Functionalism

Phil 255

Functionalism after James

- 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
- Contemporay cognitive psychology shares these commitments, but expands on them with increased rigor in discussing 'function'
- because...

The rise of the computer

Rise of the computer

- 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

- Alan Turing (1036) invented this theoretical entity
  - Showed it could compute all <u>computable function</u>
- 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 1	R1 R1	2 1
2	0 1	L0 R1	3 2
3	0 1	L0 L0	3 4
4	0 1	R0 L1	Halt 4

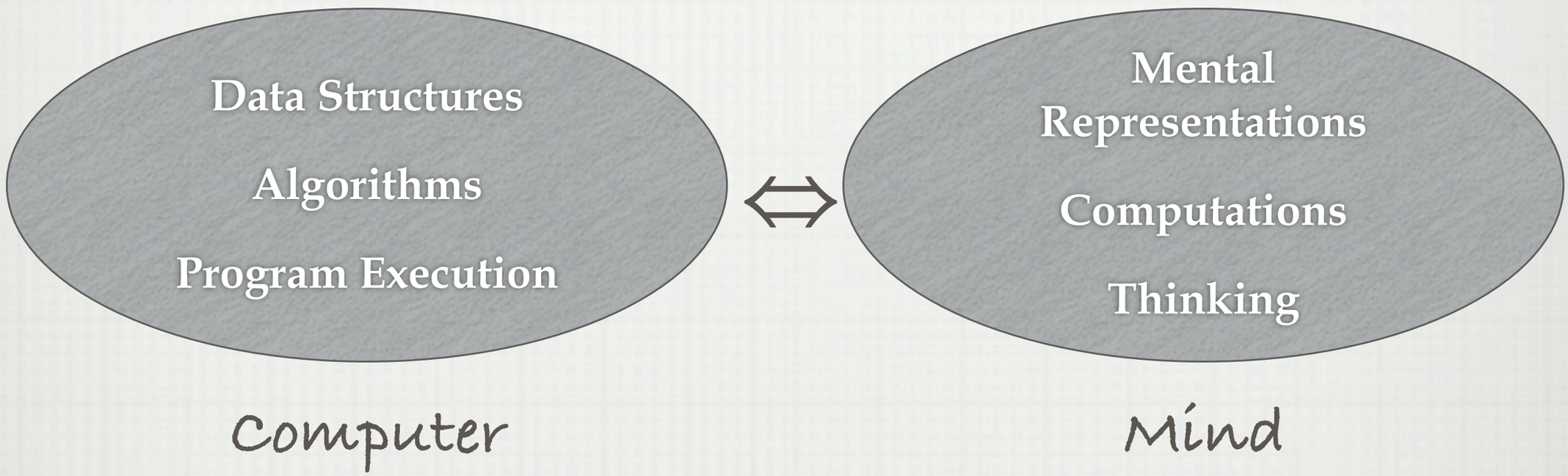
[1 0 1] => 1 1

[1 1 0 1 1 1] => 1 1 1 1 1

Consequences

- 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



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

Solves mind/brain problem

- 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

- 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

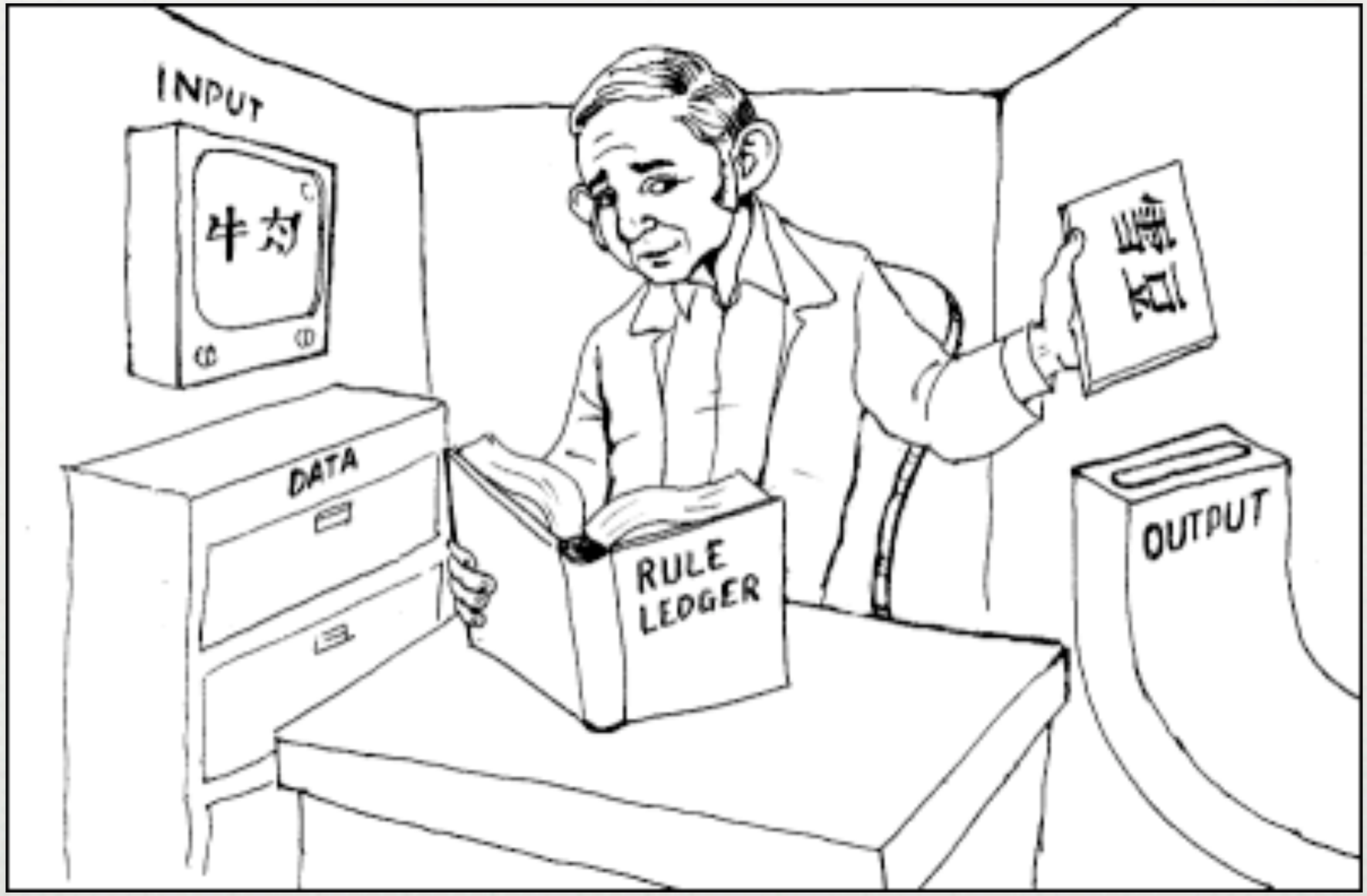
Extending functionalism

- 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

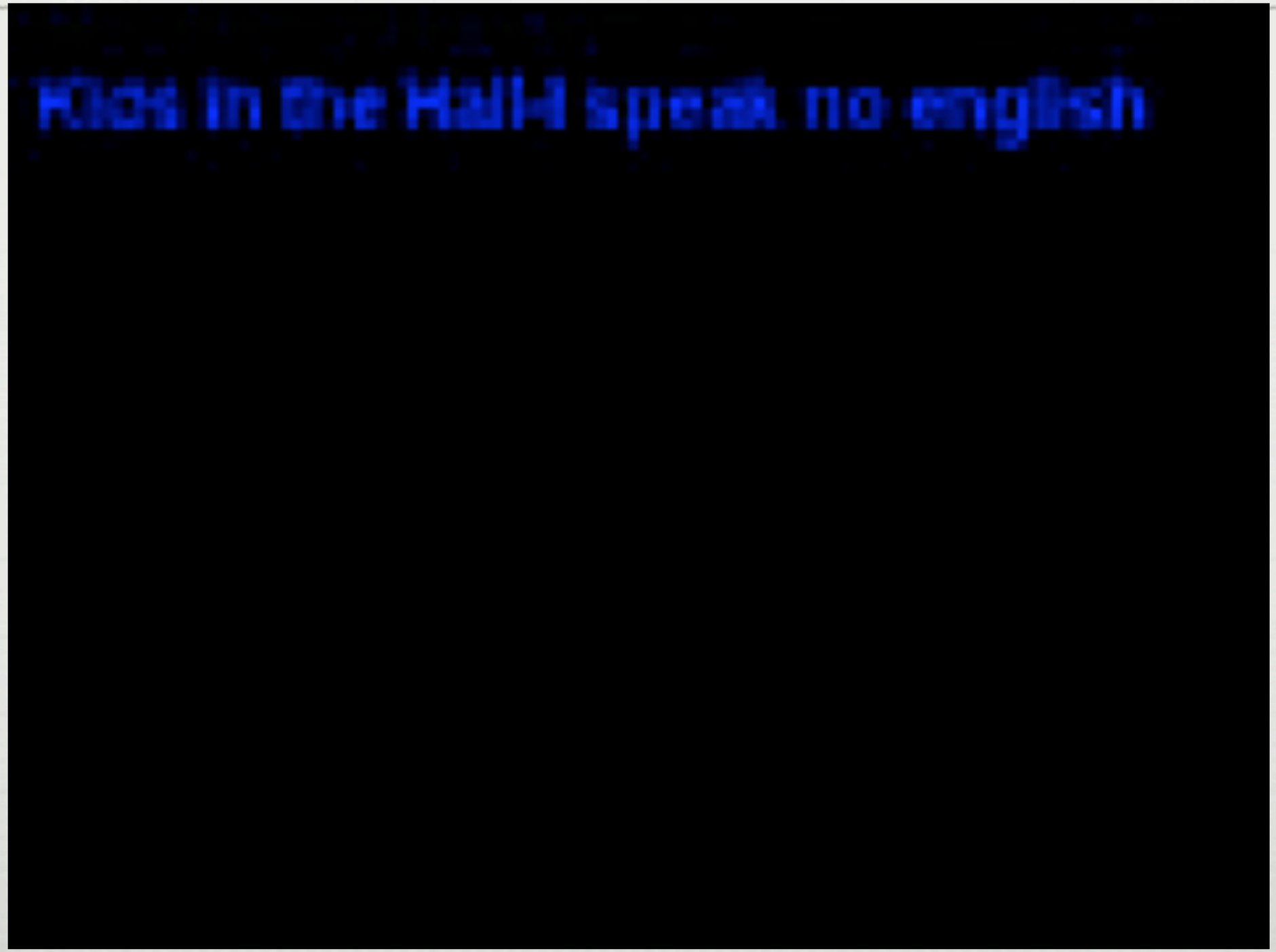
- Largely identified through the use of thought experiments
  - A number of important disanalogies to real experiments
  - However, they do have their advantages as well
  - Must be used with caution & self-consciously
- The 'Great Mind of China'
  - Lots of people (pigeons, fleas) talking on radios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

Searle



Chinese room

English Room



Consequences

- 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

- 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
No understanding

Discussion

- 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

- 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

- 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...?