

In general, there are three main theories to describe human learning:

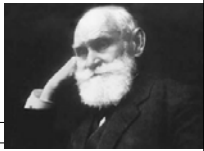
- 1. Behaviorism
- 2. Cognitivism
- 3. Humanism

• This course is going to focus extensively on behaviorism, and secondarily on cognitivism. In comparison, less emphasis will be placed on humanism.

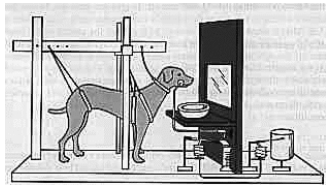
Three main off-shoots of Behaviorism

- Respondent off-shoot
- Operant off-shoot
- Social Learning off-shoot

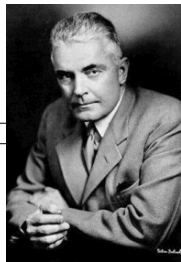
Respondent off-shoot:



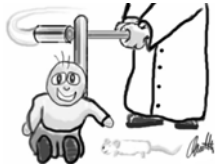
- Late 1800s early 1900s:
Pavlov
classical conditioning



Respondent off-shoot:



- John B. Watson (1913, 1916): classically conditioned fear in "poor Little Albert." Watson argued that most human behaviors could be explained as learned habits and adopted the conditioned reflex as the "unit of habit." He argued that most complex activities were due to classical (respondent) conditioning.



Respondent off-shoot:

- Clark Hull (1943, 1952): formulated a limited learning theory that meshed together both principles of respondent and operant conditioning. Hull asserted that reinforcement was still involved in Pavlovian kinds of learning.

Respondent off-shoot *continued*:

- Dollard and Miller (1950): tried to translate Freudian psychodynamic concepts into the language of Hull's learning theory.
- Joseph Wolpe (1958): reciprocal inhibition; precursor to respondent component of behavior therapy. If a response that is incompatible with fear and anxiety can be made to occur in the presence of a stimulus which normally produces fear and anxiety, then that stimulus will cease to elicit the fear reaction. Systematic desensitization.
- Hans Eysenck (1950s-60s). Applied respondent conditioning and reciprocal inhibition clinically in behavior therapy.

Operant offshoot:

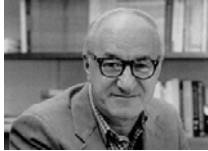
- B. F. Skinner (1938) *The Behavior of Organisms*. Outlined the basic principles of operant conditioning. (1953) *Science and Human Behavior* related topics of earlier book based on rats behavior to the behavior of humans.
- Keller & Schoenfeld (1950). Wrote first intro psychology text to discuss traditional psychological topics in terms of operant conditioning.
- Ayllon & Michael (1959) one of the first published reports that concerned using operant principles for practical, applied problems. Demonstrated use of reinforcement, extinction and escape and avoidance conditioning to modify patient behavior in psychiatric hospital.

Operant offshoot *continued*:

- 1960s brought many more systematic studies showing the effectiveness of operant conditioning to many clinical populations typically considered to be resistant to treatment, including: retardation, autism, hyperactivity, delinquency, psychosis.
- (1965) Ullman & Krasner: first book with behavior modification in its title.
- 1970s applied behavior analysis.
- Early studies emphasized how managing consequences could alleviate problems regardless of the cause.
- Functional analysis methodology (Iwata, Dorsey, Slifer, Bauman, & Richman, 1982) attempted to address the environmental causes, but still not the hypothetical inner causes emphasized by other schools of thought.

Social Learning Theory offshoot:

- Julian Rotter (1954)
- Albert Bandura (1969, 1977, 1986, 1996).
- Social learning theory emphasizes the social contexts in which behavior is acquired and maintained and the importance of observational learning.
- Bandura also emphasizes cognitive mediational processes. Based on prior experiences and current perceptions, one develops cognitive rules and strategies that serve to determine future actions, e.g. self-efficacy.

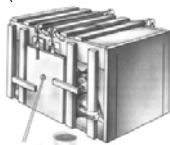


Social Learning Theory offshoot:

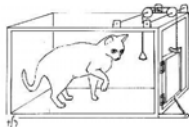
- Cognitive behavior modification (Ellis, Beck, Meichenbaum) focuses on explaining maladaptive behaviors in terms of dysfunctional thinking, and on treating behavior disorders through cognitive restructuring.



Major Theorists in Behaviorism



Thorndike



Thorndike's Laws of Learning

- **The Law of Effect:** Responses occurring just prior to a "satisfying state of affairs" are more likely to be repeated, and conversely, responses occurring just prior to an annoying state of affairs are more likely not to be repeated. The effect of a response leads to it being learned (stamped in) or not learned (stamped out).
- **The Law of Readiness:** Certain types of learning are difficult or impossible unless the learner is ready. Readiness refers to maturational level, previous learning, motivation, and other characteristics of the individual that relate to learning.

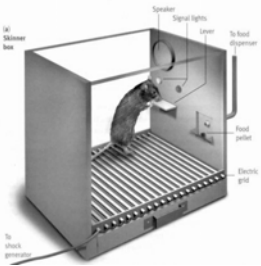

Thorndike's Laws of Learning *continued...*

- A law that was later "repealed" -- **The Law of Exercise:** Bonds become more strengthened each time they are repeated or exercised. This is not necessarily true, hence the repeal. Repetition alone does not cause learning.

Thorndike's Laws of Learning *continued... Subsidiary Laws*

- **Law of Multiple Responses:** Trial-and-error learning. If you do not have a ready solution, you will engage in a variety of responses until one is reinforced.
- **Law of Set or Attitude:** Learners are often predisposed to respond in a certain way as a result of experiences, previously learned attitudes, or even culture.
- **Law of Prepotency of Elements:** learners respond to the most striking or salient elements of a situation.
- **Law of Response by Analogy:** When learners are in new situations, they respond in ways that would be appropriate in similar situations.

B. F. Skinner:

Operant Conditioning

Necessary terminology to know:

- **Operant conditioning:** Learning that involves an increase in the likelihood of a response as a function of reinforcement.
- **Respondent:** An elicited response. A response brought about by a stimulus as in classical conditioning, also known as respondent conditioning.
- **Operant:** A response not elicited by any known or obvious stimulus. This includes most important and learned human behaviors.

Necessary terminology to know:

- **Emitted response:** An operant. A response not elicited by any stimulus but simply emitted by the organism.
- **Experimental analysis of Behavior:** Emphasizes the objective analysis of the variables involved in behavior, i.e. what a learner does, the situation in which it occurs and the consequences of the actions.
- In the system of studying behavior, the **independent variables**, or those things which can be manipulated, are things such as the type of reinforcement and the schedules of reinforcement. The **dependent variables**, are things such as acquisition rate, rate of responding, and extinction rate.

Necessary terminology to know:

- **Reinforcer:** A stimulus that causes reinforcement. A stimulus which increases the probability that a response will occur.
- **Reinforcement:** The effect of the stimulus.
- **Primary reinforcer:** Something that is naturally reinforcing and satisfies a natural drive, e.g. food, drink, sex.
- **Generalized reinforcer:** Stimuli that are not reinforcing in themselves, in that they satisfy no natural drive on their own, but they are so often paired with primary reinforcers that they become reinforcing themselves, e.g. money, praise, prestige.

Necessary terminology to know:

- **Positive reinforcer:** A stimulus that when added to a situation, increases the likelihood that a response will occur.
- **Positive reinforcement:** reward
- **Negative reinforcer:** A stimulus, that when removed from a situation, increases the likelihood that a response will occur, relief.
- **Negative reinforcement:** relief

Necessary terminology to know:

- **Punishment:** the goal of punishment is to decrease the probability of a behavior
- **Type I Punishment:** presentation punishment, presenting an aversive stimulus following a behavior.
- **Type II Punishment:** removal punishment, removing a pleasant stimulus following a behavior.

Side comment on the negative aspects of punishment:

- **Aversive control:** controlling human behavior through the presentation of unpleasant stimuli
- Aversive control can be overused in our society (detentions, reprimands, low grades, threats of punishment). The most likely consequences of aversive control are avoidance learning and escape learning.

Fred Keller

PSI--Personalized System of Instruction (1968)

PSI

- identifies target behaviors or learning requirements for a course in the form of study questions
- requires students to study only a small amount of material before demonstrating mastery, such as the amount of material in one or two chapters that might be studied in a week or two
- frequent (weekly) tests in which students demonstrate their knowledge of the answers to the study questions
- has mastery criteria so that the students must demonstrate mastery at a particular level before going on to the next level

PSI continued...

- is nonpunitive in that students are not penalized for failing to demonstrate mastery, but simply restudy and try again
- uses a number of proctors to immediately score tests and provide prompt feedback
- incorporates a "go-at-your-own-pace" feature in which all students are allowed to proceed through course material at their own individual rates according to their abilities and time demands
- uses lectures primarily for demonstration and motivation, rather than as a means of presenting new information

Criticisms of behaviorism as it applies to the classroom:

- Teachers often have no control over the most powerful reinforcers: peer acceptance, parent approval
- teaching is more about bringing about a desired responses, not just increasing its frequency or prevent it from being extinguished
- Behavior modification applied to problem behaviors ignores the cause, often does not emphasize prevention, and often lack long-term benefits.

Some of the earliest learning theories.

Ebbinghaus (1850-1909)

- Based on *Associationism* – ideas become connected through experience; the more frequent a particular association is encountered, the stronger the associative bond is.

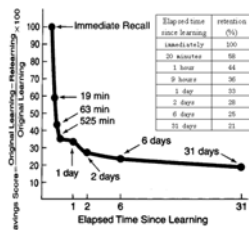


Ebbinghaus (1850-1909)

- To investigate the learning of new associations untainted by past experience, Ebbinghaus invented nonsense syllables which he learned.
- His studies provided experimental verification of some facts about memory.
- The more material there is to learn, the longer learning takes.

Ebbinghaus (1850-1909)

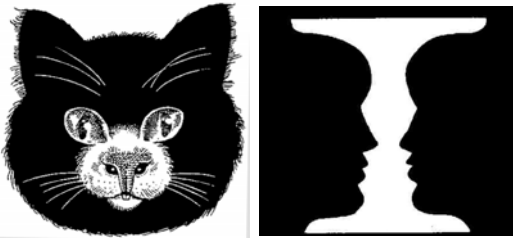
- The longer it has been since something was learned, the harder it is to remember.
- Forgetting of verbal material proceeds very rapidly at first and then more slowly as the time from initial learning increases. (The classical forgetting curve).



Gestalt Theory (early 1900s)

- Knowledge comes from more than just experience or associations; it involves the knower actively imposing organization on sensory data in an interpretivist approach. For example, the perception of motion is different from the sensory inputs that comprise it (Max Wertheimer, early article on the perception of motion, 1912).

Gestalt Theory (early 1900s)



Gestalt Theory (early 1900s)

- Wolfgang Kohler (1925) *The Mentality of Apes.*
- Kohler argued that his apes could learn by perceiving stimuli in new ways, not necessarily needing experiences of associations between stimuli and responses.



Gestalt Theory (early 1900s)
Kohler *continued...*

- *Insightful learning*
1. After a period of inactivity or trial and error, the learner suddenly and completely grasps the solution.
 2. The learner performs the solution in a smooth and errorless fashion.
 3. The learner retains the solution for a very long time.
 4. The learner can easily apply a principle gained through insight to other similar problems.
