

# Philosophy and Theoretical Linguistics meet the New Neurosciences of Language

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## Course Description

One aim of contemporary formal semantics and philosophy of language is to explain how we use of natural languages. This requires building models of how we represent and compute the meanings of various types of complex expressions, including those involving adjectives, adverbs, and quantifiers. It is often extremely hard to come up with empirical evidence to discriminate between competing models. However, recent advances in Cognitive Neuroscience allow us to consider a wider and richer array of data, and many scientists claim that neuroscientific data will prove to be crucial for the advancement of the cognitive sciences, including the study of language. The aim of this course is to consider various competing models of natural language phenomena that have played an important role in philosophy and linguistics, and then critically examine recent neuroscientific experiments that aim to discriminate amongst them. The class will be decided into various case studies, and at each stage we will critically examine the conditions under which neuroscientific data can be usefully applied to advance the cognitive science of language. We will also explore fundamental philosophical topics such as reductionism and multiple-realizability.

## Course Materials

All readings are available on the course website. ‘**R**’ stands for required readings, and ‘**OP**’ for optional readings.

## Grading Policy

The grade will be determined on the basis of a team presentation (30%), class participation (20%), and a final paper (50%). The paper can be theoretical, or include a fully specified set of experiments that bear on a theoretical debate. In the presentation, the task is to use the assigned readings to make a positive case for a particular view. The class participation is determined on the basis of responses to student presentations.

## Topics and Readings

**Oct 6: Cognitive Science, Neuroscience, and Language: Overview of the Issues**

**OP** Chomsky, “Linguistics and Brain Science”

**OP** Poeppel and Embick, “Defining the relation between linguistics and neuroscience”

**OP** Marr and Poggio, “From Understanding Computation to Understanding Neural Circuitry”

**Oct 13: Cognitive Science, Neuroscience, and Language: Overview of the Issues**

**OP** Marr and Poggio, “From Understanding Computation to Understanding Neural Circuitry”

**OP** Del Pinal and Nathan (2013) “There and Up Again: On the uses and misuses of neuroimaging in psychology” in *Cognitive Neuropsychology*.

**Oct 20: Truth-Conditional Semantics: Primer on the State of the Art**

**R** Pyllkanen, “The Syntax-Semantics Interface: Online Composition of Sentence Meaning” *Handbook of Psycholinguistics*. Sections 1-2

**R** Berwick et al. (2013) “Evolution, brain, and the nature of language”, in *Trends in Cognitive Science* 17(2)

**R** Partee, “Semantics—Mathematics or Psychology?”

**OP SGG:** Chpt. 1-3

**Oct 27: Neurolinguistics: The Neural Correlates of Compositionality?**

**R** Pyllkanen (2013), “Grounding the cognitive neuroscience of semantics in linguistic theory” in *Language and Cognitive Processes* vol. 26:9: 1317-1337

**OP** Pyllkanen (2011) “Simple Composition: A Magnetoencephalography Investigation into the Comprehension of Minimal Linguistic Phrases”

**OP** Hagoort (2014) “The Neurobiology of Language Beyond Single Words” in *Annual Review of Neuroscience* 347-62

**Nov 3: Neurolinguistics: The Neural Correlates of Compositionality (Continued)?**

**R** Pyllkanen (2013), “Grounding the cognitive neuroscience of semantics in linguistic theory” in *Language and Cognitive Processes* vol. 26:9: 1317-1337

**OP** Pyllkanen (2011) “Simple Composition: A Magnetoencephalography Investigation into the Comprehension of Minimal Linguistic Phrases”

**OP** Hagoort (2014) “The Neurobiology of Language Beyond Single Words” in *Annual Review of Neuroscience* 347-62

**Nov 10: Strong vs. Weak Compositionality: The Theories**

**R** Szabo, (2012) “The Case for Compositionality” in Werning et al. (eds.) *The Oxford Handbook of Compositionality*, Oxford University Press

**R** Recanati (2010) “Compositionality, Flexibility, and Context-Dependency” in *Truth-Conditional Pragmatics* Chapter 1.

**Nov 17: In Favor of Weak Compositionality**

**R** Murphy (2012) “Big Book of Concepts” Chapter 12

**OP** Baggio and Hagoort (2012) “The Processing Consequences of Compositionality” in Werning et al. (eds.) *The Oxford Handbook of Compositionality*, Oxford University Press

**OP** Hagoort et al. (2004) “Integration of Word Meaning and World Knowledge in Language Comprehension” in *Science*: vol 304 pp. 438-41.

**OP** Johnson and Keil, “Explanatory Understanding and Conceptual Combination”

**Nov 24: In Favor of Strong Compositionality**

**R** Asher (2011) “Lexical Meaning in Context”, Chpt 3.

**OP** Pylkkanen (2011) “Rules, Radical Pragmatics and Regular Polysemy” in *Journal of Semantics*

**OP** McElree et al. (2006) “The time course of retrieving conceptual information: A speed-accuracy tradeoff”. *Psychonomic Bulletin and Review*.

**OP** Swiney et al. (2007) “Conceptual Combination During Sentence Comprehension: Evidence for Compositional Processes”, *Psychological Sciences*

**Dec 1: NO CLASS**

**Dec 8: The Lexicon: The theories**

**R** Elbourne (2011), *Meaning: A slim guide to semantics* chpt 1-3

**Dec 15: The Lexicon: The case for atomic theories**

**R** Rey (1983) “Concepts and Stereotypes” *Cognition* (15): 237-262

**OP** Fodor (1998) *Concepts* Chapter 3-5.

**OP** Fodor et al., (1980) “Against Definitions” *Cognition* 8: 263-361

**OP** Gleitman et al. (2012) “Can Prototype Representations Support Composition and Decomposition?” in Werning et al. (eds.) *The Oxford Handbook of Compositionality*, Oxford University Press

**Jan 12: The Lexicon: The case for molecular theories**

**R** Hampton, “Concept as Prototypes” *The psychology of learning and motivation* 46, 79-113.

**OP** Sasson, “Adjectival vs nominal categorization processes”

**OP** Prinz (2012) “Regaining Composure: a Defence of Prototype Compositionality” in Werning et al. (eds.) *The Oxford Handbook of Compositionality*, Oxford University Press

**Jan 19: The Lexicon: The case for molecular theories**

**R** Leslie, (2014) “Hillary Clinton is the only man in the Obama administration: Dual Character Concepts, Generics and Gender” in *Analytic Philosophy*

**R** Knobe et al. (2013) “Dual Character Concepts and the normative dimension of conceptual representation” in *Cognition* (127): 242-257

**Jan 26: The Lexicon: The case for Embodied Theories**

**R** Binder and Desai, “The Neurobiology of Semantic Memory” *Trends in the Cognitive Sciences* (15), 527-536.

**OP** Gallese and Lakoff (2005) “The brain’s concepts: the role of the sensory-motor system in conceptual knowledge” in *Cognitive Neuropsychology* vol. (22), 455-479.

**OP** Pulvermuller, (2013) “Semantic embodiment, disembodiment or disembodiment? In search of meaning modules and neuron circuits” in *Brain & Language* 127: 86-103

**OP** Bartoli, (2013) “The disembodiment effect of negation: negating action-related sentences attenuates their interference on congruent upper limb movements” in *Journal of Neurophysiology* vol. 109(7)

**Feb 2: The Lexicon: The case against Embodied Theories and for Abstract Formatt**

**R** Mahon and Caramazza, (2009) “Concepts and categories: A cognitive neuropsychological perspective” *Annual Reviews of Psychology* (60): 27-51.

**OP** Lowerse, “How Fundamental is Embodiment to Language Comprehension? Constraints on Embodied Cognition”

**OP** Weiskopf (2010) “Embodied Cognition and Linguistic Comprehension” *Studies in the History and Philosophy of Science*