

# **DAS**

## **Semantics**

# **Introduction, Organization**

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# Welcome!

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- In this course we will introduce you to the study of meaning
  - How meaning is built up from words and phrases
  - How meaning depends on context
- Using the Sherlock Homes stories and the War with the Newts
  - I try to make this as enjoyable as possible
  - You get to read a great story

# Overview of today

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- How this course is organized
- What is semantics
- Why should we be interested in semantics
- Syllabus; Administrivia

# Textbook and Readings

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- No required text book and not much reading
- **EXCEPT you must read the story assigned**
- If you want to know more about semantics I recommend
  - Saeed, John (2009). *Semantics*. 3rd Edition. Wiley-Blackwell.
  - Lyons, John (1977) *Semantics*. Cambridge University Press
- Between now and next week, I expect you to read the assigned story.

# Studying meaning

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- I will teach you about meaning
- You will then try to analyze the use of words in the Sherlock Holmes stories in the War with the newts
  - Word Meaning (sense)  
<https://compling.upol.cz/ntumc/cgi-bin/showcorpus.cgi>  
*to knock up*
  - Word and Sentence Meaning (sentiment)  
*Julia and I had no great pleasure in our lives*
  - Idioms and metaphors  
*to cross someone's path*
- You must do the three online projects, each is 4–6 hours work

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# Introduction to Semantics

# What is Semantics

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- Very broadly, semantics is the study of meaning
  - Word meaning
  - Sentence meaning
- Why do we want to study meaning?
- What kind of knowledge does it take for a speaker to produce language and for a hearer to comprehend language?

# Layers of Linguistic Analysis

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1. Phonetics & Phonology
2. Morphology
3. Syntax
4. **Semantics**
5. **Pragmatics**
6. Stylistics



# Do people share a common conceptual system?

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- What is a *high school*?
- What color is *blue*?
- What does *verb* mean?
- What is *carrot cake*?

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Japanese traffic lights are green (as required by international agreements). However they are typically called 青い *aoi* “blue”, the same word as the color of the sky. Historically this color historically covered both green and blue “grue”, with 緑 *midori* “green” being a later addition. For this reason, the Japanese government decided in 1973 to change the color of the go light to the bluest possible hue of green!

The Japanese traffic light blues: Stop on red, go on what?

# Word Meaning and Sentence Meaning

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- We store information about words in our **mental lexicon**
  - It is still unclear what exactly a word is!
- Words can be combined to form an infinite number of expressions
  - This building up of meaning is referred to as **composition**
  - If the meaning of the whole can be deduced from the parts then it is **compositional**

# Reference and Sense

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- Words **refer** to things in the world (like **unicorns**)
- The meaning of a word across different contexts is often referred to as its **sense**
  - Same word can refer to different things
    - \* English: *I put my money in the bank*
    - \* English: *I fell asleep at the river bank*
  - Same basic concept can have different boundaries
    - \* French: *mouton* “sheep/mutton”
    - \* English: *sheep* vs *mutton*
    - \* Japanese: *hato* “dove/pigeon”
    - \* English: *dove* vs *pigeon*

# Representing meaning

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- One of our goals will be to represent meaning
- There are various ways to do this
  - Syntactic trees
  - Logical forms
  - Thesauri and Ontologies
  - Translation
  - Paraphrasing

Can you think of others?

- At the end of this course you should be able to use these to describe many aspects of meaning

# Language is normally under-specified

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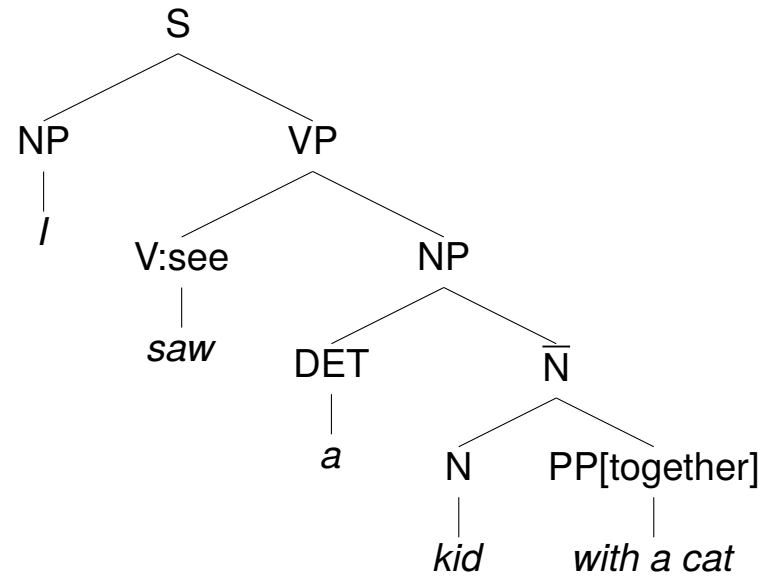
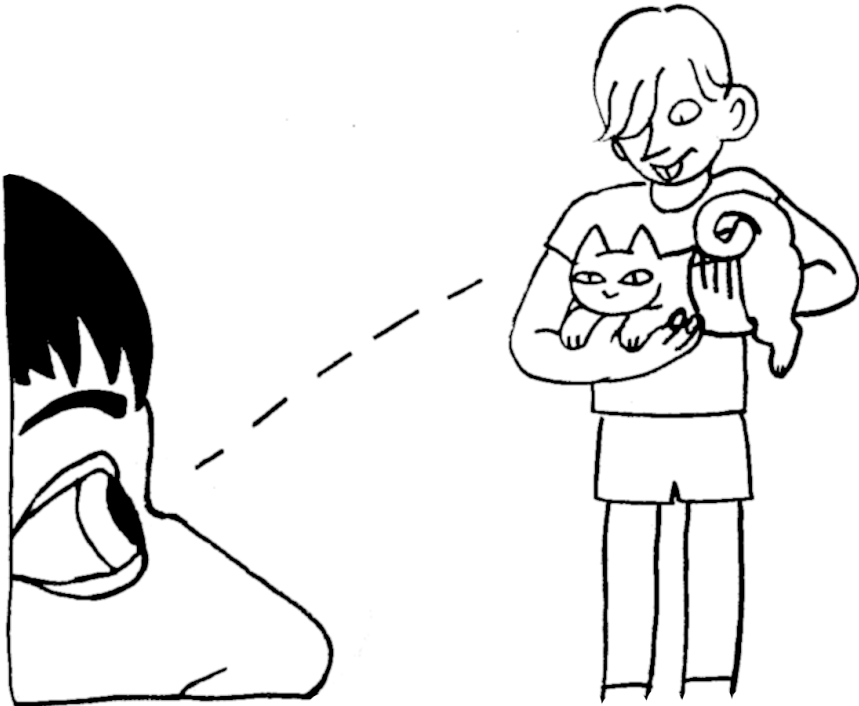
We get **words**:

*I saw a kid with a cat.*

We want **meaning**:



# I saw a kid with a cat<sub>1</sub>



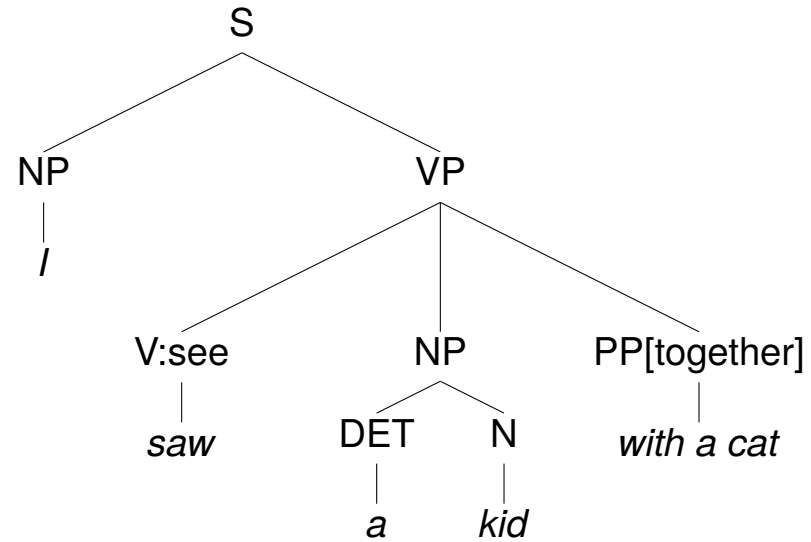
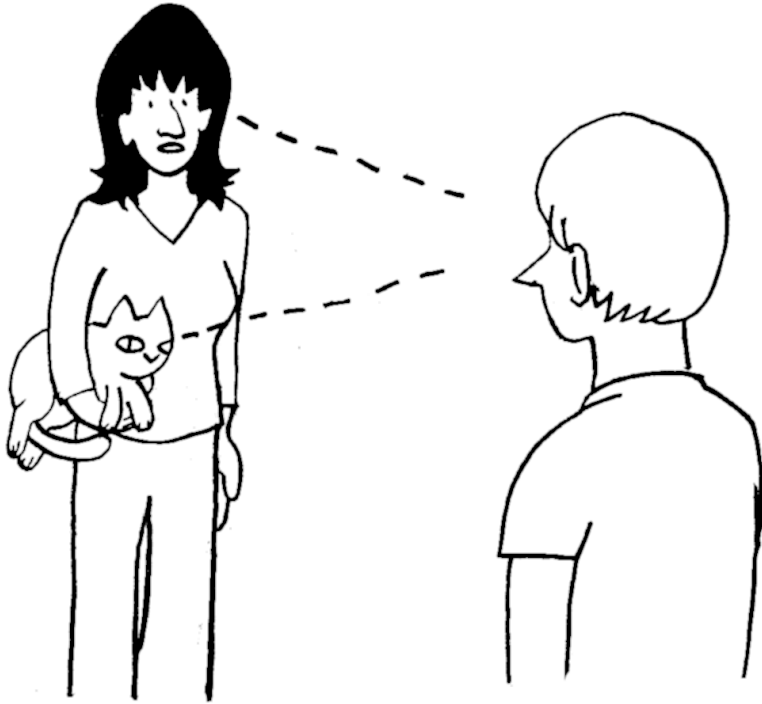
*see(I, kid: past); with(kid, cat)*

*see*  $\subset$  *perceive*

*kid*  $\sim$  *child*

*with*  $\subset$  *together*

# I saw a kid with a cat<sub>2</sub>



see(I, kid: past) with(I, cat)

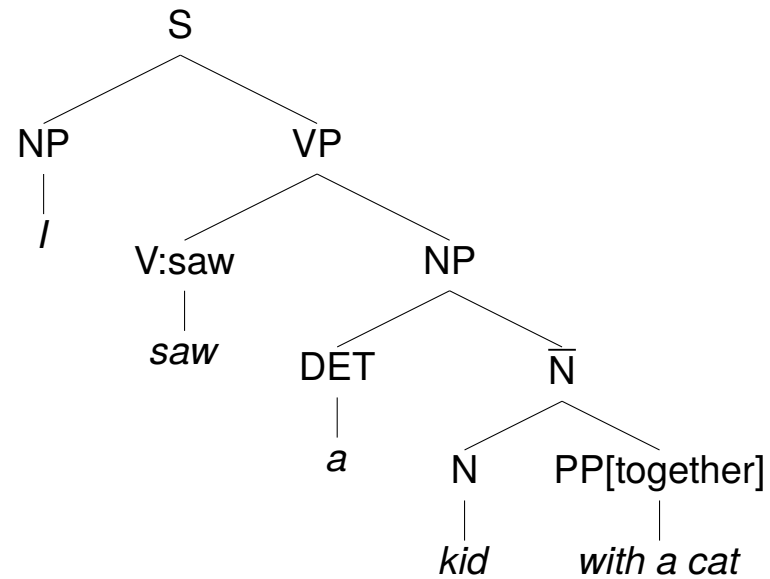
see  $\subset$  perceive

kid  $\sim$  child

with  $\subset$  together



# I saw a kid with a cat<sub>3</sub>



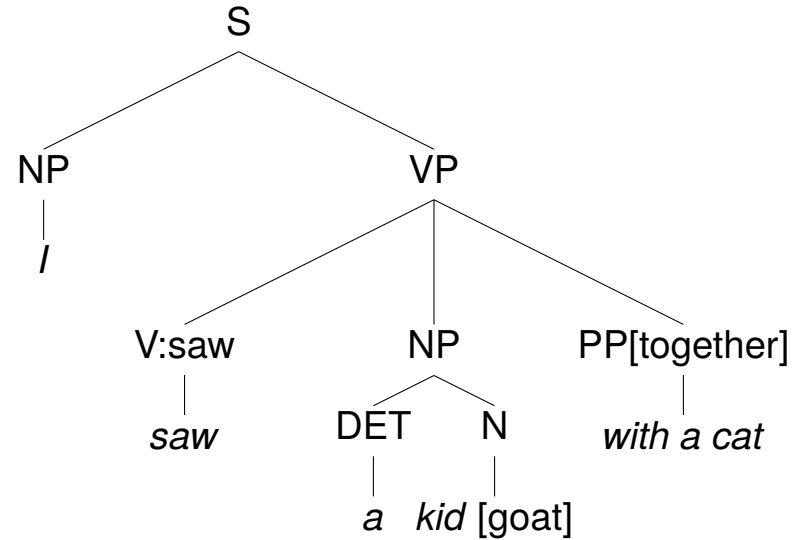
`saw(I, kid: pres); with(kid, cat)`

`saw  $\subset$  cut`

`kid  $\sim$  child`

`with  $\subset$  together`

# I saw a kid with a cat<sub>4</sub>



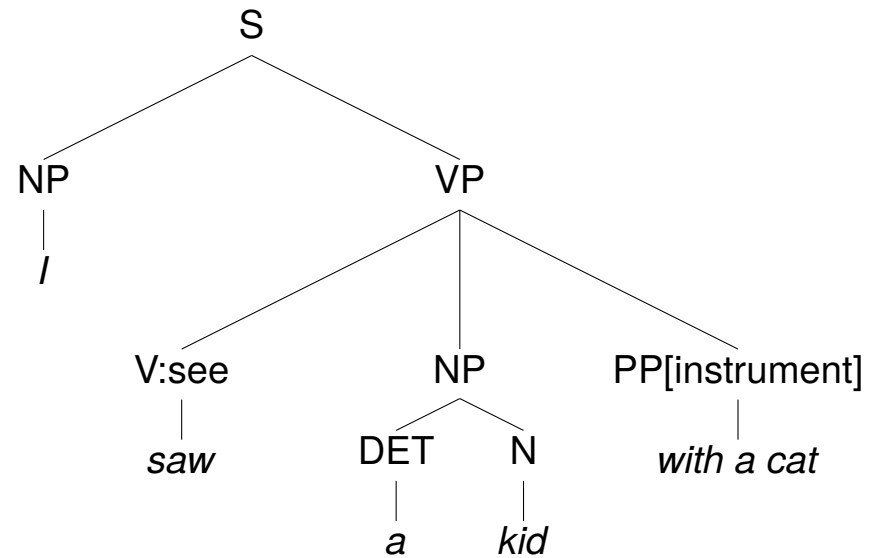
*saw(I, kid: present) with(I, cat)*

*saw*  $\subset$  *cut*

*kid*  $\sim$  *young goat*

*with*  $\subset$  *together*

# I saw a kid with a cat<sub>5</sub>



see(I, kid: past) with(I, cat)

see  $\subset$  perceive

kid  $\sim$  child

with  $\subset$  instrumental

## We can also use translations

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- (1) 我 看到了 一个抱着 猫 的 孩子  
wǒ kàndào le yīgè bào zhe māo de hái zi.  
I saw one holding cat 's child  
I did see a child holding a cat
- (2) 我 抱着 猫 看到了 一个 孩子  
wǒ bào zhe māo kàndào le yīgè hái zi  
I holding cat saw one child  
I holding a cat did see a child
- (3) 我 锯锯 一个 孩子 和 他/她 的 猫  
wǒ jù jù yīgè hái zi hé tā/tā de māo  
I saw one child and he/she 's cat  
I saw a child and their cat

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- (4) 我 和 一 只 猫 锯 锯 一 只 小 山 羊  
wǒ hē yīzhǐ māo jù yīzhǐ xiǎo shānyáng  
I and one cat saw one small goat  
I and a child saw a young goat
- (5) 我 用 一 只 猫 看 到 了 一 个 孩 子  
wǒ yòng yīzhǐ māo kàndào le yīgè hái zi  
I use one cat saw one child  
Using a cat, I did see a child

Your turn: try to paraphrase — translate into English  
aim to be unambiguous, even if slightly disfluent



# Administrivia

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**Coordinator** Francis Bond <bond@ieee.org>

!<francis.bond@upol.cz>

Details will all be online:

<https://bond-lab.github.io/Semantics/>

# Extra Credit

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- If you submit a correction that gets accepted for one of the resources we use then it shows good mastery of the material
  - you can get 1-5% extra credit (depending on the size/difficulty)  
Mark  $n \propto 10^{n-1}$  lines of code/documentation
  - You can't go over 100%
- A correction can involve
  - fixing an error in transcription or annotation
    - \* spelling error
    - \* wrong sense
    - \* error in the dictionary
  - making the documentation easy to read
  - pointing out an error in a translation / finding a new translation

# Student Responsibilities

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By remaining in this class, the student agrees to:

1. Make a good-faith effort to learn and enjoy the material.
2. Read assigned texts and participate in class discussions and activities.
3. Submit assignments on time.
4. Attend class at all times, barring special circumstances.
5. Get help early: approach us when you first have trouble understanding a concept or homework problem rather than complaining about a lack of understanding afterward.
6. Treat other students with respect in all class-related activities, including on-line discussions.



# Attendance

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1. You are expected to attend all classes.
2. Be on time - lateness is disruptive to your own and others' learning.
3. Valid reasons for missing class include the following:
  - (a) A medical emergency (including mental health emergencies)
  - (b) A family emergency (death, birth, natural disaster, etc).
4. There will be significant material covered in class that is not in your readings. You cannot expect to do well without coming to class.
5. If you miss a class, it is your responsibility to get the notes, any handouts you missed, schedule changes, etc. from a classmate.

# Remediation and Academic Integrity

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1. No late work will be accepted, except in the case of a documented excuse.
2. For planned, justified, absences on class days or days on which assignments are due, advance notice must be provided.
3. Cheating will not be tolerated. Violations, including plagiarism, will be seriously dealt with, and could result in **a failing grade for the entire course**.
4. Refer to the University Honour Code
5. As always, use your common sense and conscience.

# The winning strategy

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- Read the stories before class (and after again, if necessary)
- Work together: make study groups
- Tasks: Discuss as much as you want (but not project 1), annotate your own answers
- Ask questions ... early and often!