Semantic Theory
Week 12 – Current issues in Semantic Theory

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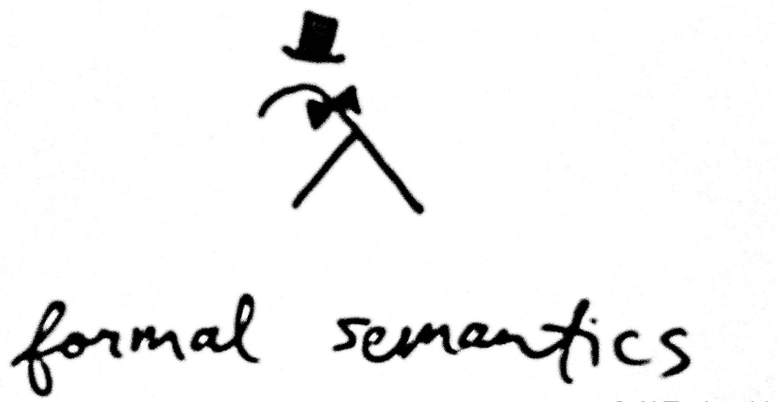
Semantic Theory

Topics covered in this course:

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



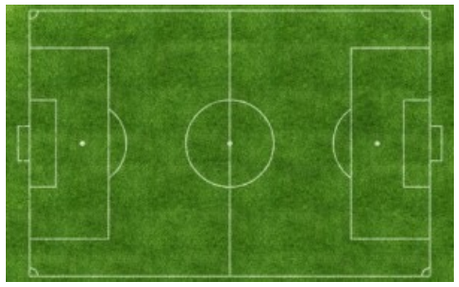
Open questions

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

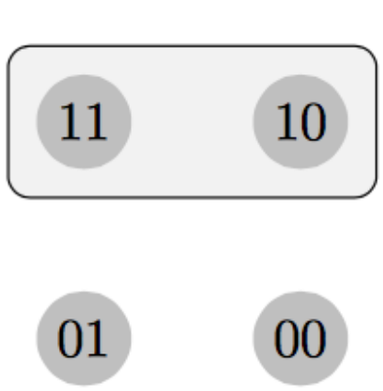
Inquisitive semantics

“Meaning is Information EXchange Potential”

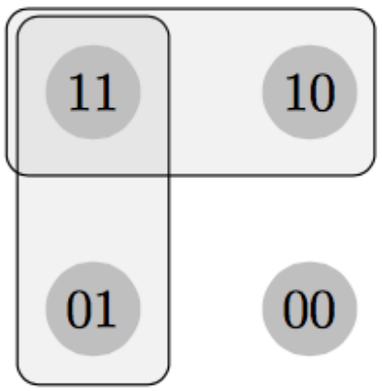
(1) $[\![\text{John plays}]\!]^{M,w,g} := \{\lambda v.\text{play}(\text{John})(v)\} :: \langle s, t\rangle$

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

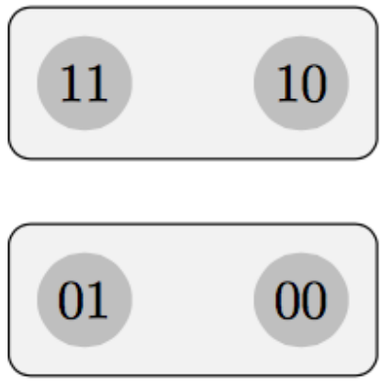
(3) $[\![\text{Does John play?}]\!]^{M,w,g} := \{\lambda v.\text{play}(\text{John})(v), \lambda v.\neg\text{play}(\text{John})(v)\}$



(a) $[\![p]\!]$



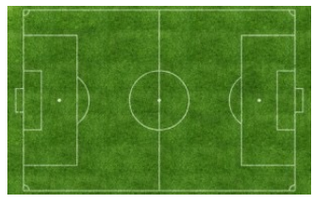
(b) $[\![p \vee q]\!]$



(c) $[\![?p]\!]$

(Groenendijk, 2009; Groenendijk & Roelofsen, 2009)

Defining the playing field of semantic theory



What can/should be captured in a semantic formalism?

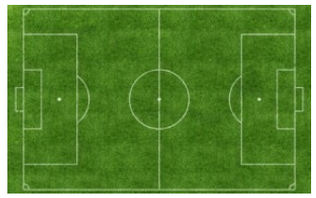
The syntax-semantics interface:

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

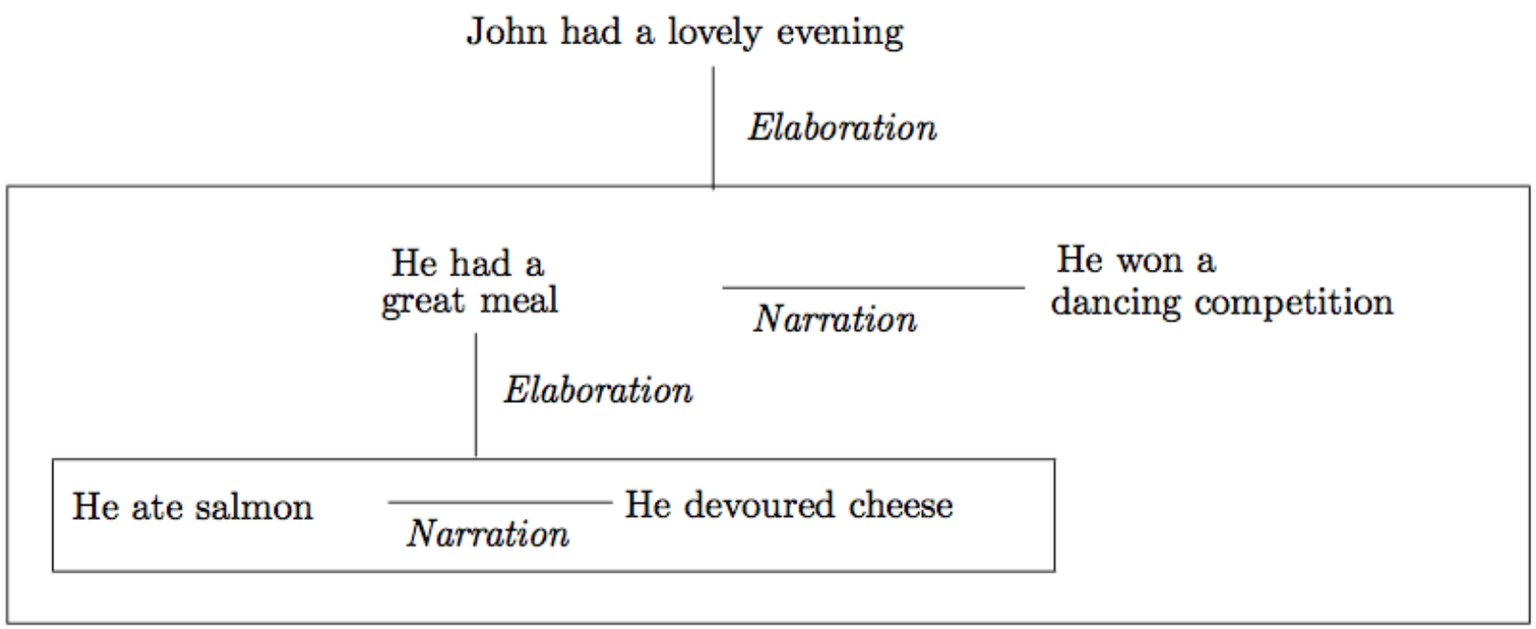
The semantics-pragmatics interface:

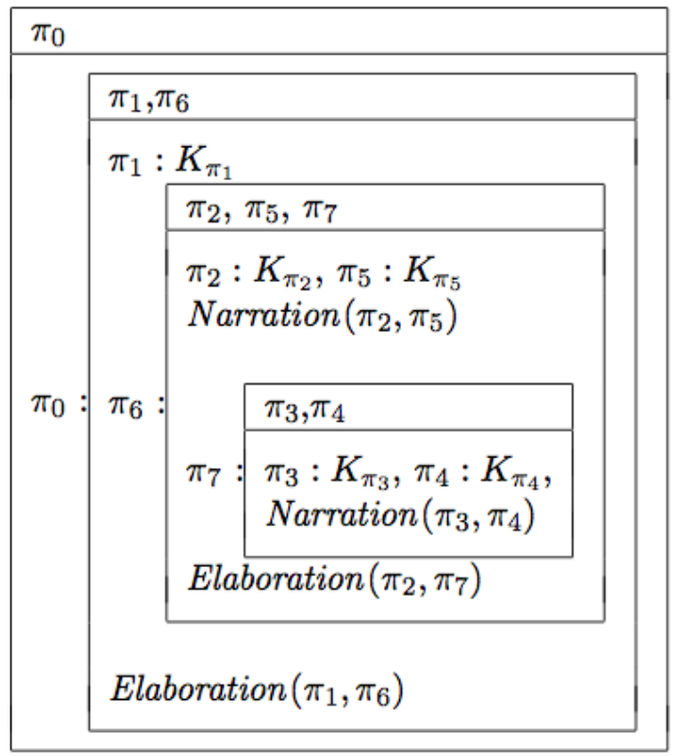
- rhetorical structure, implicature, presuppositions, information structure, …

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.

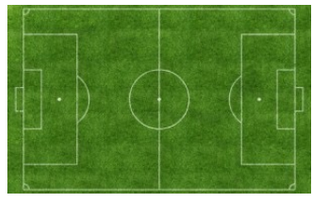




Segmented DRT: DRT with discourse relations

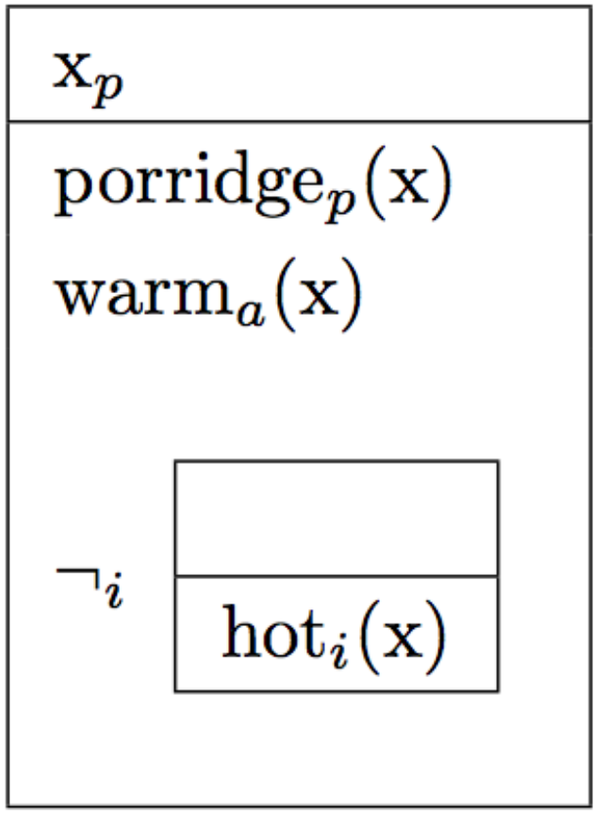
(Asher, 1992; Asher & Lascarides, 2003)

Beyond truth-conditional meaning: Implicature



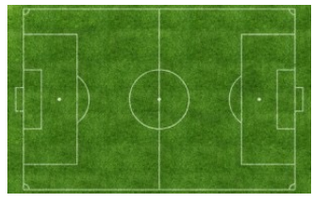
(1) a. The porridge is warm. As a matter of fact, it is hot.
b. ?The porridge is warm. As a matter of fact, it is cold.

Layered DRT: DRT with multiple layers of meaning



Geurts & Maier 2003; 2013

Beyond truth-conditional meaning: Information structure

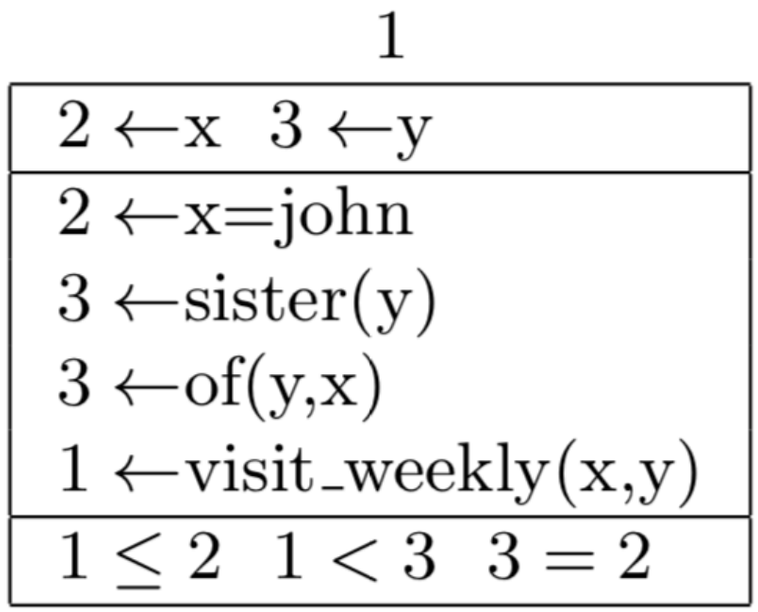


(1) John <u>has a sister</u>. He visits her every week. → assertion

(2) John visits <u>his sister</u> every week. → presupposition

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

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



Venhuizen, 2015; Venhuizen et al. 2018

Beyond tru
Information

(1) John has a

(2) John visits

(3) John, who

Projective Dis
DRT with infc

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OXFORD

Discourse Semantics with Information Structure

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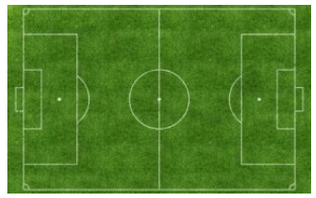
Abstract

The property of projection poses a challenge to formal semantic theories, due to its apparent non-compositional nature. Projected content is therefore typically analyzed as being different from and independent of asserted content. Recent evidence, however, suggests that these types of content in fact closely interact, thereby calling for a more integrated analysis that captures their similarities, while respecting their differences. Here, we propose such a unified, compositional semantic analysis of asserted and projected content. Our analysis captures the similarities and differences between presuppositions, anaphora, conventional implicatures and assertions on the basis of their *information structure*, that is, on basis of *how* their content is contributed to the unfolding discourse context. We formalize our analysis in an extension of the dynamic semantic framework of Discourse Representation Theory (DRT)—called Projective DRT (PDRT)—that employs projection variables to capture the information-structural aspects of semantic content; different constellations of such variables capture the differences between the different types of projected and asserted content within a single dimension of meaning. We formally derive



ssertion
resupposition
onventional
implicature

DRT):

15; 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)

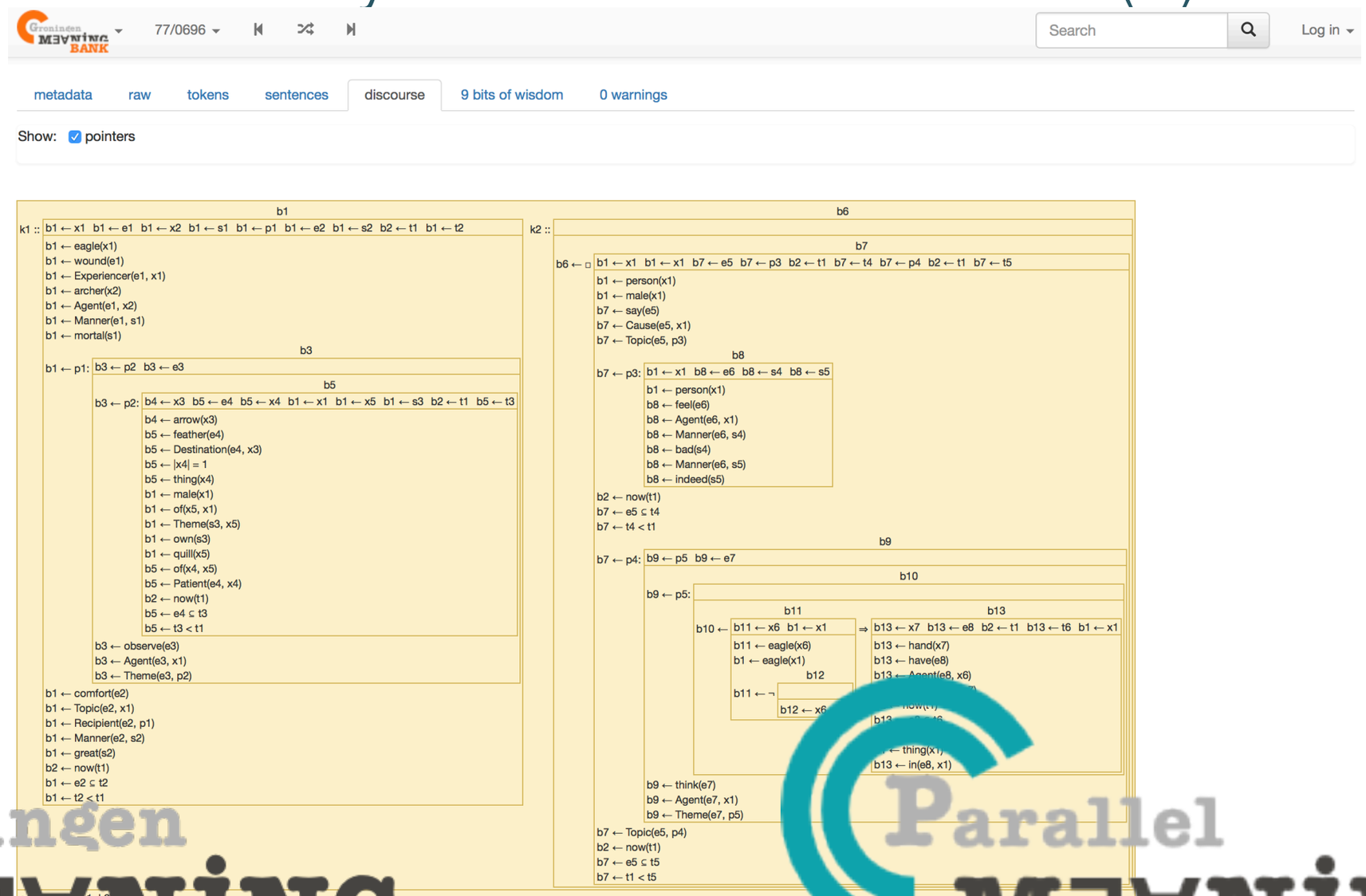
- Geurts et al. (2010); Chemla et al. (2011); Florian Schwarz (ed., 2015), …

⇐ 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!



Groningen MEANING BANK

Parallel MEANING BANK

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

But first… the exam!

- The date for the final exam is: **Thursday July 18, 10am (sharp!)**
- You can (have to!) register for the exam
- You can find a practice exam at: http://njvenhuizen.github.io/teaching/ST19/practice_exam.pdf
- As well as an example of the supplementary materials: http://njvenhuizen.github.io/teaching/ST19/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

- Parallel Meaning Bank:
  http://pmb.let.rug.nl

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