20180110 COGS 101b Lecture Notes

Cabinet COGS101b Lecture Notes

Early studies -> Behaviorism -> Cognitive Psychology

Ebbinghaus (1885)

Studied time-course of forgetting…on himself.

This demonstrated that memory can be quantified.

Wilhelm Wundt & Introspection

Observing your own thoughts.

Focus on conscious mental events

Meticulous training on how to describe and record mental experiences.

Problems

Some thoughts are unconscious
No way to objectively test claims.

John Watson & Behaviorism

Early to Mid 1900s

Replace the study of the mind (which is unobservable) with study of behavior (which is observable).

Classical Conditioning

Definition A neutral stimulus with a stimulus that elicits a response causes the neutral stimulus to elicit a response.

Operant Conditioning

Definition Focuses on how behavior is strenghtened by presentation of positive reinforcement, or withdrawal of negative reinforcements. Essentially, how behavior is shaped by reward and punishment of that behavior.

Thorndike's Puzzle Box: Cat learns to press a lever through reward of fish.

B.F. Skinner

Prominent behaviorlist

Pigeon Bombs

Cognitive Revolution (1940s & 1950s)

1. Behavior is often best explained by positing rich internal states
2. The digital computer
3. New methods for studying the mind.

Behavior is often best explained by positing rich internal states

Tolman's Maze (1948)

1. Let Rat explore maze
2. Place Rat in the same spot
3. Place food in the maze
4. Condition rat to find the food
5. Place Rat in different spot
6. Observe where the rat goes

Operant Conditiong Prediction: Rat will be conditioned to turn right regardless of where the Rat starts

Reality: Rat correctly finds food, regardless of starting position

Noam Chomsky's vs. B.F. Skinner

Language demonstrates why behaviorism isn't the whole picture.

Kids learn to say things they weren't rewarded/punished for.

Digital Computer

Donald Boradbent (1958)

Proposed flow diagrams for the mind to represent attention, inspired by the digital computer model.

Input -> Filter -> Detector -> Memory

The birthday of Cognitive Science (1956)

Summer research project on artificial intelligence
Massachusetts Institute of Technology Symposium on Information Processing

Could we program a computer to mimic the operations of the human mind??

New methods of studying the mind

Shepard and Metzler (1971)

1. Show shapes that may or may not be rotations of each other
2. Ask people if they are the same shape

Results: More rotation = more time to determine.

Transcendental Method

Immanuel Kant

“Inference to the best Explanation”

Start with observable facts and work backwards

Observable effects from an unobservable cause.

Cognitive Models

Definition Representations of structures or processes that help us visualize or explain the structure or process.

Structural Models

A plastic model of the brain
Flowchart of the visual system
Pain matrix

Processes Models

Represent the processes that are invovled in cognitive mechanisms, with boxes usually rpresenting specific processes and arrows indicating connections between the processes