

Welcome to Computational Semantics!

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Today's Plan

- ▶ Introductions
- ▶ Syllabus
- ▶ Two Perspectives on Meaning in Natural Language
- ▶ Personal Learning Goals Part 1

Question for Discussion

- ▶ What is **meaning**?

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 - ▶ Just kidding!

Question for Discussion

- ▶ What is **meaning**?
 - ▶ Just kidding!
 - ▶ Great question; maybe a little bit too open-ended for the first day of class...

Question for Discussion, Take 2

- ▶ Suppose we know what meaning is. What should we be able to do with it? Or, what kinds of properties do we want our theory of meaning to have?

Question for Discussion, Take 2

- ▶ Suppose we know what meaning is. What should we be able to do with it? Or, what kinds of properties do we want our theory of meaning to have?
 - ▶ Possible examples:
 - ▶ “If we know the meaning of a word, we should be able to tell what (some of) its synonyms or antonyms are.”
 - ▶ “If we know the meanings of two sentences, we should be able to tell whether one logically follows from the other.”
 - ▶ etc.

Expression Meaning and Speaker Meaning

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- ▶ First, we should distinguish between:
 - ▶ What a linguistic **expression** (word, sentence, etc.) “means”
 - ▶ What a **speaker** “means” when they use it
- ▶ This course is mostly about expression meaning
 - ▶ “This chapter introduces computational semantics as the art and science of computing meanings for the expressions of a language.” (van Eijck and Unger, 2010)

Semantics and Pragmatics

- ▶ More from van Eijck and Unger:
 - ▶ “**Semantics** is the study of the relation between strings and their meanings, i.e. their relation with the extralinguistic structure they are about.”
 - ▶ “**Pragmatics** is the study of the use of meaningful strings to communicate about extralinguistic structure in an interaction process between users of the language.”

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 - ▶ Speaker intent
 - ▶ Previous utterances in the discourse
 - ▶ Modes of communication beyond language (e.g., gesture)
 - ▶ etc.

Two Perspectives on (Expression) Meaning in Natural Language

- ▶ Meaning is about **truth**
- ▶ Meaning is about **use**

Meaning is about Truth

- ▶ (More specifically, about **truth conditions**)

Meaning is about Truth

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- ▶ “To know the meaning of a sentence is to know its truth-conditions.” (Heim and Kratzer, 1998)
- ▶ “To understand a proposition means to know what is the case, if it is true.” (Wittgenstein, 1921)

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Meaning is about Truth

- ▶ Central concepts: **reference, entailment, compositionality**
- ▶ Traditional tools of the trade: **formal (model-theoretic) semantics**
 - ▶ Building models of the (or a) world, and evaluating the truth of sentences in those models

Meaning is about Use

- ▶ In some sense, speaker meaning is about use (by some speaker in some context)
 - ▶ “In a slogan: syntax studies Form, semantics studies Form + Content, and pragmatics studies Form + Content + Use.”
(van Eijck and Unger, 2010)

Meaning is about Use

- ▶ In some sense, speaker meaning is about use (by some speaker in some context)
 - ▶ “In a slogan: syntax studies Form, semantics studies Form + Content, and pragmatics studies Form + Content + Use.” (van Eijck and Unger, 2010)
- ▶ But in another sense, (context-independent) expression meaning can also be about use
 - ▶ “...the meaning of an expression is an abstraction over [all of] its uses.” (Westera and Boleda, 2019)

Meaning is about Use

- ▶ “You shall know a word by the company it keeps.” (Firth, 1957)
- ▶ “The meaning of a word is its use in the language.” (Wittgenstein [again], 1953)

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- ▶ Methodology: **distributional semantics**
 - ▶ Representing words by abstractions over (counts or predictions of) their contexts

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- ▶ Concerned with **word similarity** and other **relations between words**
- ▶ Methodology: **distributional semantics**
 - ▶ Representing words by abstractions over (counts or predictions of) their contexts
 - ▶ “It may be presumed that any two morphemes A and B having different meanings, also differ somewhere in distribution: there are some environments in which one occurs and the other does not.” (Harris, 1951)

For Wednesday

- ▶ Read van Eijck and Unger Chapter 2
- ▶ Fill out the poll for student hours