UNIT 6: LEARNING

Learning:

Stressing the *lasting change/permanent*

Behaviorist Psychologists vs. Cognitive Psychologists

Behavioral: Learning only occurs with behavior since they can observe behavior.

Cognitive: Behavioral view is too limiting… must consider mental processes that cannot be seen

Instinct Behavior: innate behaviors… not greatly influenced by experience

Without learning we would have to depend upon reflexes and instincts

A. SIMPLE FORMS OF LEARNING

Habituation:

Mere Exposure Effect:

B. COMPLEX FORMS OF LEARNING

Two types of Behavioral Learning
Classical Conditioning Operant Conditioning

1. **Classical Conditioning:**

2. **Operant Conditioning:**

Behavioral Learning: Forms of learning, such as classical and operant conditioning, that can be described in terms of stimulus and response

KEY QUESTION: What type of learning does classical conditioning explain?

CORE CONCEPT:

THE ESSENTIALS OF CLASSICAL CONDITIONING

Classical Conditioning: Pavlov's Dog Theory
A form of behavioral learning in which a previously neutral stimulus (A bell) acquires the power to elicit the same innate reflex produced by another stimulus (dog food)

1. A Ringing bell produces salivation in a dog, just like dog food does
2. Your mouth waters at the sound of the ice cream truck…and you don't even realize it

Reflexes:

Neutral Stimulus:

Examples: A bell sound is neutral, (it does nothing) until paired with a natural producing stimulus, such as food..soon it will, by itself, produce a learned response (salivation)

Unconditioned Stimulus (UCS):

Examples: In Pavlov's experiment, food was the UCS because it produced a salivation reflex, or UCR

Unconditioned Response (UCR):

The UCS - UCR involves NO learning...it's reflective

Conditioned Stimulus:

The response (dog salivating)is now a Conditioned Response

Conditioned Response:

In most cases, the CS (bell) and UCS (food) must be presented together close enough in time for the subject to make a connection

Acquisition —> Conditioned Stimulus —> Conditioned Response

Acquisition:

1. Here is where a neutral stimulus (a bell/tone) is paired with an unconditioned stimulus (dog food)
2. After several trials, the two will elicit the same response (a dog salivating)
3. When the former neutral stimulus (a bell/tone) produces a response (salivation), it is now a conditioned stimulus.

Reversing the Behavior (Conditioned Response)...Extinction !!!

Conditioned Responses (CR)are not permanent..they can be reversed, or made extinct
(Withholding the dog food while continuing to ring the bell)

Extinction:

The CS (bell/tone) now has nothing to connect to (food)

Example of Extinction: The ice cream truck always runs out of ice cream before it gets to your house, so the sound of its bell will no longer make your mouth water and crave ice cream.

BUT....it may return spontaneously

Spontaneous Recovery:

This lower intensity is useful in the behavior modification of such things as fears and phobias.

Stimulus Generalization:

Examples: A. If you fear spiders you will respond the same way to all types of spiders.
B. Dogs salivating to all types of bells
C. Being bitten by a dog results in fear of all dogs

Stimulus Generalization is common in people who have acquired fears due to traumatic events

Stimulus Discrimination:

The opposite of stimulus generalization

Experimental Neurosis:

APPLICATIONS OF CLASSICAL CONDITIONING

**Classical conditioning explains many behaviors, such as cravings, aversions, and fears
**Also useful in eliminating unwanted behavior

Little Albert
Taught to fear a white rat when it was paired with a loud noise that scared the child.
This fear was later generalized to other white , furry objects

Food Aversions: The Bad Food Experience

Taste-Aversion Learning: A biological tendency in which organism learns, after a **single experience**, to avoid certain foods if **eating** them is followed by **illness**

OPERANT CONDITIONING

KEY QUESTION: How do we learn new behaviors by operant conditioning?

CORE CONCEPT:

With classical conditioning, you can teach a dog to salivate, but you can't teach it to sit up or roll over

"Voluntary' behaviors are really controlled by ***rewards*** and ***punishments***

Operant:

Example: If you are reading the text to get a better grade, reading is an operant behavior

OPERANT CONDITIONING

Learning occurs as a result of reinforcement where specific rewards or punishments are implemented in order to achieve or discourage the behavior to be changed.

1. Accounts for a much wider spectrum of behavior than classical conditioning
2. It explains new behaviors, not simply reflective behaviors (salivation)

Common Rewarding Consequences: money, praise, food, good grades,.... = *encourage* behaviors

Common Punishment Consequences: pain, loss of privilege, low grades,... = *discouraged* behaviors

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EDWARD THORNDIKE'S LAW OF EFFECT

Law of Effect:

Change in behavior based on the outcome of previous trials...similar to 'trial and error'
Inefficient behaviors eliminated for more successful ones... 'cat in the box'

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B.F. SKINNER

Skinner was the leading exponent of the school of psychology known as **behaviorism**, which explains the behavior of humans and other animals in terms of the physiological responses of the organism to external stimuli in their environment.

Skinner maintained that learning occurred as a result of the organism responding to, or operating on, its environment, and coined the term **operant conditioning** to describe this phenomenon. He was also influenced by Thorndike

John B. Watson founded Behaviorism in 1913

Behaviorist
Believe infants are born with only three instinctive responses
1. Fear 2. Rage 3. Love
All others behaviors are developed during life through learning

Reinforcer:

Ex: a smile, praise, attention

*** Positive Reinforcement:**

Every time Madge raises her hand in class she is called on. She raised her hand 3 time during the first class, 3 times in the second and 4 times during the last class.

1. What behavior was changed? hand raising
2. Was the behavior strengthened or weakened? strengthened (eliminates punishment)
3. What was the consequence? being called on (A good thing..a reward)
4. Was the consequence added or subtracted? added

Since the consequence was added and the behavior was strengthened, the process is positive reinforcement

*** Negative Reinforcement:**

Negative means subtract, like in math

Example: Buckling your seatbelt stops the annoying buzzer

John does not go to the dentist every 6-months for a checkup. Instead, he waited until a tooth really hurts, then goes to the dentist. After two emergency trips to the dentist, John now goes every 6-months.

1. What behavior was changed? going to the dentist
2. Was the behavior strengthened or weakened? strengthened (eliminate response cost and punishment)
3. What was the consequence? tooth no longer hurting
4. Was the consequence added or subtracted? Subtracted..the pain is gone

Since the consequence was subtracted and the behavior was strengthened, the process is negative reinforcement.

Operant Chamber...The Skinner Box.

Continuous Reinforcement:

Often can miss correct responses, causing confusion, and typically loses its reinforcing quality

*** Shaping:**

Example: Getting a scared child to slide down a high slide...begin at the bottom, and gradually go higher up the slide with each turn until the child is at the top.

*** Behavior modification**:

It has been used on all sorts of psychological problems – addictions, neuroses, shyness, autism, even schizophrenia – and works particularly well with children.

Intermittent Reinforcement: (partial reinforcement)

I.E. is resistant to extinction

Skinner on Language Acquisition

Skinner assumed that children were born as 'blank slates' or 'tabula rasae' and that they learn language via shaping the sounds they hear from their caregivers into words and eventually sentences through selective reinforcement. (ALL NUTURE)

This viewpoint was most avidly criticized by **Noam Chomsky** who found evidence for an innate 'Language Acquisition Device' or 'LAD', where newborns are biologically programmed for language learning. (NATURE AND NURTURE)

EXTINCTION

Operant Conditioning Extinction: A learned response is weakened by the removal/absence of reinforcement

Classical Conditioning Extinction: The CR (dog salivating)is eliminated by repeated presentations of the CS (bell/tone)**without** the USC (food)

SCHEDULES OF REINFORCEMENT

Programs specifying the frequency and timing of reinforcements

A. Ratio Schedules

Fixed Ratio: The number of responses for a reward (reinforcement) remains constant

EX: Piecework jobs..$1.00 for every 10 tires produced

Variable Ratio: The number of responses for a reward (reinforcement) varies

EX: telemarkers never k now how many calls before their next sale
***Produces more responding than any other schedule of reinforcement*

B. Interval Schedules

Reinforcement is based upon responses made in certain period of time

Fixed Interval: Time period between rewards remains constant

EX: a weekly paycheck, quarterly grades

Variable Interval: The time between rewards varies

EX: Fishing

PRIMARY AND SECONDARY REINFORCERS

Primary Reinforcers:

Example: sex, food

Secondary/Conditioned Reinforcers:

Example: money, status, awards

Virtually any stimulus can become a secondary reinforcer

Culture and Reinforcement

–Culture plays a powerful role in determining what will act as reinforcers
–Culture shapes preferences for reinforcement, but reinforcement also shapes culture

PUNISHMENT

Punishment: An ***aversive*** consequence used to ***weaken*** the behavior that follows

Positive Punishment:

Example: touching a hot stove will likely reduce the chance it will happen again

Negative Punishment/Omission Training:

Example: taking away the car key's from a misbehaving teen

Why Punishment Doesn't Work

1. The power of punishment to suppress behavior usually disappears when the threat of punishment is removed
2. Punishment triggers aggression or escape (Fight or flight)
3. Punishment increase apprehension in the learner, inhibiting new and better responses/behaviors
4. Punishment is often unfair and applied unequally

Punishment must be administered consistently to be effective!!!!!!!

Classical Conditioned behavior is largely a response to past stimulation and ends with the response…while..
Operant conditioned behavior is directed at attaining some future reinforcement or avoiding punishment and requires a stimulus that follows the response

KOHLER AND INSIGHT LEARNING

Wolfgang Kohler (KER-ler)

Mental processes had to be an essential component of learning, even though behaviorists disagreed.

Insight Learning: Problem solving occurs by suddenly **perceiving familiar objects in new forms or relationships**

Example: chimp stacks crates to reach food This is a form of cognitive learning

TOLMAN'S COGNITIVE MAP

Edward Tolman

Argued that it was a **cognitive map** that accounted for a rat quickly selecting an alternative route in a maze when the preferred path was blocked

Cognitive Map: A mental image that an organism uses to navigate through a familiar environment

Example: giving directions, walking through your house in the dark

–Challenged the work of Pavlov, Watson, and Skinner –Claimed learning was mental, not behavioral.

Instead of learning a series of left and right turns, he argued that they acquired a more abstract *mental representation* of the maze's spatial layout

–Reinforcement is not needed (as behaviorists believed) in rats solving the maze

Organisms learn the spatial layout of their environments by exploration, even if they are not reinforced for exploring
(Evolutionary perspective: Animals foraging for food)

Recent studies have pointed to the hippocampus as a structure involved in 'drawing' the cognitive map

BANDURA AND REWARDS

Albert Bandura: Proposed that rewards can be effective if we merely see someone else get them

Observational Learning…aka Social learning:
We learn by imitation or observation

Accounts for rapid spread of clothing fashions and slang expressions

Summary

Reinforcement changes not only the behavior but also the individual's **expectations** for future rewards/punishment in similar situations .

Are There Two Learning Circuits??

1. **Simple 'mindless' learning**, like learning to ride a bike
2. **More complex learning** that requires conscious processing: concept formation, insight learning, observational learning, memory of specific events.

Behavioral learning, involving rewards and punishments, doesn't tell the entire story when dealing with cognitive learning, like that seen in college classes where abstract ideas are different from stimulus-response learning

The Brain and Learning

Long-Term Potentiation: the strengthening of connections in the synapses between nerve cells during learning