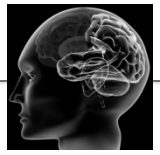
PHIL/PSYCH 256
INTRODUCTION TO COGNITIVE SCIENCE
Week 10: Consciousness



PLEASE PUT AWAY ALL ELECTRONIC DEVICES

1

Philosophy of Consciousness

- Dualism: consciousness = soul.
  - Qualia: qualitative experiences
- Materialism:
  - Identity: consciousness = brain process
  - Functionalism: consciousness = computational
  - Mysterion: consciousness is incomprehensible
- Idealism: the universe is conscious

2

Dualism

- David Chalmers
- Zombie argument: I can imagine a being just like us physically but without consciousness.
- So brains are not essential to consciousness.

3

Discussion

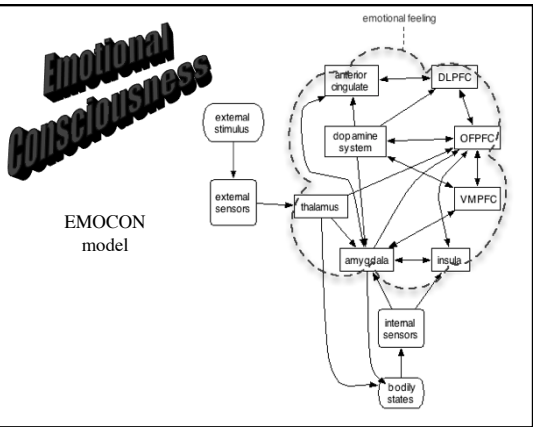
- Can cognitive science explain consciousness in terms of representation, computation, and/or brain processes?

4

Understanding Consciousness

- Representations of representation
- Neuronal integration, as in EMOCON model.
- Temporal coordination
- Molecular basis: anesthesia.
- Multilevel mechanisms

5



EMOCON model

Flanagan: Prospects for a scientific theory of consciousness

- Someday there may be a coherent theory of consciousness, as there is for memory.
- Single brain property: 40-hertz oscillations. Plus others to be discovered.
- Our common sense concept of consciousness may need revision.
- Relate consciousness to both psychological and neurological phenomena.

7

Key Points

- Dualists claim that consciousness is non-material.
- Neural explanations of consciousness are being developed based on representation and interacting brain areas.

8

The Body and World Challenges

- Embodiment: Thinking depends on our bodies interacting with the world.
- Embedded: Interacting with the world reduces the need for representation and computation.

9

Body & World Challenges

- Being-in-the-world: Heidegger, Dreyfus, Winograd
- Robotics and embedded computation: Brooks, Mackworth
- Situated acton: Suchman, Lave
- Body & direct perception: Gibson, Lakoff
- Intentionality (aboutness): Searle

10

Embodiment Theses

- Moderate (Gibbs): Language and thought are inextricably shaped by embodied action.

- Extreme (Dreyfus): Embodiment refutes the computational-representational approach to mind.

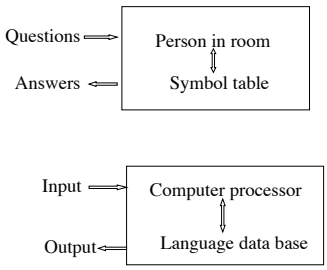
11

Discussion Question

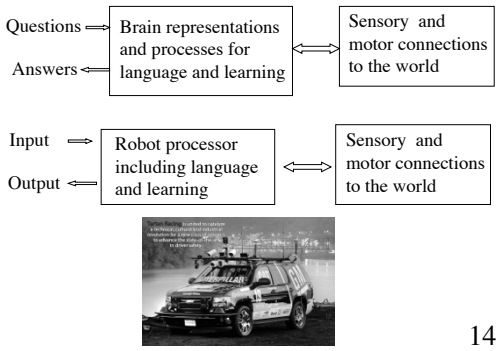
- How important is your body and its interactions with the world to your thinking?

12

Searle's Chinese Room



13



14

Responses to Searle

- The person in the room would not produce natural language.
- The analogy only applies to the simplest computers.
- A robot with the capacity to interact with the world and learn from its experience would have meaning and intentionality.

15

Mackworth on Situated Agents

- AI has restrictive assumptions about beliefs
- Need cognitive integration: tight coupling of perception, reasoning, and action.
- Situated robots are real physical systems interacting with the world.
- Dynamic perception tracks the world.
- Situated agents are multiple (social).

16

Key points

- Intelligent agents need to be embodied and embedded in the world.
- But they still need representation and computation for intelligence.

17