
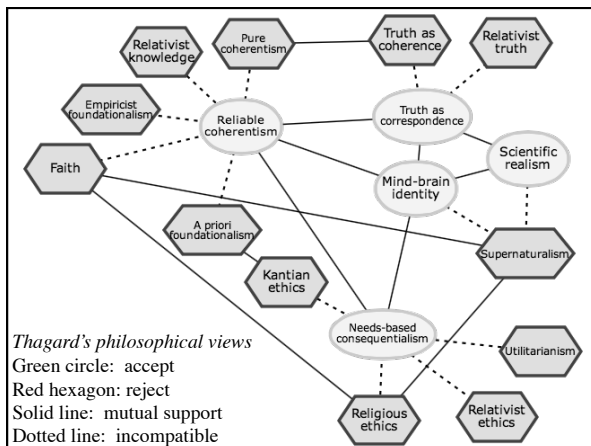


PHIL 110A
Week 10
 Paul Thagard

Mind-brain identity
 Functionalism
 Please turn off and put away all electronics.



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Mind-Brain Identity


“Mind=brain” is short for: **All mental processes are brain processes.**

Includes:

- perception (e.g. vision, pain)
- memory
- inference, reasoning, learning
- language
- emotion
- consciousness



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JJC Smart 

Mind=Brain

Mind=brain is supported by simplicity (parsimony): there is only one kind of thing (matter/energy) not two as in dualism.

Dualism is totally stagnant: Explanations have not improved since Descartes.

But cognitive neuroscience has made dramatic progress since 1980 in explaining perception, memory, thinking, learning, language, and emotions. See recent textbooks in cognitive psychology and cognitive neuroscience.

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Super Argument for Mind=Brain

Mind=brain explains mental processes, including sensation, imagery, problem solving, learning, language, etc.

Mind=brain is a better explanation than alternative theories like dualism.

Simpler: only assumes matter/energy, not soul.

No problem with interaction.

Therefore, mental processes are brain processes.

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Objections to Mind=Brain

David
Chalmers



Arguments for dualism based on conceivability:

Zombie, Mary, etc.

Mind=brain fails to explain after-death experiences.

Mind=brain fails to explain consciousness.

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Mind=Brain Defense

Claim: mind=brain is obviously false, because minds and brains have different properties:

1. We can imagine not having a brain, but can't imagine not having a mind.

Response: Imagination is a poor guide to reality. Mind=brain is a scientific claim, like water=H₂O.

2. Brains are divisible and have weight, but minds aren't.

Response: begs the question, based on ignorance.

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Discussion Question

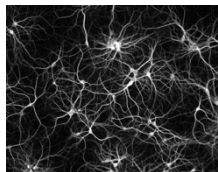
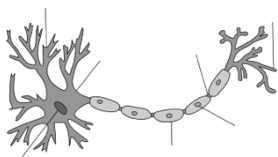
What are the best reasons for believing that mental processes are brain processes? Are they good reasons?

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Mind=Brain: Neurons

Brains consist of neurons: cells connected to other cells that build up electrical charges and then fire.

Neurons are connected to other neurons by synapses and fire by chemicals called neurotransmitters.



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Mind=Brain: Representation

Groups of neurons (populations, assemblies) can represent the world by their firing patterns.

Concepts (and other mental representations) are patterns of firing in neural groups.



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Chris Eliasmith



Mind=Brain: Binding

Building up complex representations requires binding combination of simpler ones:

Bind taste and smell and color of coffee. Chris Eliasmith

Bind subject and verb and object into sentence.

Convolution: activity of neural populations becomes "twisted together": convolve. Representations are braided together.

Chris Eliasmith has shown how neural populations can perform convolution.



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Mind=Brain: Competition

Mental representations (complex patterns of neural firing) compete to be active.

Hypothesis: **consciousness** is competition among patterns of neural firing.

Alternative 1: consciousness is neural synchrony (Crick).

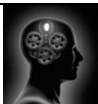
Alternative 2: consciousness is information integration (Tononi).



Francis Crick

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Mind=Brain: Sum



1. Since 1980, dramatic progress has been made in providing neural explanations for many mental processes.
2. Consciousness is still unsolved, but hypotheses are being generated.
3. Neural mechanisms for consciousness should explain the differences in the qualitative experiences of different kinds of perception, thinking, emotion, illness, etc.

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Hilary Putnam



Functionalism

Functionalism: minds are computational functions that connect inputs and outputs. The specific physical system (hardware) doesn't matter.

Critique of mind=brain: Mental processes need not be brain processes, because they can also be processes in computers and space aliens.

Minds have "multiple realization" in different kinds of physical processes.

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Multiple Realizability

Mental states are not just brain states because:

1. Different kinds of brains have mental states, e.g. birds, squid.
2. Computers are on their way to having mental states, using silicon chips not brains.
3. There may be beings in the universe that have mental states using very different organs than brains.

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Responses to Functionalism

Dualism: Functionalism is as bad as mind=brain in not seeing that mind has to be non-material.

Mind=brain:

1. Multiple realizability is just a thought experiment because computer intelligence is still limited, and no alien intelligence has been found.
2. Even if artificial intelligence succeeds, computer mental processes will be very different from human ones. *Human* minds are brains.

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