

The Epistemics of Presupposition Projection (Abstract)

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Summary *We carry out the Karttunen-Stalnaker pragmatic account of presupposition projection within a state-of-the art version of dynamic epistemic logic. It turns out that the basic projection facts can all be derived from a Gricean maxim ‘be informative’. This sheds light on a recent controversy on the appropriateness of dynamic semantics as a tool for analysing presupposition.*

Accounts of presupposition and presupposition projection almost invariably go back to Karttunen [4, 5] and Stalnaker [9, 10]. These authors proposed an explanation for the fact that the presupposition of a conjunction $A \wedge B$ consists of the presupposition of A conjoined with the implication $\text{ass}_A \rightarrow \text{pres}_B$. When a speaker utters this conjunction, she may take it for granted that A after she has uttered this first conjunct. So even if A is not presupposed initially, it will be presupposed by the time she gets to assert B , for now the context has shifted to encompass A .

This idea has been worked out by various authors who have tried to make the idea of shifting context precise, most notably Heim [3], and presupposition projection has been a major topic in dynamic semantics of natural language ever since, although there have been dissenting voices, witness the recent attack by Schlenker [7].

Recent advances in the logic of announcements and knowledge — the logic of public announcements of Plaza [6], the action style dynamics of Baltag cs [1], and the axiomatisation of a very general logic of communication and change by Van Benthem cs [2] — make it possible to have another go at formalizing the intuitions of Karttunen and Stalnaker. This task is taken up in this paper. Context is represented (not as a set of propositions but) as a multimodal Kripke model, utterances are (public) announcements, sequencing is uttering one announcement after another, context shift is epistemic updating, common ground is common knowledge between discourse participants (or, more subtly, knowledge that the speaker believes to have in common with the audience).

Indeed, it is obvious that the machinery is available for a dynamic epistemic account of presupposition, but as far as we know we are the first to actually carry out such a task. We will show that the core of proposition projection facts follows from the way in which announcements are composed in dynamic epistemic logic.

Asserting A and next asserting B boils down to the same thing as making a single assertion ‘ A holds, and, after I assert A , B will hold’. In dynamic epistemic logic with announcements this is made precise by the following equivalence:

$$[!A][!B]\phi \leftrightarrow [!(A \wedge \langle !A \rangle B)]\phi.$$

A basic proposition with precondition has the form $Cp \wedge q$, where Cp expresses that p is common knowledge, and q is the assertion proper. Updating with such a basic proposition in a context where the precondition holds boils down to the same thing as first updating with the presupposition, and next with the basic proposition.

$$\text{If } M, s \models Cp \text{ then } M, s \models [!(Cp \wedge q)]\phi \text{ iff } M, s \models [!p][!(Cp \wedge q)]\phi.$$

Updating with the assertion proper would also have the same effect, but we assume $(Cp \wedge q)$ is an atomic unit. If p is not common knowledge, then updating with $Cp \wedge q$ will lead to an inconsistent knowledge state:

$$\text{If } M, s \not\models Cp \text{ then } M, s \models [!(Cp \wedge q)]\perp.$$

The logic allows the use of $!p$ followed by $!(Cp \wedge q)$ in cases where p is compatible with the context model but not yet common knowledge. In such cases the use of just $!(Cp \wedge q)$ is ruled out, however. (Accommodation of the presupposition would boil down to replacement of $!(Cp \wedge q)$ by just $!(p \wedge q)$.) The logic allows the use of $!(Cp \wedge q)$ in contexts where p is common knowledge. By invoking the Gricean maxim ‘be informative’ one can explain why $!p$ followed by $!(Cp \wedge q)$ is not appropriate in contexts where p is already common knowledge.

The full paper will extend this to other logical operators and to quantifiers. One of the benefits of our approach is the availability of the notion of ‘embedded assertions’ inside formulas ($!A$ is an embedded assertion inside $(A \wedge (!A)B)$). We claim that this allows us to carry out the program of giving a pragmatic account of presuppositions without running into some difficulties that were raised recently in the literature [7, 8]. Because dynamic epistemic logic allows one to switch back and forth between a static level of formulas and a dynamic level of communicative actions, with a semantics defined by mutual recursion, and with the possibility to embed assertions inside formulas and vice versa, our analysis sheds light on the recent debate on the usefulness of dynamic semantics for the analysis of presupposition projection.

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