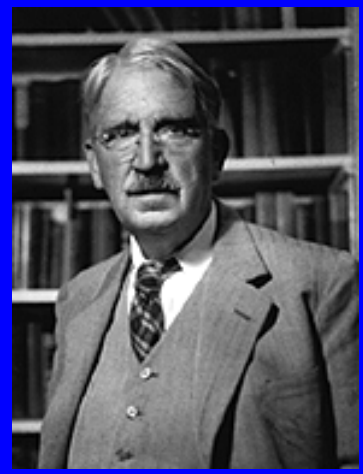
Behaviorism: Laws of the Observable

The Backdrop to Watson: Functionalism at the Univ. of Chicago

John Dewey, like James, was influenced by both Peirce and Darwin



Moved to the University of Chicago in 1894, bringing George Herbert Mead, Addison W. Moore, and James Rowland Angell

Contrast with structuralism: rejected elementarism
Rejected the reflex arc in favor of more holistic, adaptive view: a reflex is an instrument "for successful coordination"

Angell's Characterization of Functionalism

"Functional psychology...involves the...effort to discern and portray the typical operations of consciousness under actual life conditions, as over against the attempt to analyze and describe its elementary and complex contents...It is...synonymous with descriptions and theories of mental action as distinct from the material of mental constitution... The most essential quarrel which the functionalist has with structuralism in its thoroughgoing and consistent form...touches the feasibility and worth of the effort to get at mental process as it is under the conditions of actual experience rather than as it appears to a merely post mortem analysis...The functional psychologist...is wont to take his cue from the basal conception of the evolutionary movement, i.e., that for the most part organic structures and functions possess their present characteristics by virtue of the efficiency with which they fit into the extant conditions of life broadly designated the environment." (Angell, 1907)

Ivan Petrovich Pavlov: Physiologist

In vivo study of the physiology of the digestive system using fistulas

Role of nervous system in controlling digestive processes

Investigated "psychic secretion"—secretion in response to food stimuli located at a distance

Treated phenomenon as a reflex, albeit a conditioned one.

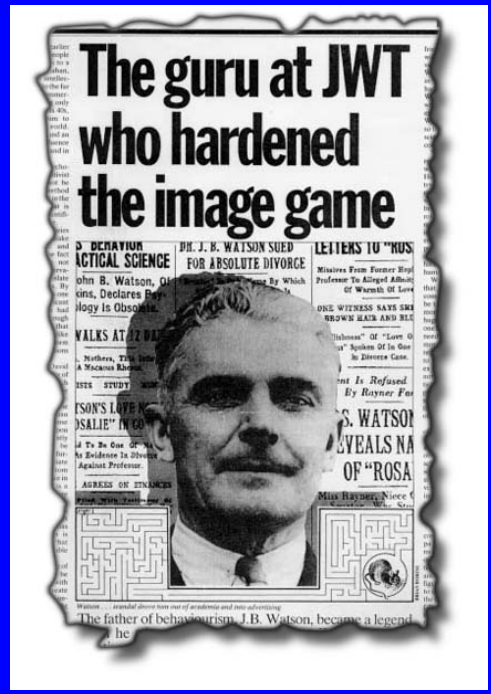
These reflexes involve the cerebral cortex

unconditioned stimulus →unconditioned response

conditioned stimulus→conditioned response

"The Experimental Psychology and Psychopathology of Animals" (1903)

James Watson



Frustration at the University of Chicago

- Dominated by Functionalists
- Sought refuge in Jacques Loeb and his studies of tropism in plants and animals

Dissertation on the relation between behavior in the white rat and the growth of the nervous system

- Title: Animal Education: The Psychical Development of the White Rat

Emerging view: “Can't I find out by watching...[animal] behavior everything that the other students are finding out by using [human] O[bserver]s?"

Watson's Manifesto: "Psychology as the Behaviorist Views It"

Rejected focus on consciousness and use of introspection

Focus instead on behavior, with emphasis on control and prediction

Thinking as covert speech—thus the product of conditioning

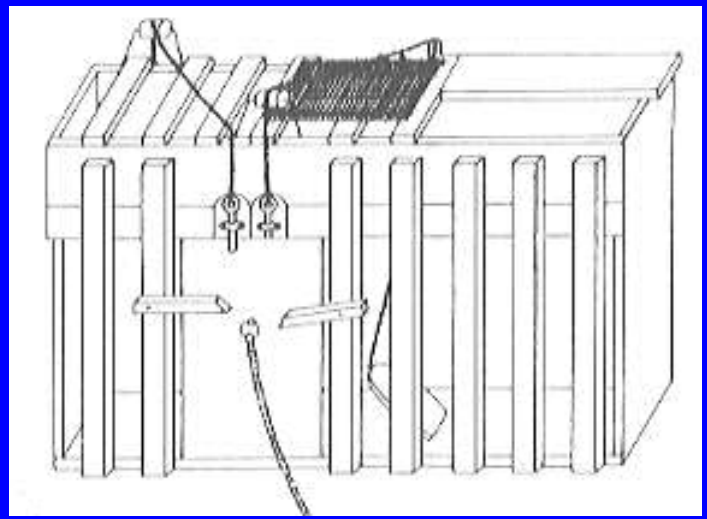
Started with animals, but moved to humans

Little Albert study: "condition and control the emotions of human subjects."
Classical conditioning of fear

Edward Thorndike: The Law of Effect

Thorndike's puzzle box:

Animals, generally hungry cats, were placed in the box. To escape they had to solve the puzzle.



Observed trial and error learning. Cat would try various strategies until one worked. On repeat trials, gradually reduce time to respond. Not insight but successful strategies gradually "stamped in."

Law of Effect: ***successful behaviors led to stronger neural connections*****.**

Development in Philosophy: Logical Positism

Concerned about the epistemological status of new scientific (and possibly pseudo-scientific) developments in the early 20th century, several philosophers sought to explicate the foundations of science

In sensory experience (positive knowledge)

And in logic

Logic provided the way to build from sensory experience to scientific theories

Hypothetical-Deductive Method: Theories are hypotheses tested by the statements derived from them

Learning Theory: Clark Hull

Broad early interests: effects of tobacco, hypnosis, intelligent machines

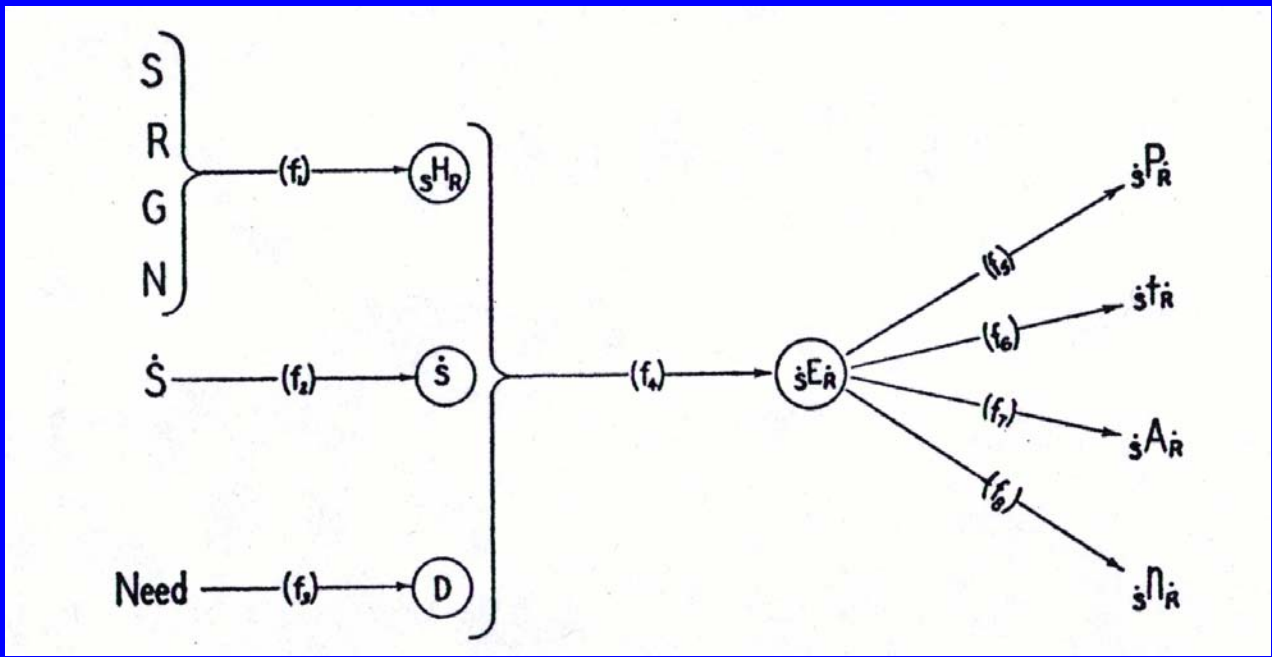
"It has struck me many times of late that the human organism is one of the most extraordinary machines – and yet a machine. And it has struck me more than once that so far as thinking processes go, a machine could be built which would do every essential thing that the body does (except grow) as far as concerns thinking, etc." (Idea Book, 1926)

Laws of Learning

Quest for a mathematical account of learning

Looking for laws by use of the hypothetical-deductive method

Intervening variables fine as long as well-defined.



Edward Tolman: Purposive Behaviorism

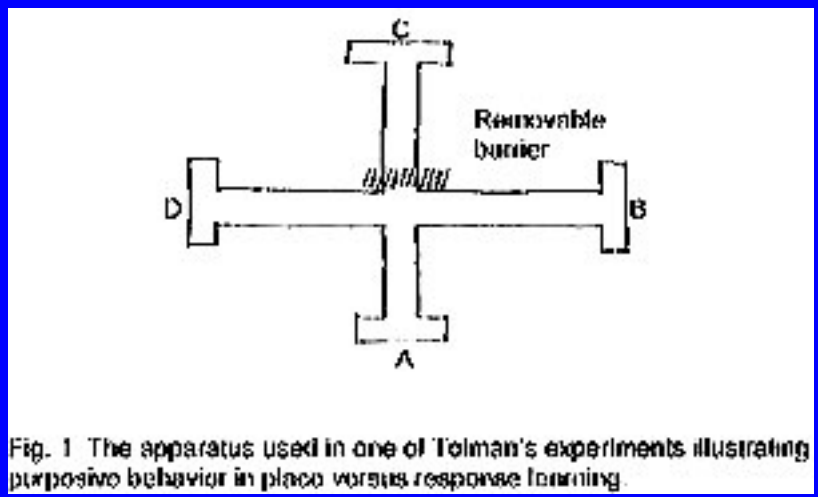


Fig. 1 The apparatus used in one of Tolman's experiments illustrating purposive behavior in place versus response learning.

Argued for a molar, not molecular perspective (reflexes, S-R pairs are molecular)

Articulated an intervening variable theory of learning, not a stimulus-response theory

Animals and humans engage in *latent learning*: build up knowledge of their environment from engaging the environment

- rats running mazes—with and without rewards—developed *cognitive maps*
- if rat learns to go from A to B, where will it go when released from C?

Burrhus Frederic Skinner and his Epistemology

Operational definition of psychological terms—tie them to what can be experienced

Initially construed this as ruling out any mental (subjective) entities—radical behaviorism

Later developed a strategy for talking about the inner subjective life: “The irony is that while Boring must confine himself to an account of external behavior, I am still interested in Boring-from-within.”

Skinner's Treatment of Private Mental Lives

But what are mental events for Skinner? Certainly they are physical, but what do we know of them?

How can we talk about them? Learn language by having words brought under stimulus control. But those teaching us our language cannot observe events in our private lives so as to link our responses to them. Limited to what is public.

"It is social reinforcement which leads the individual to know himself. It is only through the gradual growth of the verbal community that the individual becomes 'conscious'. He comes to see himself only as other see him, or at least only as others insist that he see himself."

Mental Events: Treat as Effects, not Causes

Suppose mental events were intervening steps in the causal pathway from stimulus to response

Stimulus→Mental Events →Response

Mental events (1) are not observable and (2) not independently controllable

Controllability important both for experimentation and for clinical use. If you cannot control it, it is not a worthy focus of "scientific" inquiry

Skinner's use of the Theoretician's Dilemma

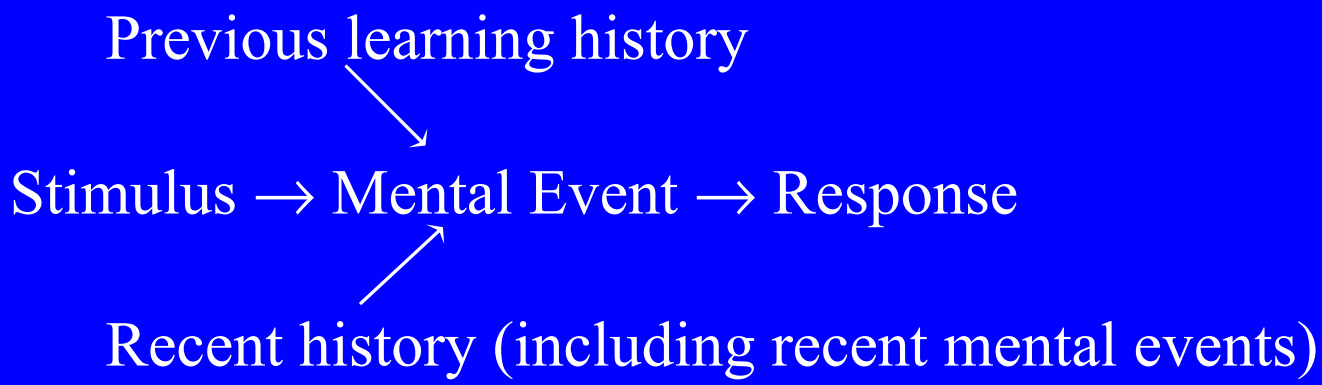
Uses Theoretician's Dilemma to argue against theories positing theoretical entities:

"The objection to inner states in not that they do not exist, but that they are not relevant in a functional analysis. . . . Unless there is a weak spot in our causal chain so that the second link is not lawfully determined by the first, or the third by the second, then the first and third links must be lawfully related"

If Stimulus→Mental Events →Response
then Stimulus→ Response

How could mental events be more than idle intermediates in causal chain?

If they are the product of multiple causes.



Can no longer be eliminated without losing predictive power

Is Skinner surreptitiously invoking intentional idioms?

Dennett:

Skinner's experimental design is supposed to eliminate the intentional, but it merely masks it. Skinner's nonintentional predictions work to the extent they do, not because Skinner has truly found nonintentional behavioral laws, but because the highly reliable intentional predictions underlying his experimental situations (the rat desires food and believes . . .) are disguised by leaving virtually no room in the environment for more than one bodily motion to be appropriate action and by leaving virtually no room in the environment for discrepancy to arise between the subject's beliefs and the reality."

Skinner's Innovation: Operants

Skinner rejects S-R psychology, which focuses only on bringing existing responses under the control of new stimuli. How do new responses arise?

Turns to Thorndike's Law of Effect

- Behaviors that are reinforced increase in probability
- Those that are not reinforced decrease in probability

Rejects Thorndike's construal as trial and error—too cognitive (errors as intentional acts in the attempt to solve a problem) and doesn't emphasize the role of reinforces increasing the probability of any behavior that elicits them.

By putting the emphasis on behavior as being shaped by consequences (a la Darwin), Skinner was a functionalist, but very different from the mentalistic functionalists like James

Shaping and Complex Behaviors

Shaping:

Begin by reinforcing a behavior that is only remotely similar to the target. Then reinforce variants of it that are closer to the target.

Verbal behavior

Skinner was well aware that language was the human behavior that had to be explained by an adequate psychology

Proposed that if words counted as stimuli and reinforcers, could develop an operant theory of language use.

Object of Chomsky's scathing review.

Skinnerian Utopias

What are some good things to do once we understand what causes behavior?

- Remove reinforcers that promote conflict
- Remove reinforcers that promote inequality and discrimination

If human life, including the unhappy parts of human life, are the product of the histories of reinforcement individuals have received, then it is irresponsible not to arrange these reinforcers, as much as possible, so as to make human life happier.

But why these "enlightenment" ends? Was he conditioned to advance those ends?