

PSYC 101 - Study Guide for Mid Term

Definition of Psychology

The scientific study of behavior and processes

Psychology is not Common Sense

Scientific Method - In Order

Identify a Research Problem

Design a Study

Collect and Analyze Data

Draw Conclusions

Communicate findings

Ask Geoman

1. Wild and Crazy Idea
2. Hypothesis
3. Thoery
4. Law
5. Dogma
6. Stagnation

Goals of Psychology

Description

Explanation

Prediction

Control

Descriptive Research Methods

Naturalistic and Laboratory Observation

Case Study

Survey Research

Experimental Method

Definition

The only research method that can be used to identify cause-effect relationships between two or more conditions or variables

Hypothesis

A prediction about a cause-effect relationship

Independent variable

The condition that is deliberately manipulated in order to determine whether it causes any change in another condition

Dependent variable

The condition that is measured at the end of an experiment and presumed to vary as a result of the independent variable

Experimental group

The group that is exposed to an independent variable

Correlational method

Definition

Used to establish the degree of relationship between two events or occurences

Relationships not causes

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Correlation Coefficient

Correlation and Prediction

Correlation is NOT Causation

Biopsychology

Looks for links between specific behaviors and equally specific biological processes that often help explain individual difference

Neurons

Definition

Cells specialized for communicating information and the basic building blocks of the nervous system

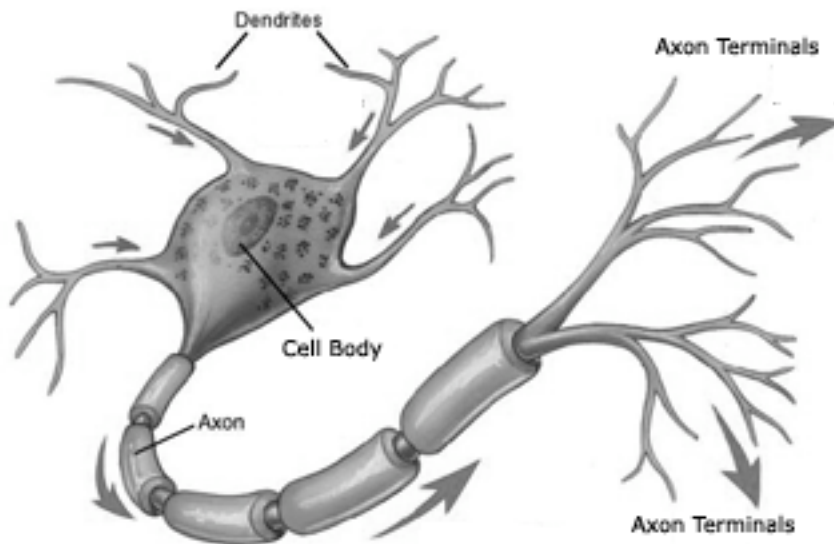
Three Parts

A cell body

An axon (with axon terminals)

One or more dendrites

Be Able To Label Parts



Three types of neurons

Afferent (Sensory)

Efferent (Motor)

Interneurons

The Synapse

The Parts

Neurotransmitters - specialized chemicals which pass through neurons

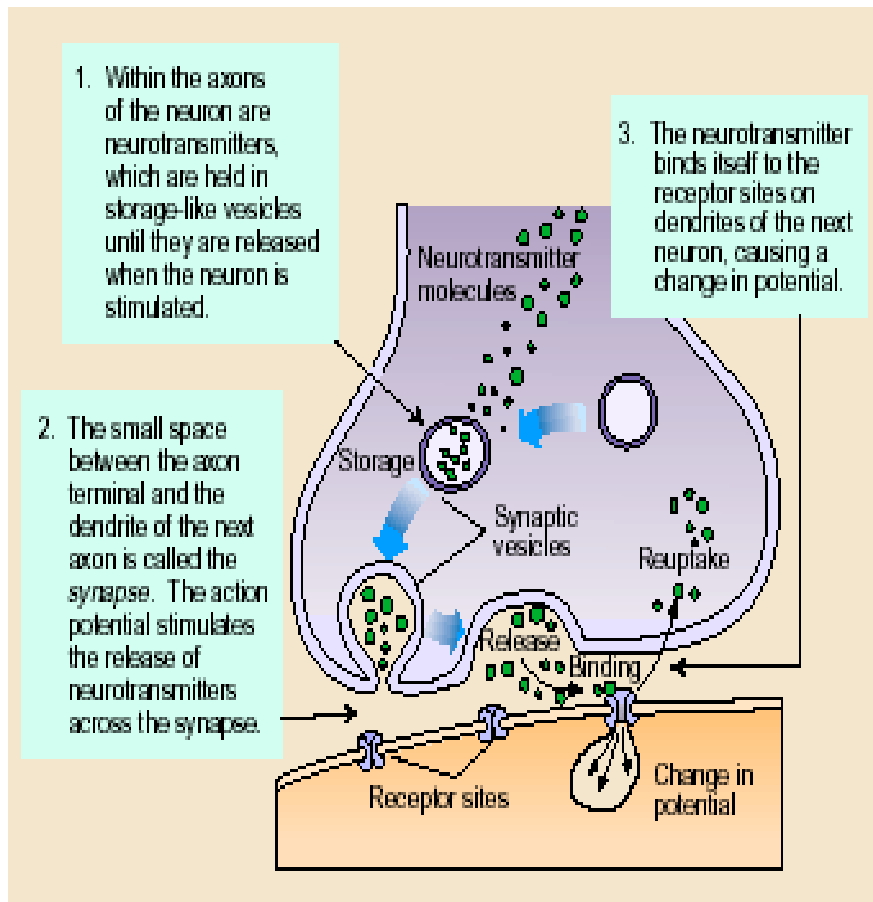
Synaptic vesicles - storage for neurotransmitters

Synaptic cleft - space between axon terminals and dendrites

Receptor sites - Areas on dendrites which receive neurotransmitters from axon terminals

Diagram

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Resting Potential

Voltage difference value between the inside and outside of the axon

Action Potential

Positively charged particles enter the membrane through specialized ion channels, thereby momentarily eliminating the negative charge just inside the neuron's membrane.

Movement of this disturbance along the membrane constitutes the action potential.

After a brief period, however, positively charged particles are forced outside of the neuron's membrane via the ion channels

All or None Law - refers to the activity of a single neuron

A neuron will either fire or it will not

When it fires, it fires with the same intensity everytime

Implications

Because intensity is always the same, variability comes from somewhere else

That variability is the rate of nerve impulses

The central nervous system is binary

Information is encoded as frequency coding

Neurotransmitters

Kinds

Acetylcholine

Found throughout the central nervous system, in the autonomic nervous system, and at all neuromuscular junctions. Involved in muscle action, learning, and memory

Epinephrine

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Affects metabolism of glucose and causes energy release from muscles during exercise

Norepinephrine

Found in neurons in the autonomic nervous system. Primarily involved in the control of alertness and wakefulness

Dopamine

Produced by neurons located in a region of the brain called the substantia nigra. Involved in movement, attention, and learning. Degeneration of dopamine-producing neurons has been linked to Parkinson's disease. Too much dopamine has been linked to schizophrenia.

Serotonin

Found in neurons in the brain and spinal cord. Plays a role in the regulation of mood and in the control of eating, sleeping, and arousal. Has also been implicated in the regulation of pain and in dreaming.

Endorphins

Endorphins were first discovered during the 1970s by researchers studying the effects of morphine and other opiates. To their surprise, the researchers learned that there were special receptor sites for such drugs within the brain.

Endorphins are released by the body in response to pain or vigorous exercise. They help reduce the sensations of pain and also serve to intensify positive sensations. "Runner's High"

Gamma Aminobutyric Acid

Found throughout the brain and spinal cord. GABA is the major inhibitory neurotransmitter in the brain. Abnormal levels of GABA have been implicated in sleep and eating disorders.

Glutamate

Primary excitatory, involved in learning, memory, and emotions

Know One In Depth

Dopamine

Where: In the brain, hypothalamus

What: Plays a role in learning, attention, movement, and reinforcement

Disease: Degeneration of dopamine-producing neurons has been linked to Parkinson's disease. Too much dopamine has been linked to schizophrenia.

Location: Released from the substantia nigra

How Psychoactive Drugs Work

How do they work?

Agonistic - increases synthesis, release, or activates (mimicry)

Antagonistic - Decreases by interference, false response (blocking), or causes leakage

They exist because...

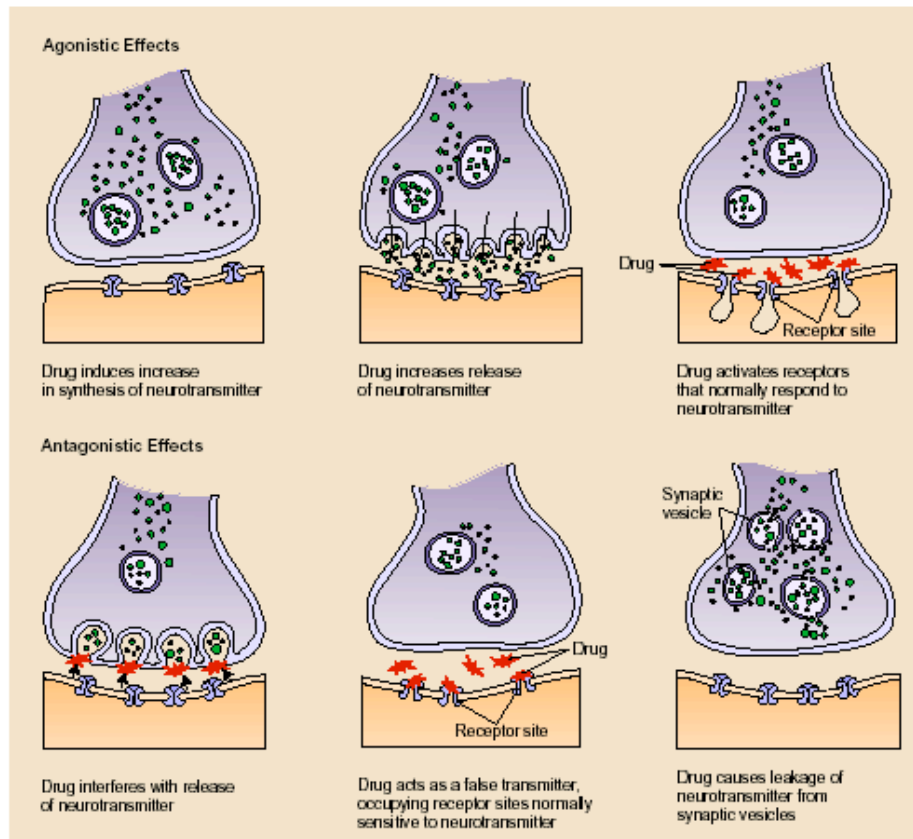
They are produced in nature or artificially by man

They mimic the brain's own neurotransmitters or affect the brain's own neurotransmitters

They cross the blood brain barrier

Diagram

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Central Nervous System

Parts

Brain

Spinal Cord

Brainstem

Optical System

Cerebral Hemispheres

Frontal Lobes

Reasoning, planning, parts of speech, movement, emotions, and problem solving

Parietal Lobes

Movement, orientation, recognition, perception of stimuli

Occipital Lobes

Visual Processing

Temporal Lobes

Perception and recognition of auditory stimuli, memory, and speech

Other Structures

Cerebellum

Motor cortex

Divisions

Left Brain

Language

Mathematics

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Logic

Right Side Movement

Right Brain

Music

Art

Spatial Skills

Creativity

Intuition

Emotion

The Limbic System

Hypothalamus

Amygdala

Corpus Callosum

Pituitary Gland

Hippocampus

Brain Waves

Alternating Current

Types

Beta Waves - Physical Activities

Low amplitude, fastest, 15 to 40 cycles/second

Alpha - Deep Relaxation

Slow, High Amplitude, 9 to 14 cycles/second

Theta - Light Sleep

Greater in amplitude, slowest, 5-8 cycles/second

Delta - Slow Wave Sleep

Greatest amplitude, slowest, 1.5 - 4 cycles/second, typically 2-3 cycles/second

The Peripheral Nervous System

Somatic Nervous System

Contracts skeletal muscles

Interacts with external environment

Autonomic Nervous System

Sympathetic - Mobilizes

Parasympathetic - Rescues

They actively suppress each other

The Endocrine System

Pituitary Gland (Master Gland)

Thyroid Glands

Pancreas

Adrenal Glands

Ovaries and Testes

Five Senses

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Taste

Touch

Hearing

Vision

Smell

Secondary Senses

Balance

Pain

Hunger

Sensation

The process through which the senses **detect** visual, auditory, and other sensory stimuli and **transmit** them to the brain

Perception

The process by which sensory information is actively **organized** and **interpreted**

Absolute threshold

Minimum stimulus intensity that a person can detect

Psychologists have defined this as the minimum that can be detected and reported 50% of the time

Difference threshold

Minimum amount by which stimulus intensity must be changed in order to produce a just noticeable change

The JND is the smallest change in sensation that a person is able to detect 50% of the time

Weber's Law

The law stating that the just noticeable difference (JND) for all the senses depends on a proportion or percentage of change in a stimulus rather than on a fixed amount of change.

Signal Detection Theory

Also called the signal decision theory

The view that the detection of a sensory stimulus involves both discriminating that stimulus from background "noise" and deciding that a stimulus is present depends partly on the probability that the stimulus will occur and partly on the probability that the stimulus can be observed.

Noise and Observer Bias exist

Transduction

Process where receptors change/convert the sensory input into neural impulses, then the impulses are transmitted to the precise/proper location in the brain.

Sensory Receptors

Specialized cells designed to detect a certain type of energy, one type of sensory stimuli

Essential link between the physical, sensory world and the brain

Discriminating a stimulus from background "noise"

Deciding whether the stimulus is actually present

Sensory Adaptation/Habituation

The process of becoming less sensitive to an unchanging sensory stimulus over time

The sensory system is more sensitive to changes in stimuli than to sameness

After a time the sensory receptors grow accustomed to constant, unchanging levels of stimuli.

Our senses are designed to be more sensitive to changes in stimulus than fixed

Vision

This flattening and bulging action of the lens is known as **accommodation**

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With age, the lens loses some elasticity

It loses the ability to change its shape to accommodate the near vision

Called **presbyopia** ("old eyes")

Bone Conduction

Dogs lack color vision, which helps with their night vision

Hearing

Theories

Place

Frequency

Olfaction

Process of detecting smells

Gestalt

Figure - Ground

Grouping

Similarity

Proximity

Continuity

Closure

Organization

Perceptual Constancy

Shape Constancy

Brightness Constancy

Color Constancy

Depth Perception

Binocular Depth Cues

Convergence

Binocular Disparity

Monocular Depth Cues

Interposition

Linear Perspective

Relative Size

Extraordinary Perception

Ambiguous Figures

Impossible Figures

Illusions

Muller-Lyer Illusion

Ponzo Illusion

Cultural Differences

Bottom-Up Processing

Begins with the individual components of the stimulus that are detected by the sensory receptors, it is transmitted to the brain where it is combined and assembled into patterns

Top-Down Processing

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Previous experience and conceptual knowledge is applied in order to recognize the nature of the "whole" and logically deduce the individual components of that whole.

Definition of Consciousness

Everything of which we are aware at any given time - our thoughts, feelings, sensations, and perceptions of the external environment

This is lousy because sensation is not something we are aware of.

Circadian Rhythm

All eukaryotes and some prokaryotes (cyanobacteria) wax and wane through the cycle of days and nights in a 24 hour period

When the organism is placed in constant conditions these rhythms persist

However, without environmental cues, they tend to be somewhat longer or somewhat shorter than 24 hours

Giving rise to the name circadian rhythms

The level of the hormone **melatonin** that rises during the night and falls during the day

Suprachiasmatic Nucleus

A discrete brain region lying within the hypothalamus

Responsible for the generation of circadian oscillation

Jet Lag

The disruption to your cycle by traveling far enough that your clock and your environment differ in time

Shift Work

About 20% of Americans worked at night and sleep during the day

Shift workers average 2 to 4 hours less sleep than nonshift workers

Alertness and performance deteriorate if people work during their subjective night

Taking Melatonin

Is sold over the counter as a sleep aid or dietary supplement

Helps reset the biological clock of night-shift workers and those suffering from jet lag

Sleep

NREM Sleep

Non-rapid eye movement sleep, consisting of the four stages of sleep and characterized by slow, regular respiration and heart rate, an absence of rapid eye movements, and blood pressure and brain activity that are at a 24 hour low point

Moves from Light to Deep Sleep in Stages

Stages have smooth transitions

Called "quiet sleep"

REM Sleep

Sleep characterized by rapid eye movements, paralysis of large muscles, fast and irregular heart rate and respiration rate, increased brain-wave activity, and vivid dreams

Called "active sleep"

Constitutes 20-25% of a normal night's sleep in adults

External calm, the large muscles of the body are paralyzed

Sleep Cycles

Sleepers progress through four NREM stages

Stages 1 and 2 - faster, low voltage waves

Stages 3 and 4 - slower, large delta waves

Normal Sleep

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Follows a predictable pattern

We all sleep in cycles

Each cycle lasts about 90 minutes

A person has one or more stages of NREM followed by a period of REM sleep

Functions of Sleep

Restorative theory

Circadian theory

A blended theory

Sleep Deprivation

After missing two or three nights

Difficulty concentrating

Lapses in attention

After 60 hours without sleep

Some people have minor hallucinations

Microsleeps

2-3 second lapses from wakefulness into sleep

What suffers most from prolonged sleep is loss is the motivation to sustain performance

Variations

Older you get less sleep

Larks - 25%

Owls - 25%

In Between - 50%

Dreaming

Can occur during both REM and NREM sleep

Matches real world in time

We can only remember a few

Features that stand out are bizarre or emotional

Narcolepsy

Lack of the neurotransmitter that causes awakeness, genetic component

A sudden attack of REM Sleep

Excessive daytime sleepiness

Usually lasting 10 to 20 minutes

Sleep Apnea

Don't take sleeping pills or consume alcohol if you suffer from this

Breathing stops during sleep

The individual must awaken briefly to breath

Can happen up to 800 times a night

Meditation

A Group of techniques that focus on

An object

A word

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One's body

Breathing

In the U.S., used to

Increase relaxation

Reduce arousal

Expand consciousness

Hypnosis

A procedure through which one person uses the power of suggestion to influence the thoughts or behaviors of another

People allow themselves to experience distortions in perception

They make experience...

Positive - creation of or addition of

Negative - absence of or taking away of

Individual proness to fantasy and their expectation of responding to hypnosis

Myths

Under complete control and will violate moral values

Perform superhuman strength

Reveal embarrassing secrets

Memory is more accurate

Can relive an event and function mentally at a younger age

Medical Use

Control of Pain

Treating

High Blood pressure

Side effects of chemotherapy

Bleeding

Altered States of Consciousness

A mental state other than ordinary wakeful consciousness, such as sleep, meditation, hypnosis, or a drug-induced state.

Drug Addiction

Both types of dependencies must be addresses to combat the addiction

Physical dependence

Psychological dependence

Stimulants

Caffiene

Nicotine

Amphetamines

Cocaine

Depressants

Alcohol

Barbiturates

Minor Tranquelizers

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Narcotics

Inhalants

Hallucinogens - Alter or distort perceptions of time and space

Marijuana

LSD

MDMA (Ecstasy)

Mushrooms

Peyote

LSD

Usually produces extreme perceptual changes - visual hallucinations and distortions

LSD can cause bad trips that can be terrifying and leave the user in a state of panic

Can produce a **flashback**, a brief recurrence of a previous trip.

MDMA (Ecstasy)

A Designer Drug, a cross between a hallucinogen and an amphetamine

Is more toxic than most other hallucinogens

Destroys serotonin producers in the brain

Learning

Definition

Learning is defined as a relatively permanent change in behavior, knowledge, capability, or attitude that is acquired through experience and cannot be attributed to illness, injury, or maturation

Origins

A lot of the first "real" scientific Psychology was done in learning

Problem Statement

Learning cannot be observed directly, but must be inferred that it has occurred

Draw inference from changes in observable behavior or in measurable capabilities and attitudes

Learning does not always result in an **observable** change in behavior.

Motivation - We "want" to

Context - Only "fits in" occasionally

Capability - Requires external conditions

To document learning, the change must be observable

How do we learn?

Habituation (sensory adaption)

Classical Conditioning

Instrumental or operant learning

Cognitive Learning

Classical Conditioning

Classical Conditioning is defined as - a learning process through which one stimulus comes to predict the occurrence of another stimulus and to elicit a response similar to or related to the response evoked by that stimulus.

Unconditioned Stimulus == **Not Learned**

Not learned

Any stimulus that without learning will automatically cause an unconditioned response

Examples

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Food

Loud Noise

Light in Eye

Unconditioned Response

A response that is invariably elicited by the unconditioned stimulus without prior learning

Conditioned Response

A learned response rather than a naturally occurring one.

Conditioned Reflex is an improper term, as reflexes cannot be learned

Conditioned Stimulus

Any stimulus that comes to elicit a conditioned response through Classical Conditioning

Dr Ivan Pavlov - 1849 - 1936

Organized and directed research in physiology

At the Institute of Experimental Medicine in St Petersburg

Conducted experiments on the physiology of digestion

Nobel Prize in 1904

Careful Research

Experimental apparatus eliminated

Vibration, horse, temperature extremes, odors, drafts

Nothing could influence the animals except the conditioning stimuli to which they were exposed

The Dogs were...

Isolated inside soundproof cubicles

Put in harnesses to restrain their movements

Experimenters were in an adjoining cubicle

Observed through a one-way mirror

Presented food by remote control

Other conditioning stimuli also presented by remote control

A tube carried the saliva from the dog's mouth to container where it was measured.

Tie off stomach - Pavlovian Pouch

Stimulus - Any event or object in the environment to which organisms response.

Reflex - An involuntary response to a particular stimulus, not learned.

Reflexes are made up of both a stimulus and a response.

Generalization

In classical conditioning, the tendency to make a conditioned response to a stimulus similar to the original conditioned stimulus.

Discrimination

The learned ability to distinguish between similar stimuli so that the conditioned response occurs only to the original conditioned stimulus but not to similar stimuli.

Higher-Order Conditioning

Conditioning that occurs when a neutral stimulus is paired with an existing conditioned stimulus, becomes associated with it, and gains the power to elicit the same conditioned response.

Factors of Influence

How reliably the Conditioned Stimulus predicts the Unconditioned Stimulus

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The number of pairings of the Conditional Stimulus and the Unconditioned Stimulus

The intensity of the Unconditional Stimulus

The temporal relationship (proximity in time) between the Conditional Stimulus and the Unconditional Stimulus

Watson - Research into Conditioning and Response - American

Little Albert

In the laboratory, Rayner presented Little Albert with a white rat.

As Albert reached for the rat, Watson struck the steel bar with a hammer just behind Albert's head.

This procedure was repeated, and Albert "jumped violently, fell forward and began to whimper" (Watson & Rayner, 1920, p. 4).

A week later, Watson continued the experiment, pairing the rat with the loud noise five more times.

Then at the sight of the white rat alone, Albert began to cry.

When Albert returned to the laboratory 5 days later, the fear had generalized to:

a rabbit

somewhat less, to a dog, a seal coat, Watson's hair, and a Santa Claus mask.

After 30 days Albert's fears were still evident, although less intense.

Albert moved away still afraid of fuzzy things

Peter

Afraid of rabbits, fur coats, feathers, cotton, and a fur rug

Strongest fear of rabbit

Rabbit brought into room in cage, kept far from Peter, Peter was given candy

The rabbit was brought closer and closer to Peter and his friends were brought in to play with the rabbit

He grew fond of the rabbit and lost his fear of the other objects

Ideal Time

The ideal time between conditioned and unconditioned stimuli is about 1/2 second

Varies according to the type of response being conditioned, the nature and intensity of the conditioned stimulus, and the nature and intensity of the unconditioned stimulus

Taste Aversions

The intense dislike and/or avoidance of a particular food, that has been associated with nausea or discomfort

An example of a Second Order conditioning

Operant Conditioning

Definition

A kind of learning in which the consequences are manipulated to increase or decrease a response.

Thorndike

American Psychologist

Preceded Pavlov

Designed and conducted experiments in animal intelligence

Nature of Learning across species

Investigated "trial and error learning" in cats, dogs, chicks, and monkeys

Best known experiments placed a hungry cat in a wooden box with slats, called a puzzle box

After many trials, the cat learned through trial and error to open the door almost immediately after being placed in the box

Law of Effect

The consequence of a response (behavior) will determine whether the tendency to respond the same way in the future will be strengthened or weakened.

Responses closely followed by satisfying consequences are more likely to be repeated

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Connections between a stimulus and a response will be strengthened if the response is followed by a satisfying consequence and weakened if the response is followed by discomfort

Operant vs. Classical

In classical conditioning

Organism does not learn a new response

learns to make an old or existing response to a new stimulus.

cannot help but respond in expected ways.

Classically conditioned responses are involuntary or reflexive

Process begins with stimulus to evoke a reflexive response.

In operant conditioning

learns a new response

learns to apply voluntary responses.

Response comes first, the consequence that follows tends to modify this response in the future.

Consequences of behavior manipulated to increase or decrease response frequency or to shape an entirely new response.

Behavior that is reinforced tends to be repeated.

Process does not begin with a stimulus to elicit a response.

Reinforcers

anything that strengthens or increases the probability of the response it follows. Behavior which is ignored or punished is less likely to be repeated

Shaping

Gradually molded a desired behavior (response) by reinforcing that becomes progressively closer to it.

Skinner Box

A soundproof chamber with a device for delivering food and detecting behavior.

Reinforcement

Positive

A reward that follows a response and increase the probability that the responses will be repeated.

Negative

The termination of an unpleasant stimulus after a response that increases the probability that the response will be repeated

Primary

Fulfills basic physical need for survival

Secondary

NS that becomes reinforcing after repeated pairings with other reinforcers

Schedules

Partial Reinforcement

Fixed Ratio - given after a fixed number of correct responses

Variable Ratio - given after a variable number of correct responses

Fixed Interval - first correct response after a fixed passage of time

Variable Interval - first correct response after a variable passage of time (**most powerful**)

Shaping

Particularly effective in conditioning complex behaviors

Process

Don't wait for desired response and then reinforce it

Reinforce any movement in the direction of desired response

Gradually guide responses closer and closer to goal

Superstitious Behavior

Sometimes a reward follows a response, but the two are unrelated

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An individual falsely "believes" that a connection exists between the act and its consequences

Extinction

Responses followed by reinforcers tend to be repeated and responses no longer followed by reinforcers will occur less frequently and eventually die out.

In operant conditioning, extinction occurs when reinforcers are withheld

Spontaneous recovery also occurs in operant conditioning

Factors of Influence

Magnitude of Reinforcement

Immediacy of the Reinforcement

Level of Motivation of the Learner

Issues

Punishment

Escape Learning - Result of Punishment

Avoidance Learning - what occurs due to punishment after Escape Learning (Greater Severity)

Learned Helplessness - (greater than Avoidance Learning)

Cognitive Learning

Insight

The sudden realization of the relationship between elements in a problem situation, which makes the solution obvious

Latent Learning

Learning that occurs without apparent reinforcement but that is not demonstrated until sufficient reinforcement is provided

Cognitive Maps

A mental representation of a spatial arrangement such as a maze

Observational Learning

Observing the behavior of others and the consequences of that behavior learning by imitation

Modeling (another name for observational learning)

Also called Social Learning Theory

Occurs when an observer's behavior changes after viewing the behavior of a model