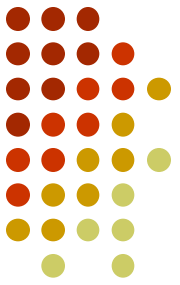


Philosophy of Cognition

Introduction to Cognitive Science
Lecture 3

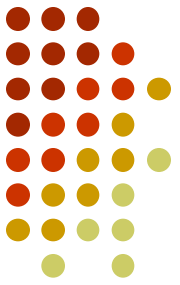
Amitabha Mukerjee
IIT Kanpur

Debates



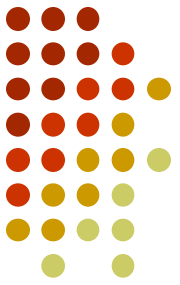
- Is the mind the same as the brain?
→ **mind-body problem** : dualism vs monism
- Is all of our knowledge based ultimately on the senses, or is some of it innate or *a priori* (e.g. the capacity for language) ?
→ **empiricism vs rationalism**
- Other debates: how do I know the mental state of others (*other minds*)?

Dualism

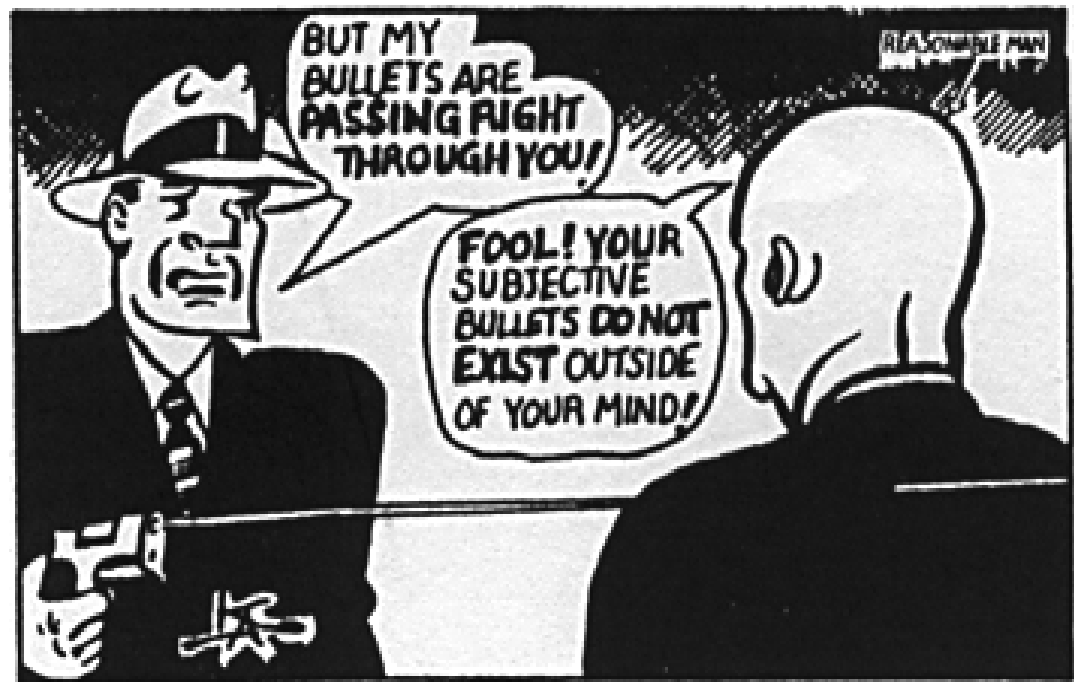


- Mind and Body are separate
- How are they different
 - Different substances → **substance dualism** [Cartesian]
 - Q. is “mental substance”? Where is it located? Does it have volume or mass?
 - Different properties → **property dualism**
 - There is only one brain, but it has two properties – physical and mental
 - Mental states cannot be reduced to the physical
 - e.g. Experiences differ from physical objects in that they refer to things (technical name: *intentionality*)
 - mental states may be emergent – arising from complexity of brain
 - Q. But how can a property be independent of the object?

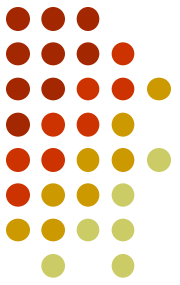
Cartesianism



Can doubt the existence of physical objects, even the body
→ **skepticism**



Cartesianism



- Can doubt the existence of physical objects, even the body → **skepticism**
- But cannot doubt the fact that one is doubting – this thought is central to our sense of self
 - □ *cogito ergo sum*
- Perception is unreliable – e.g. Wax may change near fire - can only deduce it's sameness
- All knowledge is based on reasoning [*epistemology*]

I think therefore I am.
I am therefore I think... I think...
I think, and therefore (yawn) -
therefore I am.
I am, therefore I

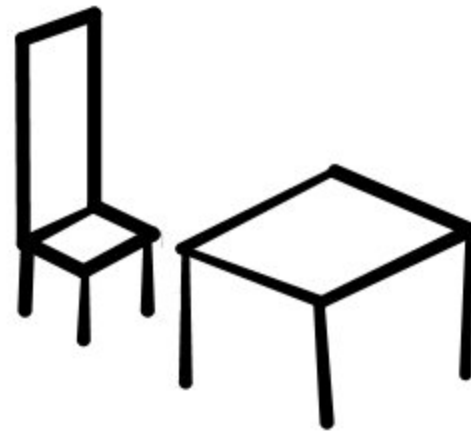
(YAWN) think.

I think....



ZZZZzzzz

ZZzzzzzz.



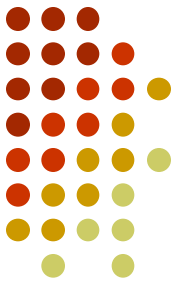
DJL

Dualism : Connecting body and mind



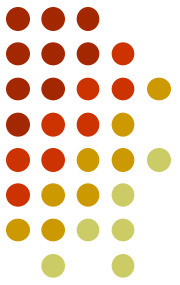
- How are the mind and body connected?
 - Physical processes (e.g. brain signals) cause sensation of pain, and mental states cause physical effects → **interactionism**
 - Descartes: They are connected at the pineal gland – not duplicated in the two lobes
 - Others: requires intervention of God
 - Mental states are not causes, but a side-effect of physical processes → **epiphenomenalism**
 - Mental states do not affect physical states

Monism



- There is no physical world, only mental → **idealism** [Berkeley]
 - Problem: How come different people think alike?
- There is no separate mental world, it's all physical → **materialism**
 - view of the vast majority of monists
 - problem: how do mental states arise?
 - mind-body identity
 - **behaviourism**

Materialism



- mind-brain identity

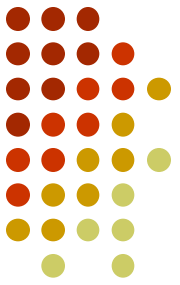
- all mental events can be ultimately reduced to physical explanation,
- “mental state” is nothing but a “brain state” [not believed by property dualists]
- may be emergentist
e.g. heat is explained in terms of molecular motion.

→ also called: **reductive materialism**

- as we understand the brain, many notions of “mental state” may disappear

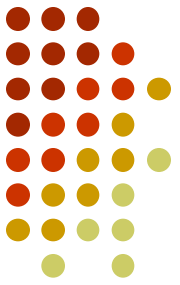
→ **eliminative materialism**

Functionalism

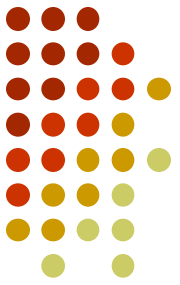


- Early 19th c. : Emphasis on “mental” → psychology based on introspection
- *Behaviourism* : reject “mental” altogether. An organism is determined by its environment (inputs) and its observable response (output)
 - *John is hungry = John has a propensity to eat*
- **Functionalism:**
 - Mental states determined by the function performed
 - = causal relation between input, output, mental states, and other minds’ mental states
 - *Multiple realizability* : can do same function w different bodies
 - Robots, computers, and aliens can also have mental states
 - Searle’s Chinese room argument

Searle's Chinese Room



Searle's Chinese Room



Strong AI:

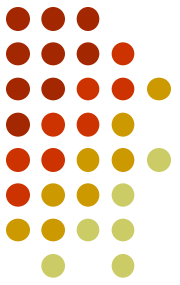
A machine can “think” just by virtue of implementing a sufficiently competent computer program

Weak AI:

Computer models are simply useful for studying the mind.

→ abstract question about computation,
independent of *substance*

Searle's Chinese Room



Strong AI:

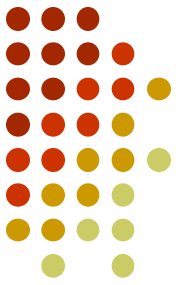
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Weak AI:

Computer models are simply useful for studying the mind.

→ abstract question about computation,
independent of *substance*

SYSTEM Response to Searle



Argument:

Searle doesn't understand Chinese, but the whole system - room + rulebook + data - does.

Searle:

An “understanding” based on formal, meaningless, symbols is *qualitatively different* from a Chinese speakers. Even if Searle memorizes all the rules before constructing responses, he does not “understand” Chinese.
[*qualia* argument]

Formal symbol vs Grounded symbol

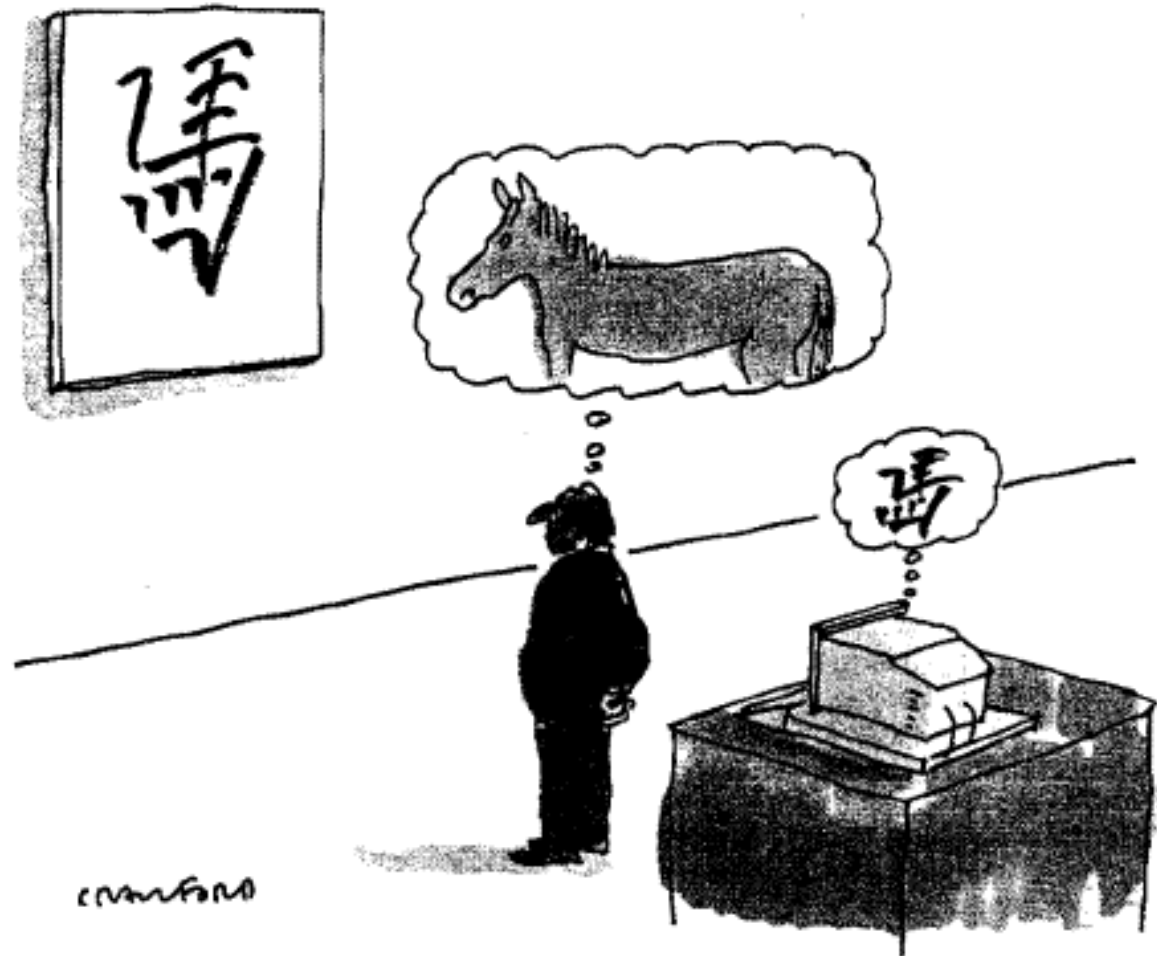
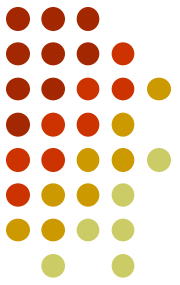
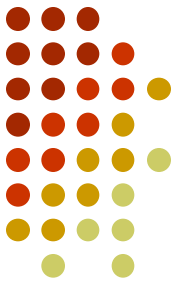


illustration [Searle 90]

BRAIN SIMULATOR

argument

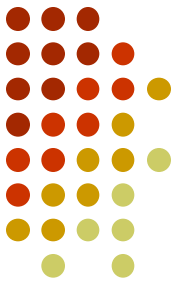


Argument:

Suppose that we simulated the brain of a Chinese person at the level of neurons. Since this is an actual Chinese person's brain, clearly it "understands" Chinese...

Searle:

Understanding in human minds have mental content (semantics). Syntax alone is not sufficient for semantics. Hence such a formal system cannot have mental content, and therefore does not "understand" in the sense of a Chinese speaker.



Related debates

Q. What is the nature of the “rule-book+data”?

If a system is to learn language at human levels, the most efficient approach may be to expose the system to both sensorimotor as well as linguistic data.

Then the “rules “would actually be grounded in semantics.

Mental content and reference



Peirce:

icon: physical similarity with referent

index: association w referent

symbol: social convention

Harnad (1990):

iconic : analogical forms of sensory input

categorical : identify features → category detector

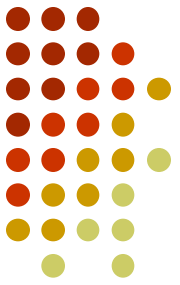
symbolic :

elementary: name \leftrightarrow event/object category

higher-order: relations between symbols

(First 2 are internal, 3d external)

Consciousness

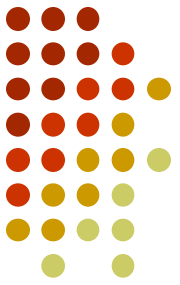


- Key aspect: Role of “consciousness”
 - How important a part of the mind is consciousness?



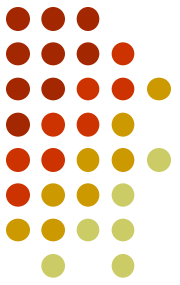
- Problem for materialism: How is consciousness achieved?
 - Gamma wave theory
- Is consciousness a by product (epiphenomenal)?

Other minds



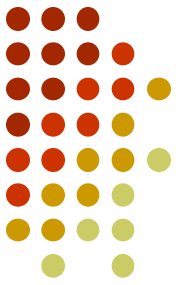
- How to tell if creature or system X has conscious experiences?
- I have direct knowledge only about my consciousness
- Descartes: “Je pense donc je suis “ [I think therefore I am]
- Knowledge of other minds is basis for language
 - Autists lack awareness of others’ feelings
- Reasons for believing in other minds:
 - a) Other people behave similarly in similar circumstances
I may recognize pain in a dogs (but not frogs or worms?)
 - b) Structural similarity - face, eyes, legs, etc.
- Babies appear to recognize “contingently behaving” robots as alive

Visual Awareness



- How do I know your perception of something may not be quite different from mine?
 - e.g. you may have your red-green receptors inverted.
 - Would result in the same behaviour [*“inverted spectrum”*]
 - Spectra in the world are same → sameness of our perception, not the mediating internal experiences
 - L / M = Long/Medium -wavelength cones → may be inverted
- Argument for functionalist stance – architecture may be different

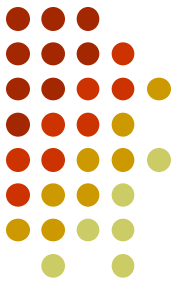
Representation



- Initial attempts to model the mind were based on introspection
 - Led to models of conscious knowledge
- Reaction: **Behaviourism** – models of stimulus-response; no mental representations
- But some kind of **Representation** is needed for tasks such as
 - Path planning / navigation
 - Language

representations may also be subconscious

- plans and hierarchies (Lasheley 1951)



Reading:

Stephen Palmer, VISUAL AWARENESS

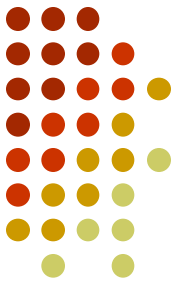
from Levitin, **Foundations of Cognitive Psychology**

Robert Wilson, PHILOSOPHY

MIT Encyclopedia of the Cognitive Sciences

Both at <https://cognet.mit.edu/>

Supervenience



- Different Mental events ← must differ in neural activity [Jaegwon Kim 78]
 - But not all neural activity has conscious effects
 - Robots or computers can also have mental states

