

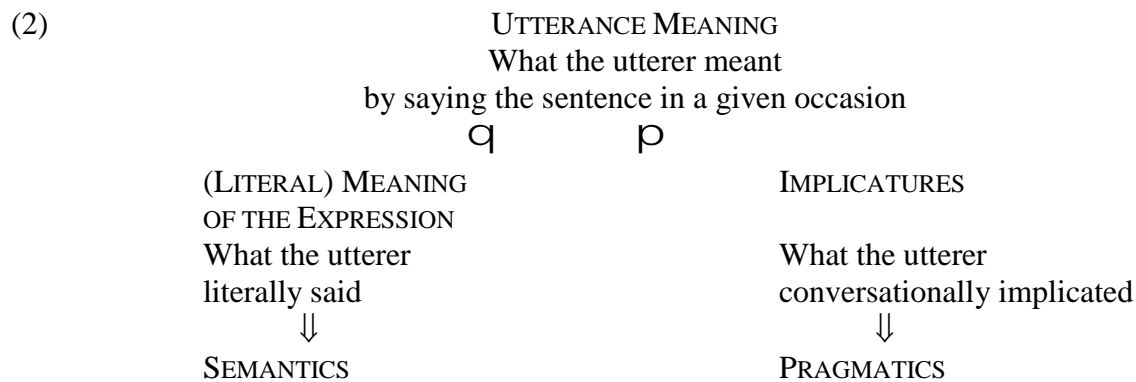
The semantic enterprise: Compositionality. Denotations in Truth-Conditional Semantics.

1. Preliminaries.

- Sentences in natural language encode information. For example, the sentence in (1) conveys some information about Maribel's arrival in Philadelphia. The information conveyed by a linguistic expression is the *meaning* of that expression.

(1) Maribel's luggage got lost when she arrived at Philadelphia's airport in January 2005.

- Utterance meaning vs. literal meaning of an expression.



(3) Nirit has four portable chairs.

- a. Utterance 1: A: What camping equipment do you guys have?
B: I have two tents, Rosa has a burner and Nirit has four portable chairs.
- b. Utterance 2: A: Oh, no! Four more guests are coming and I don't have enough chairs.
B: Why don't you ask Nirit? She has lots of camping equipment. I'm sure she has four portable chairs.

(4) Other professors wear a suit when they teach.

- a. Utterance 1: A: What do you think of Maribel's style?
B: Well, you know, other professors wear a suit when they teach.
- b. Utterance 2: A: How does Maribel dress when she teaches?
B: Actually, I'm not sure about her, but other professors wear a suit when they teach.

2. Frege's Compositionality Principle.

- One central assumption in current semantic theory is the Principle of Compositionality from Frege:

(5) The Principle of Compositionality: The meaning of a complex expression is determined by the meaning of its parts and the way those parts are combined.

(6) Joan saw Nirit.

(7) Sri saw Nirit.

(8) Nirit saw Sri.

(9) The tired girl arrived.

(10) The girl arrived tired.

(11) Loli only saw PhiLIP.

(12) Loli only SAW Philip.

- This principle explains why we are able to understand sentences that we have never heard before:

(13) “It is astonishing what language accomplishes. With a few syllables it expresses a countless number of thoughts, and even for a thought grasped for the first time by a human it provides a clothing in which it can be recognized by another to whom it is entirely new. This would not be possible if we could not distinguish parts in the thought that correspond to parts of the sentence, so that the construction of the sentence can be taken to mirror the construction of the thought. (...) If we thus view thoughts as composed of simple parts and take these, in turn, to correspond to simple sentence-parts, we can understand how a few sentence-parts can go to make up a great multitude of sentences to which, in turn, there correspond a great multitude of thoughts. The question now arises how the construction of the thought proceeds, and by what means the parts are put together so that the whole is something more than the isolated parts.” (Frege, “Logische Untersuchungen. Dritter Teil: Gedankengefüge”.)

- We need to find out:

The meaning (or thought) corresponding to a whole sentence.

The meaning (or partial thought) of each sentence-part: word or larger constituent.

The semantic contribution of the way the parts are combined.

2. Meanings or denotations.

What are meanings? What do linguistic expressions “stand for” or “denote”?

- *Sentences*: truth-conditional approach to the meaning of sentences:

- (14) To know the meaning of a sentence is to know the conditions or worlds/situations under which it is true. Two ways to view this:
- the meaning of a sentence is the set of possible worlds in which that sentence is true, or
 - the meaning of a sentence in a given world w is a truth value: TRUE (=1) or FALSE (=0).

Hence, a theory of meaning pairs sentences with truth-conditions:

- (15) Maribel’s luggage got lost when she arrived at Philadelphia’s airport in January 2005.
- (16) Scenario (= partial model):
 Worlds $w_1, w_2, w_3, w_4, \dots, w_{10}$: worlds where Maribel’s luggage was lost upon her arrival in January 2005.
 Worlds $w_{11}, w_{12}, w_{13}, w_{14}, \dots, w_{20}$: worlds where Maribel’s luggage was not lost upon her arrival in January 2005.
- (17) The sentence **Maribel’s luggage got lost when she arrived at Philadelphia’s airport in January 2005** denotes the following set of worlds:

w_1	w_2	w_3	w_4
w_5	w_6	w_7	w_8
	w_9	w_{10}	

- (18) Definition: $\llbracket \cdot \rrbracket^w$ is a function (the interpretation function) that takes a linguistic expression and yields its meaning or denotation in the specific world w . (w_0 is the actual world by default.)

- (19) a. $\llbracket \text{Maribel’s luggage got lost when she arrived at Philadelphia’s airport} \rrbracket^{w_1} = \text{TRUE}=1$
 b. $\llbracket \text{Maribel’s luggage got lost when she arrived at Philadelphia’s airport} \rrbracket^{w_{15}} = \text{FALSE}=0$

- Digression: object language vs. metalanguage.

The language whose semantics we are studying –namely, English, represented in boldface-- is our *object-language*. In order to talk about it, though, we have to use a language too, our *metalanguage*. Our metalanguage happens to be English –normal font—enhanced with some symbols.

- Some *phrases and words* can be used to stand for or denote a concrete individual (or for a group of them) in the world. Instead of using that word or phrase, you could simply point at the real object in the actual world. The following are some examples:

- (20) Proper names:
Maribel, Philadelphia, Morocco, Delaware River, Williams Hall.
- (21) Noun Phrases with the definite article (=definite descriptions):
The highest mountain in Pennsylvania, the tallest spy, the authors of *Meaning and Grammar*, the students of 255 in 2005, the president of Italy.
- (22) Noun phrases with demonstratives:
This table here, that window over there, these chairs, those pens.
- (23) Pronouns:
I, you, he, us, them...
- (24) $[[\text{Williams Hall}]]^{w0}$ = the concrete building we are in right now.
- (25) a. $[[\text{the students of 255 in 2005}]]^{w0}$ = the group formed by all of you.
b. $[[\text{the students of 255 in 2010}]]^{w0}$ = ?

- Some *other phrases and words*, though, do not stand or denote a concrete object:

- (26) Non-referential Noun Phrases:
a. **Nothing is trivial.**
b. **No student is sick.**
c. **Every woman_i talked to the cat sitting on her_i lap.**
- (27) Verbs and adjectives:
Run, see, put, red, tall, blond.

Current semantic theory proposes to treat meanings as set-theoretic objects. Some Noun Phrases stand for or denote concrete individuals in the world, but other phrases denote more abstract entities: a set of individuals (or the characteristic function thereof), a set of pairs of individuals, a relation between sets of individuals, etc.

- (28) $[[\text{blond}]]^{w341}$ = Karen Al
Patrick
- = {Karen, Al, Patrick}
= {x: x is blond in s}