

Compositionality

Chris Potts, Ling 130a/230a: Introduction to semantics and pragmatics, Winter 2025

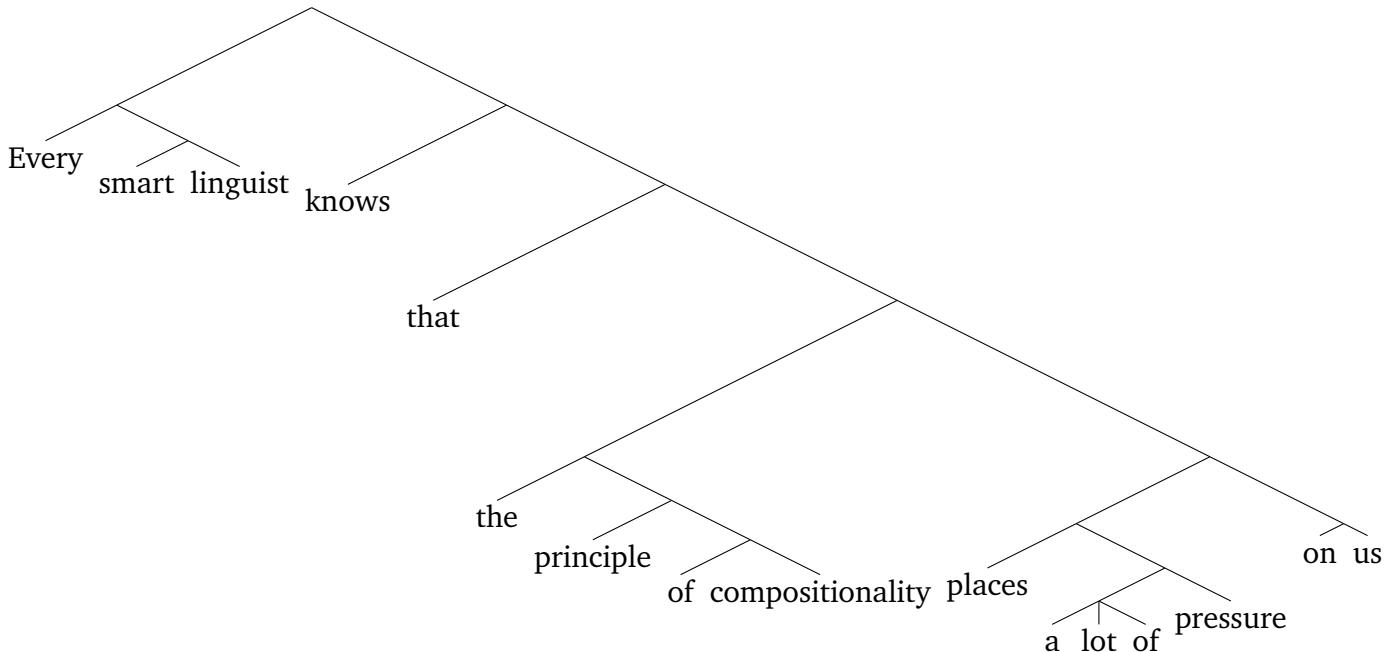
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1 The principle of compositionality

“The meaning of a whole is a function of the meanings of the parts and of the way they are syntactically combined.” (Partee 1995:313)

2 The technical, analytic challenge of compositionality

We have to give an independent meaning to every word (“leaf node”) in trees like this *and* explain how all the meanings combine systematically to create meanings for all the phrasal nodes!



3 Motivations for compositionality

- i. Modeling all meaningful units
- ii. Our “infinite” capacity to produce and interpret novel utterances
- iii. Linguistic creativity
- iv. The systematicity of linguistic knowledge (Fodor & Pylyshyn 1988)

Compositionality can be seen as an explanation for these things, but it should be said that none of these motivations *implies* compositionality. Less restrictive principles might suffice (Potts 2019).

4 Partee's methodology

“Compositional semantic analysis is typically a matter of working backward from intuitions about sentences’ truth-conditions [...]; and reasoning our way among alternative hypotheses concerning (a) lexical meanings, (b) syntactic structure, and (c) modes of semantic composition. Choices of any one of those constrain choices among the others; some choices lead to dead ends or at least make things much harder; others survive.” (p. 322)

5 Compositionality and cognition

Nefdt (2020) identifies conceptually different notions of compositionality or compositional behavior that an agent might manifest with respect to a particular complex linguistic unit:

- **Process compositionality:** The agent analyzes the complex structure in compositional terms. (This is presumably what linguists assume as their default view of compositionality.)
- **State compositionality:** The complex structure can in principle be analyzed in compositional terms, but we make no claim about whether any particular agent actually does that.
- **Outcome compositionality:** The agent’s input–output behavior appears compositional, but we make no claim that it actually is compositional.

My view: phrases like *every linguist* and *no philosopher* are process compositional for us. Phrases like *a lot of* are state compositional (one could dream up a compositional analysis, but it might seem contrived). And words and phrases that you have memorized and encounter a lot (e.g., *better late than never*) could be merely outcome compositional – you treat these phrases as atomic units but you can still revert to the compositional treatment.

6 Questions about compositionality

Partee has been one of the most vocal proponents of compositionality in semantics, but she has also critically explored its limits. Partee 1984 is a classic example. The following are drawn from that important paper.

6.1 Gottlob Frege on context and compositionality

Compositionality is often attributed to Gottlob Frege. However, as Janssen (1997:420) notes, Frege actually only explicitly endorses a “Principle of contextuality”, which says, “One should ask for the meaning of a word only in the context of a sentence, and not in isolation.” See also Partee 1984:153

6.2 Ambiguity resolution

For ambiguous words, the meaning we are most likely to assume is shaped by the surrounding linguistic (and non-linguistic) context, which seems on the face of it like a violation of the locality of the compositionality principle.

- (1) The crane flew away.
- (2) The crane picked up a large steel beam.
- (3) I saw a crane on my way to class.

Usual response: semantics is about *representations*, whereas ambiguity resolution is about how people *use* those representations.

6.3 Things “in the wrong place”

There are many cases in language where the parts seem not to have come together in a predictable way to make the whole (Partee 1984:161):

- (4) An occasional sailor strolled by. (“Occasionally, a sailor strolled by.”)
- (5) All that glitters is not gold. (“Not all that glitters is gold.”)

Usual response: the *logical form* may be different from the surface form, and compositionality is defined on logical forms.

6.4 Noun compounds

Partee (1995:341):

“In compounds, on the other hand, there is no general rule for predicting the interpretation of the combination [...]. A TOY store (in typical contexts) is a store that sells toys, a TOY box is a box that holds toys, and so on. Semanticists in general do not expect a semantic theory to provide a compositional semantics for compounds but do expect a compositional semantics for modifier–head constructions. The reasoning is that a native speaker cannot generally interpret a novel compound on first hearing on the basis of knowledge of the language alone, but can do so for a novel modifier–noun construction.”

We will discuss this case in detail later in the quarter in connection with Levin et al. 2019.

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