Functionalism and the Chinese Room

Searle, John. “Minds, Brains and Programs”

The Story so Far

- **Materialism (Physicalism):** one substance only – the physical
- **Identity Theory:** pain = C-fibre firing (some complex process in brain)
  - **Problem**: it is conceivable that there are other beings, say Martians or other animals, that are in pain but do not have anything like C-fibre structures. So, pain cannot be identical to any specific human brain mechanism
- **Behaviorism**: pain = if one were pinched then one would say 'ow', grimace, …
  - **Objection:** suppression and pretending
  - when we are in pain, we can behave as if we are not in pain, [Suppression]
  - when we are not in pain, we can behave as if we are in pain [Pretending/Lying]
- Is there a materialist theory that avoids these objections?

Functionalism

- mental states (e.g. pain) are constituted by
  - i) relations to sensory inputs
  - ii) their causal relations to other mental states
  - iii) relations to behavioral outputs
- person P is in pain =
  - P is in a state that is typically caused by
  - **[input]:** bodily injury or disturbances which
  - **[relations to other mental states]:**
    - causes awareness of injury
    - causes frustration
    - causes the desire to eliminate the cause of injury
  - **[output]:** causes avoidance behavior, wincing, etc.

Improvements

- Functionalism avoids problems of behaviorism
  - One is not in pain if one is pretending (internal state)
  - One is in pain if despite the fact they are suppressing behavior (internal state)
- Functionalism avoids problems of identity theory
  - Does not identify pain with a biological structure (C-Fibre)
  - Causal structure between states can be implemented in any biological structure

Computer Programs

- Algorithm relates input to output via states of the computer; relations of internal states is really a computer program
- Algorithm: output all even natural numbers larger than input
  - 0) Memory state = input
  - 1) If memory state is even then
    - output state
    - increase state by 1
    - Back to 1
  - 2) If memory state is odd then
    - increase state by 1
    - Back to 1
- Running the algorithm
  - Input = 5
  - Memory state = 5, 6, 7, 8, 9, 10, 11, …
  - Output = 6, 8, 10, 12, …

Functionalism and Strong AI

- Functionalism entails strong AI
- **Strong AI**: the mind *is* a computer
- **Weak AI**: use computers to study the human mind
- Strong AI and Functionalism say that computers and minds think as long as they have the right program
- Searle criticizes Strong AI and Functionalism

Cognitive Science

- Multi-disciplinary effort to studying the mind
- **Artificial Intelligence:** develop computer models to help understand how the human mind works
- **Psychology**: studies behavior in various circumstances
- **Neuroscience**: studies the underlying brain mechanisms
- **Linguistics**: studies one area of the mind; internal processes having to do with syntax, phonology and semantics
- **Philosophy of Mind**: theoretical foundation for scientific study

Chinese Room Thought Experiment

- Searle is locked in a room; he doesn't known Chinese
- Receives Chinese symbols through slot
- Uses rule book to correlate input symbols with output symbols
- Outputs Chinese symbols through slot

The Thought Experiment

- Suppose that he starts to process these rules very quickly so that to an outside observer it appears there is a Chinese speaker in the room
- Still, Searle does not understand Chinese at all
- Manipulating formal symbols (simulation) is not sufficient for understanding or thinking
- This is all that computers could ever do, so computers can't understand or think

If '##$^^', then '^%&*'

If '#&^*$#', then '@!%$'

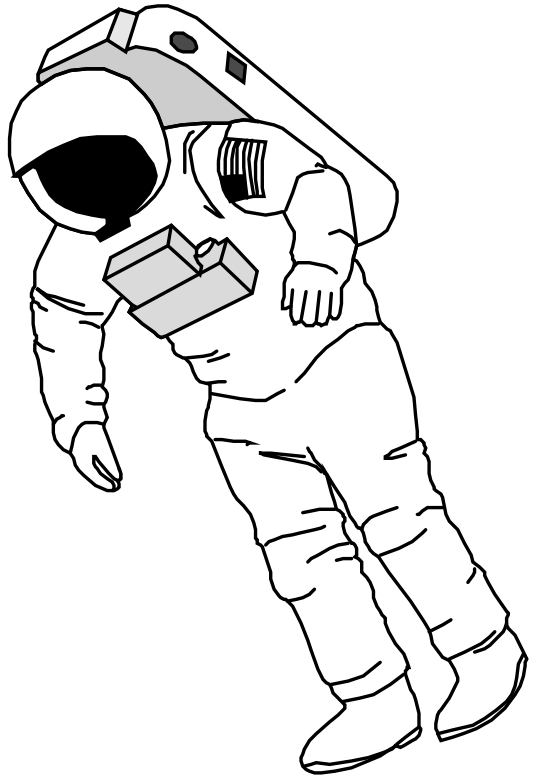
…

The systems reply

- **Objection to Experiment:** the person in the room doesn't understand. But, the person is only part of the room, the larger system understands.
- **Reply (Searle)**: Let the person internalize all the elements of the system. Still, the person doesn't understand and neither does the system because there is nothing in the system that is not in him
- **Reply**: The idea is that, although the guy doesn't understand Chinese, somehow the conjunction of the guy plus the rulebook, the batches of script, the slot, and the room does understand. That's ridiculous.

The robot reply

- Put a computer in the head of a robot giving the computer "perceptual" and motor capacities—this will bestow understanding.
- **Reply:** Put the room in the head of a robot. Still no understanding.



Searle and the Turing Test

- Turing Test: Are computers thinking minds?
  - Turing: If a computer passes Turing Test then it is a thinking thing
  - Searle: The Chinese Room is a computer and it passes the Turing test, but it is not thinking, so the Turing Test is not a good test for thinking/intelligences
- Searle's point is even stronger
  - Functionalist: if correct computer program relates inputs and outputs and internal states then it is a mind
  - Chinese room is a computer program but it does not understand, so it is not a mind

Searle's Positive View

- What is missing in the functionalist view of the mind?
- Searle only gives hints in this paper but
  - he thinks that the possibility of implementing a program by anything physical (e.g. beer cans, toiler paper) is a problem
  - So, we need to look at kinds of biological implementations that produces thinking

Addenda

Further Reading

- Block, Ned. “What is Functionalism?”
- Block, Ned. “Troubles for Functionalism?”