Partee 1995: Towards a compositional theory

Chris Potts, Ling 130a/230a: Introduction to semantics and pragmatics, Winter 2018

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1 Overview

Themes

- The interpretation of proper names
- A typology of modifier meanings
- The prevalence of vagueness and context-dependence
- Compounds and the limits of compositionality

Page references are to Partee 1995. For more on the issues raised by this article for cognitive science more generally, check out Kamp & Partee 1995.

2 Guiding principles

Lewis’s advice  “In order to say what a meaning is, we may first ask what a meaning does, and then find something that does that.”

Compositionality

The meaning of the whole is a function of the meanings of the parts and how they were syntactically combined.

A. J. Ayer’s ‘principle of verification’ (Ayer 1936:48)  “We say that a sentence is factually significant to any given person if, and only if, he knows how to verify the proposition which it purports to express — that is, if he knows what observations would lead him, under certain conditions, to accept the proposition as being true, or reject it as being false.”

Cresswell’s “Most Certain Principle”  “For two sentences $\alpha$ and $\beta$, if [in some possible situation – BHP] $\alpha$ is true and $\beta$ is false, $\alpha$ and $\beta$ must have different meanings.”

Jointly, these equate meaning with truth conditions.

Rejected by Chris

Converse Cresswell  If $\alpha$ and $\beta$ have different meanings, then some situation should be such that $\alpha$ is true and $\beta$ is false.

If different meanings, then different truth conditions.

Equivalently, if same truth conditions, then same meanings.

This feels much more restrictive, in that it requires us to find claim conditional differences wherever we perceive differences in meaning.
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)

3 Interpretation

The interpretation function is \[ \text{interpretation function} \]. It is our bridge from language to the world.

This function accepts language (words, phrases, sentences) as its inputs, and it returns objects in the world. This bridge from language to the world is the heart of semantics.

4 Proper names

4.1 Kripke’s (1980) direct-reference theory of proper names

Proper names refer directly to the entities they pick out.

\[ [\text{Bart}] = \begin{array}{c}\text{Bart}\end{array} \quad [\text{Burns}] = \begin{array}{c}\text{Burns}\end{array} \]

i. Baptism: There is an initial “baptism”, in which the entity is named.

ii. Convention: From then on, it is a convention of the language (and the society), that that name picks out that particular entity.

iii. A historical chain of users: Speaker \( S_n \) acquires the name from speaker \( S_{n-1} \), who acquires it from \( S_{n-2} \), and so forth, all the way back to people who were present at the “baptism”.

iv. Intentions: If I am not part of such a historical chain but I use the name anyway, then I do so with the intention to refer to the same entity that speakers in the chain intend to refer to.

For proper names, we’ll mainly treat them as directly referential, as in the equations given above as examples, but I like having Kripke’s theory as a backdrop. It’s an interesting example of a complex linguistic convention.

The next page presents data that distinguishes this theory from one on which proper names abbreviate definite descriptions. I think the data favor direct reference, but further experimental investigation is always worthwhile.
4.2 Proper names and definite descriptions: A comparison

Some confusion about authorship  It happens that

(1) $[\text{The author of Syntactic Structures}] =$

(2) $[\text{Noam Chomsky}] =$

Suppose we learned that Chomsky did not in fact write *Syntactic Structures*. Suppose it was written by Kurt Vonnegut. What would happen to our intuitions about the values in (1) and (2)?

Some confusion about the meaning of a proper name  Suppose I falsely believe the equation in (3) (because I am not part of the historical chain for this name):

(3) $[\text{Noam Chomsky}] =$

What truth values does the direct-reference theory assign to my utterances (4) and (5)?

(4) “Noam Chomsky wrote *Syntactic Structures*.”
(5) “Noam Chomsky wrote *Slaughterhouse-Five*.”
5 Modification

5.1 The typology

Intersective An adjective ADJ is intersective iff (‘if and only if’), for all N, \([\text{ADJ N}] = [\text{ADJ}] \cap [\text{N}]\)

Subsective An adjective ADJ is subsective iff, for all N, \([\text{ADJ N}] \subseteq [\text{N}]\)

Nonsubsective An adjective ADJ is nonsubsective iff ADJ is not subsective, i.e., there is at least one N such that \([\text{ADJ N}] \not\subseteq [\text{N}]\)

Privative An adjective ADJ is privative iff, for all N, \([\text{ADJ N}] \cap [\text{N}] = \emptyset\)
Examples

(6) a. future
b. so-called
c. virtual
d. foreign
e. boring
f. current
g. actual
h. non-
i. simulated

Question What problems do we face if we try to define \[\text{former}\] and \[\text{skillful}\] as sets?

5.2 Interpretation

(7) If ADJ is intersective:

\[
\begin{align*}
&[\text{ADJ}] \cap [\text{N}] \\
&[\text{ADJ}] \quad [\text{N}]
\end{align*}
\]

(8) If ADJ is not intersective:

\[
\begin{align*}
&[\text{ADJ}][[\text{N}]] \\
&[\text{ADJ}] \quad [\text{N}]
\end{align*}
\]

(The other nonintersective subtypes tell us something about what function \[\text{ADJ}\] is, but there is still an incredible amount of room for variation in meaning.)
6 Vagueness and context dependency

“Even the line between vague and nonvague predicates is vague; a concept may count as sharp for most purposes but vague relative to the demands of scientific or legal or philosophical argument. Probably almost every predicate is both vague and context-dependent to some degree.” (p. 332)

The role of context

(9) a. Win is a tall 14-year-old. (p. 330)
b. Win is a basketball player.
c. Therefore Win is a tall basketball player.

(10) a. My 2-year-old son built a really tall snowman yesterday. (p. 331)
b. The D.U. fraternity brothers built a really tall snowman last weekend.

Sorites Paradox

(11) a. A $5 cup of coffee is expensive (for a cup of coffee).
b. Any cup of coffee that costs 1 cent less than an expensive cup of coffee is expensive (for a cup of coffee).
c. Therefore, any free cup of coffee is expensive. (Kennedy 2007)

(12) “12:01 is noonish”, “one hair on his head”, “10,000 grains of sand is a heap”, …

(13) \([\text{expensive}]^c = \{x | x \text{ is above } c \text{ on the scale of costs}\}\)

A closing note

it is also worth noting that as one studies how vagueness works in more detail, one quickly overcomes the common prejudice that vagueness is always a bad thing, that it is some kind of “defect” of natural language. (p. 336)
7 Compounds and the limits of compositionality

In compounds […] there is no general rule for predicting the interpretation of the combination (p. 341)

<table>
<thead>
<tr>
<th>Modifier-head</th>
<th>Compound</th>
</tr>
</thead>
<tbody>
<tr>
<td>black BIRD</td>
<td>BLACK bird</td>
</tr>
<tr>
<td>black BOARD</td>
<td>BLACK board</td>
</tr>
<tr>
<td>white HOUSE</td>
<td>WHITE house</td>
</tr>
<tr>
<td>toy STORE</td>
<td>TOY store</td>
</tr>
<tr>
<td>brick FACTORY</td>
<td>BRICK factory</td>
</tr>
</tbody>
</table>

From work by (Levin et al. 2014) (slides by Lelia Glass):

Partee on compounds
- “Semanticists… do not expect a semantic theory to provide a compositional semantics for compounds”
- “One of the challenging parts of the problem is how to articulate the interface between linguistic and non-linguistic contributions…”
- “[Compounding], like … vagueness and context-dependence, appears to exploit the cognitive capabilities of language users in ways that allow natural languages to be much more flexible than we can allow … formal languages to be”

Our study
- 948 two- and three-word noun-noun and adjective-noun compounds in the conceptual domain of food and cooking, scraped from the web:
  - Greens and legumes (clear natural kinds)
  - Cooking utensils (clear artifacts)
  - Cake/cookie recipes (also artifacts, but less function-oriented)
- Coded each compound for the relation between head and modifier

Examples

Greens/beans
- Lima bean
- Adzuki bean
- Green bean
- Kidney bean
- Winter pea

Utensils
- Apple corer
- Citrus sprayer
- Bottle opener
- Bread knife
- Cheese grater

Cakes/cookies
- Honey cake
- Date bars
- Skillet cake
- Cowboy cookies
- Tea cake

Results
- We grouped the head-modifier relations into four meta-relations:
  - (i) describe entity’s perceptual properties
  - (ii) describe entity’s environment
  - (iii) evoke associated event
  - (iv) used a borrowed word (e.g. adzuki bean)
References


Levin, Beth, Lelia Glass & Daniel Jurafsky. 2014. Corpus evidence for systematicity in English compounds. In *Sinn und bedeutung 19*,.