

# Functionalism

Phil 255

# Functionalism after James

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- Angell and Dewey are largely credited with continuing James' vision
- However, Angell's textbook, 'Psychology,' came out in 1909, when behaviourism was on the rise
- Focus was on: conscious/unconscious division; cognitive development, and a scientific approach
- Contemporary cognitive psychology shares these commitments, but expands on them with increased rigor in discussing 'function'
- because...

# The rise of the computer

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# Rise of the computer

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- 19th c. Babbage's analytical engine (never built)
  - CPU, APU, RAM, output
- 1945 ENIAC first fully electronic computer
- 1945 Von Neumann introduced current computer architecture (stores program in same form as data)
- Recent advance challenge our notion of intelligence (e.g. Deep Thought and Deep Blue)
- Most important theoretical development: Turing Machine

# Turing Machines

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- Alan Turing (1936) invented this theoretical entity
  - Showed it could compute all computable function
- TMs consist of:
  - 1) tape of ones and zeros;
  - 2) read/write head;
  - 3) table of instructions re: what to do given value on tape

# An adder

State	Input	Output	Next State
1	0	RI	2
	1	RI	1
2	0	L0	3
	1	RI	2
3	0	L0	3
	1	L0	4
4	0	R0	Halt
	1	LI	4

$[101] \Rightarrow 11$

$[110111] \Rightarrow 11111$

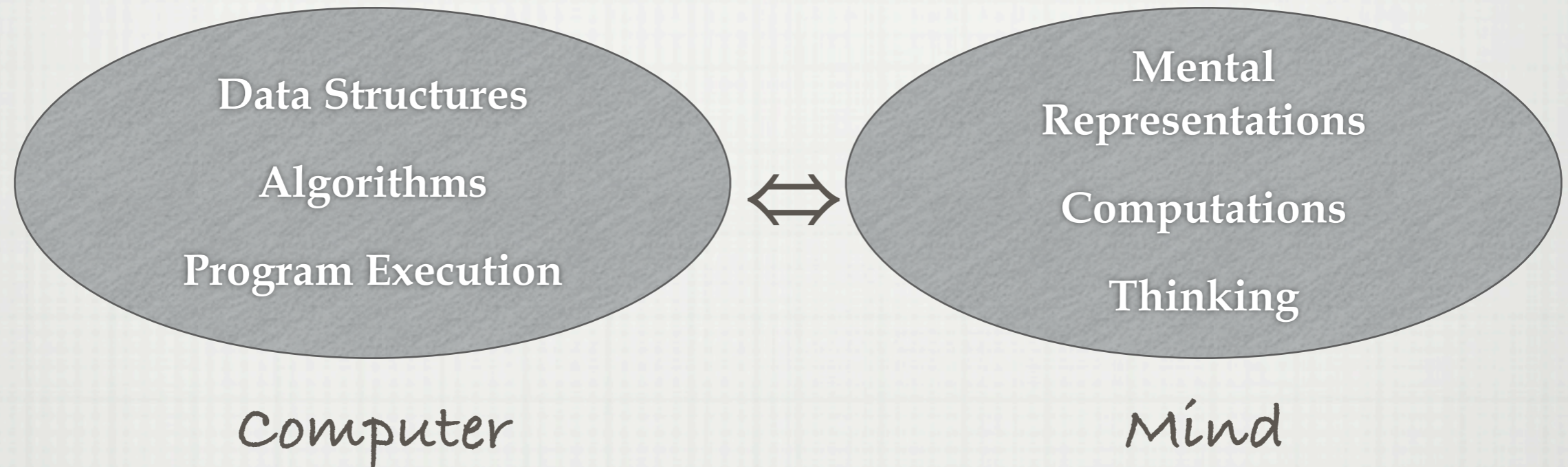
# Consequences

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- Very simple, but shares essential properties with all computers
- Divorces computation from implementation
- Defines the function of a device
- If human thought is determined by functions, and TMs describe functions in the abstract...
- Turing suggested the Turing test for intelligence
  - Imitation game (computer tries to fool a judge into thinking it's human)
  - If successful, Turing says, machine should be considered intelligent

# Computer as mind

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- Further analogies: hardware? program? programmer?
- Disanalogies?

# Solves mind/brain problem

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- How can minds and brains be the 'same'?
  - Property dualism
  - Materialist
  
- Putnam was one of the first to argue for 'TM functionalism'
- Functional isomorphism determines 'mentality'
  - Autonomy from physics
  - No ontological dualism
  - TMs/FI is abstract hence independent of implementation

# Consequences

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- Identity theory must be false
- Multiple realizability thesis must be true
- Dualists and materialists are both wrong assuming explanation follows ontology
  - e.g. square peg
  - More general explanations are more useful
- TM functionalism must be modified
  - states of humans are experience dependent
  - mental states can be multitudinous

# Extending functionalism

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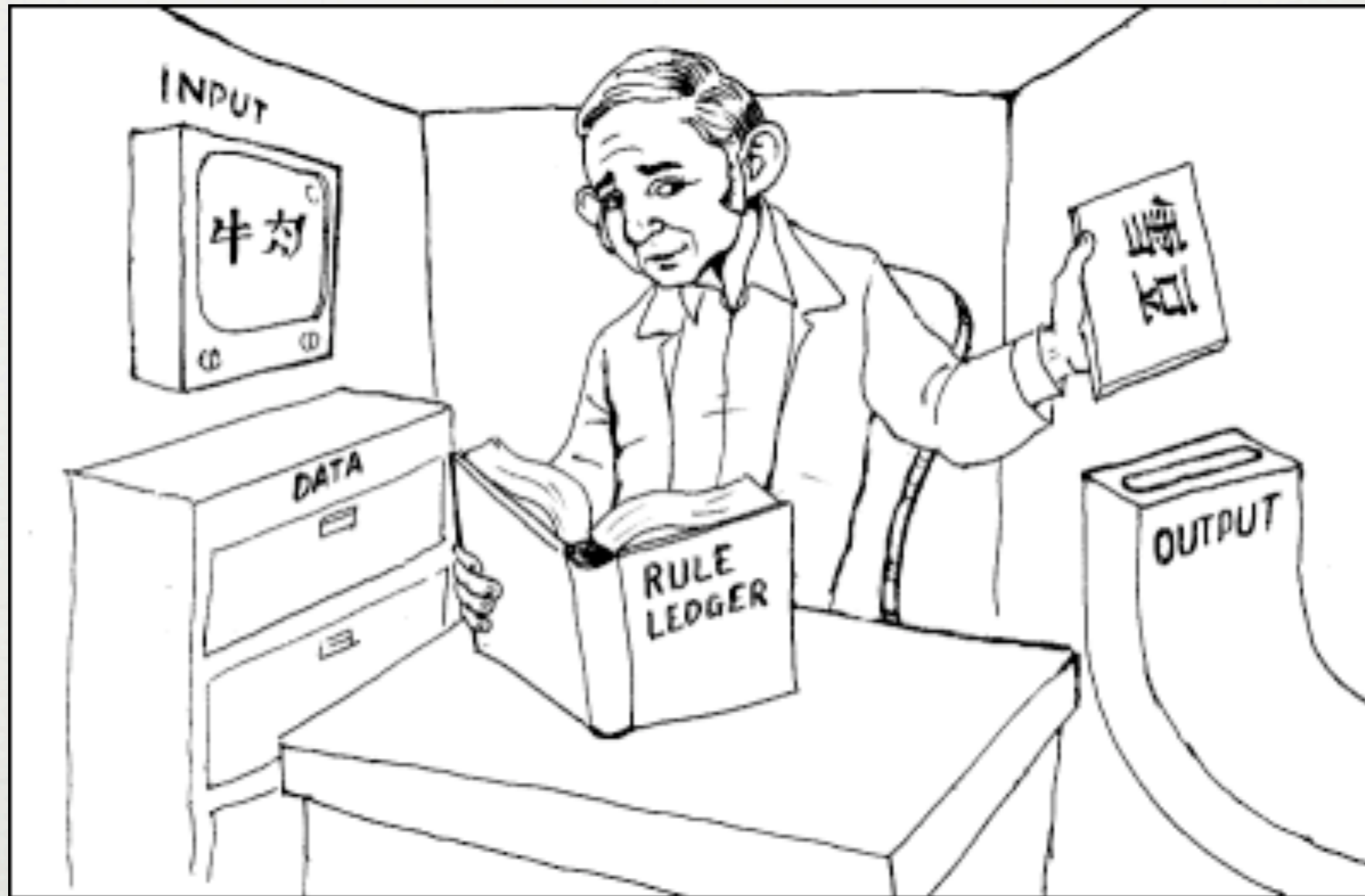
- Functionalism was well-received because it
  - Was theoretically well-founded
  - Solved (at least) four main problems with past approaches
- Functionalism was associated with other theses to provide a more complete psychological theory (Fodor)
  - Language of Thought hypothesis
  - CTM
- This approach is (very) consistent with folk-psychology

# Problems with functionalism

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- Largely identified through the use of thought experiments
  - A number of important disanalogies to real experiments
  - However, they do have their advantages as well
  - Must be used with caution & self-consciously
- The 'Great Mind of China'
  - Lots of people (pigeons, fleas) talking on radios with appropriate functional isomorphism
  - Intended as a reductio ad absurdum
  - Begs the question, no alternative

# Searle



Chinese room

# English Room

Rich in the Hall speak no english

# Consequences

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- Intended to be a reductio ad absurdum as well
- Aimed at 'strong AI' as opposed to 'weak AI'
- It satisfies all the tenets of CTM, but fails to be intentional
  - Functionalism is false
  - CTM is false
- Obvious by analogy to simulations of fire and weather
- Disanalogies?

# Responses

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- Systems reply
    - rejoinder: Internalize the rules
  - Robot reply
    - rejoinder: 1) broke the rules; 2) still doesn't work
  - Brain simulator reply
    - rejoinder: 1) gave up functionalism; 2) still doesn't work
  - Combination reply
    - rejoinder: 1) might fool people; 2) still no understanding
  - Learning reply
- No understanding  
+ No understanding  
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No understanding*

# Discussion

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- Searle thinks machine's can have understanding
- But formal descriptions are the wrong way to find them
  - need the right causal properties
- Is this an alternative to strong AI?
- Do they not suggest causal properties?
- What are the right causal properties? (Or how can we discover them?)
- Why do somethings with those causal properties not count as understanding? (Or do they?)

# Functionalism & Consciousness

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- Absent qualia
  - Entrance of zombies into philosophy
  - Machine table of zombie is the same, but experience isn't
  - Begging the question?
- Inverted spectra
  - Qualia and function are separable
  - Begging the question?

# Blindsight

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- Usually from significant damage to primary visual cortex
  - Not always: <http://serendip.brynmawr.edu/bb/blindsight.html>
- Taken (e.g., by Lyons) to show independence of function and qualia
- Is the function the same?
- Does this establish the independence of qualia and function?
- What does it show?
- Completely different: Animals, qualia, and zombies...?