Lexical and Compositional Semantics

Introduction to Linguistics, Fall 2015

Department of Linguistics
Stanford University

October 1, 2015

Overview

Semantics is the area of linguistics that deals with encoded meaning:

- ▶ **Lexical semantics** deals with the meanings of individual expressions (and the relations they bear to one another)
- ▶ **Compositional semantics** deals with how we combine these individual ideas into larger ones.

Two aspects of linguistic meaning:

- ▶ **sense** is something like the mental image evoked by an item
- ▶ **reference** is the relationship of the lexical item to the world, or those things that it picks out

An old puzzle:
Why is *The morning star is the evening star* a meaningful sentence?

Lexical semantics: reference

Some aspects of the meaning of a word include any mental images or prototypes that it may invoke, knowledge about the appropriate circumstances in which to use it, and any objects in the words that it picks out (referents):

- The referent of "Bart Simpson" is
- The referent of "Stanford" is this campus
- The referent of "(current) Ling 1 student" can't pick out any one of you – instead it plausibly invokes the set containing all of you
- More generally, the referent of common nouns like "dog" or "tree" are the set of things that can be described by that word.

Lexical relationships

One aspect of lexical semantics is figuring out how words relate to one another:

- W is a **hyponym** of Z if everything that W picks out is also picked out by Z:
  - e.g. *tabby* is a hyponym of *cat*

  In this case, Z is a **hypernym** of W.
- W and Z are **synonyms** if they pick out exactly the same set of things – that is, if W is a hyponym of Z *and* Z is a hyponym of W
  - e.g. *eggplant* is a synonym of *aubergine*

  Words can have very similar meanings without being complete synonyms. For example, *hard* and *difficult* might be synonyms in some contexts, but not in others.

Lexical relationships – antonymy

W and Z are **antonyms** if they are opposites in some way.

- ▶ W and Z are **complementary antonyms** if it is not possible for something to belong to the meaning of both at the same time
- ▶ Antonyms are **gradable pairs** if it is not possible to be both at the same time but it is possible to be neither
- ▶ **Reverses** are pairs where one seems to "undo" the other
- ▶ **Converses** are pairs which have to coexist, but from different points of view

What kinds of antonyms can you find for these words?

- ▶ *moving, real, soft, empty, ancient, student, elephant, skinny, build, manmade, up, dense*

Compositional semantics

The **principle of compositionality** states that we put together the meanings of phrases and sentences by (somehow) combining the meanings of the parts. Syntax is clearly important here:

- *Dog bites man* does not mean the same thing as *Man bites dog*!

What do you think is happening here? How does what we've learned about syntax matter?

Propositions

Full sentences express **propositions**, which are essentially claims about the world. If you understand the language being spoken, then you understand what the world would need to look like for a given sentence to be true:

- *John smokes*

  For this proposition to be true, the individual referent of "John" has to be someone who smokes (that is, who belongs to the set of individuals that are smokers). So, to put together a simple sentence like this, we check if the referent of the (subject) NP is found in the set that is the referent of the predicate VP.

Entailment

Just like lexical items can have meaning relationships, so can propositions: we say one proposition S **entails** another proposition R if R must be true whenever S is true:

- ▶ Solomon managed to build a temple.
- ▶ Solomon built a temple.

- ▶ Fluffy is a Newfoundland.
- ▶ Fluffy is a dog.

- ▶ All men are mortal.
- ▶ Donald Trump is mortal.

What do you notice about the source of the entailment relationships here?