

Glossary

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Disclaimer: Some of the definitions included in this glossary are controversial and do not reflect universal agreement among researchers. The definitions provided below report what the authors of this volume intend to refer to when they use the term and are meant to serve as a guide for orienting the reader through this volume. We encourage skepticism and curiosity and do not intend to imply that these definitions are indisputably correct.

access consciousness: the functional aspects of being consciously aware of contents as they become accessible to cognitive systems.

action binding: the perceived shift forward of the time of action toward the outcome in voluntary conditions; a kind of intentional binding.

actuarial risk assessment: generating predictions about an offender's future behavior on the basis of algorithms and statistics that assess the offender's degree of fit with a large group of offenders with known histories.

acute sleep deprivation: a situation or environment in which wakefulness extends over twenty-four hours.

agency: the manifestation of a capacity (or capacities) to act; paradigmatic instances of agency include intentional action, where what an agent wants and believes causally produces what she does.

awareness/consciousness: umbrella terms that refer to different phenomena; common distinctions include state versus creature consciousness and phenomenal versus access consciousness.

belief: an attitude with a world-to-mind direction of fit that takes propositions as its content and is such that having a belief disposes one to assert sincerely the content of the belief when prompted in the right circumstances.

blindsight: after damage to the primary visual cortex, the ability to perform above chance in perceptual tasks while reporting no conscious awareness of the relevant stimuli.

catatonia: a behavioral symptom characterized by reduced responsiveness to the environment, immobility or slow movement, rigidity, and/or mutism or difficulty with speech.

ceteris paribus: all else equal, or holding everything else constant.

channel specificity: whether a representation is specific to processing information from a certain sensory modality.

chronic sleep restriction: a situation or environment in which an individual is awake for more than 80 percent of a twenty-four-hour period across more than five days.

clinical risk assessment: generating predictions about an offender's future behavior on the basis of a clinician's professional judgment.

cognitive behavioral therapy (CBT): a class of therapeutic interventions in which a therapist assists a client in reducing negative symptoms by challenging unhelpful thoughts, beliefs, and attitudes and then finding and practicing new, more effective strategies.

cognitive empathy: inferring another's non-affective mental state in order to empathize with them.

cognitive map: a structured mental representation that is organized by dimensions shared with physical space; recently suggested to underlie understanding of both physical and abstract spaces.

commissurotomy (in neurosurgery): the severing of the anterior commissure and usually also the corpus callosum, which thereby disconnects the two hemispheres of the brain; sometimes used as a treatment for severe epilepsy.

concepts: in cognitive science, elements of the mind that allow for tracking observations and forming thoughts about a certain kind of thing; these elements can be used to identify observations, build propositional thoughts, and create and understand linguistic utterances.

confabulate: to construct an explanation of one's behavior that does not accurately represent the true cause of one's behavior (e.g., a patient explains

her inability to remember your name in terms of fatigue rather than dementia).

construct validation: the process of determining whether a psychological scale or instrument (e.g., the Stroop task or Implicit Association Test) actually measures the real-world mental construct it is intended to measure (e.g., cognitive control or implicit bias).

content (of consciousness): the object of a conscious state; what the state is about.

contralateral: pertaining to the opposite side.

contrast sensitivity: the responsiveness of a neuron to changes in luminance across space.

cortico-cortical: of or relating to transfers of information from one cortical region to another.

criterion: in signal detection theory, the amount of evidence needed for an observer to decide that a stimulus or feature was present.

d' (d prime): in signal detection theory, the sensitivity of an observer to discriminate signal from noise (measured by the distance between the means of evidence distributions).

deep brain stimulation (DBS): the delivery of electrical current to a set of neurons somewhere in the brain; an invasive technique that requires surgical implantation of electrodes into the brain (i.e., requires opening the skull); is used for therapeutic and research purposes.

deontological: moral reasoning in terms of rules (e.g., do not kill, do not intend harm) that is relatively insensitive to the effects of violating such rules.

effect binding: the perceived shift backward of the time of the outcome toward the action in voluntary conditions; a kind of intentional binding.

electroconvulsive therapy (ECT): a therapeutic intervention used in some cases of severe mental disorder wherein, under anesthesia, a small amount of electric current is applied to induce a brief seizure.

emotional contagion: non-voluntarily adopting another's affective states; in infants, this presents as contagious crying upon hearing sounds of another person's distress.

encode: come to represent or to carry information about; when sensory neurons encode some information, it means that they represent it through their pattern of activity.

endogenous: internally generated, occurring (as in cognitive process), or existing (as in ion channels).

episodic memory: memory for particular past experiences or events (in contrast to memory for general facts or procedures); often thought to involve imagery and other phenomenological features.

exogenous: externally generated, directed, or existing.

experiential scope: the extent to which a representation aggregates over specific experiences rather than representing individual episodes.

experimental philosophy: a subfield that uses quantitative methods to understand or answer philosophical questions; often contrasted with “armchair philosophy,” which answers similar questions on the basis of introspection.

folk intuitions: immediate reactions of non-philosophers to moral dilemmas or other philosophical problems.

folk psychiatry: prescientific or commonsense terms and concepts about mental health; folk psychiatric categories include insane, psychotic, irrational, and delusional.

folk psychology: prescientific or commonsense psychological terms and concepts used to understand others’ thoughts and behaviors; folk psychological categories include beliefs, desires, and intentions.

functional connectivity: a measure of whether spatially distinct brain regions have correlated mental functions or properties (e.g., memory, moral judgment).

Gaussian: of or relating to a type of probability distribution, which is symmetric about its peak; also called a normal distribution, or more colloquially, a “bell curve.”

germline editing: genetic modification of reproductive (egg or sperm) cells, resulting in hereditary alterations.

graphical model: a declarative representation that consists in a set of nodes connected by edges.

grid cells: neurons in the medial entorhinal cortex that fire in multiple regularly spaced locations.

identity theory: in philosophy of mind, the position that the workings of the mind are identical with the workings of the brain.

identity: sameness; can also refer to qualities or characteristics of a person.

instrumental response: a behavior (e.g., work) that an animal performs as a result of learning that the behavior is a means (instrumental) to a reward (e.g., money).

intentional binding: an indirect measure of senses of agency; measured as the time interval between perceived time of action and perceived time of outcome, usually compared between active and passive action initiation conditions (see also “action binding” and “effect binding”).

internal response: in signal detection theory, a quantity returned by a detector, indicating how much evidence there is for the presence of a stimulus or feature on a given trial.

interoception: the sensory system that informs us about the internal state of our body (heart rate, arousal, hunger, thermoregulation, etc.).

intrusive thoughts: a psychiatric symptom characterized by the presence of involuntary and unwelcome ideas, images, or thoughts.

ipsilateral: pertaining to the same side.

mask: in psychophysics, a stimulus briefly presented before or after a target stimulus with the goal of rendering the target stimulus unconscious.

material monism: in philosophy of mind, a metaphysical position arguing that all naturally occurring entities and phenomena can be reduced to the same fundamental material or physical components; that is, a rejection of the idea that the mind is composed of different material than the brain/body (as in dualism).

mentalizing: the process of attributing mental states to a target.

mental kinds: categories for classifying human cognition and emotion; for example, attempts to delineate how many kinds of memory there are (e.g., semantic memory, episodic memory, working memory, sensory memory, implicit memory, etc.).

mental representation: any feature of the mind symbolizing or referring to some thing or property, x , and employed in mental activities (e.g., imagining, reasoning, feeling, deciding, controlling behavior, etc.) concerning x .

metacognition: the capacity to monitor and evaluate one's own cognitive processes.

metacontrast mask: a mask presented after a target stimulus that surrounds and abuts it without overlap.

meta- d' (meta d prime): a measure that extends signal detection theory by quantifying how well confidence judgments correlate with accuracy, independently of response bias.

mind wandering: a mode of thinking where the structure of mental content is less constrained by personal-level goals and concerns relative to goal-directed thinking; a typical (though not necessary) feature of mind wandering is shifting between topics without feeling distracted.

mirror neurons: cells that are activate both when one performs an action and when one observes another performing that action.

momentary evidence: in drift diffusion models, an internal response—that is, measured as a quantity indicating the amount of evidence for deciding between two choices that is generated at each moment during stimulus processing.

multi-voxel pattern analysis: a way to analyze brain activity in many voxels (through functional magnetic resonance imaging data) that uses pattern-recognition algorithms and machine learning to predict behavioral responses.

neural resonance: in the case of empathy, the activation of similar populations of neurons in the empathizer and in the individual with whom they empathize.

neuroethics: an interdisciplinary subfield of philosophy that considers the ethical implications of advances in neuroscience, as well as whether and to what extent evidence from neuroscience factors into ethical theory.

neuroprediction: the use of neuroscientific measures to characterize biological markers of human behavior that increase the ability to predict particular behavioral outcomes accurately.

nociception: the sensory system that encodes harmful stimuli (e.g., burning, stinging, cutting, crushing, etc.); conceptually distinct from pain perception, which represents the way the brain interprets nociceptive signals (e.g., football players may experience several nociceptive episodes while playing, but *feel* the pain only after the match).

nosology: the classification of diseases.

ontology: in informatics, an ontology represents knowledge in a particular domain by representing the concepts in that domain and the relationships between them.

opsins: light-sensitive proteins.

optogenetics: in neuroscience, a method that uses light-sensitive proteins to manipulate, with very high precision and specificity, the activity of neurons.

phenomenal consciousness: first-person, subjective experience of some dimension of the world.

place cells: neurons in the hippocampus that fire preferentially in certain locations; originally discovered in rats (O'Keefe, J., & Dostrovsky, J. [1971]. The hippocampus as a spatial map. Preliminary evidence from unit activity in the freely-moving rat. *Brain Research*, 34(1), 171–175); thought to exist in all mammals with similar hippocampal structures; Key component of the idea that memory is based in cognitive maps.

prima facie: “on the face of it”; defeasible epistemic or practical justification.

probabilistic: describes a process or entity that involves chance variation; in neuroscience, a probabilistic representation of some feature of the world is one that reflects the system’s uncertainty about that feature.

proprioception: the sensory system that enables us to perceive the location, movement, and sense of effort of parts of the body.

psychological continuity: persistence of psychological characteristics (memories, dispositions, attitudes, preferences, etc.) over time.

psychotropic: substance that affects behavioral states and cognitive functioning via effects on neurotransmitter systems.

readiness potential: a slow, negative, bilateral buildup of precentral and parietal electrical activity preceding the initiation of an action; also termed the Bereitschaftspotential.

response-congruent evidence rule: the finding that confidence judgments depend heavily on evidence congruent with a perceptual decision while ignoring or downweighting evidence that contradicts the decision.

risk assessment: in criminal justice, generating probabilistic predictions about an offender's future behavior on the basis of their attributes and/or circumstances.

saccade: a rapid, jerky eye movement between fixation points that often occurs automatically and without any initiation.

self-report: a method of recording judgments about whether one has (or had) a particular experience or holds (or held) a particular attitude; for example, a researcher might ask a participant whether she feels focused after performing a task.

semantic memory: type of long-term memory that contains concepts and other general knowledge about the world.

sensory field: in essence, the extent of a particular sensory system (e.g., humans have a visual field of $\sim 210^\circ$, and an auditory field of 20 Hz to 20 kHz); the concept of a sensory field implies that all sensory objects must occupy a certain space.

sharedness: quality of a memory by which it refers to information likely also known to others.

slow-wave brain activity: electrical brain signals in the delta (0.5–4 Hz) and theta (4–8 Hz) ranges that are markers of restful and recuperative sleep states.

somatic editing: genetic modification of nonreproductive cells resulting in non-hereditary alterations.

somatosensation: any sensory activity originating elsewhere than in the specialized sense organs (eyes and ears) and conveying information about the state of the body and its immediate environment.

striatal: pertaining to the corpus striatum, a nucleus within the basal ganglia located lateral to the thalamus; the dorsal portion is comprised of

the caudate nucleus and the putamen, and the ventral portion is comprised of the nucleus accumbens and the olfactory tubercle.

sympathy: a process wherein an agent evaluates the perceived mental/affective state of another and forms a motivational attitude toward it.

tactile: of or relating to touch.

thought experiment: hypothetical scenario designed to probe intuitions about a particular philosophical hypothesis or position.

triangulation: combining results from multiple different experiments or disciplines, each of which addresses a unique dimension of an explanatory target, in order to come to a robust conclusion about that target.

tuning curve: the response profile of a neuron to different values of a particular feature (e.g., orientation, wavelength of light, spatial frequency, etc.).

unicept: a term coined by Millikan: “neural node that helps in storing factual or procedural knowledge through its connections with other unicepts or with behavior controllers. Each unicept is supplied with its own unitracker” (Millikan, R. G. [2017]. *Beyond concepts: Unicepts, language, and natural information* (p. 225). Oxford: Oxford University Press).

unitracker: a term coined by Millikan: “neural network whose function is to recognize information arriving at the sensory surfaces that concerns one particular thing and present it for use or storage by its proprietary unicept” (Millikan, R. G. [2017]. *Beyond concepts: Unicepts, language, and natural information* (p. 225). Oxford: Oxford University Press).

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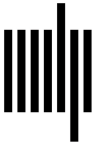
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