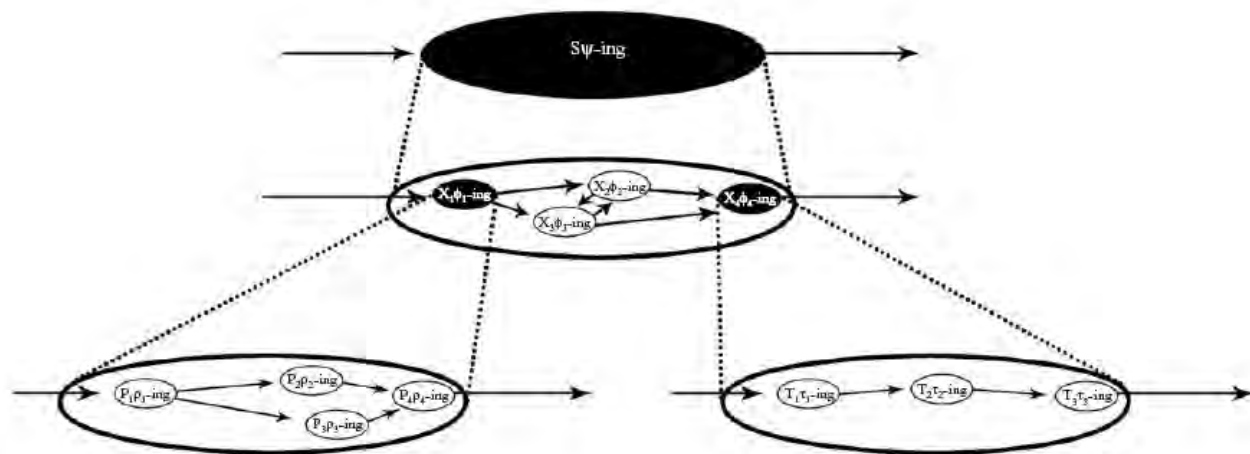


Multidimensional interdisciplinarity and coherence in cognitive neuroscience: challenges for philosophy

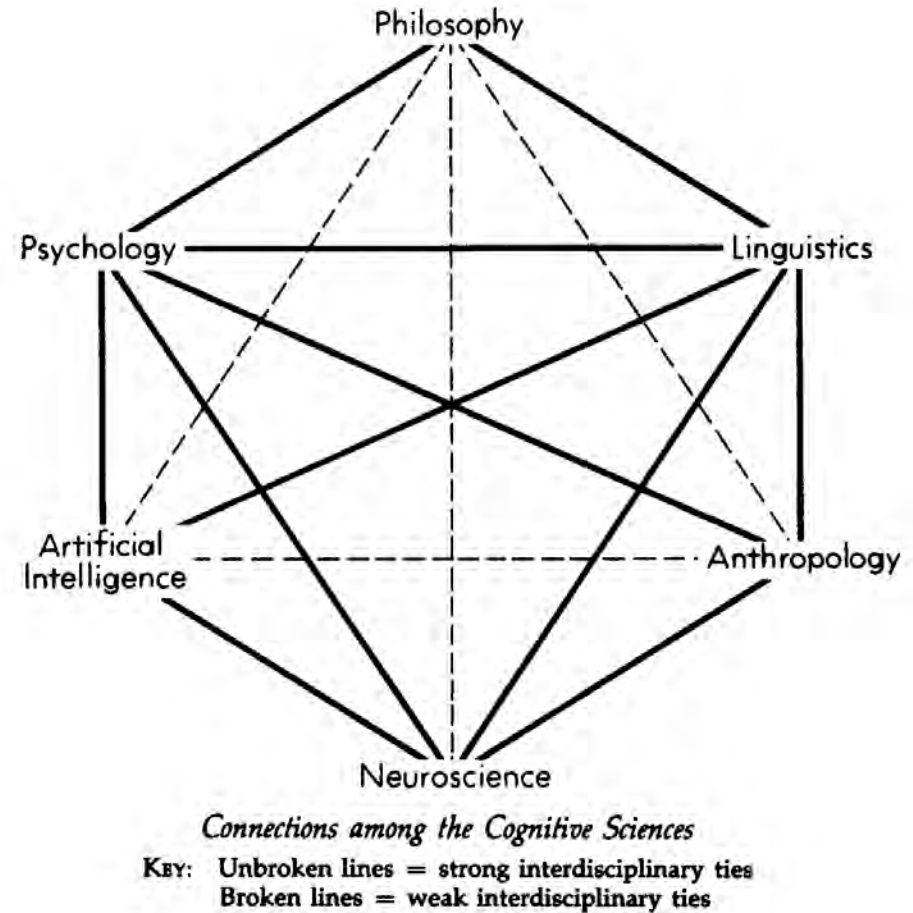


Machiel Keestra, Institute for Interdisciplinary Studies, U Amsterdam
 PIN Network, Tübingen, Sept. 22, 2012
<http://home.medewerker.uva.nl/m.keestra>

Interdisciplinary Cognitive (Neuro-)Sciences:

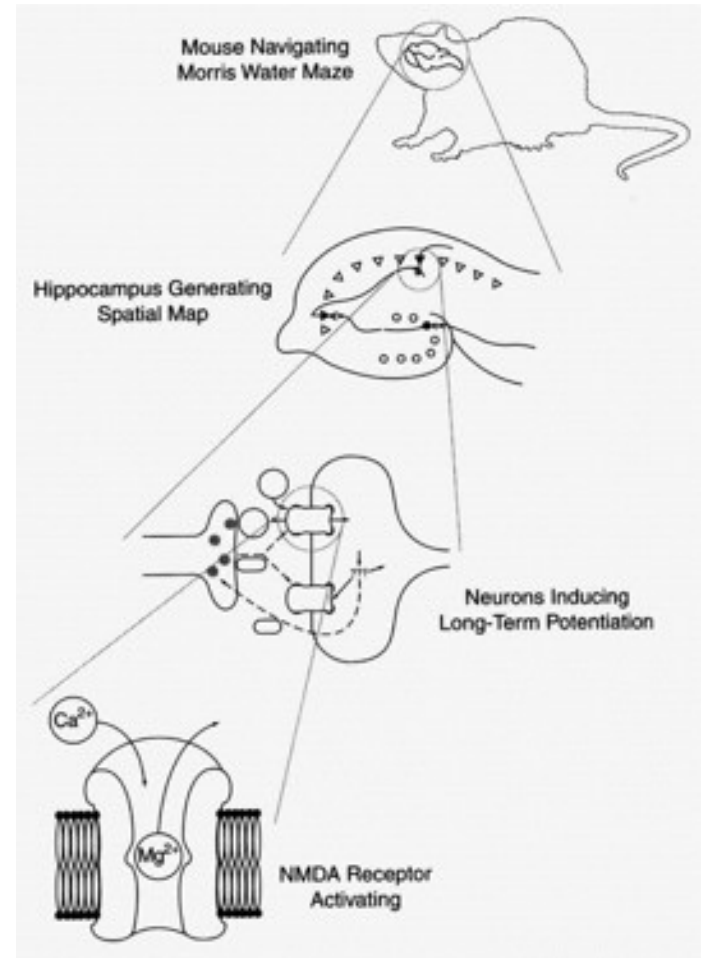
11/9/1956, MIT: Cognitive Sciences
 ~ 1975, NYC; Cognitive neuroscience

(fig.: Miller, 2003, TiCS)



Mechanistic explanation & vertical (inter-level) interdisciplinarity

■ “[A] mechanism is an organized *system* of component *parts* and component *operations*. The mechanism’s components and their *organization* produce its *behavior*, thereby instantiating a phenomenon” (Bechtel, 2005).



Mechanistic explanation: 2 dimensions of interdisciplinarity

- Horizontal ID through decomposition of the phenomenon
- Vertical ID through localization of the phenomenon

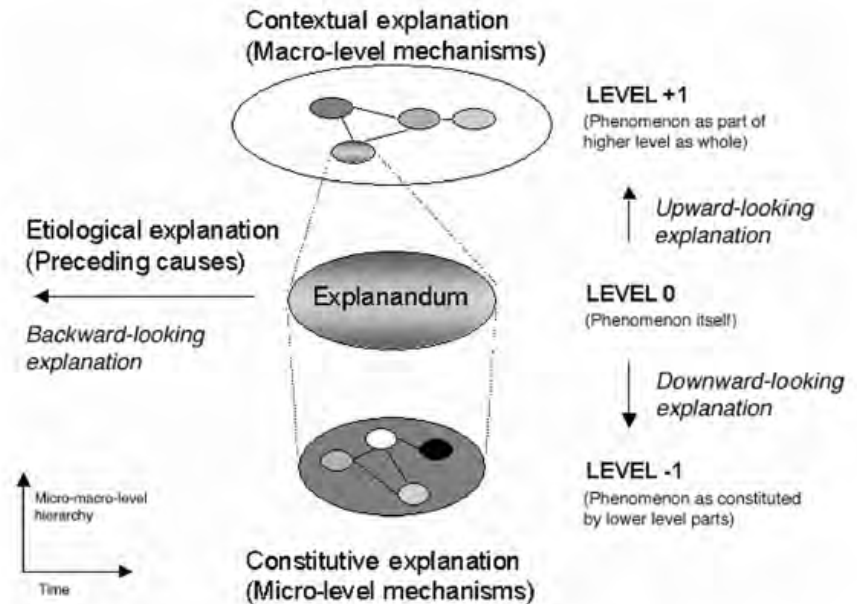


Figure 1. General scheme of multilevel framework of biological explanation.

- * Decomposition and horizontal dimension of ID;
- * Localization and vertical dimension of ID.

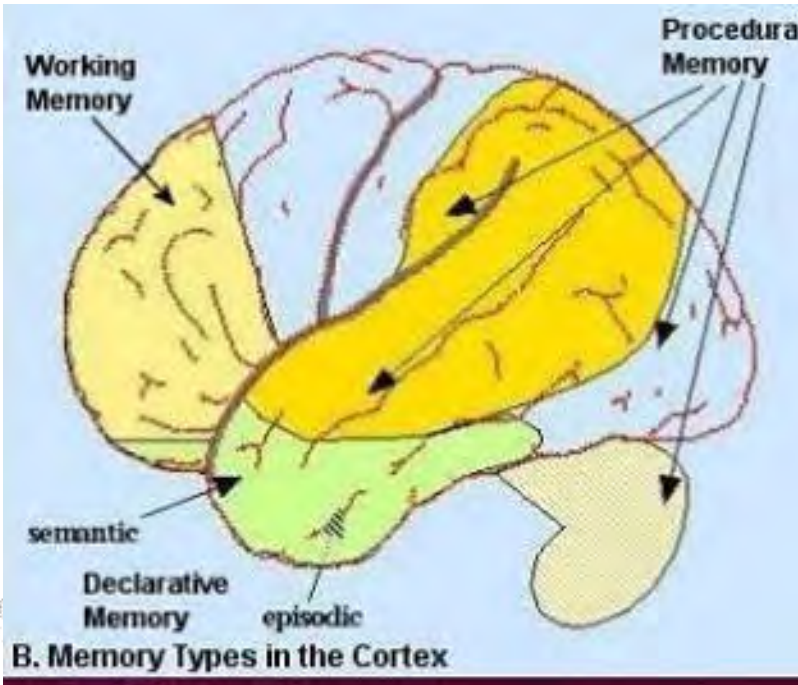
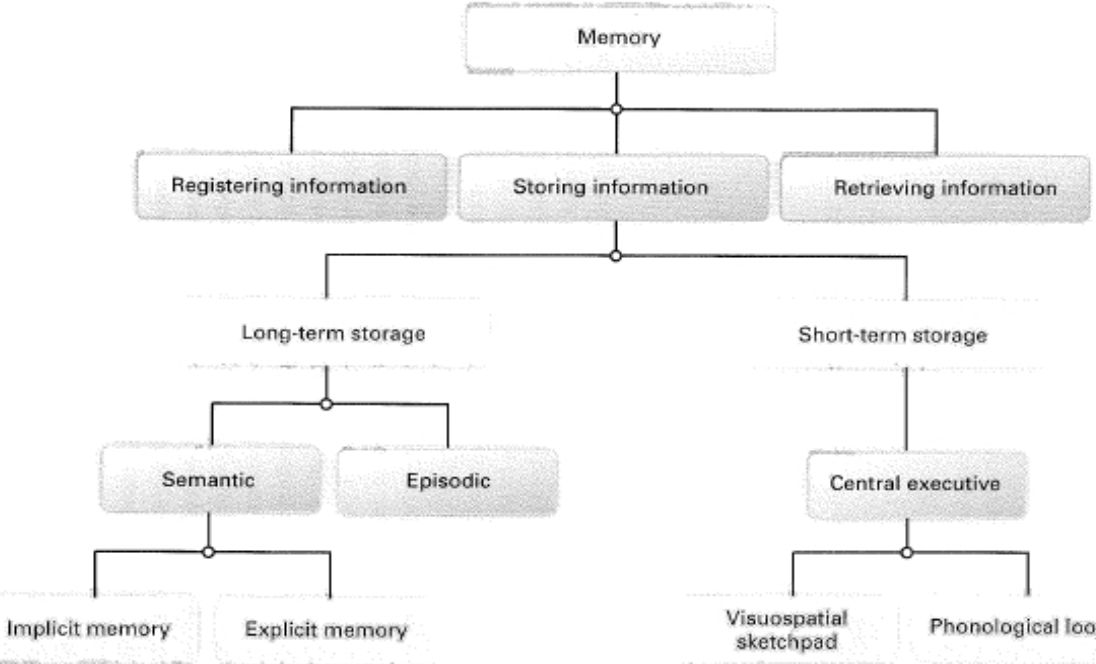
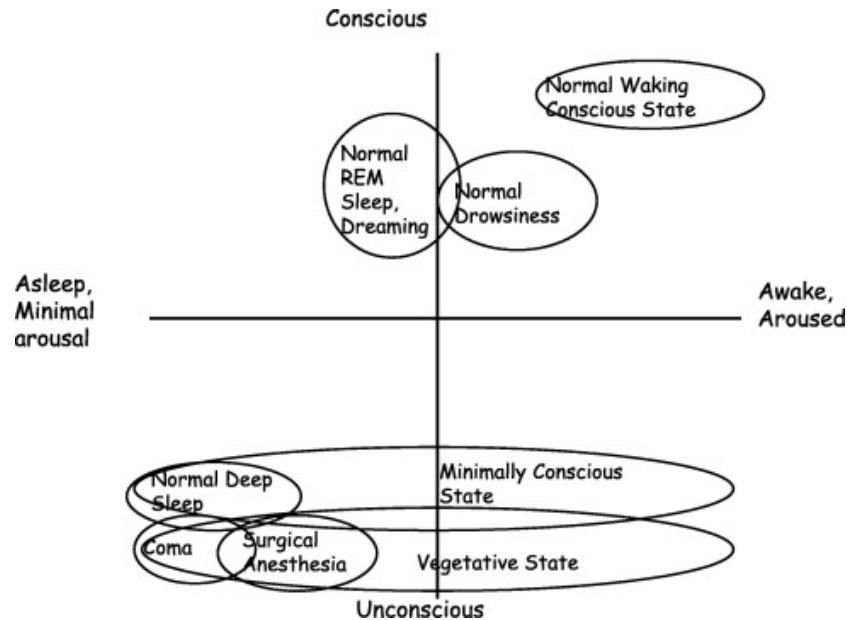


Figure 5.3 The initial stages of a functional decomposition of memory.

Consciousness studies:

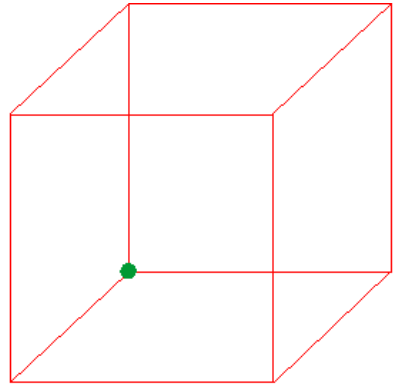
2 distinct types of decomposition

a) States of consciousness



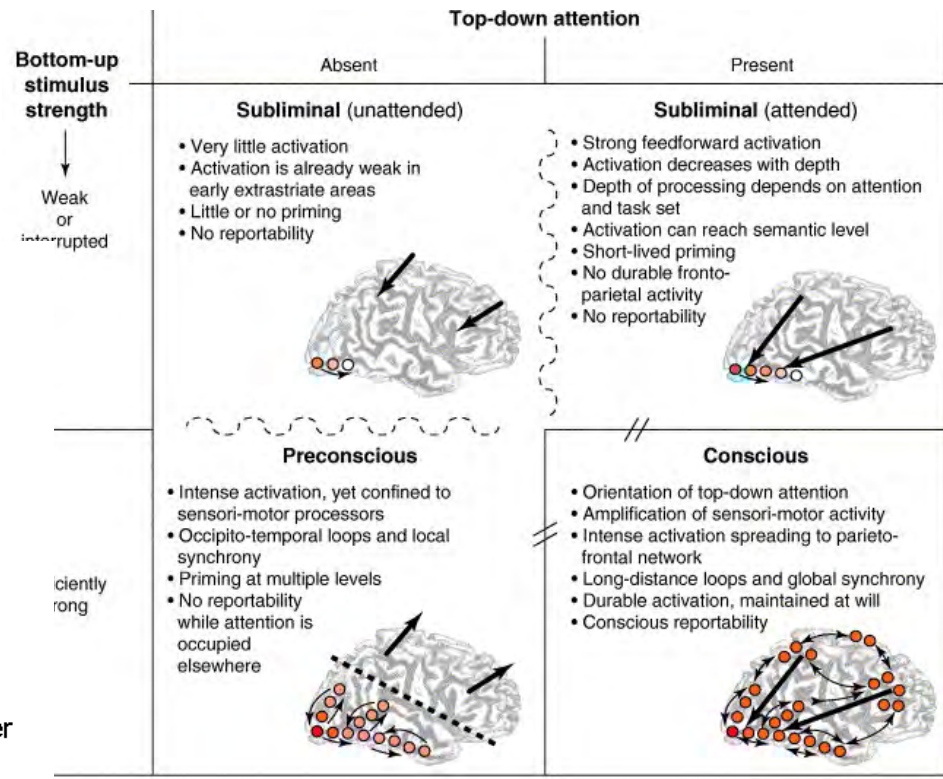
Consciousness: 2 distinct types of decomposition

- a) states of consciousness
- b) contents-of-consciousness



Necker Cube

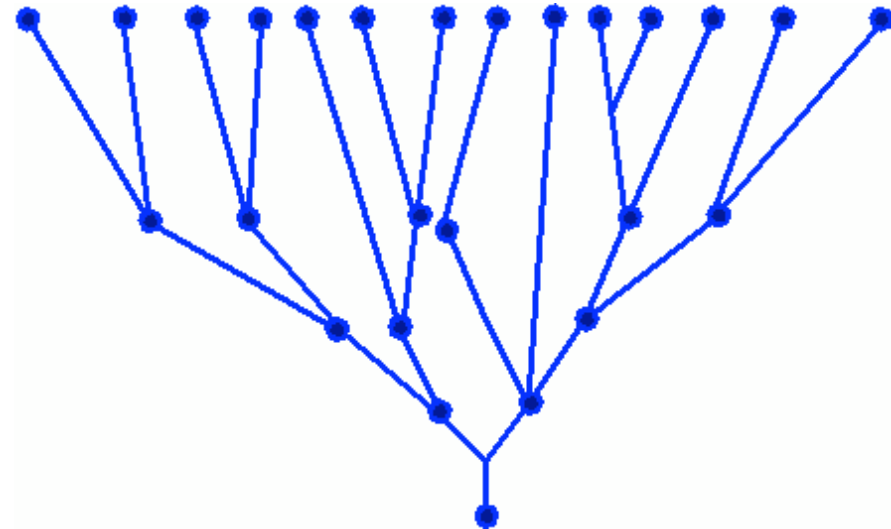
Look at the green dot. Is it located in the lower left rear or in the lower left front?



TRENDS in Cognitive Sciences

A multiply decomposed domain, yet occupied by coherent wholes?

- pluralism of concepts, theories, methodologies
- no foundationalist – branching – structure, therefore:
 - no regress problem
 - no input problem
 - strength depends not on weakest link



Coherence – network – conception of knowledge & truth

- different kinds of propositional content
- each kind of proposition has its own ‘plausibility criterion’
- no distinction in fundamentality of propositions
- mutual support of different kinds of propositions
- heterogeneity of support makes for more robustness

*“This approach is fundamentally holistic, judging the acceptability of every purported item of information by its capacity to contribute towards a well-ordered whole”
{Rescher, Coherence theory of truth, 1973,317}.*

How to avoid coherent yet isolated wholes

Arbitration between competitors via:

■ degree of coherence

- internal coherence, within the (sub)domain
- external coherence, with other (sub)domains

■ practical successes

- prediction and control
- application

Roles of philosophy in interdisciplinarity

- Coping with vertical interdisciplinarity
 - conceptual clarification
 - interlevel (methodological) alignment
 - data interpretation (re definition & decomposition)

- Coping with horizontal interdisciplinarity
 - reconstitution of the definition & decomposition
 - scrutinizing for methodological interactions across ‘wholes’
 - proactively looking for interdependencies

Philosophy of/as Interdisciplinarity? - Systematic philosophy!

‘Das Wahre ist das Ganze’

Hegel, Phaenomenologie des Geistes, 1807.