

# Minds and Machines

spring 2003

Functionalism, contd.

# preliminaries

- no problem set this week






# the 3-Coke vending machine

initial  
state  
s

output  
for  
25¢ input

next  
states

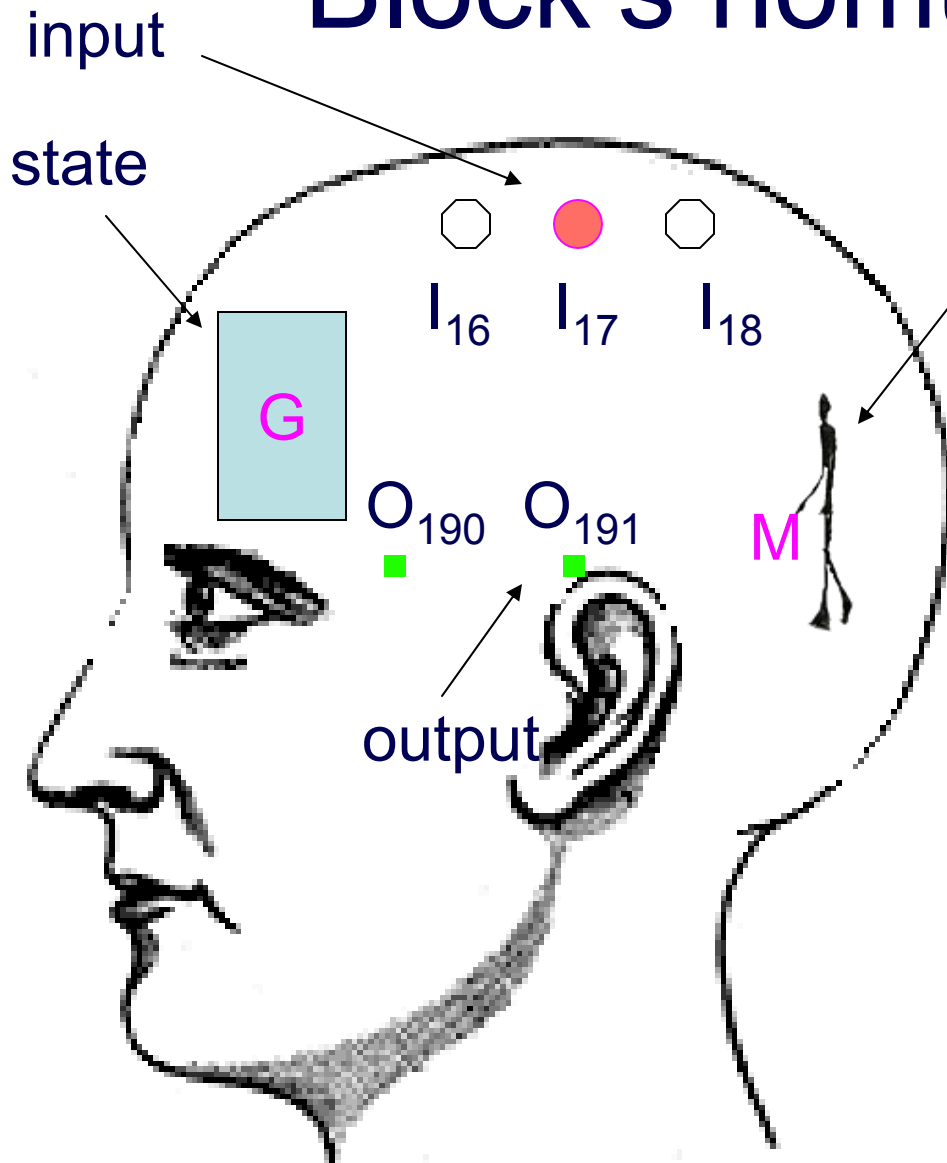
$M_3 I_0$	$M_2 I_0$	$M_1 I_0$	$M_3 I_1$	$M_2 I_1$	$M_1 I_1$
"25¢"	"25¢"	"25¢"			
$M_3 I_1$	$M_2 I_1$	$M_1 I_1$	$M_2 I_0$	$M_1 I_0$	shut down

# “Troubles with functionalism”

Imagine a body externally like a human body, say yours, but internally quite different. The neurons from sensory organs are connected to a bank of lights in a hollow cavity in the head. A set of buttons connects to the motor-output neurons. Inside the cavity resides a group of little men. Each has a very simple task: to implement a "square" of an adequate machine table that describes you. (96)

On one wall is a bulletin board on which is posted a state card, i.e., a card that bears a symbol designating one of the states specified in the machine table. Here is what the little men do: Suppose the posted card has a 'G' on it... Suppose the light representing input I 17 goes on. One of the G-men has the following as his sole task: when the card reads 'G' and the I 17 light goes on, he presses output button O 191 and changes the state card to 'M'... In spite of the low level of intelligence required of each little man, the system as a whole manages to simulate you because the functional organization they have been trained to realize is yours... (96)

# Block's homunculus head



input	$I_{16}$	$I_{17}$	$I_{18}$
state	$O_{25}K$	$O_{191}M$	$O_{45}P$
<b>G</b>	$O_8H$	$O_{77}Z$	$O_5C$

there is prima facie doubt whether [the homunculus head] has any mental states at all -- especially whether it has what philosophers have variously called “qualitative states”, “raw feel” or “immediate phenomenological qualities” ...there is prima facie doubt whether there is anything it is like to be the homunculi-headed system. (97)

# Functionalism vs. psychofunctionalism (see Block)

- suppose functionalism is true
- could you (at least “in principle”) write down the functional characterization of mental states just by reflecting on the meanings of mental vocabulary?
- the (“commonsense”, “analytic”) **Functionalist** says ‘yes’
- the (“scientific”, “empirical”) **psychofunctionalist** says ‘no’ -- science will tell us the functional story, not conceptual analysis

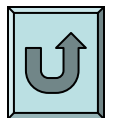
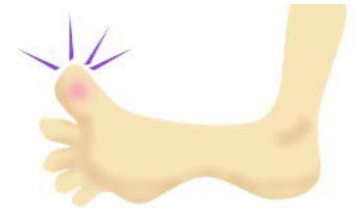


# Functionalists and psychofunctionalists

- Lewis and Armstrong are Functionalists (“analytic functionalists”)
- Putnam is a psychofunctionalist
- psychofunctionalism is probably the more popular version
- we will return to this issue when we discuss Chalmers’ paper “Consciousness and its Place in Nature”

# a toy functionalist theory of pain

input \ state	toe-stubbing	icepack on toe
P	P, "Ow!"	R, "Phew!"
R	P, "Ow!"	R, no output



# the toy functionalist theory

- the state of being in pain (or being in a state of relief) just *is* being in P (R)
- S is in P iff S is in the first of two states X, Y, that are related to one another and to the possible inputs and outputs of S as follows:

being in X and stubbing its toe causes S to remain in X and emit “Ow!”; being in Y and stubbing its toe causes S be in X and emit “Ow!”; being in X and having an icepack on the toe causes S to be in Y and emit “Phew!”; being in Y and having an icepack on the toe causes S to remain in Y and produce no output

# “Psychophysical and theoretical identifications”

- proposes a way of extracting explicit functional definitions of mental terms from a psychological theory
- defends Functionalism -- the psychological theory that implicitly defines our mental vocabulary is commonsense or folk psychology
- (implicitly) defends “realizer state” as opposed to “role state” functionalism

# role state vs. realizer state

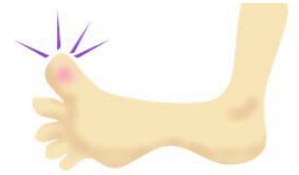
- functionalism as explained so far is “role state functionalism”
- recall the toy functionalist theory of pain:



- S is in Pain iff S is in the first of two states X, Y, that are related to one another and to the possible inputs and outputs of S as follows:

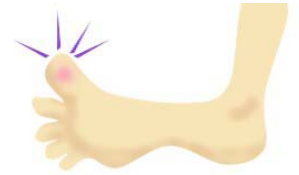
being in X and stubbing its toe causes S to remain in X and emit “Ow!”; being in Y and stubbing its toe causes S be in X and emit “Ow!”; being in X and having an icepack on the toe causes S to be in Y and emit “Phew!”; being in Y and having an icepack on the toe causes S to remain in Y and produce no output

# role state vs. realizer state



- put a bit more explicitly:
- S is in Pain iff there are two states X, Y, that are related to one another and to the possible inputs and outputs of S as follows:  
being in X and stubbing its toe causes S to remain in X and emit “Ow!”; being in Y and stubbing its toe causes S to be in X and emit “Ow!”; being in X and having an icepack on the toe causes S to be in Y and emit “Phew!”; being in Y and having an icepack on the toe causes S to remain in Y and produce no output  
*and*: S is in X

# role state vs. realizer state



- suppose that two neural states (having one's  $\alpha$  fibers fire [state Alpha], having one's  $\beta$  fibers fire, [state Beta]) are such that:

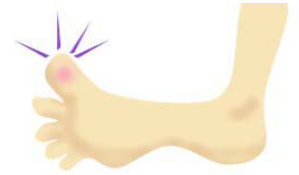
being in Alpha and stubbing its toe causes S to remain in Alpha and emit "Ow!"; being in Beta and stubbing its toe...

...remain in Beta and produce no output

*and*: S is in Alpha

- assuming the toy functionalist theory is correct, is the state of being in pain the very same state as being in Alpha?

# role state vs. realizer state



- no
- there could be two hydraulic states of some system  $S^*$  (having one's  $\gamma$  valves open [state Gamma], having one's  $\delta$  valves fire [state Delta]) such that:

being in Gamma and stubbing its toe causes  $S$  to remain in Gamma and emit "Ow!"; being in Delta and stubbing its toe...

...remain in Delta and produce no output



# role state vs. realizer state

- if the state of being in pain just *is* the state of being in Alpha, then  $S^*$  (only in Delta) is not in pain. But, assuming the toy functionalist theory is correct,  $S^*$  is in pain if it's in Delta.

$S^*$  (in Delta)

# role state vs. realizer state



- Alpha and Gamma are two states that each “realize” the state of being in pain
- according to the **role state** functionalist, neither one is identical to the state of being in pain
- the state of being in pain is a “role state” -- the state of having some realizer state or other
- according to the role state functionalist, both the biological system  $S$  and the hydraulic system  $S^*$  are in pain
- according to the **realizer state** functionalist, there is no one state of pain that  $S$  and  $S^*$  share

# role state vs. realizer state



- according to Lewis, mental states should be relativized to kinds of creatures. S is in one mental state (pain-for-humans), S\* is in a different mental state (pain-for-sea-monsters). [This is in his paper “Mad pain and martian pain”]
- the motivation for realizer state functionalism is the idea that the realizer state does the causing, not the role state
- sleep inducing drugs share the same role state -- “dormativity”. But isn’t it the Diphenhydramine HCl in Tylenol PM that puts you to sleep, not its dormativity?
- the issue is controversial; some think that the realizer state and the role state can be causes (we will take this up later)

# the Ramsey/Lewis method of defining theoretical terms

**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 **Y** in the billiard room and gave him the lead pipe...just when the bomb went off in the attic, **X** fired three shots into the study through the French windows...

(Lewis, 88)

The “theoretical term” ‘**X**’ can be defined, according to Lewis, as follows:

The first member of the unique triple  $\langle a, b, c \rangle$  such that:  $a$ ,  $b$ , and  $c$  conspired to murder Mr. Body, and seventeen years ago, in the gold fields of Uganda,  $a$  was Body’s partner...and seventeen minutes later,  $a$  met  $b$  in the billiard room and gave him the lead pipe...and just when the bomb went off in the attic,  $a$  fired three shots into the study through the French windows...

If we discover that the members of a certain unique triple interacted in these ways, then we can *identify* **X** with the first member, **Y** with the second member, and **Z** with the third member

**X** =

**Y** =

**Z** =

## another argument for the identity theory

- according to Lewis we can define 'pain' by applying the Ramsey/Lewis method to T, our commonsense psychological theory
  - this gives Lewis an argument for the identity theory that is different from Smart's appeal to Ockham's razor:
    - (1) pain = the state that realizes causal role R  
[by armchair reflection]
    - (2) the state that realizes causal role R = c-fibers firing  
[by science]
- hence:
- (3) pain = c-fibers firing

# Minds and Machines

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Content:  
intentionality and externalism





from the philosophical toolkit:

**extrinsic** and **intrinsic** properties

perfect duplicates:

not-so-perfect duplicates:

# extrinsic and intrinsic properties

the all-purpose  
duplicating machine



# extrinsic and intrinsic properties

- property  $P$  is *intrinsic* iff it is necessarily shared between perfect duplicates



- otherwise,  $P$  is *extrinsic*

# extrinsic and intrinsic properties

- being cylindrical
- having mass 200g
- being red

(intrinsic)



- being a Campbell's soup can
- having weight 200g
- being in the cupboard

(extrinsic)



# are mental properties intrinsic?

yes, according to:

- Descartes (well, arguably)
- the identity theory (taken as theory of all mental states, not just properties like being in pain)
- functionalism and behaviorism (on one natural way of spelling these theories out)
- commonsense(?)

“thoughts are in the head!”

# a “twin earth” thought experiment

# Cambridge and twin-Cambridge

Harvard Square



Hilary

twin-Harvard Square



twin-Hilary

# Cambridge and twin-Cambridge

“Cambridge is pretty”



Hilary

“Cambridge is pretty”



twin-Hilary



# different utterances

- Hilary's utterance is about *Cambridge* (not Twin-Cambridge, of which he has never heard)
- his utterance is true iff Cambridge is pretty
- the aesthetics of twin-Cambridge are totally irrelevant -- if we imagine that twin-Cambridge is an imperfect duplicate of Cambridge (a twin Harvard Square, but exceptionally attractive elsewhere), then Hilary's utterance remains false, although twin-Hilary's utterance is true

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- read Putnam (“The meaning of ‘meaning’”) and Burge