Consciousness

PSY 200

Greg Francis

Lecture 32

Do you see red like I see green?

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1

What is consciousness?

- Awareness of events, stimuli, thoughts, self
- A sequence of meaningful items
- Stream of thoughts
- Distinct from unconscious processing (e.g., hearing a sentence, retrieving information from memory,…)

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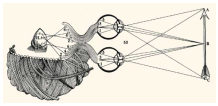
History

- Descartes' dualism (Cartesian dualism)
  - pineal gland link between body and spirit
  - how they could connect was a real problem



- Mind-body problem
- Materialism (the brain *is* the mind)
  - or the mind derives from the brain

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Materialism

- Nearly all scientists are materialists, but old ideas die hard
- A lot of work (e.g., fMRI) looks for the *site* of consciousness
  - a special physical transformation
  - thalamus
  - reticular formation
  - quantum mechanics
  - distributed awareness

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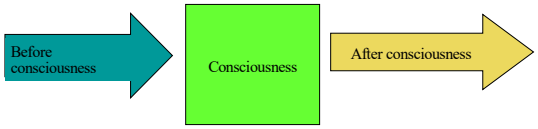
A turning point

- A common view is that there is a moment/ place which/where before something was *not* conscious and which after it *is* conscious
- But this is not true in the brain



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Distributed processing

- Information processing is spatially and temporally *distributed* in the brain
- Processing changes with new stimuli
- There really is no "moment of consciousness"
  - different brain areas know different things at different times

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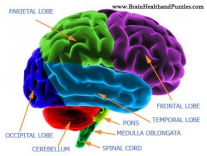
An analogy

- When did the British empire learn of the end of the War of 1812?
  - treaty signed in London months before the Battle of New Orleans
  - word was not received by British troops in America until two weeks after the Battle of New Orleans (January 8, 1815)

7

An analogy

- For complicated systems like the British empire (and human brains)
  - different parts know different things at different times
  - there is no official moment of knowledge
  - no official moment of consciousness!
- Demonstration
  - when does the class know/understand?



8

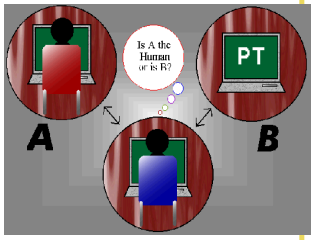
How / Why?

- There is no "moment" because information is *distributed* in the brain
  - Both in space and time
- Can distributed processing really produce consciousness, or must there be something else to "put it all together"?
  - can consciousness arise from non-conscious processors? (artificial intelligence?)

9

Turing test

- How do you know a person is conscious/intelligent?
  - They behave in a way that we interpret as consistent with a conscious being
- Turing test: apply the same logic to a computer
  - if a conversation with a computer is indistinguishable from a conversation with a human
  - Then conclude the computer is intelligent



10

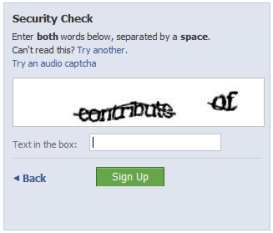
Artificial intelligence

- No computer has (formally) passed anything but a weak form of the Turing test
  - lack sufficient schemas, creativity, general knowledge
  - Many people expect a version of Chat GPT(-5?) will be able to pass the Turing test
- It is worth noting that other things would also not pass a Turing test
  - children
  - mentally impaired people
  - mute people
  - people who speak a language we do not understand
- Passing a Turing test is not *necessary* for consciousness

11

Captcha

- The basic ideas are implemented in several methods for computer security
- Completely Automated Public Turing test to tell Computers and Humans Apart



12

Turing test

- The Turing test is only one way to demonstrate intelligence
  - and a rather strict one at that
  - not passing the Turing test does not mean that a computer is not intelligent
  - of course, it doesn't mean the computer *is* intelligent either
- Variations on Turing test
  - discriminate conversation between a child and a computer
  - look at a conversation and decide which was the computer
  - …

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Doubters

- Many people have suggested that computers cannot, in principle, become intelligent
  - they argue that purely symbolic computations cannot lead to consciousness
  - and humans use emotion, insight, intuition, intentionality instead of simple computation
  - This is often the basis of arguments that Chat GPT is not "intelligent"
- Let's look at two arguments against "strong AI"

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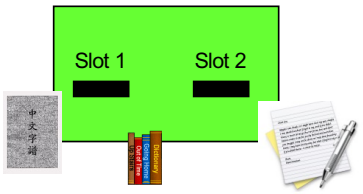
1. The Chinese room (Searle)

- Imagine you are in a room with two slots and a book
  - Slot 1: someone sends you notes with Chinese characters on them
  - Book (written in English): in the book you can look up the Chinese characters and write down corresponding Chinese characters on another piece of paper
  - Slot 2: you can send your piece of paper out this slot



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15

1. The Chinese room (Searle)

- If the book provides rules on how to answer questions in Chinese
  - then you can answer written questions in Chinese
  - even though *you* do not know Chinese!
- Consciousness (in general, understanding) is not a function of the thing (or person) who *implements* the rules
- But consider it from the point of view of a person outside the room
  - Who is sending messages in

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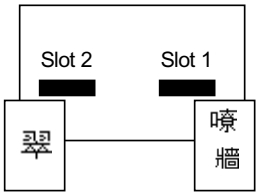
1. The Chinese room (Searle)

- You are having a conversation with someone
  - You have to decide if the person understands what you are saying (it's the Turing test)
  - You ask them to describe the wall of their room
  - They report it is green
  - …and so on…



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17

1. The Chinese room (Searle)

- Searle's point is that
  - We know the person in the room does not understand Chinese
  - We might be fooled into thinking they do based on their responses to the questions
  - Thus, the Turing test is a bad test
- Because the Turing test is essentially the same structure
  - The computer plays the role of the person in the room

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However,...

- Searle has set up a deceptively simple scenario
  - the Chinese room may be an impossibility
- You can *imagine* a situation where one has a book with rules to answer questions in Chinese
  - but only if you do not think too hard
  - in reality, there may be no such book!
  - if the questions can be on almost any topic, then understanding is *required* for that type of complex processing
- And understanding is generally restricted to consciousness
  - Or maybe one needs to conclude that such an advanced book has *potential* consciousness

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And moreover...

- At a smaller level of computation, it is hard to see how consciousness could *not* be (theoretically) possible in computers
- Each cell in your head is data in - data out
  - suppose cells were gradually replaced by tiny computers that kept *all* processing the same
    - » Neuromorphic chips
  - would you claim that at some point you are no longer conscious?
- This suggests there is nothing fundamental about *organic* consciousness

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2. Qualia

- Some researchers object to the very idea that computers could become conscious
  - They argue that some things in consciousness are *not* just computation
  - e.g., consider the color red
  - There seems to be a particularly subjective experience of seeing something red

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2. Qualia

- Consider two people who see the world in color opposites

Qualia for person 1

"A red apple with a green leaf"

Qualia for person 2

"A red apple with a green leaf"

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2. Qualia

- Clearly, there's a big difference in the perceptual experience of these people, but their behavior is essentially the same
  - And there seems no way to distinguish one experience from the other
  - It's the unmeasureable experience that is a qualia

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2. Qualia

- Qualia proponents argue, for example,
  - you can learn all there is to know about light waves, photoreceptors, neural transduction and coding of color,...
  - But suppose you never see any red objects
  - Your knowledge will not tell you what you will experience when you first see the red of an apple
  - Indeed, you could be tricked into believing a green apple was red (if you had never seen green either)

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2. Qualia

- But this is a defeatist argument, or a pointless one
  - *if* I knew *everything* about light, photoreceptors, and neural representation of colors, then I *would* be able to know what I will experience when I see red
  - it is difficult (maybe impossible for any single human) to know (or even imagine knowing) all that information in an academic sense
  - but that doesn't mean that such information does not exist
- It's partly an empirical question
  - But no one can do the experiment

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Conclusions

- Consciousness
- distributed processing in the brain
  - no *site* of consciousness
  - no *time* of consciousness
- Chinese room
- Qualia
- Artificial Intelligence
- Daniel Dennet *Consciousness Explained* (1991)

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Next time

- Review for exam 4
- After exam 4
  - Decision making
  - Framing effects
  - Risks
  - Alternatives
  - CogLab on Monty Hall
- *What every consumer should know before they buy.*

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27