

Introduction to Dynamic Semantics

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Static semantics

Traditionally, the semantic content of a sentence is defined as the set of circumstances (or *possible worlds*) in which the sentence is true.

E.g. *Obama got a Nobel peace prize* is true just in those possible worlds where Obama got a Nobel peace prize; the semantic content of the sentence is the set of those worlds.

$$\{w \mid \text{Obama got a Nobel peace prize in } w\}$$

A **proposition** (something that can be true or false) can be seen as the set of possible worlds the proposition is true (or a function that takes a world as input and outputs true or false).

Dynamic semantics

The meaning of a sentence is a way of updating the discourse context.

Varieties:

- ▶ File Change Semantics (Heim 1982, 1983)
- ▶ Discourse Representation Theory (Kamp 1981, Kamp & Reyle 1993)
- ▶ Update Semantics (Veltmann 1990)
- ▶ Dynamic Predicate Logic / Dynamic Montague Grammar (Groenendijk & Stokhof 1991)
- ▶ ...

Motivations for dynamic semantics

Main motivations that I am aware of:

- ▶ Presupposition projection (see Karttunen 1973, 1974)
It's possible that all of John's children are bald.
If John has children, then all of his children are bald.
- ▶ Anaphora, especially donkey-sentences
If a farmer owns a donkey, then he beats it.
- ▶ Tense (related to anaphora)
Max entered the room. He got upset.
Max entered the room. He was upset.
Max entered the room. He had gotten upset.

Some presupposition triggers

Possessives:

John's son is bald.

» *John has a son.*

Factive verbs:

John regrets that he beat his wife.

» *John beat his wife.*

Aspectual verbs:

Sue stopped smoking.

» *Sue smoked in the past.*

Projection across negation

John's son is not bald.

» *John has a son.*

John does not regret that he beat his wife.

» *John beat his wife.*

Sue has not stopped smoking.

» *Sue smoked in the past.*

Context sets

The dynamic view of presupposition builds very much on Stalnaker's ideas about presupposition.

Stalnaker (1978): the **context set** is the set of worlds that the speakers consider possible candidates for being the actual world.

If a proposition holds in every world in the context set, it is **presupposed**.

From Stalnaker (1978), *Assertion*

*Roughly speaking, the presuppositions of a speaker are the propositions whose truth he takes for granted as part of the background of the conversation. A proposition is presupposed if the speaker is disposed to act as if he assumes or believes that the proposition is true, and as if he assumes or believes that his audience assumes or believes that it is true as well. Presuppositions are what is taken by the speaker to be the **common ground** of the participants in the conversation, what is treated as their **common knowledge** or **mutual knowledge**...*

From Stalnaker (1978), *Assertion*

*It is **propositions** that are presupposed – functions from possible worlds into truth-values. But the more fundamental way of representing the speaker’s presuppositions is not as a set of propositions, but rather as a set of possible worlds, the possible worlds compatible with what is presupposed. This set, which I will call the **context set**, is the set of possible worlds recognized by the speaker to be the “live options” relevant to the conversation. A proposition is presupposed if and only if it is true in all of these possible worlds.*

From Stalnaker (1978), *Assertion*

The motivation for representing the speaker's presuppositions in terms of a set of possible worlds in this way is that this representation is appropriate to a description of the conversational process in terms of its essential purposes. To engage in conversation is, essentially, to distinguish among alternative possible ways that things may be. The presuppositions define the limits of the set of alternative possibilities among which speakers intend their expressions of propositions to distinguish.

Dynamic semantics

In dynamic semantics, the meaning of a sentence is a *context change potential* (Heim 1982, 1983), rather than a description of the world.

Basic idea: The meaning of a sentence is a function that narrows down the context set. For “John is happy,” it takes the context set and intersects it with the worlds where John is happy.

The update will be **undefined** for input contexts that don't satisfy the presuppositions of the sentence.

This sheds light on the **projection problem**.

Projection from the consequent of a conditional

If baldness is hereditary, then John's son is bald.

>> John has a son.

If John wrote an apology letter, then John regrets that he beat his wife.

>> John beat his wife.

If Mary stopped smoking, then Sue stopped smoking.

>> Sue smoked in the past.

Failure of projection from the consequent of a conditional

If John has a son, then John's son is bald.

✧ *John has a son.*

If John beat his wife, then John regrets that he beat his wife.

✧ *John beat his wife.*

If Sue smoked in the past, then she stopped smoking.

✧ *Sue smoked in the past.*

Satisfaction

In a conditional sentence of the form *If A then B*, if the antecedent *A* satisfies the presuppositions of *B*, then the conditional as a whole does not carry the presuppositions of *B*.

We can make sense of this by imagining that we first update the global discourse context with *A*, and that it is in this temporary, hypothetical context that the presuppositions of *B* have to be satisfied (Karttunen 1974).