, R_s, V \rangle$  where  $R_e$  is the familiar epistemic accessibility relation and  $R_s$  is a suppositional accessibility relation which relates  $w$  and  $v$  when everything some relevant agent supposes in  $w$  holds at  $v$ . We take what an agent supposes to be a body of information which an agent considers at utterance time without regarding it as factual. We assume that  $R_e$  and  $R_s$  are both (minimally) serial, transitive, and Euclidean in order to capture the fact, observed by Yalcin, that attitude verbs followed by a possibility modal is equivalent to the dual of the attitude verb.

**Capturing EC’s.** We analyze the unembedded EC in (1a) as the formula  $\phi \wedge \diamond_e \neg \phi$ , which is not itself a contradiction. To reach a contradiction, we apply some standard pragmatic enrichment along the lines of Hintikka (1966) and Unger (1978). According to such a story, a sentence is only felicitous if it is true as far as the speaker knows, and so an utterance of (1a) is enriched to the formula  $\Box_e(\phi \wedge \diamond_e \neg \phi)$ . As we can easily deduce from the fact that  $R_e$  is serial, transitive, and Euclidean, this formula is equivalent to  $\Box_e \phi \wedge \diamond_e \neg \phi$ , which is a patent contradiction. Thus, we capture the infelicity of unembedded EC’s via pragmatic enrichment.

In light of our treatment of embedded ‘might’ as suppositional, we analyze the embedded EC in (1b) as the formula  $\Box_s(\phi \wedge \diamond_s \neg \phi)$ .<sup>1</sup> Since  $R_s$  is serial, transitive, and Euclidean, this formula is equivalent to  $\Box_s \phi \wedge \diamond_s \neg \phi$  which is a contradiction. Thus, we predict that embedded EC’s are infelicitous on their default suppositional reading because they are contradictions. When we force the embedded ‘might’ to have an epistemic reading as in (3), we translate the resulting sentence as  $\Box_s(\phi \wedge \diamond_e \neg \phi)$ . This sentence is not a contradiction and cannot be enriched to one via any proposed pragmatic mechanism, so our system predicts that it is felicitous.

**Conditionals.** Yalcin shows that we find an analogous pattern when EC’s are embedded in the antecedents of conditionals.

(4) #If it’s raining and it might not be raining, then...

This data motivates a treatment of conditionals as a special kind of supposition. This view is not new, but rather has precedent in Ramsey’s famous footnote. We can cash out this idea in our framework in order to interpret an operator  $\Rightarrow$  which corresponds to natural language conditionals. To account for the infelicity of conditionals with EC’s as their antecedents, we demand that the antecedent is *supposable* in the sense that there exists a relation  $R_s$  making  $\Box_s \phi$  true. On this view,  $\phi \Rightarrow \psi$  holds at  $w$  whenever  $\phi$  is supposable and  $\psi$  holds in all the worlds accessible from  $w$  under this relation.

**Conclusion.** We have shown that a relational semantics can account for Yalcin’s problematic data by positing that ‘might’ switches from an epistemic reading to a suppositional one when embedded in suppositional environments. This proposal is tightly linked to Yalcin’s own, since in his domain semantics, the attitude verb in (1b) shifts the information parameter for items in its scope from epistemic to suppositional. The main difference between our proposal and his is whether the shiftness comes from context or from the semantics. Future work should investigate the plausibility of this division of labor by seeing whether an epistemic reading can be coerced using background stories, intonation, or gestures. For present purposes, suffice to say that relational semantics does not face the steep empirical problems that Yalcin envisioned. Given its conceptual advantages, this swings the balance in favor of relational semantics.

**References.** Hintikka, J. (1962). Knowledge and Belief: An Introduction to the Logic of the Two Notions. Cornell University Press. • Kratzer, A. (1977). What ‘must’ and ‘can’ must and can mean. Linguistics and Philosophy 1(3),337-155 • Unger, P. (1975). Ignorance: a Case for Scepticism. Oxford University Press. • Yalcin, S. (2007). Epistemic modals. Mind 116(464), 983-1026

<sup>1</sup>Here we follow Yalcin in glossing over the fact that ‘suppose’ is an imperative. Skeptical readers can take comfort in the fact that the speaker of (1b) commands the addressee to make our proposed formula true, meaning that on our account, they are making an incoherent command.