

L7: Semantics I - Meaning

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Introduction to semantics

What is semantics?

The study of linguistic meaning and interpretation of linguistic expressions.



What is semantics?

The study of **linguistic meaning** and **interpretation of linguistic expressions**.

But what is meaning?

(1) He is the Prime Minister.

In 2013 true with he = Fredrik Reinfeldt

In 2015 true with he = Stefan Löfven

- ▶ **Utterances:** unrepeatable speech or writing events at a particular point in space and time
- ▶ **Sentences:** linguist's abstractions from utterances:
“a contextually identified male is the PM”



Semantics and Pragmatics

Speaker's meaning: the speaker intends to convey something extra with the utterance

(2) I'd like a glass of water.

Contextual and inferential

- ▶ In a restaurant: a request or command.
- ▶ Hiking in the mountains on a very hot day: an expression of desire.

Language is always produced in context



Semantics or pragmatics

Semantics: study of meaning of linguistic expressions

Pragmatics: the study of meaning related to the situated use of linguistic expressions: the status of utterances (rather than sentences) and their effects.



Literal and non-literal meaning

Metaphors:

- (3) a. letting the cat out of the bag
- b. put the foot down
- c. chicken or the egg



The significance of language

What does language (i.e. sentences) mean? What is the meaning about?

Informational significance: meaning is a link between linguistic expressions and things in the world.

Cognitive significance: meaning is a link between linguistic expressions and human mental constructs.



Informational significance

Referential theories: regular correspondences between linguistic expressions and the world, e.g. **Truth-conditional semantics**.

(4) The door is closed.

Corresponds to an infinity of somehow related situations.

The nature of correspondences:

- ▶ not predetermined by the structure of the environment;
- ▶ perception and reasoning is involved.



Cognitive significance: reference to private internal worlds

- ▶ The hearer can judge what mental state this refers to:
(5) Joan wants a tomato sandwich.
- ▶ Can communicate about our internal experience.

Regular correspondences between linguistic expressions and cognitive processes and states in the brain (without considering relations to situations), e.g. [representationalists](#).



The productivity of linguistic meaning

- ▶ NL syntax produces infinite number of sentences.
- ▶ Each sentence has a meaning: infinite number of meanings.
- ▶ We know the meaning of words.
- ▶ How to combine meanings of words to more complex meanings?
 - (6) a. $1437.952 + 21.84$
 - b. I saw a pink whale in the parking lot.



Compositionality

The principle of compositionality: the meaning of a complex expression is determined by the meanings of its constituent expressions and the rules used to combine them



(Gottlob Frege, a logician (2nd half on C19 and early C20)).



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A brief history of formal semantics

End of 1960s: **Richard Montague**, philosopher at University of California Los Angeles (UCLA): introduced logic for the study of linguistic meaning



A brief history of semantics

Barbara Partee, linguist and philosopher at UCLA introduced this approach to linguistics: **Montague grammar** or **Montague semantics**



A brief history of semantics

Developed in 1970s and 1980s as a research area.

Many computational approaches appeared in the 1990s and beyond: Patrick Blackburn and Johan Bos



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Meaning

Denotation

The name **denotes** denotation, denotatum, reference, or semantic value.

Pavarotti: a certain person with this name

Other NPs have similar denotations:

- (7) a. It is a pencil.
- b. This is yellow.
- c. The tallest man in the world lives in Los Angeles.
- d. ?The present queen of France is smart.
- e. ?The book that Agatha Christie wrote is about Hercule Poirot.



NPs are more complicated in terms of denotation

- ▶ Distributive and collective reading of sets of individuals
- (8) a. The students in my class are Swedish.
b. The students in my class outnumber those in yours.



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 - (9) Gold is expensive



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- (10) Running is healthy.



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- (11) Justice should be prized.

- ▶ Fictional characters

- (12) Bond is my hero.



A theory of individuals

(13) The table cannot be identified as the sum of partitions of matter that make it up at a given time: all parts may be replaced through repairs and we would still identify it as a table.

- ▶ A theory of individuation is required.
- ▶ We can work with the notion of individuals here.



The denotation of quantified NPs

- (14) A/some student in my class is blond.
An individual from the class or a set of students is blond.
- (15) Every student is blond.
Every individual from the class or a set of students (the entire class of students) is blond.
- (16) No student in my class is blond.
No individual from the class or a set of students is blond.
- (17) //Every student outnumbered the professors.
//The class of students outnumbered the professors.



The denotation of quantified NPs

Interaction with negation:

- (18) a. Every Italian doesn't like Pavarotti.
b. //The class of Italians doesn't like Pavarotti.
c. Not every Italian likes Pavarotti.
d. Every Italian dislikes Pavarotti.



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The choice of individuals - random?

- (19) a. In my class, a woman is blond and a woman is red-haired
and ...
b. Every man loves a woman.



Productivity of meaning

- ▶ What do other linguistic categories denote?
- ▶ How does the reference of complex expressions depends on the reference of their components?



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(20) Pavarotti is an Italian singer.

- ▶ $\llbracket \text{Pavarotti} \rrbracket^v$: an individual
- ▶ $\llbracket \text{is an Italian singer} \rrbracket^v$: a property denoting a state of affairs or a situation
- ▶ $\llbracket \text{Pavarotti is an Italian singer} \rrbracket^v$: a situation where a certain individual has a property of being an Italian singer



Productivity of meaning

(21) No woman smokes.

- ▶ $\llbracket \text{no woman} \rrbracket^v$: no denotation
- ▶ $\llbracket \text{smokes} \rrbracket^v$: property
- ▶ $\llbracket \text{no woman smokes} \rrbracket^v$: situation where no individual from the class of women has the property of smoking



Non-existing, hypothetical situations

- (22) a. Pavarotti is French.
b. If Pavarotti sings “O che gelide manine,” I want to be there.



The meaning of sentences

- ▶ We never deal with labels and objects in isolation.
- ▶ Even...
 - (23) a. Pavarotti! (pointing at a person)
 - b. This person is Pavarotti.
- ▶ Frege: Nur im Zusammenhange eines Satzes bedeuten die Wörter etwas - Only in the context of a sentence do words have meaning.
- ▶ Well-formed structures expressing thoughts/propositions referring to/denoting whole situations.
- ▶ True or false



Tarski (1935, 1944)

S is true if conditions that S claims to obtain do obtain.

(24) S is true in v iff (if and only if) p. (T-sentence)

- ▶ S: a structural description of a language L
- ▶ v: a situation, a specification of facts
- ▶ p: the conditions for S to be true in v
the truth conditions for S.



Inference

We must be able to model **entailment**:

(25) a. Pavarotti is an Italian singer.

b. Someone is an Italian singer.

- ▶ Situation denoted by (25b) is contained in the situation denoted by (25a).
- ▶ Whenever situation denoted by (25a) occurs, the situation denoted by (25a) also occurs.
- ▶ Whenever (25a) is true, (25a) is true.



Sense and reference

- ▶ Two expressions that entail each other have the same reference.

(26) a. the sister of John
b. the daughter of John's parents

- ▶ If we have an expression A containing an expression B and we replace B in A with an expression C that has the same reference as B, the reference of A does not change.

(27) a. the sister of John
b. the sister of Mary's husband



Reference and entailment of sentences

If a sentence is true, it's truth value is true (T) or false (F).

(28) a. Pavarotti is cute.

b. The truth value of "Pavarotti is cute" = T.

c. The truth value of "It snows" = T

d. It snows.

- ▶ (28a) and (28b) have the same reference and hence entail each other
- ▶ (28b) and (28c) entail each other due to replacement with a co-referential expression
- ▶ (28c) and (28d) entail each other

Two arbitrary sentences with the same truth value have the same reference!



Meaning = sense + reference

- ▶ Sentences are describing situations not only referring to them.
- ▶ Gottlob Frege: reference or *Bedeutung* and sense or *Sinn*
- ▶ Carnap (1947): intension and extension

NPs: “the morning star”:

- ▶ sense: the concept of a star that disappears last in the morning
- ▶ reference: Venus



Sense and reference

NPs: “the evening star”:

- ▶ **sense**: the concept of a star that appears first in the evening
- ▶ **reference**: Venus



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VPs: “is Italian”:

- ▶ **sense**: the concept of being Italian
- ▶ **reference**: a set of all individuals who are Italian



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VPs: “is Italian”:

- ▶ **sense**: the concept of being Italian
- ▶ **reference**: a set of all individuals who are Italian

S: “Pavarotti is Italian”:

- ▶ **sense**: the thought/proposition that Pavarotti is Italian
- ▶ **reference**: True



Further reading

(Chierchia and McConnell-Ginet, 2000), Chapter 2, Denotation, Truth, and Meaning.



References I

Chierchia, Gennaro and Sally McConnell-Ginet. 2000. *Meaning and grammar: an introduction to semantics*. MIT Press, Cambridge, Mass, 2nd ed edition.

