Semantic Theory
Week 12 – Current issues in Semantic Theory

Noortje Venhuizen

Universität des Saarlandes

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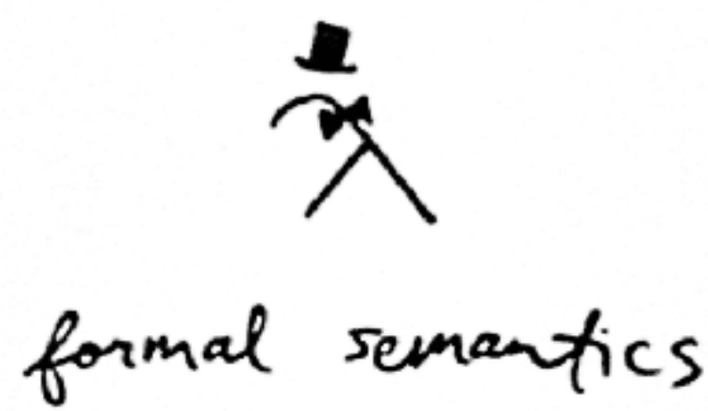
Semantic Theory

Topics covered in this course:

Predicate logic - Type Theory - Lambda Calculus - Generalised Quantifiers - Event Semantics - Dynamic Semantics - Discourse Representation Theory - Presuppositions - Neural Semantics



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Open questions

I. What is meaning?

Truth-conditions vs. context-change potential vs. answering the Question Under Discussion

II. Which phenomena should be captured by a semantic formalism?

Syntax vs. Semantics vs. Pragmatics

III. How to validate predictions from formal semantic theories?

Experimental approaches, Computational Semantics

Communication as question-answering

The Goal of communication: to determine what the world is like.

But: an exhaustive characterisation of the current state of the world – “The Big Question” (Roberts, 1996) – is too big a task

- What makes certain issues more important to us than others has to do with our goals
- Therefore, we establish certain subgoals, which take the form of issues to be resolved or Questions Under Discussion (QUDs)
- Content that addresses the QUD is called *at-issue* content; all other content is *not at-issue*

Roberts, 1996; 2012; Simons et al. 2010; Tonhauser et al. 2013

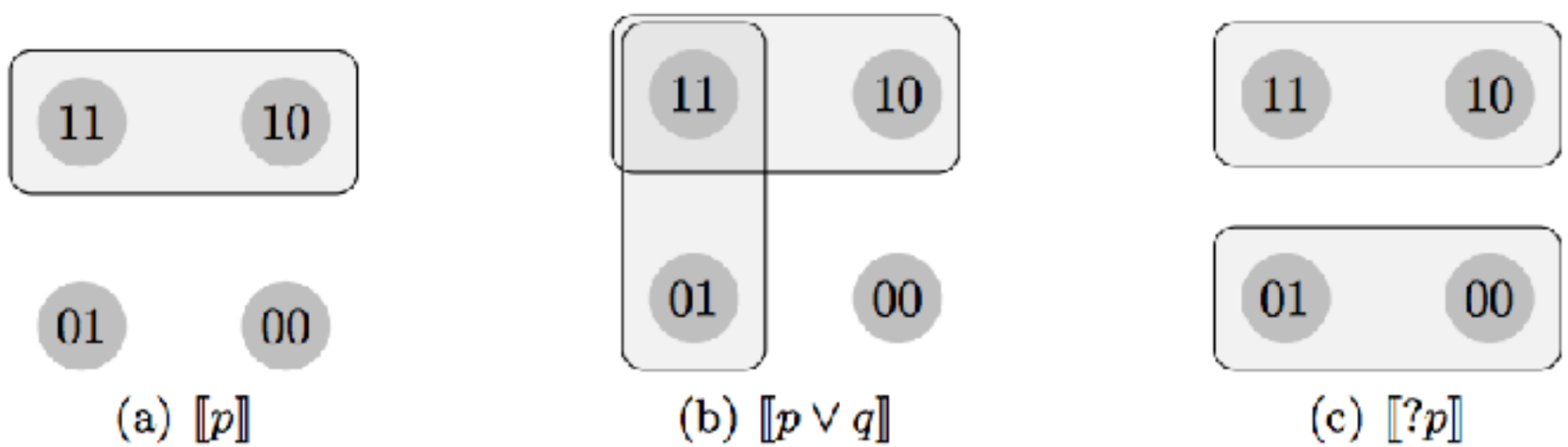
Inquisitive semantics

"Meaning is Information EXchange Potential"

(1) $[\![\text{John plays}]\!]^{M,w,g} := \{\lambda v.\text{play}(\text{John})(v)\} :: \langle s, t\rangle$

(2) $[\![\text{John or Bill plays}]\!]^{M,w,g} := \{\lambda v.\text{play}(\text{John})(v), \lambda v.\text{play}(\text{Bill})(v)\}$

(3) $[\![\text{Does John play?}]\!]^{M,w,g} := \{\lambda v.\text{play}(\text{John})(v), \lambda v.\neg\text{play}(\text{John})(v)\}$



(Groenendijk, 2009; Groenendijk & Roelofsen, 2009)

Defining the playing field of semantic theory

What can/should be captured in a semantic formalism?

The syntax-semantics interface:

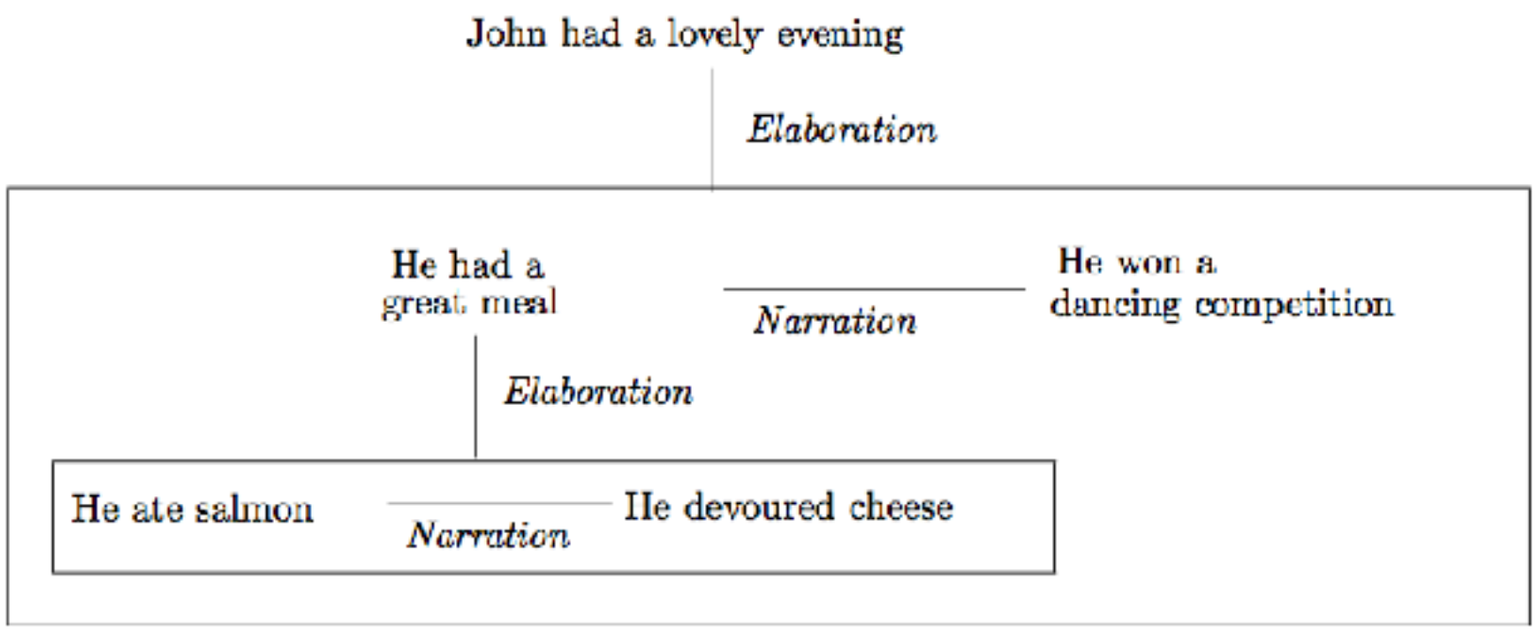
- quantification, anaphora, tense and aspect, thematic roles, …

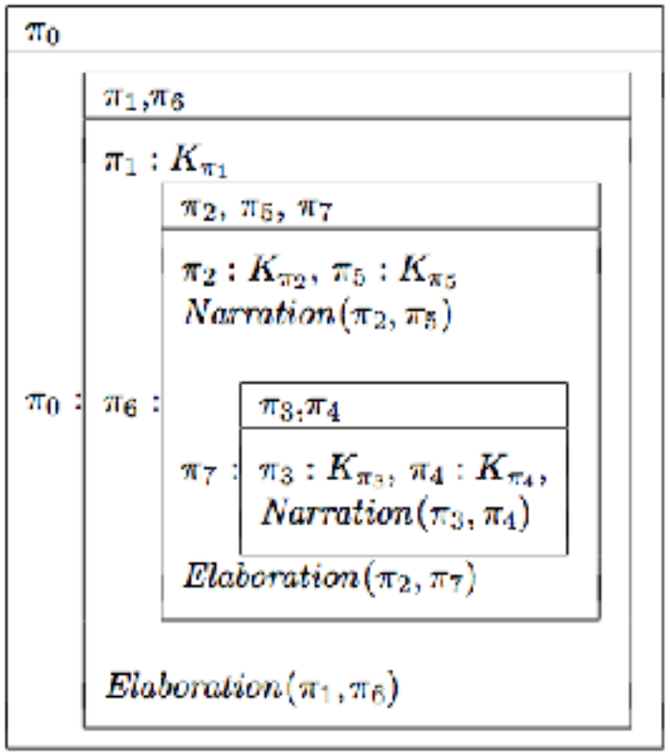
The semantics-pragmatics interface:

- rhetorical structure, implicature, presuppositions, information structure, …

Beyond truth-conditional meaning: Rhetorical Structure

(1) John had a great evening last night. He had a great meal. He ate salmon. He devoured lots of cheese. He won a dancing competition. ??It was a beautiful pink.





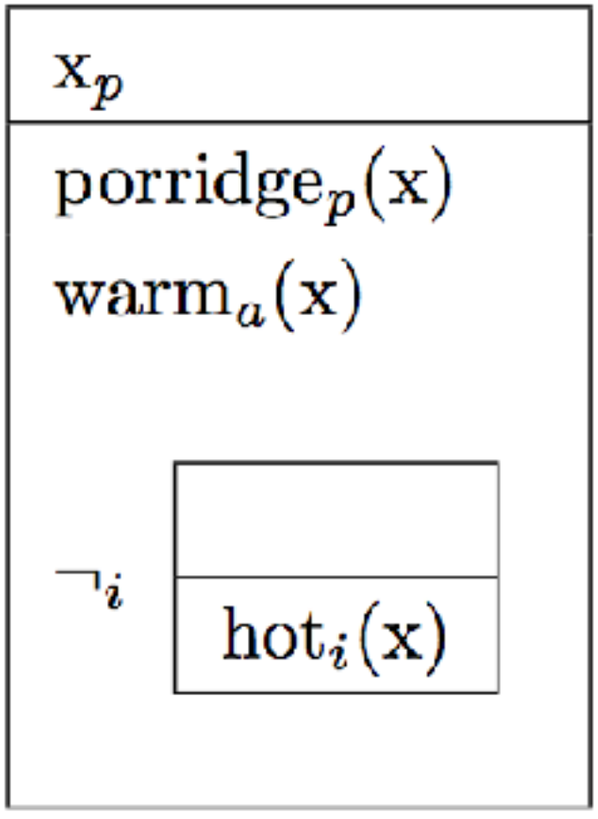
Segmented DRT: DRT with discourse relations

(Asher, 1992; Asher & Lascarides, 2003)

Beyond truth-conditional meaning: Implicature

(1) a. The porridge is warm. As a matter of fact, it is hot.
b. ?The porridge is warm. As a matter of fact, it is cold.

Layered DRT: DRT with multiple layers of meaning



Geurts & Maier 2003; 2013

Beyond truth-conditional meaning: Information structure

(1) John has a sister. He visits her every week. → assertion

(2) John visits his sister every week. → presupposition

(3) John, who has a sister, visits her every week → conventional implicature

Projective Discourse Representation Theory (PDRT): DRT with information structure

1

2 ←x 3 ←y
2 ←x=john 3 ←sister(y) 3 ←of(y,x) 1 ←visit_weekly(x,y)
$1 \leq 2$ $1 < 3$ $3 = 2$

Venhuizen, 2015; Venhuizen et al. 2018

Formal semantics in the real world

How to apply and evaluate formal linguistic theories?

⇒ Testing predictions from formal semantic theories using psycholinguistic methods (questionnaires, eye-tracking, EEG)

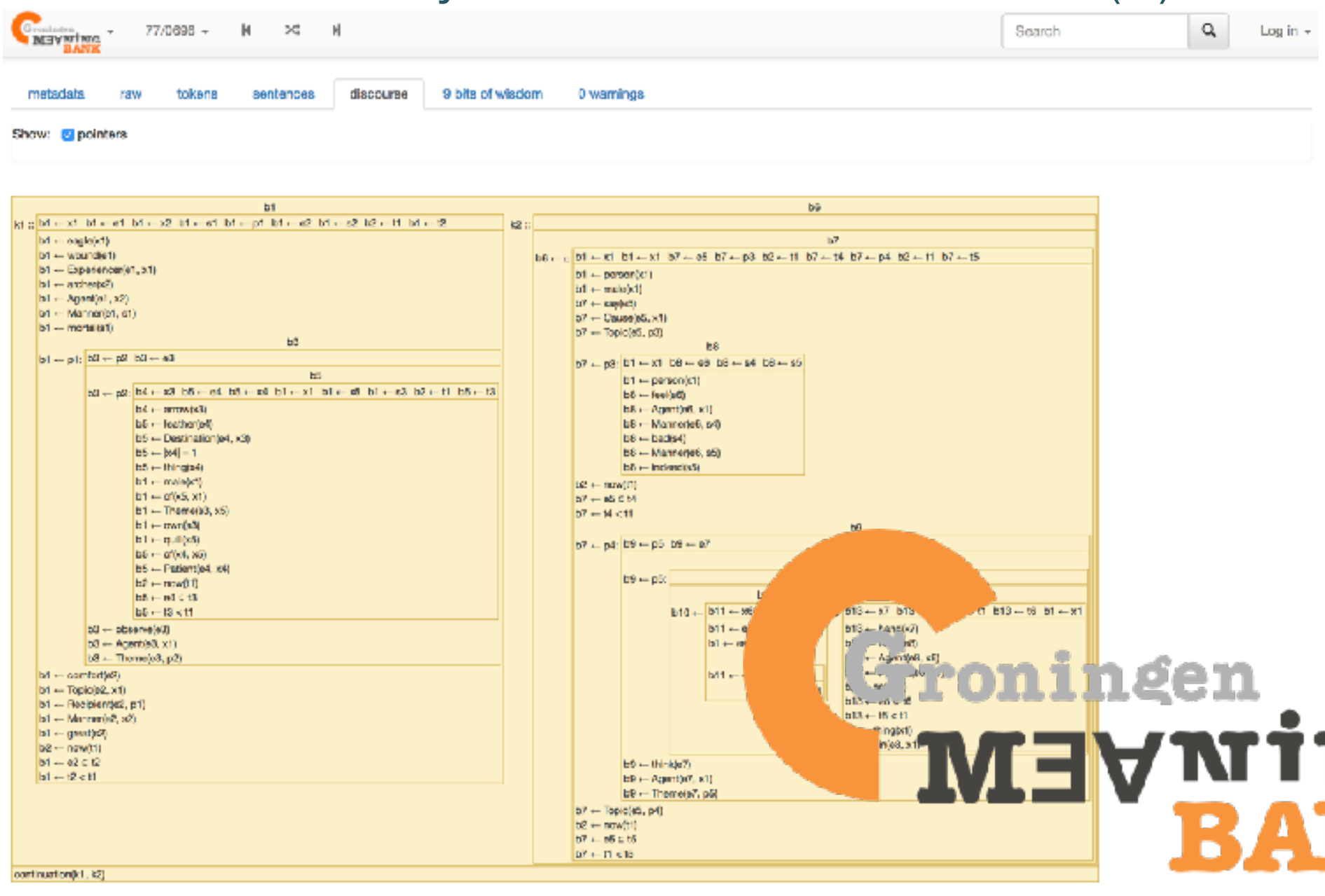
- Geurts et al. (2010); Chemla et al. (2011); Florian Schwarz (ed., 2015), …

⇐ Using implementations of semantic formalisms to perform large-scale computational semantic analyses

- PDRT-Sandbox (Brouwer & Venhuizen, 2013)
- Boxer (Bos, 2008)
- The Groningen Meaning Bank (Basile et al., 2013; Bos et al., 2017)

Groningen Meaning Bank

Corpus of semantically annotated texts – with (P)DRSs!



Semantic Theory: from past to present (and future?)

But first… the exam!

- The date for the final exam is: **Tuesday July 17, 10am (sharp!)**
- You can (have to!) register for the exam: until Wednesday (04.07)
- You can find a practice exam at:
  http://njvenhuizen.github.io/teaching/ST18/practice_exam.pdf
- As well as an example of the supplementary materials:
  http://njvenhuizen.github.io/teaching/ST18/practice_exam_suppl.pdf
- Next Thursday: Q&A. Take a look at the practice exam, previous exercises, and the slides — Prepare questions!

Links

- Groningen Meaning Bank:
  http://gmb.let.rug.nl

- Groningen Meaning Bank Web Demo:
  http://gmb.let.rug.nl/webdemo/demo.php