

Glossary

accommodation

adapting one's current understandings (schemas) to incorporate new information; the process by which the eye's lens changes shape to focus the image of near objects on the retina.

acquisition

the initial stage of learning, during which a response is established and gradually strengthened. In classical conditioning, the phase in which a stimulus comes to evoke a conditioned response. In operant conditioning, the strengthening of a reinforced response.

action potential

a neural impulse; a brief electrical charge that travels down an axon, produced by rapid fluctuations in the concentrations of sodium and potassium ions in the fluid inside and outside the axon membrane.

affective disorder

a group of disorders primarily characterized by a disturbance of mood

alcohol dependence

disorder characterized by habitual consumption of alcohol in quantities large enough to interfere with daily activities

assimilation

interpreting one's new experience in terms of one's existing schemas
concrete operations period - in Piaget's theory, the stage of cognitive development (from about 6 or 7 to 11 years of age) during which children gain the mental operations that enable them to think logically about concrete events

alpha waves

the relatively slow brain waves of a relaxed, awake state

amnesia

loss of memory; psychogenic amnesia, a dissociative disorder, is selective memory loss often brought on by extreme stress

amplitude

the distance from the crest (top) to the trough (bottom) of a wave

anions

negatively-charged particles.

antisocial personality

a personality disorder in which the person (usually a man) exhibits a lack of conscience for wrongdoing, even toward friends and family members; may be aggressive and ruthless or a clever con artist

anvil

the middle of the three bones or ossicles in the middle ear; also called the incus

anxiety disorder

psychological disorders characterized by distressing, persistent anxiety or maladaptive behaviors that reduce anxiety

attention

selective perception

auditory cortex

area of the cerebral cortex located in the temporal lobe

auditory nerve

the cranial nerve that contains the sensory neurons for hearing and the vestibular sense

axon

part of a neuron specialized to send impulses to other neurons.

axonal conduction

electrochemical process by which the neural impulse (action potential) is passed along the axon to the axon terminals.

axon terminals

branching fibers at the end of an axon (also called synaptic knobs, synaptic terminals, or terminal buttons). Contain the synaptic vesicles which release neurotransmitters into the synaptic cleft.

base rate

the relative frequency; for a given set of possible outcomes, the relative frequency of each outcome is the number of times that particular outcome has occurred in the past divided by the total number of times that any of the outcomes in the set have occurred

basilar membrane

a flexible membrane in the cochlea of the inner ear; the wavelike movement of this structure in response to sound stimulates the receptor cells for hearing

beta waves

the relatively fast and irregular waves of an awake, alert state

biological clock

also called the circadian rhythm

bipolar disorder

a mood disorder in which the person alternates between the hopelessness and lethargy of depression and the overexcited state of mania

bipolar neuron

type of neuron in the retina of the eye; receives signals from the rods and cones.

catatonic schizophrenia

a type of schizophrenia primarily characterized by strange motor patterns, such as prolonged immobility or repetitive motions

cations

positively-charged particles.

cell body

part of a neuron that contains the nucleus. Also called the soma.

central tendency

the center or middle of a distribution of scores, computed as the

mean, the median, or the mode

chained associations

conditioned associations; associative links formed between two stimuli (as in classical conditioning) or between a response and a rewarding or punishing stimulus (as in operant conditioning)

chance

unpredictable fluctuations; events occurring at random

circadian rhythm

the biological clock; regular bodily rhythms (for example, of temperature and wakefulness) that occur on a 24-hour cycle

classical conditioning

a type of learning in which an organism comes to associate events. A neutral stimulus that signals an unconditioned stimulus (US) begins to produce a response that anticipates and prepares for the unconditioned stimulus. (Also known as Pavlovian conditioning.)

classical conditioning

a type of learning in which a stimulus which automatically provokes a behavioral response comes to be associated with a neutral stimulus; the neutral stimulus then is able to provoke the response. See the PsychSim module called "Classical Conditioning" for more information.

cochlea

a coiled structure in the inner ear in which the receptor cells for hearing are located; consists of a canal that spirals for two and a half turns around a central bone core

cognitive map

a mental representation of the layout of one's environment; for example, after exploring a maze, rats act as if they learned a cognitive map of it

concrete operations period

in Piaget's theory, the stage of cognitive development (from about 6 or 7 to 11 years of age) during which children gain the mental operations that enable them to think logically about concrete events

conditional probability

the probability that a particular event will occur, given that another event has already occurred

correlation

a statistical measure that indicates the extent to which two factors vary together and thus how well either factor predicts the other

correlation analysis

a statistical technique that indicates the extent to which two factors vary together and thus how well either factor predicts the other

correlation coefficient

a statistical measure of how much two factors vary together (and thus how well either predicts the other); referred to as r

conditioned response

in classical conditioning, the learned response to a previously neutral

conditioned stimulus

conditioned stimulus

in classical conditioning, an originally neutral stimulus that, after association with an unconditioned stimulus, comes to trigger a conditioned response

CR

CR stands for conditioned response. This response is the same as the unconditioned response, except that it is produced by the conditioned stimulus rather than by the unconditioned stimulus.

CS

CS stands for conditioned stimulus. This formerly neutral stimulus gradually begins to produce a conditioned response, as it becomes associated with the unconditioned stimulus. An example of a CS would be a dinner bell. extinction -- the diminishing of a response when, in classical conditioning, an unconditioned stimulus (US) does not follow a conditioned stimulus (CS); or when, in operant conditioning, a response is no longer reinforced

conditioned association

the formation of associative links between two stimuli (as in classical conditioning) or between a response and a rewarding or punishing stimulus (as in operant conditioning)

conditioned associations

associative links formed between two stimuli (as in classical conditioning) or between a response and a rewarding or punishing stimulus (as in operant conditioning)

continuous reinforcement

reinforcing the desired response every time it occurs

conservation

the principle (which Piaget believed to be a part of concrete operational reasoning) that changing the shape or form of an object or group of objects doesn't change the amount

conservation of liquid quantity

the principle (which Piaget believed to be a part of concrete operational reasoning) that volume remains the same despite changes in the forms of objects

conservation of number

the principle (which Piaget believed to be a part of concrete operational reasoning) that number remains the same despite changes in the forms of objects

conversion reaction disorder

a rare somatoform disorder in which a person experiences very specific genuine physical symptoms for which no physiological basis can be found

corpus callosum

the largest bundle of neural fibers connecting and carrying messages between the two brain hemispheres

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the unconditioned response, except that it is produced by the conditioned stimulus rather than by the unconditioned stimulus.

CS

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deductive reasoning

logical reasoning from the general to the specific; the reasoner begins by accepting the truth of one or more general premises or axioms and uses them to assert whether a specific conclusion is true, false, or indeterminate; also called hypothesis construction

deep sleep

stages 3 and 4 of the sleep cycle

delta waves

the large, slow brain waves associated with deep sleep (stages 3 and 4)

dendrites

parts of a neuron specialized to receive messages from other neurons.

depolarization

sudden positive shift in the electrical potential inside a neuron, caused by the inflow of positively-charged sodium ions. When this occurs at an excitatory synapse, it becomes temporarily easier for the neuron to fire.

descriptive statistics

mathematical methods for summarizing sets of data

discrimination

In classical conditioning, the ability to distinguish between a conditioned stimulus and similar stimuli that do not signal an unconditioned stimulus. In operant conditioning, responding differently to stimuli that signal that behavior will be reinforced or nonreinforced.

disorganized schizophrenia

a type of schizophrenia characterized by disorganized thinking, incoherent speech, and inappropriate emotional outbursts

dissociative disorder

disorders in which conscious awareness becomes separated

distribution

a set of scores arranged in order from lowest to highest

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ear

the organ of hearing, composed of the outer, middle, and inner ears

ear canal

the chamber in the outer ear extending from the pinna to the eardrum

eardrum

a thin, tense membrane separating the ear canal from the middle ear; vibrates in resonance to incoming sound waves; also called the tympanic membrane frequency the number of waves that pass a point in a given time (for example, per second)

egocentrism

in Piaget's theory, the inability of the preoperational child to take another's point of view

electrode

a conductor, such as a wire, through which an electric current enters or leaves

electroencephalogram (EEG)

an amplified recording of the waves of electrical activity that sweep across the brain's surface. These waves are measured by placing electrodes on the scalp.

emotions

responses of the whole organism, involving physical arousal, expressive behaviors, and conscious experiences

encode

to process information into the memory system, for example by extracting meaning

encoding

the processing of information into the memory system, for example by extracting meaning

excitatory synapses

synaptic connections which, when stimulated, increase the likelihood that the receiving neuron will fire.

extinction

the diminishing of a response when, in classical conditioning, an unconditional stimulus (US) does not follow a conditioned stimulus (CS); or when, in operant conditioning, a response is no longer reinforced

facial code

the system of emotional signals displayed by altering the positions of the facial muscles around the eyes and the mouth

FI

(fixed-interval schedule); in operant conditioning, a schedule of reinforcement that reinforces a response only after a specified time has elapsed

fixed-interval schedule

in operant conditioning, a schedule of reinforcement that reinforces a response only after a specified time has elapsed

fixed-ratio schedule

in operant conditioning, a schedule of reinforcement that reinforces a response only after a specified number of responses

FR

(fixed-ratio schedule); in operant conditioning, a schedule of reinforcement that

formal operations period

in Piaget's theory, the stage of cognitive development (normally beginning about age 12) during which people begin to think logically about

formal thought

type of thinking that becomes possible when the individual enters the formal operations period

frequency

the number of complete wavelengths that pass a point in a given time (for example, per second)

frequency distribution

a method of summarizing a distribution of scores by indicating the number of times that each score occurs in the distribution

frequency histogram

a graph that illustrates a frequency distribution, with a rectangle for each score in the distribution. The height of each rectangle represents the frequency of that score.

frequency polygon

a graph that illustrates a frequency distribution, with points representing the frequency of each score and lines connecting the points

hair cells

the receptor cells for hearing, which are arranged in rows along the basilar membrane of the cochlea in the inner ear

hammer

the largest of the three bones or ossicles in the middle ear; attached to the eardrum laterally and to the anvil or incus medially; moves in resonance to the vibrations of the eardrum; also called the malleus

hemisphere

one half of the brain

Hertz

a unit of frequency; one cycle per second

Horizontal-vertical illusion

a visual illusion in which a vertical line perpendicular to a horizontal line of the same length appears longer than the horizontal line

hyperpolarization

sudden negative shift in the electrical potential inside a neuron. When this occurs at an inhibitory synapse, it becomes temporarily more difficult for the neuron to fire.

hypothalamus

a neural structure lying below ("hypo") the thalamus; it directs

several maintenance activities (eating, drinking, body temperature), helps govern the endocrine system via the pituitary gland, and is linked to emotion

hypothesis

a testable prediction, often implied by a theory random - occurring by chance

iconic memory

a momentary sensory memory of visual stimuli; a photographic or picture-image memory lasting no more than a second or so

inductive reasoning

logical reasoning from the specific to the general; the reasoner begins with a set of specific observations or facts and uses them to infer a more general rule to account for those observations or facts; also called hypothesis construction

inhibitory synapses

synaptic connections which, when stimulated, decrease the likelihood that the receiving neuron will fire.

inner ear

the innermost part of the ear, containing the cochlea and the semicircular canals

interference

failure to encode, store, or retrieve items because of interference from items learned before or after

interneurons

neurons in the brain and spinal cord that link the sensory and motor neurons. They do the additional processing of the information needed to make sense of the events occurring within your body and outside in the environment. Most of the neurons in the central nervous system are of this type.

ions

positively-charged or negatively-charged particles (atoms or molecules).

lateral

on the side; opposite of medial

lateral hypothalamus

region in the left or right side of the hypothalamus

learning

a relatively permanent change in an organism's behavior due to experience

lesion

tissue destruction; a naturally or experimentally caused destruction of brain tissue

LH

lateral region of the hypothalamus

likelihood estimation

calculating how likely it is that a certain event will occur

long-term memory

the relatively permanent and limitless storehouse of the memory system

loudness

the quality of the psychological experience (sensation) of a sound that is most related to the amplitude of the physical sound stimulus

mean

the arithmetic average of a distribution, obtained by adding the scores and then dividing by the number of scores

median

the middle score in a distribution; half the scores are above it and half are below it

memory

the relatively permanent and limitless storehouse of the memory system
proactive interference - the disruptive effect of prior learning on the recall of new information

mental operations

logical thought processes that are reversible

middle ear

the chamber between the eardrum and cochlea containing three tiny bones (hammer, anvil, and stirrup) that transmit the vibrations of the eardrum to the cochlea's oval window

minimax strategy

in gaming situations, a strategy that minimizes potential losses and maximizes potential gains under the worst situation that an opponent can produce.

mode

the most frequently occurring score in a distribution

motor neurons

neurons that carry instructions from the central nervous system to the body's organs and tissues; also called efferent neurons.

Müller-Lyer illusion

a visual illusion in which a horizontal line looks longer if attached at each end to an outward-extending, V-shaped object, and looks shorter if attached at each end to an inward-extending, V-shaped object

negative correlation

scores that are negatively correlated are associated in such a way that one score falls as the other rises (as in the relationship between self-esteem and depression); correlation coefficient is negative

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scores that are negatively correlated are associated in such a way that one score falls as the other rises (as in the relationship between self-esteem and depression); correlation coefficient is negative

negative reinforcement

in operant conditioning, a situation in which the subject's response

terminates (by escaping) or prevents (by avoiding) the delivery of an aversive stimulus. Thus the removal of the aversive stimulus increases the likelihood that the response will occur.

nervous system

the body's speedy, electrochemical communication system, consisting of all the nerve cells of the peripheral and central nervous systems.

neurons

nerve cells; for more information, see the Neural Messages module

neurotransmitters

molecules released by the axon terminal into the synapse, influencing the firing rate of the next neuron.

no correlation

correlation coefficient is near zero

non-zero-sum environment

a situation in which shared resources are not limited. This means that certain sets of decisions could lead to gains for all, while other sets of decisions could produce losses for everyone.

non-zero-sum game

a laboratory game in which shared resources are not limited. This means that certain sets of decisions could lead to gains for all, while other sets of decisions could produce losses for everyone.

normal

with reference to a distribution, normal means a symmetrical bell-shaped curve that describes the distribution of many physical and psychological attributes. Most scores fall near the average, and fewer and fewer scores lie near the extremes.

not correlated

correlation coefficient is near zero

object permanence

the awareness that things continue to exist even when not perceived.

occipital

with reference to the brain, the portion of the cerebral cortex lying at the back of the head; includes the visual areas, each of which receives visual information from the opposite visual field

operant behavior

behavior that operates on the environment, producing consequences.

operant conditioning

a type of learning in which a behavior is strengthened or diminished, depending on the nature of the consequences that follow it

optic nerve

the nerve that carries neural impulses from the eye to the brain

outer ear

the part of the ear consisting of the pinna, the ear canal, and the

eardrum

oval window

an opening in the medial wall of the entrance or vestibule of the cochlea; closed by the foot of the stirrup or stapes; converts the mechanical vibrations of the ossicles into pressure changes in the cochlea; also called vestibular window

partial reinforcement

reinforcing a response only part of the time; results in slower acquisition of response but much greater resistance to extinction than does continuous reinforcement

payoff matrix

in decision games, this matrix shows the outcome of each possible decision one player could make, given each possible decision the other player could make.

person-centered therapy

therapy developed by Carl Rogers. The therapist provides a warm, supportive, non-judgmental environment in which the person can explore feelings and gain self-awareness.

pinna

the shell-shaped part of the outer ear that protrudes from the side of the head; also called the auricle

pitch

the quality of the psychological experience (sensation) of a sound that is most related to the frequency of the physical sound stimulus

Poggendorf illusion

a visual illusion in which the center portion of a diagonal straight line is hidden by a rectangular object, but the two ends are visible. The two ends appear offset; that is, they don't appear to be part of the same line.

Ponzo illusion

a visual size illusion in which two converging lines cause objects between the two lines to look larger near the converging ends of the lines and smaller near the diverging ends

positive correlation

scores that are positively correlated go up and down together (as with high school and college GPAs); correlation coefficient is positive

positively correlated

scores that are positively correlated go up and down together (as with high school and college GPAs); correlation coefficient is positive

positive reinforcement

in operant conditioning, a situation in which the subject receives a reinforcer after performing a particular operant behavior and does not receive a reinforcer if that operant behavior is not performed. Thus the presence of the reinforcer increases the likelihood that the behavior will occur.

preoperational period

in Piaget's theory, the stage (from about 2 to 6 or 7 years of age) during which a child learns to use language but does not yet comprehend the mental operations of concrete logic

primary affects

according to Paul Ekman, the six basic emotions that are displayed on the face: surprise, fear, disgust, anger, happiness, sadness

prisoners' dilemma game

a laboratory game which pits competition against cooperation. The highest combined payoff to the two players occurs if both choose a cooperative response, but a higher individual payoff goes to a player choosing a competitive response while the other chooses a cooperative response.

proactive interference

the disruptive effect of prior learning on the recall of new information

probability

a ratio expressing the likelihood of an occurrence

pyramidal neuron

neurons whose cell body has the shape of a pyramid; found in the neocortex and hippocampus.

r

the correlation coefficient; a statistical measure of how much two factors vary together (and thus how well either predicts the other)

range

the difference between the highest and lowest scores in a distribution

raw scores

scores that have not been averaged, sorted, or processed yet

recall

to get information out of memory storage

receptor

special area on a neuron's membrane that can interact with neurotransmitter molecules. When a molecule binds to the receptor, changes occur in the membrane.

reinforcer

in operant conditioning, any event that strengthens the behavior it follows

relative frequency

for a given set of possible outcomes, the relative frequency of each outcome is the number of times that particular outcome has occurred in the past divided by the total number of times that any of the outcomes in the set have occurred

REM

rapid eye movement sleep; a recurring sleep stage during which vivid dreams commonly occur; also known as paradoxical sleep because the muscles are relaxed (except for minor twitches) but other body systems are active

REM sleep

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repolarization

negative shift in the electrical potential inside the axon, caused by the outflow of positively-charged potassium ions. This produces a return to the resting potential of the axon.

respondent behavior

behavior that occurs as an automatic response to some stimulus; Skinner's term for behavior learned through classical conditioning

resting potential

the axon's electrical state during the period between action potentials. The fluid inside the axon membrane is electrically negative compared to the fluid outside the axon.

retina

the light-sensitive inner surface of the eye, containing the receptor rods and cones plus layers of neurons that begin the processing of visual information

retrieval

the process of getting information out of memory storage

retrieve

to get information out of memory storage

retroactive interference

the disruptive effect of new learning on the recall of old information

retroactive interference

the disruptive effect of new learning on the recall of old information

Rogersian approach

pioneered by Carl Rogers, this perspective on therapy focuses on the person or client rather than the therapist. The therapist provides a warm, supportive, non-judgmental environment in which the person can explore feelings and gain self-awareness.

saddle point

in decision games based on a payoff matrix, the point at which the minimax strategies of the two players converge.

scatterplot

a graphed cluster of dots

schema

a concept or framework that organizes and interprets information

semicircular canals

three small semicircular tubes or ducts in the bony labyrinth of the inner ear; the anterior, lateral, and posterior canals lie in planes at right angles to each other; involved in sensing rotational motion and head position

sensorimotor period

in Piaget's theory, the stage (from birth to about 2 years of age) during which infants know the world mostly in terms of their sensory impressions and motor activities

sensory neurons

neurons that carry information from the body's tissues and organs to the central nervous system; also called afferent neurons.

set-point

point of equilibrium, as in a thermostat

skewed

with reference to a distribution, skewed means that more of the scores are clustered toward one end of the distribution

skewed distribution

a distribution that is not symmetrical; more of the scores are clustered toward one end of the distribution

Skinner Box

a chamber containing a bar or key that an animal can manipulate to obtain a food or water reinforcer, and devices to record the animal's rate of bar pressing or key pecking; used in operant conditioning research

sleep spindles

very brief bursts of rapid brain activity observed in stage 2 of the sleep cycle

soma

another name for the cell body of a neuron.

somatosensory neuron

neuron that carries information from the skin to the spinal cord.

split-brain

a condition in which the two hemispheres of the brain are isolated by cutting the connecting fibers (mainly those of the corpus callosum) between them

spontaneous recovery

the reappearance, after a rest period, of an extinguished conditioned response

standard deviation

a measure of score variability, computed by (1) calculating the difference between each score and the mean, (2) squaring those differences, (3) calculating the mean of the squares of the differences, and (4) taking the square root of this mean

statistics

special numbers that have been computed from a set of scores to tell us something about the scores

stirrup

the smallest of the three bones or ossicles in the middle ear; attached to the oval window medially and to the anvil or incus laterally; transmits the vibrations of the ossicles to the oval window; also called the stapes

storage

the maintenance of encoded information over time

symmetrical distribution

a distribution that is balanced; the pattern of scores below the midpoint of the distribution is the mirror-image of the pattern of scores above the midpoint of the distribution

synapse

the junction of the axon tip of the sending neuron with the dendrite or cell body of the receiving neuron. Technically, a synapse consists of the pre-synaptic membrane, the synaptic gap or cleft, and the post-synaptic membrane.

synaptic transmission

chemical process by which the neural impulse is passed from the axon terminal of one neuron to the dendrite or cell body of another neuron.

synaptic vesicles

sacs in the axon terminals that contain the neurotransmitter molecules.

timbre

the quality of a sound that enables us to tell what sort of object produced the sound; related to the waveform of the sound wave.

trucking game

a laboratory game in which two players share a single road (limited resource), and must choose to cooperate or compete with each other for the use of the road.

uncorrelated

correlation coefficient is near zero

unconditioned response

in classical conditioning, the unlearned, naturally occurring response to the unconditioned stimulus, such as salivation when food is in the mouth

unconditioned stimulus

in classical conditioning, a stimulus that unconditionally (naturally and automatically) triggers a response

UR

UR stands for unconditioned response. This is an automatic response that is always produced by an unconditioned stimulus. For example, lemon juice in your mouth (an unconditioned stimulus) triggers the release of saliva (the unconditioned response).

US

US stands for unconditioned stimulus. This type of stimulus always produces a response. The association doesn't need to be learned. An example of a US would be lemon juice, which always produces salivation.

variable-interval schedule

in operant conditioning, a schedule of reinforcement that reinforces a response at unpredictable time intervals

variable-ratio schedule

in operant conditioning, a schedule of reinforcement that reinforces a response after an unpredictable number of responses

variability

the degree to which the scores are clustered or scattered around the middle of the distribution; low variability means that the scores are packed tightly around the middle of the distribution

ventromedial

medial means "in the middle," ventro means on the same side of the body as the stomach (as opposed to the back)

ventromedial hypothalamus

region in the bottom/middle of the hypothalamus

visual field

the portion of the visual environment that is projected to one hemisphere

VMH

ventromedial region of the hypothalamus

waveform

the shape of a wave; pure single-frequency waves produced by a tuning fork or flute have a smooth, rounded shape, while complex waves produced by a piano have an irregular shape with many small waves (harmonics) of different frequencies embedded in the main wave

zero-sum environment

a laboratory game in which shared resources are strictly limited. If one person gains, the others lose.

zero-sum game

a laboratory game in which shared resources are strictly limited. If one person gains, the others lose.