



HS 002: Introduction to Psychology

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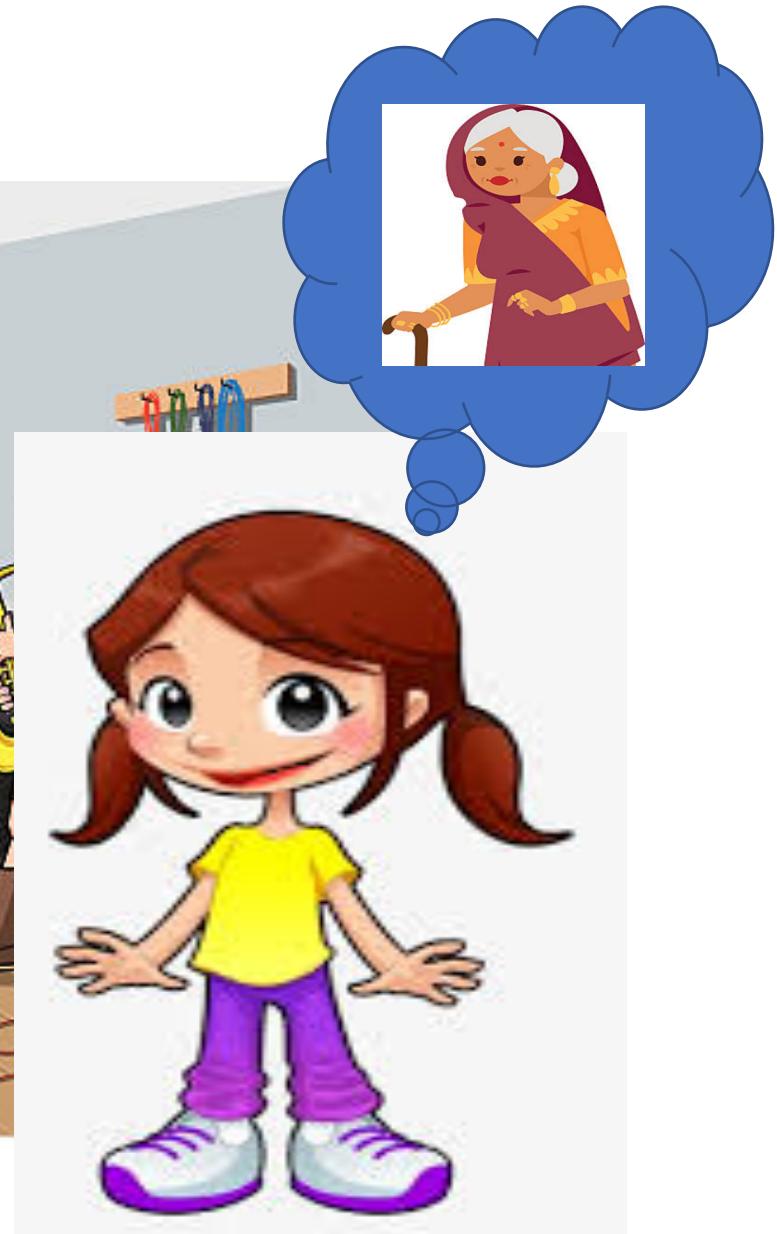
Lecture 8: 26.09.2019



Association



John & Lisa



What is learning?

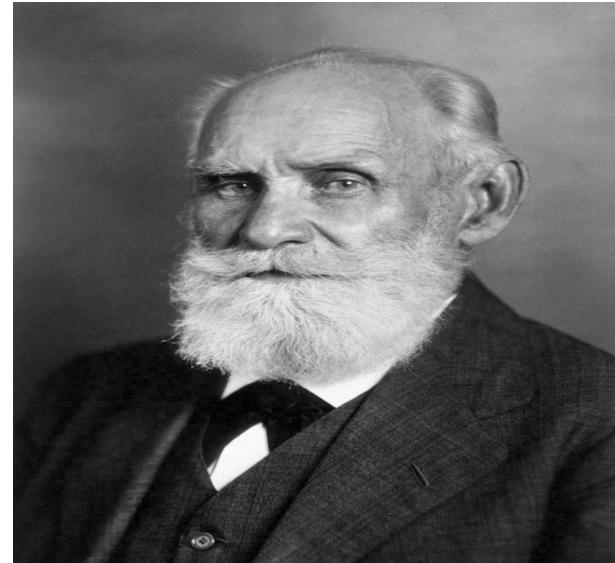
“Learning is a relatively permanent change in a behavioral potentiality that occur as a result of reinforced practice” (Gregory Adams Kimble, 1961)

- As we can't see learning so we measure performance
- Psychotherapy, where behavior change is the goal of treatment.
- Three basic types of learning
 1. Classical conditioning (Pavlovian conditioning)
 2. Instrumental learning (Operant conditioning)
 3. Cognitive learning approach

Classical Conditioning (Pavlovian Conditioning)



- Learning takes place two or more events are associated because they occur together.
- Ivan P. Pavlov (1849 – 1936), Russian Physiologist
- Nobel Laureate (1904) for his work on *digestive functioning*.



Classical Conditioning

- Dog given food in dishes would, after several presentation show salivation to the dish itself.
- Eventually a *standard experimental procedure emerged*.
- **Conditioning:** process of learning associations between environmental stimuli & behavioral responses

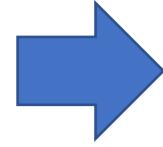
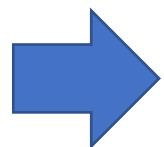


Figure 6.2



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FIGURE 6.2 An apparatus for Pavlovian conditioning. A tube carries saliva from the dog's mouth to a lever that activates a recording device (far left). During conditioning, various stimuli can be paired with a dish of food placed in front of the dog. The device pictured here is more elaborate than the one Pavlov used in his early experiments.

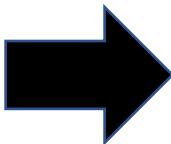
Classical Conditioning



- Neutral stimulus (NS)
- Unconditioned stimulus (UCS) is an event that reflexively produces a response called an Unconditioned response (UR), without prior training/conditioning.



UCS

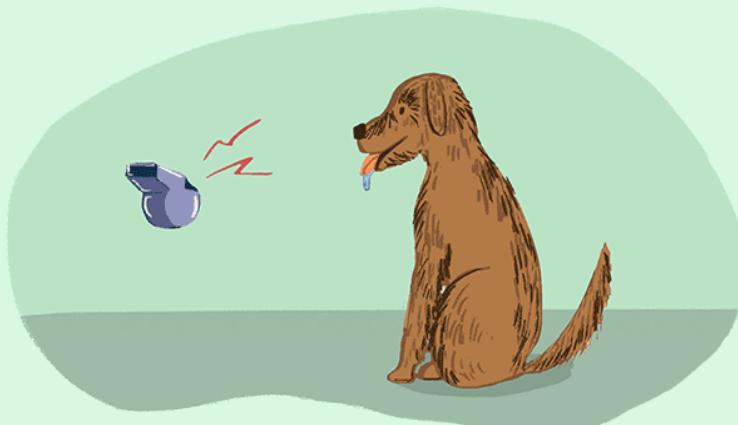


UCR / CR

CS

- Conditioned stimulus (CS): previously NS after coupling with UCS elicits conditioned response (CR), which resembles UR.

What to Know: The Little Albert Experiment



Classical conditioning to condition an emotional response



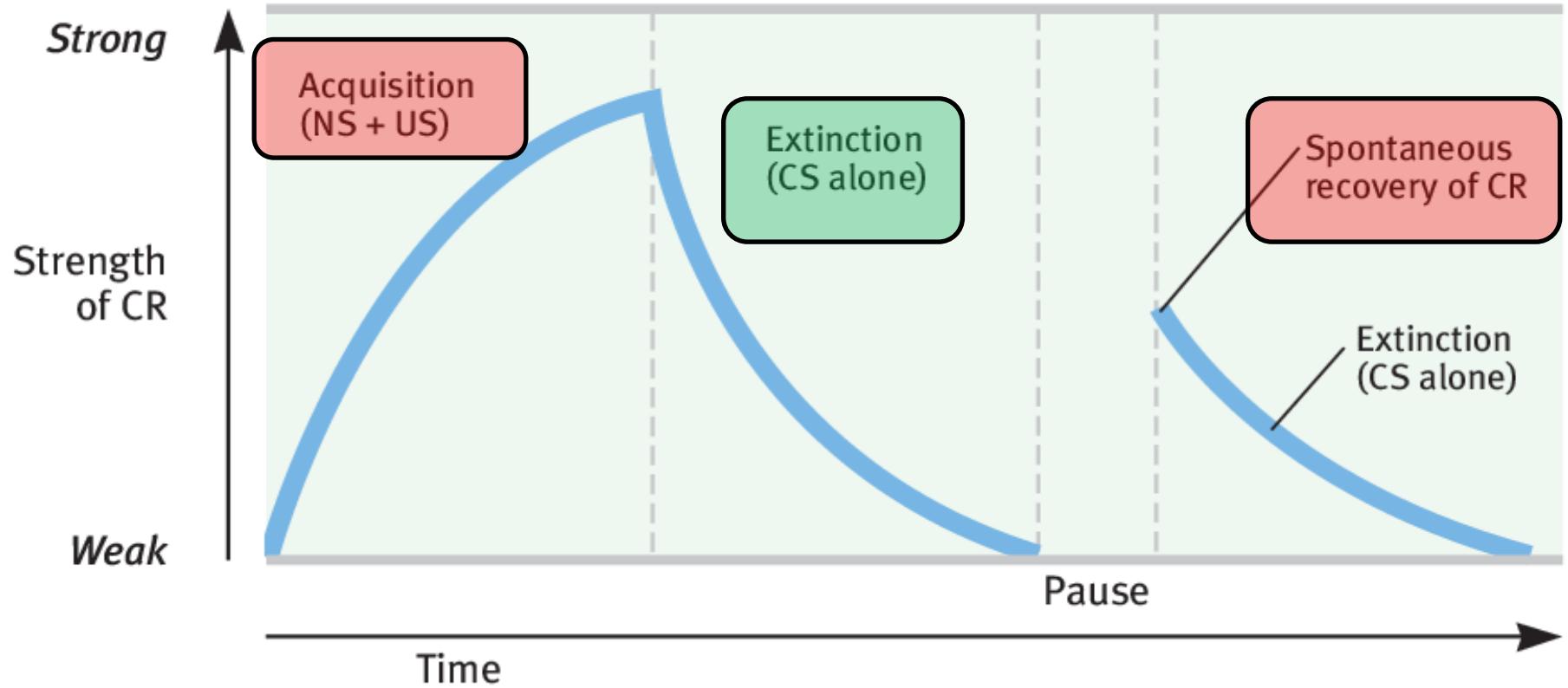
9-month-old "Albert" exposed to stimuli and observed



White rat paired with loud noise



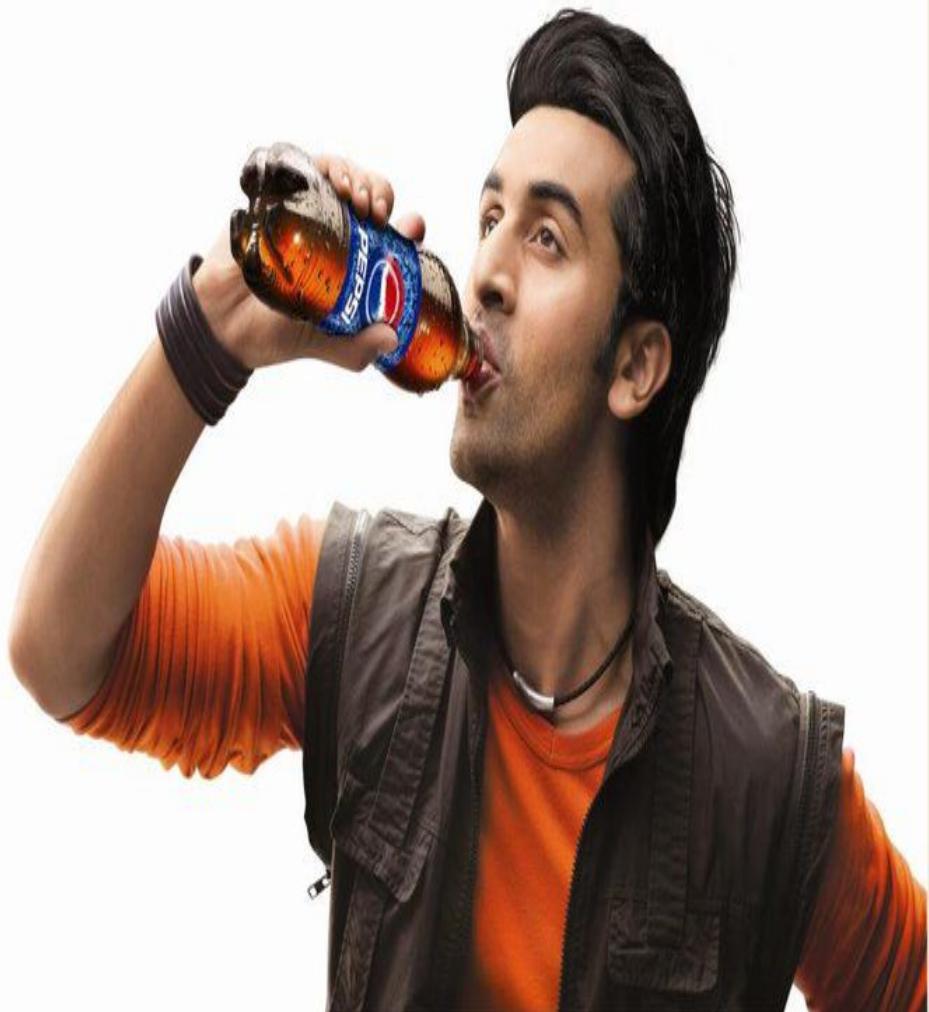
Albert conditioned to fear white rat



3-Stages of conditioning:

1. **Acquisition:** CS coupled UCS, presented repeatedly and CR increases over time
2. **Extinction:** CS presented alone, CR dissipates
3. **Spontaneous Recovery:** CR appears after sufficient time has passed

Example



Generalization

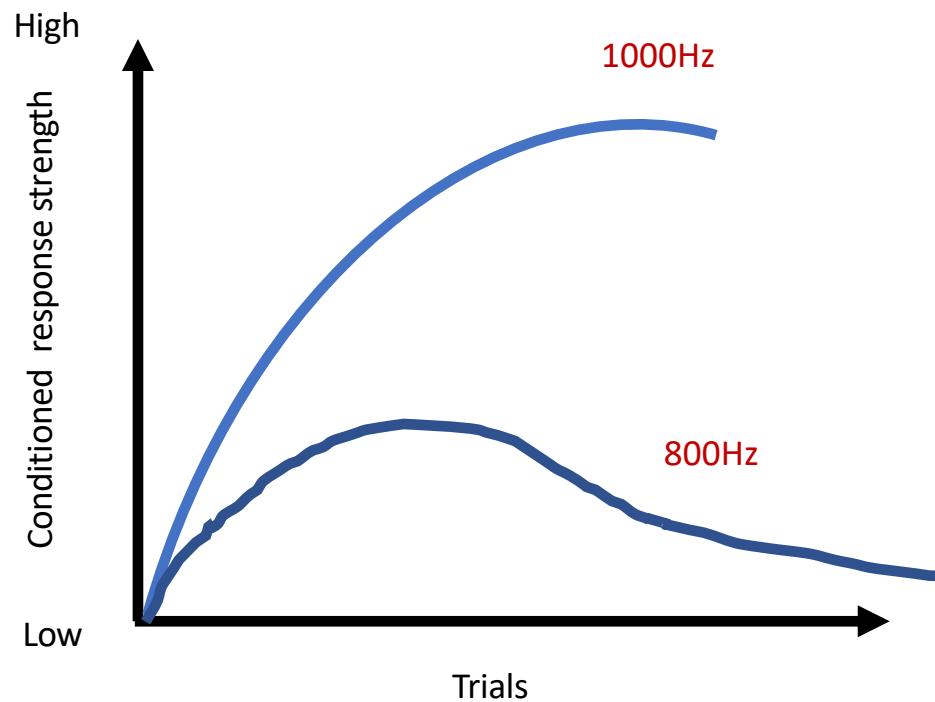
- UCS (loud noise), CS (rat), CR (cry)



1. *"The fact that Albert was afraid of objects that had not actually been paired with the UCS but that were physically rather like the original CS that was paired with the UCS is evidence of a principle called stimulus generalization."*
2. *Social behavior learned in one context transfer to another situation. It is beneficial in some context such as potential danger of hot stoves/hot coffee mug etc.*

Discrimination involves the organism's ability to detect differences among stimuli and respond to only one or a few such stimuli to the exclusion of all others.

- For example:

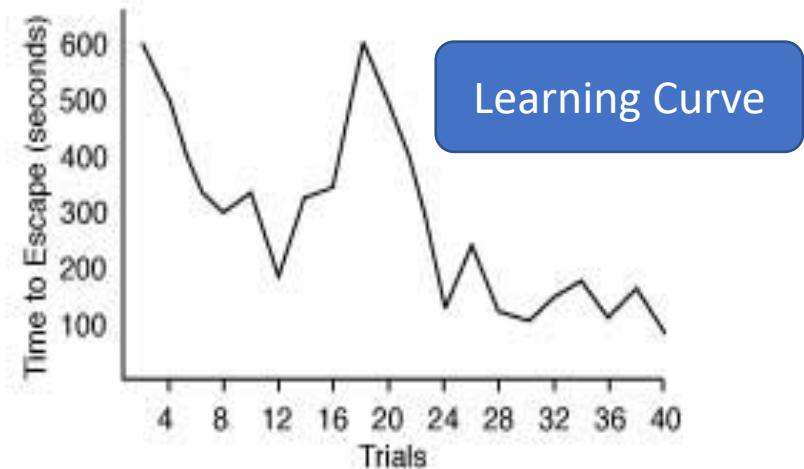
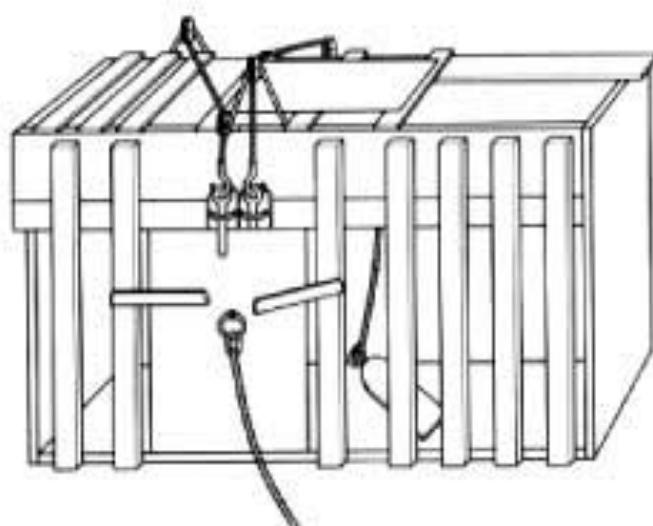


50 training trial: 25 training trials with 1000Hz tone and 25 trials with 800Hz tone.
CS+ = 1000Hz + food
CS- = 800 Hz + no-food

Typical performances in a discrimination study where a 1000Hz tone is paired with food and an 800Hz tone is paired with the absence of food. (Adapted from Book on Psychology: Benjamin, Hopkins & Nations, 1987)

Thorndike: Principle (Law) of Effect (trial and error)

- Edward Lee Ted Thorndike (1874-1949) – American psychologist.
 - Classical conditioning – developing associations between events.
 - Operant conditioning - learning from the consequences of the behavior.



Adapted from Domjan, 1993 (modified from Thorndike, 1898 [left] and Imada & Imada, 1983 [right])

Animal tended to repeat a behavior that resulted in a pleasing effect. Thorndike believed that animal stumbled upon a behavior that produced a desirable effect. He concluded that all animal learn, solely by trial and error or reward and punishment.

Class activity

1. Please come-up with a different examples of what people (society) have learned because of the media.
2. Also, bring examples for acquisition, generalization, extinction, and discrimination

THANKS!

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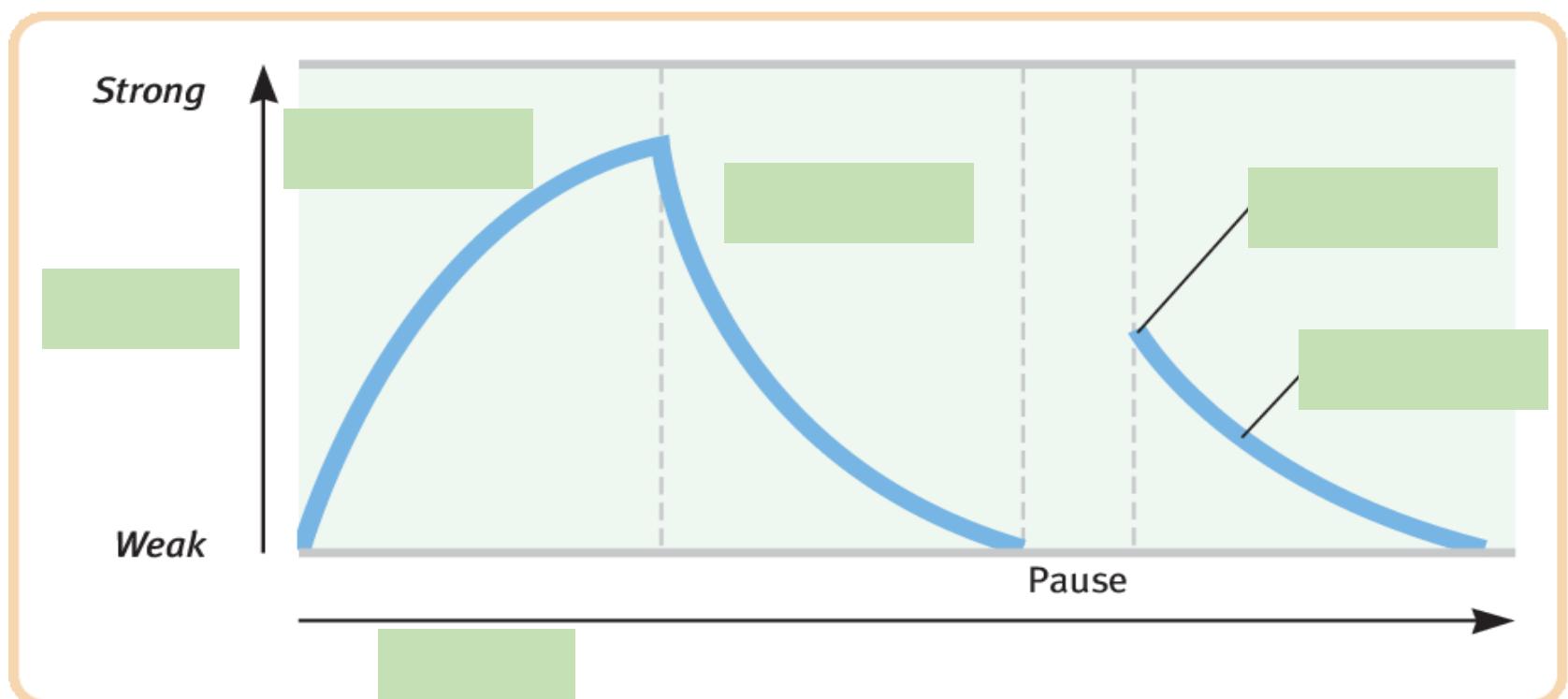
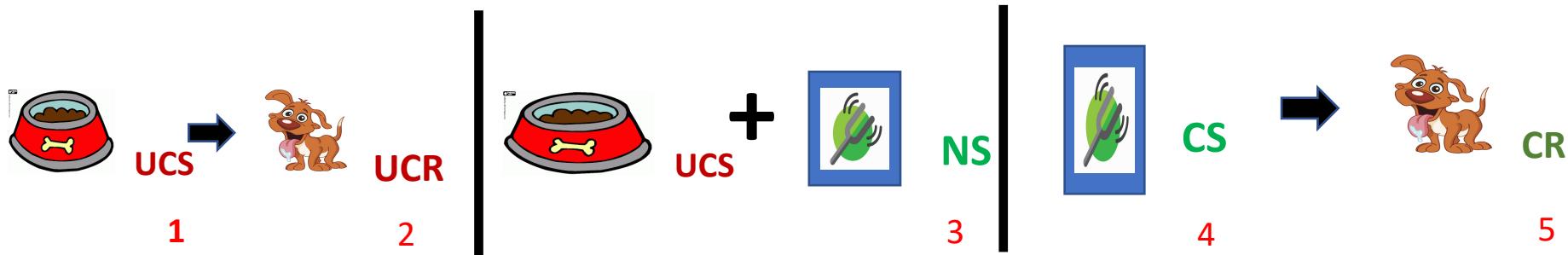
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Lecture 9: 03.10.2019



Recap

What is Pavlovian Conditioning/Classical Conditioning? Learning occurs through associations.



Recap

1. Spontaneous Recovery:
2. Extinction:
3. Stimulus Generalization (e.g. Little Albert): is the tendency to give conditioned response to stimuli that are similar in some way to the conditioned stimulus but have never been paired to the unconditioned stimulus.
4. Stimulus Discrimination (e.g. Tone experiment): is the processes of learning to make one response to one stimulus and another-or no response- to another stimulus.
5. Principle of Effect (Law of Effect: Trial & Error):
6. Thorndike's Puzzle box
7. Learning Curve

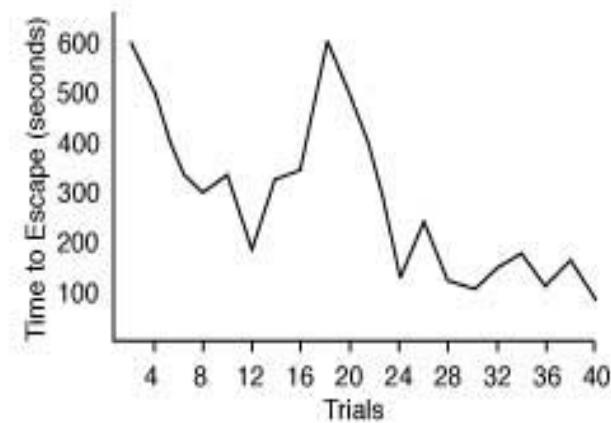
Recap

1. Principle of Effect (Law of Effect: Trial & Error):
2. Thorndike's Puzzle box

Learning occurs through consequences

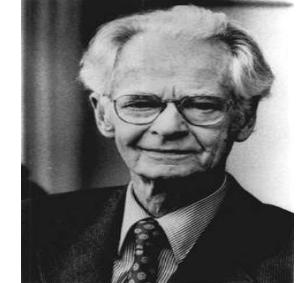


3. Learning Curve



Instrumental /Operant Conditioning

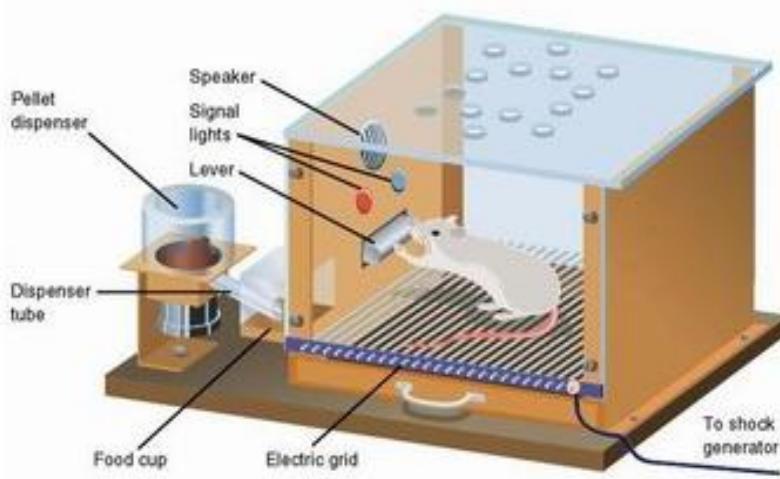
(B.F. Skinner: 1904-1990)



1. To make desired response likely and undesired response less likely. You need to set a technique this technique is instrumental conditioning.
2. *Instrumental conditioning*: an action of the learner is instrumental in bringing about a change in the environment that makes the action more or less likely to occur again in the future.
3. An environmental event that is the consequence of the an instrumental response and that makes the response more likely to occur again is known as a *reinforcer*.
4. *Positive reinforcer*: is a stimulus or event which increases the likelihood that response will be made again (*for e.g. food for a hungry animal, water for a thirsty, praise from parent, a prize, etc.*)
5. *Negative reinforcer*: is a stimulus or event which, when its termination is contingent on a response, increases the likelihood that the response will occur again (*for e.g. the shock, boss abuse, etc.*).

Law of reinforcement (Skinner Box)

- It was designed to teach rats how to push a lever. This behavior is not natural to rats, so operant conditioning with positive or negative reinforcement were performed in order to teach the behavior.

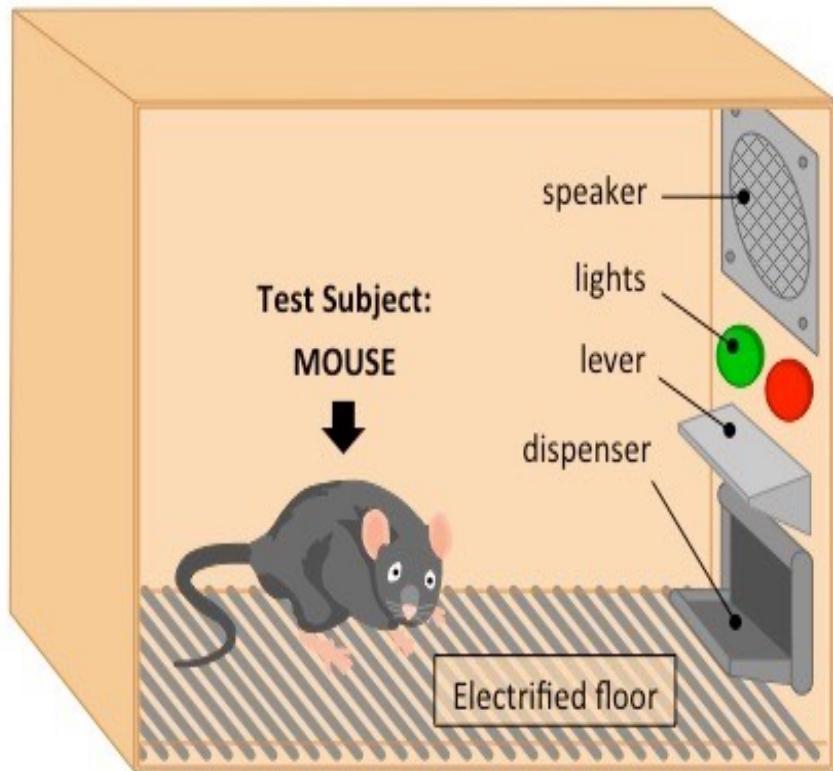


- Positive reinforcement: *rat was awarded with food by pressing the lever.*
- Negative reinforcement: *rat was able to turn-off electric-shock produced by the floor by pressing the lever.*

Four basic operant conditioning paradigm are reward training, punishment, omission training, and negative reinforcement.

Punishment: is said to occur when aversive consequences occur to responding (*for e.g. traffic fines, demerits, etc.*)

Positive punishment is omission training, positive reinforcement is withdrawn.



	Something given to the mouse	Something taken from the mouse
Increases likelihood of repeated behavior	POSITIVE REINFORCEMENT Mouse given food when lever pressed (after green light)	NEGATIVE REINFORCEMENT Loud noise stopped when lever pressed
Decreases likelihood of repeated behavior	POSITIVE PUNISHMENT Mouse is shocked when lever pressed (after red light)	NEGATIVE PUNISHMENT Not applicable in this scenario

1. Operant conditioning technique that permits the learning of a novel behavior to occur at an accelerated pace.
2. *Shaping: is achieved by the systematic application of reinforcement of successive approximations to a goal behavior.*
3. Rats are dynamic so they figured out how to press lever for food. After the learning animal stays close and touch the lever with its paws.
4. Act of shaping in humans could be handwriting.



Schedules of Reinforcement

1. How and when the reward will be delivered?
2. The significance of schedule variables derive from the fact that unique rates (number of responses per unit time) and pattern of responding are produced by selected schedule conditions.
 1. Fixed-ratio (FR): behavior is rewarded after a fixed number of responses have been made (*e.g. worker is paid after certain number of bushes of fruit picked, etc.*)
 2. Fixed-interval (FI): subject is rewarded for the first response that occurs after a specified period of time has elapsed (*e.g. waiting for the fruit to ripen on a tree*).
 3. Variable-ratio (VR): The number of responses required for reinforcement changes depending on where the subject is in the schedule (*only few responses required for the reward, e.g. slot machine at gambling casino*). [VR-10, VR-20, VR-15...]
 4. Variable-interval (VI): reward responses that occur after one given interval of time, then a different time interval, and still a different time interval until training stops. (*e.g. price fluctuation,)* [VI-4, VI2, VI6,...]

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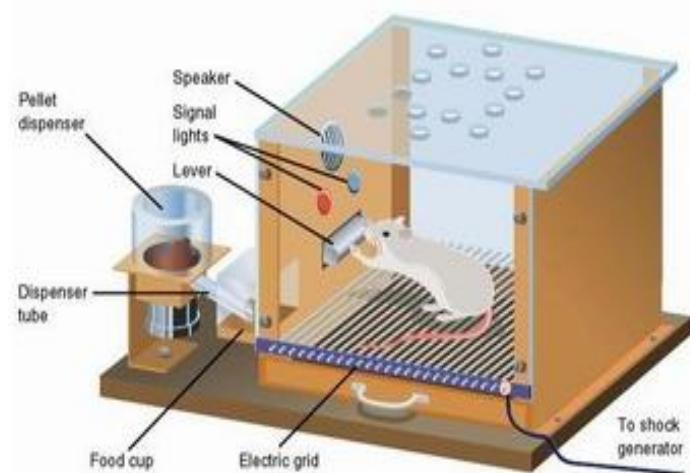
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Lecture 10: 09.10.2019



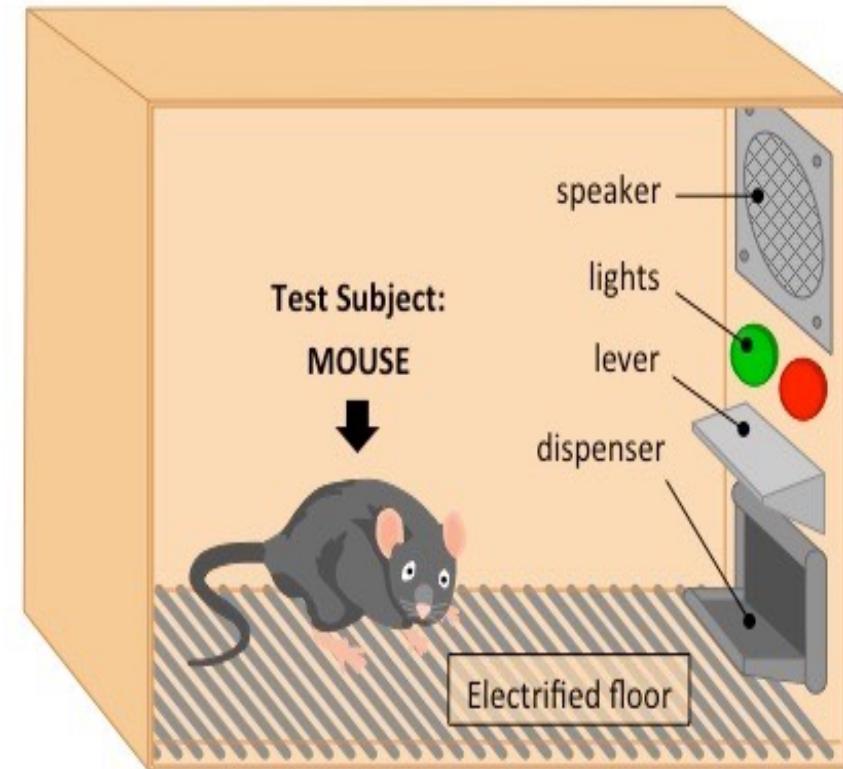
Recap

1. Laws of Effect & Laws of Reinforcement
2. *Instrumental Conditioning: an action of the learner is instrumental in bringing about a change in the environment that makes the action more or less likely to occur again in the future.*
3. *Reinforcement: Positive & Negative*
4. *Punishment*
5. *Shaping*
6. *Schedules of Reinforcement:*
 1. Fixed ratio
 2. Fixed interval
 3. Variable ratio
 4. Variable interval



Operant Conditioning: Generalization & Discrimination

- Generalization: *A behavior may be performed in more than one situation.* For e.g., the rat who receives food by pressing lever after green light, may press a lever for red light in the cage in hope that it will receive food.
- Discrimination: *Learning that a behavior will be rewarded in one situation, but not another.* For e.g., the rat does not receive food from the red light and realizes that by pressing the lever only at green light, he will receive food.



Differences

	CLASSICAL CONDITIONING	OPERANT CONDITIONING
1	Behavior is controlled by the stimuli that precede the response (by the CS & the UCS)	Behavior is controlled by consequences (rewards, punishments) that follow the response.
2	No reward or punishment is involved (although pleasant and aversive stimuli may be used)	Often involves rewards (reinforcement) and punishments
3	Through conditioning, a new stimulus (CS) comes to produce the old (reflexive) behavior.	Through conditioning, a new stimulus (reinforcer) produces a new behavior.
4	Extinction is produced by withholding the UCS.	Extinction is produced by withholding reinforcement.
5	Learner is passive (acts reflexively): Responses are involuntary. That is behavior is elicited by stimulation.	Learner is active: Responses are voluntary. That is behavior is emitted by the organism.

Laws of Insight

Sometimes we have “flashes of insight” when dealing with a problem where we have been experiencing trial and error or dog acquire expectation that CS will be followed by UCS.

Insight Learning: a problem is posed, a period follows during which no apparent progress is made, and then the solution comes suddenly.

For example: *11235813 Or 149162536496481100....

A learning curve of insight learning would show no evidence of learning for a time; then, suddenly, learning would be almost complete.

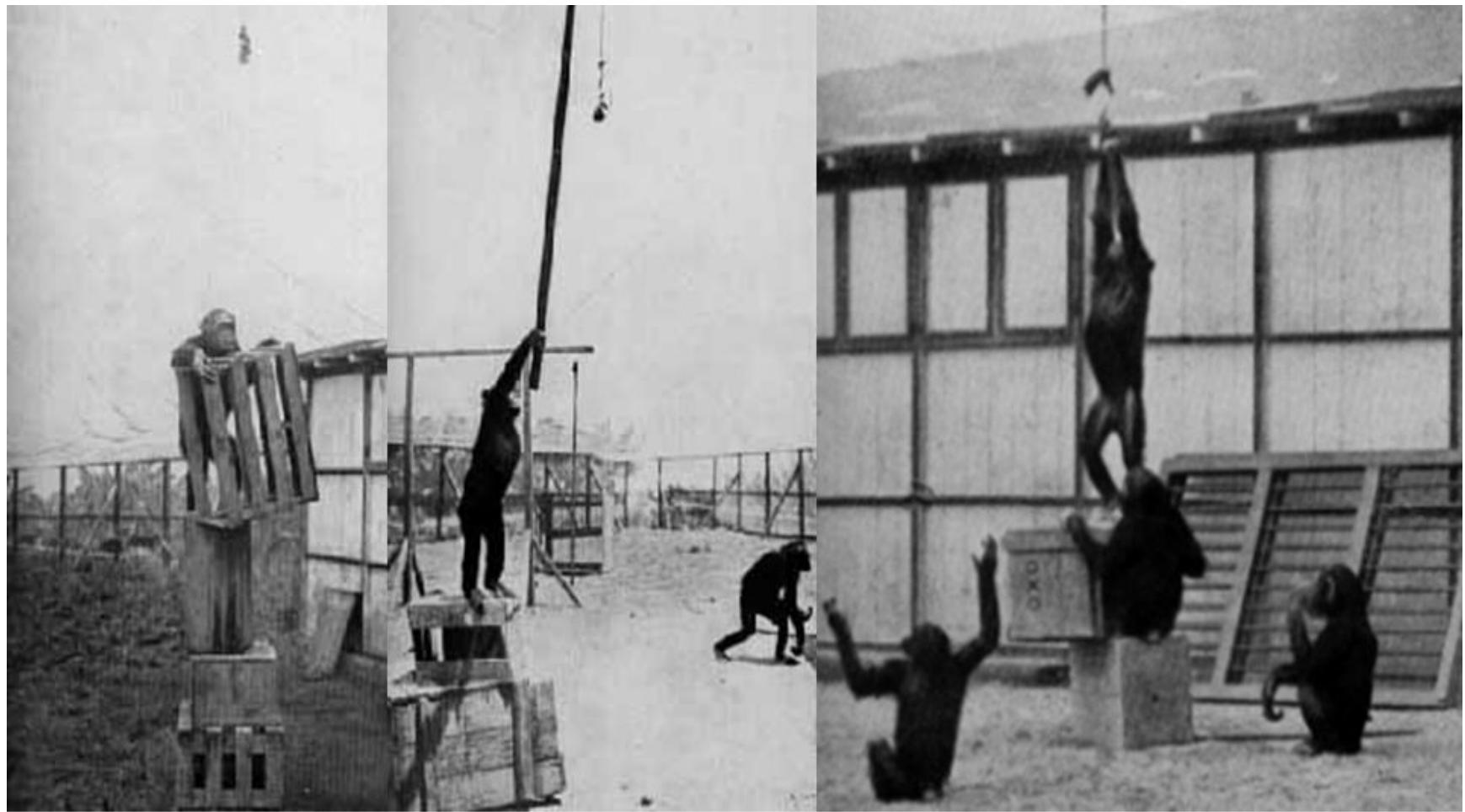
*Fibonacci Series invented by Italian **Leonardo Pisano Bigollo** (1180-1250) : branching in trees, the arrangement of leaves on a stem, the fruit sprouts of a pineapple

Experiment of Wolfgang Köhler (1925: Mentality of Apes)

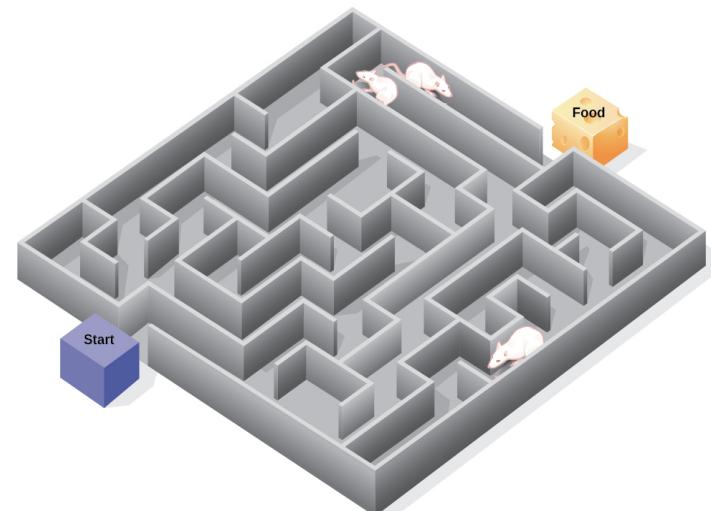


1. Dr. Wolfgang Köhler
(Gestalt Psychologists; 1887-1967)
2. The whole is different from the sum of its parts.
Integrate pieces of information into meaningful wholes.
3. Gestalt idea of perceiving whole meaningful pattern or form.
4. Kohler taught Sultan the chimp how to stack boxes to obtain bananas that were over his head and how to use a stick to obtain something that was out of his reach. He taught Sultan these skills in separate situations.

Wolfgang Kohler & Sultan



1. Many other species demonstrate insight learning. When rats were put into a maze with multiple routes to the reinforcer, the rats would repeatedly attempt the shortest route.
2. If their preferred route was blocked, they would chose the next shortest route to the reward.
3. It formerly was thought that reinforcements were essential for learning.
4. **However, the rats later were able to negotiate the maze for food more quickly than rats that had never seen the maze before.**
5. **Latent learning: Learning that occurs but is not apparent until the learner has an incentive to demonstrate it.**



Test

1. What is perception?
2. What is sensation and the process of sensation?
3. Explain absolute and difference threshold?
4. What is subliminal detection?
5. Explain gestalt principles of perceptual organization?
6. Explain laws of groupings?
7. What is learning?
8. Explain conditioning and its components?
9. Explain operant conditioning and types of reinforcement?
10. What is punishment and shaping?

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