

# Computational Semantics and Pragmatics

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# Practical Matters

- **Lecturer:** Raquel Fernández  
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- **Website:** Slides, references, and other important information will be posted on the course's website:  
<http://www.illc.uva.nl/~raquel/teaching/cosp/cosp2013/>
- **Timetable:**
  - \* Tuesdays 1-3pm, room G3.13
  - \* Wednesdays 3-5pm, room A1.06

# What is this course about?

Obviously about the semantics and pragmatics of natural language: about meaning and interpretation in context, and about language use in interaction.

The course is also about using **computational** and **empirical** methods to explore semantic/pragmatic phenomena.

The field is huge. We'll focus on three topics:

- **Lexical semantics:** models of the meaning of words.
- **Referring expressions:** production and resolution of linguistic expressions that refer to entities.
- **Dialogue interaction:** referring in dialogue, dialogue acts, interaction management.

# Prerequisites

No formal prerequisites are required to follow the course. However, some basic things are expected from you:

- I'll assume some basic knowledge of **semantics and pragmatics**
- an **empirical orientation**: an interest in the empirical evidence behind theoretical claims; and in working with existing data, or in collecting data via experiments.
- a **computational inclination**: an interest in computational methods of enquiry and evaluation
  - \* if you don't know any programming, you are still welcome
  - \* you are encouraged to learn some basic programming skills
  - \* if you have programming knowledge, you'll have the chance to use it

# Learning Outcomes

To succeed in the course, you should demonstrate an understanding of the topics covered by being able to:

- **Analyse** and critique the research questions and the methodology used to address them in existing relevant literature.
- **Formulate** your own research questions within the scope of the course.
- **Apply** appropriate (empirical/computational) techniques to address your research questions.
- **Write** about the work of others and your own work in proper scientific style.
- **Present** the work of others and your own work to an audience in a clear and engaging way.

# Evaluation

- **Coursework: 30%**
  - \* some homework exercises
  - \* reading and discussion of relevant research papers
  - \* presentation of existing research papers
- **Final project (paper + presentation): 70%**
  - \* on-topic philosophical/theoretical essays are in principle OK, but
  - \* ideally, your project should include an empirical/computational component, e.g. analysis of real data or some sort of implementation

# Final Projects

Any topic related to the themes covered in the course. A few ideas on possible types of projects (abstracting over particular topics):

- a quantitative corpus study of some interesting phenomenon
- a machine learning experiment using an existing corpus
- an analysis of data collected by yourself in an experiment
- an analysis and small extension of a paper from the literature
- an analysis of interesting connections between different approaches
- ...

Some options in this list may seem unfeasible to you, but they may be perfectly possible – don't abandon an interesting idea before discussing it with me!

# Timeline

- Roughly two weeks per topic (5/6 weeks)
- The last two weeks of the course will be dedicated to working on your project with supervision from my part
  - \* week 6: approval on project topic + presentation of project ideas
  - \* week 7: individual project work + supervision
  - \* week 8: final presentation of project
- Deadline for final paper: Sunday 27 October (no extensions)

It might be possible to work in pairs – to be decided on a case by case basis.

<http://www.illc.uva.nl/~raquel/teaching/cosp/cosp2013/>



# Overview of Topics

# Lexical Semantics

Lexical semantics is concerned with the meaning of words.

- “traditional / knowledge-based” lexical semantics:  
structure of the lexicon; word senses; semantic relations
  - \* corpus- and thesaurus-based resources
- **distributional semantic models** (data-driven / use-based)
  - \* vectors representing contexts of use
  - \* semantic similarity

Lenci (2008) Distributional Semantics in Linguistic and Cognitive Research, *Italian Journal of Linguistics*, 20(1):1–30.

Turney & Pantel (2010) From Frequency to Meaning: Vector Space Models of Semantics, *Journal of Artificial Intelligence Research*, 37:141–188.

# Referring Expressions

Linguistic expressions used to refer to entities.

- Comprehension side: resolution of referring expressions
  - \* text / discourse: anaphora resolution, coreference
  - \* visual world scenarios
- Production side: generation of referring expressions
  - \* which expression to choose (connection with Gricean pragmatics)

We will mostly look into the **generation of referring expressions**.

Krahmer & van Deemter (2012) Computational Generation of Referring Expressions: A Survey, *Computational Linguistics*, 38(1):173–218.

# Towards Dialogue: Collaborative Reference

Referring is a joint process by speakers and addressees.

A: A docksider.

B: A what?

A: Um.

B: Is that a kind of dog?

A: No, it's a kind of um leather shoe, kinda pennyloafer.

B: Okay, okay, got it.



⇒ Thereafter “the pennyloafer”

Clark & Wilkes-Gibbs (1986). Referring as a collaborative process. *Cognition*, 22:1–39.

Brennan & Clark (1996). Conceptual pacts and lexical choice in conversation. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 22:1482–1493.

# Some Issues in Dialogue

- dialogue acts ( $\approx$  speech acts)
- convergence: cooperation vs. priming
- timing and turn-taking

Raquel Fernández. Dialogue. In R. Mitkov (ed.) *Oxford Handbook of Computational Linguistics*, 2nd Edition. Oxford University Press. To appear.

## Two Relevant Upcoming Events

The 5th Biennial Conference of Experimental Pragmatics (XPRAG 2013)  
4-6 September, Utrecht

<http://xprag2013.wp.hum.uu.nl/>

The 17th Workshop on the Semantics and Pragmatics of Dialogue (DialDam)  
16-18 December, Amsterdam

<http://www.illc.uva.nl/semdial/dialdam/>