

# PHIL 470: Philosophy of Cognitive Science

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TR 4:05-5:25pm Leacock 110

McGill University, Winter 2014

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Office hours: TR 2:30-3:30pm

The ‘Cognitive Revolution’ of the 1960s united a number of disciplines—including psychology, linguistics, artificial intelligence, neuroscience, and philosophy—in a new approach to the study of mind and intelligence. The key to this new approach was the identification of thinking with computation or ‘information-processing.’

In this course, we will study the origins and development of Cognitive Science, trying as much as possible to engage directly with the scientific literature. We will start by surveying the roots of Cognitive Science in ancient and early modern philosophy, and in the behaviorist psychology that immediately preceded it. Next, we will study some landmark texts from the Cognitive Revolution in psychology, linguistics, computer science, and philosophy. Finally, we will explore more recent developments such as connectionism, dynamicism, and 4E (Embodied, Embedded, Enacted, Extended) approaches to cognition, which attempt to modify or challenge the original Cognitivist program.

## **Required Texts**

All texts for this course can be found in the Coursepack or online through MyCourses. You should expect to have between 20 and 50 pages of reading to do per week, depending on the difficulty and density of the texts.

## **Evaluation**

Your final grade in this course will be based on a research paper whose topic and thesis will be developed in consultation with me. The schedule of readings below contains a number of suggestions for further reading, and I can also point you to additional sources on your chosen topic.

## Schedule of Readings

### HISTORICAL CONTEXT

#### JANUARY

##### 7/9 The organism as self-moving

- Aristotle, *Physics*, Book II, Chapter 1
- Aristotle, *On the Soul*, Book II, Chapters 1-3

##### 14/16 The organism as machine

- Excerpts from Descartes, *Description of the Human Body* (1647), *Passions of the Soul* (1649), and *Treatise on Man* (1662)
- Huxley, “On the Hypothesis that Animals Are Automata” (1874)

#### FURTHER READING:

- Dewey, “The Reflex Arc Concept in Psychology” (1896)
- Goldstein, *The Organism*, Ch. 2 (1934)

##### 21/23 Behaviorism and its critics

- Watson, “Psychology as the Behaviorist Views it” (1913)
- Excerpts from Skinner, *Science and Human Behavior* (1953)
- Chomsky, “Review of B. F. Skinner’s *Verbal Behavior*” (1959)

### THE ‘COGNITIVE REVOLUTION’

##### 28/30 Developments in logic and math

- Dupuy, *On the Origins of Cognitive Science* (1994), Ch. 1
- Turing (1937), “On Computable Numbers”
- Turing (1950), “Computing Machinery and Intelligence”

#### FEBRUARY

##### 4/6 The rise of Artificial Intelligence research

- Newell & Simon, “Computer Simulation of Human Thinking” (1961)
- Simon & Newell, “Information Processing in Computer and Man” (1964)
- Newell & Simon, “Computer Science as Empirical Inquiry” (1975)

#### FURTHER READING: Minsky, “Steps Toward Artificial Intelligence” (1961)

##### 11/13 The ‘Cognitive Revolution’ in Psychology

- Miller *et al.*, *Plans and the Structure of Behavior* (1960), Ch. 1
- Neisser, *Cognitive Psychology* (1967), Introduction

#### FURTHER READING:

- Miller, “The Magical Number Seven, Plus or Minus Two” (1956)

##### 18/20 Cognitivism in Philosophy

- Fodor, “The Appeal to Tacit Knowledge in Psychological Explanation” (1968)
- Fodor, *The Language of Thought* (1975), Ch. 2

## Schedule of Readings (continued)

### CHALLENGES AND ALTERNATIVES

#### FEBRUARY

##### 25/27 Critics of Cognitivism

- Excerpt from Dreyfus, *What Computers Can't Do* (1972)
- Searle, “Minds, Brains, and Programs” (1980)
- Harnad, “The Symbol-Grounding Problem” (1990)

FURTHER READING: BBS Peer Commentary on “Minds, Brains, and Programs”

#### MARCH

##### 4/6 SPRING BREAK, NO CLASS

##### 11/13 Connectionism

- McClelland *et al.*, “The Appeal of Parallel Distributed Processing” (1986)

FURTHER READING:

- Tienson, “An Introduction to Connectionism” (1988)
- Fodor and Pylyshyn, “Connectionism and Cognitive Architecture: A Critical Analysis” (1988)

##### 18/20 The dynamic approach

- van Gelder, “The Dynamical Hypothesis in Cognitive Science” (1998)

FURTHER READING:

- Beer, “Dynamical approaches to cognitive science” (2000)
- Smith & Thelen, “Development as a dynamic system” (2003)

##### 25/27 Embedded, embodied, extended, enactive approaches I

- Brooks, “Intelligence Without Representation” (1987)
- Brooks, “Elephants Don't Play Chess” (1990)

FURTHER READING: Brooks, “Intelligence Without Reason” (1991)

#### APRIL

##### 1/3 Embedded, embodied, extended, enactive approaches II

- Varela, “Patterns of Life: Intertwining Identity and Cognition” (1997)

FURTHER READING: Thompson, *Mind in Life* (2007), Ch. 3

##### 8/10 Embedded, embodied, extended, enactive approaches III

- O'Regan and Noë, “A sensorimotor account of vision and visual consciousness” (2001)

FURTHER READING:

- Thompson, “Sensorimotor subjectivity and the enactive approach to experience” (2005)