Stances on the Relation of Psychological States to the Brain

Basic Question: How do mental states relate to the brain?

- Three contemporary stances:
  - **Identity Theory**: They are identical to states of the brain
  - **Functionalism**: They are states realized by states of the brain but not identical to them
  - **Eliminative materialism**: They do not exist—they are nothing, although there are states of the brain
- The position one adopts might differ depending on whether one focuses on
  - Intentional psychological states
    - Believing, remembering, wanting, etc.
  - Qualitative/experiential psychological states
    - Feeling pain, experiencing color, etc.

Clicker Question

Which of the following is an example of an identity claim (as characterized by the identity theorists)?

- A. All mental states are caused by brain processes
- B. Thunder is correlated with lightening
- C. Lightening is an electrical discharge
- D. The word "pain" means the same as "c-fiber firing"

Identity Claim:
Pain = C-Fiber Firing

- C-fibers distinguished from others in terms of their thickness and myelination (Erlanger and Gasser)
- C-fibers carry the hurting stimulus in pain
  - Aδ (faster) tell of the occurrence of damage
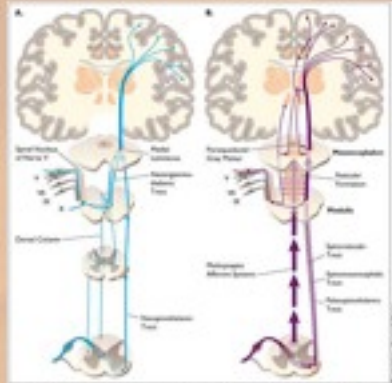- **Identity Claim: To be in pain simply is to have one's C-fibers firing**

U. T. Place: Sensations are Brain Processes

Ullin Place's brain

- Example identity claim: The morning star is the evening star (=Venus)
- Likewise, seeing green just is a process in the brain
- The brain process itself is not green--it is the object in the world that is green
  - What about when we hallucinate or see an afterimage--where is the green?
    - "When we describe the after-image as green... we are saying that we are having the sort of experience which we normally have when, and which we have learned to described as, looking at a green patch of light." Place (1956, p. 49)
    - When a person says 'I see a yellowish-orange after-image' he is saying something like this: "There is something going on which is like what is going on when I have my eyes open, am awake, and there is an orange illuminated in good light in front of me". Smart (1959)

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Identity Theory

- Place was an identity theorist only about sensations
  - With respect to intentional states he was a behaviorist
- J.J.C. Smart and David Armstrong: generalized identity theory to intentional states
  - For Sibyl to think that it is cold in Chicago just is for there to be an appropriate neural process in her brain
- Not a mere correlation, but an identity
  - "Consider an experience of pain, or of seeing something, or of having a mental image. The identity theory of mind is to the effect that these experiences just are brain processes, not merely correlated with brain processes."
- There is just one thing, although it may be described in different ways
  - "The person who stole you iPad" and "your best friend" may both refer to the same person (even though you may not know it)

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From Beliefs to Brain States

- "[B]eliefs as *mappings* of the world. They are structures within us that model the world beyond the structure. This model is created in us by the world. Purposes may then be thought of as driving causes that utilize such mappings." (D. M. Armstrong)
- Recall Tolman's *cognitive maps*
  - Rats lacking a hippocampus are unable to solve the navigation problems Tolman studied
  - Cells in CA3 fire in response to rat's location—place cells
  - Identity claim: CA3 place cells are Tolman's mental maps

Clicker Question

What is the fundamental commentment of philosophical functionalists?

A. Mental states are to be understood in terms of their evolutionary contributions

B. Mental states are to be understood by identifying the brain processes involved

C. Mental states are characterized in terms of their interactions with each other, sensory stimuli, and behavior

D. Mental states should be characterized in terms of the behavior for which they are responsible

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Functionalism (Philosophical)

- What determines the **identity** of a mental state is not its material composition, but its relation to other mental states
- Recall Aristotle's distinction between form and matter
  - Soul is the form of the person, not its matter
    - Form (soul) is what determines the kind of thing a human is
- Consider how Turing identified a Turing Machine
  - A Turing machine performs its activity in virtue of how it is organized, not what it is made of
- Challenge: figure out the right way to characterize relations between mental states that defines their identity

David Lewis' Strategy: Stories with Unspecified Role Fillers

- Consider the story of Mr. Body:
  - X, Y, and Z conspired to murder Mr. Body. Seventeen years ago, in the gold fields of Uganda, X was Body's partner . . . Last week, Y and Z conferred in a bar in Reading . . . Tuesday night at 11:17, Y went to the attic and set a time bomb . . . Seventeen minutes later, X met Z in the billiard room and gave him the lead pipe . . Just when the bomb went of in the attic, X fired three shots into the study through the French windows . . .
- Story can be understood even if you don't know who X, Y, and Z are
- If we later learn who X, Y, and Z are, we can say that they realize or play the roles in the story
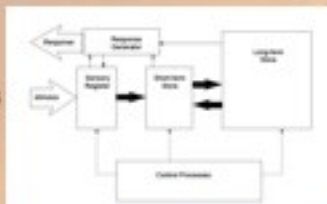- Generalize to mental states

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Machine Functionalism

- Like a coke machine, a person goes through a sequence of states

	S_1	S_2
nickel input	Emit no output Go to S_2	Emit a Coke Go to S_1
dime input	Emit a Coke Stay in S_1	Emit a Coke & a nickel Go to S_1

- If one could write the rules for such a system (a la Turing), then that would define the person's mental states
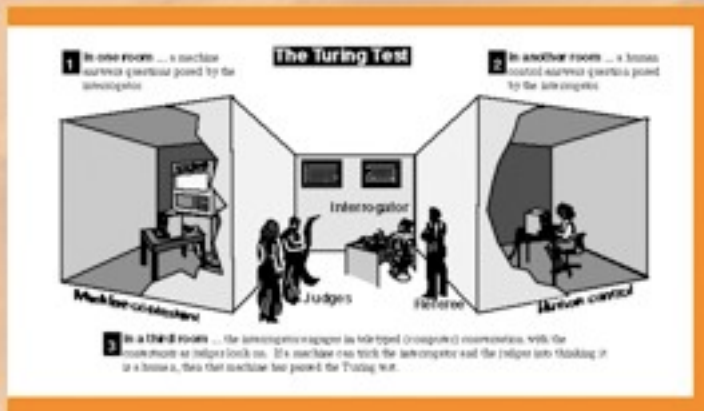 - They are simply states in the machine table

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Psycho-Functionalism

- Mental states identified in terms of their role in a network of mental processes identified in current theories
  - Psychological explanations often represented in box and arrow diagrams
  - Present the causal process without specifying what plays the various causal roles
- "Mental states and processes are just those entities, with just those properties, postulated by the best *scientific* explanation of human behavior."

Do Machines Really Think?

Opposition to Functionalism: Searle's Chinese Room

Imagine yourself as a monolingual English speaker locked in a room.

You are given three sets of paper on which strange inscriptions are written.
You are also given some directions in English. Following the directions, you match the first set of inscriptions with the second, and the third with the first two, and produce a sequence of inscriptions and slide these through a slot in the door.

You follow the directions much as a computer follows its directions—program

Carrying on a Chinese "Conversation"

Unbeknownst to you, the symbols you were given and which you produced were Chinese.

The first set of symbols in fact constituted a script (a la Schank)
The second constituted a story
The third constituted questions
By operating on these symbols following the English rules (match the top symbol of the second set with one in the first set), you were able to give cogent answers to the questions about the story

Native Chinese speakers outside believe they are conversing with a fellow Chinese speaker. *The Turing Test is passed!*

Implications of the Chinese Room

The Chinese speakers were wrong that they were having a conversation with anyone in Chinese—you don't know Chinese.

But you were doing just what the computer running Schank's program would do!

So it doesn't understand either. It is not intelligent, and does not constitute a mind.

Challenge: what would it take for a machine to use symbols meaningfully?
What does it take for you to use symbols meaningfully?

Clicker Question

What response would you offer to Searle's Chinese Room Argument

A. Searle's wrong--the person in the room really does understand Chinese

B. The person in the room doesn't understand Chinese, but the whole room (person, instructions, writing paper) does

C. Searle's right--functionalism is inadequate--only a system built out of the right kind of matter (e.g., neurons) could understand language

D. Other (be prepared to specify your response)

More Problems for Functionalism: Qualitative States

- Inverted spectrum argument

- Absent qualia argument

Clicker Question

In what respects do Eliminative Materialists agree with functionalists?

A. Mental states are to be understood in terms of how they relate to one another, not their physical realization

B. Mental states cannot be identified with brain states

C. We don't need to invoke the brain to understand cognitive processes

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Eliminative Materialism

- Wilfred Sellars: our accounts of minds as populated by beliefs, desires, etc., constitute theories, not reports
  - The Myth of Jones: imagine a group of humanoids who had developed the ability to use language to refer to things in the world and to their behavior. Along comes Jones, who constructs a *theory* that explains behaviors in terms of beliefs and desires.
    - Others learn his theory and learn to characterize themselves in terms of beliefs and desires
      - But they are still theorizing, not reporting
- AND, theories might always turn out to be wrong!

Pioneers in Eliminativism

- Theories often get replaced
  - Often the vocabularies of the old and new theory are incommensurable (Paul Feyerabend)
  - When theories are replaced by those whose vocabulary is incommensurable, the entities referred to in the old theory are abandoned
  - The view that the mind develops a mirror of nature [a mental map characterized in terms of beliefs] is such a false theory (Richard Rorty)

Eliminativism San Diego Style

- The fate of belief is like the fate of phlogiston (element of fire)
  - Once chemists understood that oxygen, carbon, etc. were the basic elements, they concluded that phlogiston does not exist
  - Folk psychology represents an impoverished, unprogressive research program
    - Neuroscience offers the promise of giving us better accounts of why we do what we do

Does Eliminativism Cost Anything?

- if commonsense psychology were to collapse, that would be, beyond comparison, the greatest intellectual catastrophe in the history of our species . . ." (Fodor, 1987, p. xii)