

Brain

<https://classesv2.yale.edu/>

Evaluation

- Midterm (30%)
- Final (35%)

- Weekly reading responses (15%)
- Book review (20%)

- Experimental participation

Other stuff

- Make contact

- How to do well

This is an odd and unnatural
view

Maybe you don't believe it
Maybe you believe in dualism

Dualism

Descartes

(1596-1650)

Animals as reflex
machines, robots

We also have material
bodies

But our minds are
immaterial and non-
physical

Dualism

Argument 1:

The creativity and
spontaneity of
human action

Dualism

Argument 2:

“I think
Therefore I am.”

Dualism

“

Dualism seems right

1. Language

“my arm”, “my heart”, “my body”,
“my brain”

Dualism seems right

2. Personal identity

Same person after radical bodily changes

Dualism seems right

2. Personal identity -- Many people, one body

Synopsis: Slapstick, fantastical farce about an eccentric millionairess whose soul inhabits her male lawyer's body

Dualism seems right

3. The survival of the self after the destruction of the body

Current view: Dualism is wrong Mind = Brain

1. Problems with dualism
2. We know have a better understanding of what physical things can do (computers & robots)
3. Strong evidence for the role of the brain

How does the brain work?

Neurons

- About 1,000,000,000,000
- Sensory neurons, motor neurons, interneurons
- All-or-nothing
- Intensity: expressed through number of neurons firing & frequency of firing

Neurons

- Communication over synapses; axons release neurotransmitters
 - excitatory
 - inhibitory
- Drugs: agonists vs. antagonists
 - curare
 - alcohol
 - amphetamines
 - Prozac
 - L-DOPA

Is the brain wired up like a personal computer?

NO -- because it is:

- highly resistant to damage
- extremely fast

... Unlike most human-designed computers, the brain works through massively parallel processing

What do different parts of the brain do?

- You don't need your brain for everything ...
 - sucking in newborns
 - limb flexion in withdrawal from pain
 - erection of the penis
 - vomiting

Some subcortical structures

Medulla: certain reflexes,
heartbeat, breathing

Cerebellum: complicated
skilled motor
movements

Hypothalamus: hunger,
thirst, sleep

Less than 1/4 of the human cortex contains projection areas -
- the rest is involved with language, reasoning, moral thought, etc.

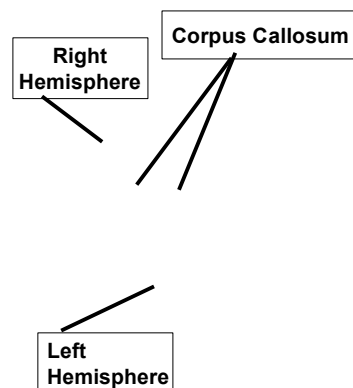
Some very bad things that could happen to you and your brain

- Apraxia
- Agnosia
 - visual agnosia
 - prosopagnosia
- Sensory neglect
- Aphasia
- Acquired psychopathy

How many minds do you have?

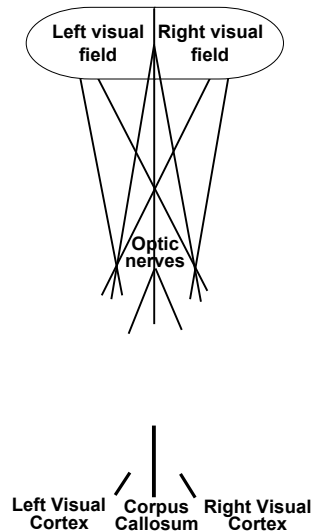
Brain has 2 Hemispheres

- Left & Right sides are separate
- Corpus Callosum : major pathway between hemispheres
- Some functions are 'lateralized'
 - language on left
 - math, music on right
- Lateralization is never 100%



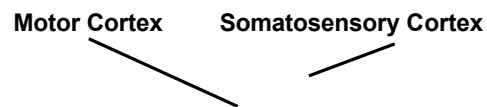
Sensory Information sent to opposite hemisphere

- Principle is Contralateral Organization
- Sensory data crosses over in pathways leading to the cortex
- Visual Crossover
 - left visual field to right hemisphere
 - right field to left
- Other senses similar



Contralateral Motor Control

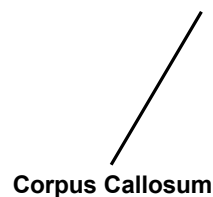
- Movements controlled by motor area
- Right hemisphere controls left side of body
- Left hemisphere controls right side
- Motor nerves cross sides in spinal cord



Corpus Callosum

- Major (but not only) pathway between sides
- Connects comparable structures on each side
- Permits data received on one side to be processed in both hemispheres
- Aids motor coordination of left and right side

Medial surface of right hemisphere



A bit of humility, Part I

- Mind as information processor, as computer
- Recognition, language, motor control, logic, etc.
- But there still remains The Hard Problem of consciousness
- Subjective experience, “what it’s like”, qualia

“How it is that anything so remarkable as a state of consciousness comes about as a result of irritating nervous tissue, is just as unaccountable as the appearance of the Djin, when Aladdin rubbed his lamp.”

-- Thomas Huxley

A bit of humility, Part II

- Mechanistic conception of mental life
- But what about humanist values?
 - free will and responsibility
 - intrinsic value
 - spiritual value?
- Can they be reconciled?