2.1 Structure of inference to the best explanation, with a higher hypothesis explaining a hypothesis that competes to explain the evidence. The solid lines indicate explanatory relations, whereas the dotted lines show competition between alternative explanations.
3.1 A functional model of two connected neurons.

- CELL BODY: maintains cellular processes, synthesizes neural messages, determines response to message input.
- AXON: transports neural messages.
- NUCLEUS:
- DENDRITES: receive neural messages.
- POSTSYNAPTIC DENDRITE: receive neural messages.
- SYNAPSE (gap):
- PRESYNAPTIC AXON TERMINALS: store and release neural messages into the synapse.

Direction of neural messages: from one neuron to the other.
3.2 Rough sketch of some major regions of the brain. For a more detailed diagram, see figure 5.1.
3.3 Structure of the inference that mind-body identity is the best available explanation of many psychological phenomena. Explanations are indicated by solid lines, and competition between hypotheses by dotted lines.

4.1 Duck-rabbit reversing figure.

O.J. was angry at Nicole

O. J. killed Nicole -- Drug dealers killed Nicole

Blood on O. J.’s sock
Nicole was killed

4.2. Structure of the inference concerning who killed Nicole Simpson.
5.1 Location of the amygdala and some other brain areas important for emotion. Locations are only approximate because of the difficulty of portraying the three-dimensional structure of the brain.
5.2 The EMOCON model of how different brain areas interact to produce emotions as the result of both cognitive appraisal and bodily perception. Abbreviations: DLPFC is dorsolateral prefrontal cortex; OFPFC is orbitofrontal prefrontal cortex; VMPFC is ventromedial prefrontal cortex. The dotted line is intended to indicate that emotional consciousness emerges from activity in the whole system. See figure 5.1 for the relevant brain anatomy.
7.1 Role of emotions in scientific problem solving.

10.1 How descriptive information can be relevant to normative conclusions. Arrows indicate inferential relevance.
Glossary

A priori knowledge—Knowledge that is gained by reason alone, independently of sensory experience.

Amygdala—Brain area located centrally below the cortex, important for emotions such as fear.

Anthropic principle—View that the existence of human observers is relevant to explaining the nature of the universe.

Autonomy—Psychological need to self-organize and regulate one's own behavior and avoid control by others.

Bodily perception—Component of emotion that uses internal sensors to detect bodily states such as heart and breathing patterns.

Brain revolution—The emerging replacement of the belief that minds are souls by the hypothesis that minds are brains.

Brain scanning—The use of imaging techniques such as functional magnetic resonance imaging (fMRI) to investigate the structure and function of the brain.

Cognitive appraisal—Component of emotion that assesses the impact of a situation on a person's goals.

Cognitive neuroscience—Investigation of mental functions linked to neural processes.

Cognitive science—The interdisciplinary study of mind and intelligence, embracing philosophy, psychology, neuroscience, linguistics, anthropology, and artificial intelligence.

Coherentism—The epistemological theory that beliefs are justified by how well they fit with other beliefs and with sensory experience.

Competence—Psychological need to engage optimal challenges and experience physical and social mastery.

Confirmation bias—The tendency of people to search for evidence that supports rather than challenges their beliefs.

Consciousness—Mental state involving attention, awareness, and qualitative experience.

Consequentialism—The ethical theory that whether an act is right or wrong depends on its effects on people. Needs-based, pluralistic consequentialism says that the effects to be considered concern vital human needs.

Constructive realism—The view that reality exists independently of minds, but that our knowledge of reality is constructed by mental processes.

Cortex—Outer layer of the brain, responsible for many higher cognitive functions.

Descriptive—Pertaining to how things are, as opposed to how they ought to be.

Dopamine—Neurotransmitter used in reward pathways in the brain.

Dualism—The view that a person consists of two kinds of substances, a spiritual mind and a physical body.

Electroencephalography—The use of electrodes placed on the scalp to record electrical activity in the brain.
Embodiment — The view that our thinking depends heavily on the ways our bodies enable us to perceive the world and act on it.

EMOCON — Model of how brain areas interact to produce emotional consciousness through the interaction of working memory, cognitive appraisal, and bodily perception.

Emotion — Brain state involving positive or negative appraisal of a situation and perception of physiological changes.

Empathy — The capacity to appreciate the states of mind of others by imagining oneself in their place.

Empiricism — The philosophical view that all knowledge is based on sense experience.

Epistemology — The philosophical study of the nature of knowledge.

Ethics — The philosophical study of the basis of right and wrong.

Evidence — Information gathered by careful observation, especially through scientific experiments.

Evidence-based philosophy — Philosophical investigation tied to the observational, experimental, and theoretical results of science rather than to faith or a priori reasoning.

Explanation — Specification of how a state or process results from an underlying causal mechanism.

Faith — A belief in, trust in, and devotion to gods, leaders, or texts, independent of evidence.

fMRI — Functional magnetic resonance imaging. A brain-scanning technique that uses the flow of blood in the brain to measure activity in brain areas.

Free will — The ability to make choices that are uncaused by physical processes.

Functionalism — The philosophical view that mental states are defined by their functional (input-output) relations to each other, not by any particular kind of physical realization.

Goal — Emotionally valued neural representation of imagined states of the world and self.

Happiness — Emotion characterized by positive experience with intensity ranging from contentment to intense joy.

Hebbian learning — Process in neural networks that strengthens the association between two neurons that are simultaneously active.

Hippocampus — Brain region involved in the acquisition of memories.

Hope — Brain process that produces a positive feeling about future goal satisfaction.

Hypothesis — A conjecture about what factors might explain why something happens.

Idealism — The philosophical view that reality is inherently mental.

Identity theory — The hypothesis that mental states and processes are states and processes of the brain.

Inference to the best explanation — The acceptance of a hypothesis on the grounds that it provides a better explanation of the available evidence than do alternative hypotheses.

Inference to the best plan — Decision making by choosing an action on the grounds that it is part of the best means for accomplishing goals.
Intuition—Apparently immediate conscious judgment arising from unconscious brain processes.

Materialism—The metaphysical view that nothing exists except matter and energy.

Mechanism—A system of connected parts whose interactions produce regular changes.

Metaphysics—The philosophical study of the fundamental nature of what exists.

Mirror neurons—Neurons that fire both when an animal acts and when it perceives the same action in another animal.

Motivated inference—The tendency to use memory and evidence selectively in order to arrive at beliefs that facilitate our goals.

Multimodal representation—Brain structure that may involve different kinds of sensory and emotional as well as verbal information.

Naturalism—The view that we can best address philosophical questions by taking into account scientific evidence and theories rather than supernatural sources.

Need—Condition without which a person would be harmed.

Neural naturalism—The version of naturalism that emphasizes knowledge gained from neuroscience in addition to other sciences.

Neural network—Interconnected group of neurons.

Neuron—Nerve cell.

Neuropsychology—The investigation of mental functions linked to neural processes.

Neurotransmitter—Molecule that transmits nerve impulses across a synapse.

Nihilism—The view that life has no meaning at all.

Normative—Pertaining to how things ought to be, as opposed to how they are.

Nucleus accumbens—Brain area located below the cortex, important for pleasure and positive emotions.

Parallel constraint satisfaction—Process, naturally performed by neural networks, in which a problem is solved through the simultaneous discovery of the best assignment of values to interconnected aspects of the problem.

Philosophy—The search for answers to fundamental questions about the nature of reality, knowledge, morality, and the meaning of life.

Positive philosophy—Approach to philosophy, analogous to positive psychology, that emphasizes the achievement of knowledge, morality, and meaning rather than doubt and despair.

Ptolemaic counterrevolution—Attempt to place mind at the center of reality, analogous to attempting to go back to Ptolemy's view that the sun and planets revolve around the earth.

Reductionism—View that explanations of phenomena should always be stated in terms of component entities and processes.

Reflective equilibrium—Philosophical method that reaches normative conclusions by mutual adjustment of principles and intuitions.

Relatedness—Psychological need for social attachments and feelings of security, belongingness, and intimacy with others.

Representation—Structure intended to stand for something.

Responsibility—Being held morally accountable for one's actions.

Science—The experimental and theoretical investigation of the world.
Skepticism — Philosophical view that knowledge is unattainable.

Slacker serenity — A state of happiness that comes from having only minimal goals. (A slacker is a person who shirks work and other duties.)

Synapse — Space in which a signal passes from one neuron to another.

Telic rationality — Consideration of how goals ought to be acquired, abandoned, and revalued.

Theory — A collection of hypotheses that together explain a range of evidence.

Thought experiment — Mental construction of an imaginary situation in the absence of attempts to make observations of the world.

Transcranial magnetic stimulation — Use of magnetic pulses to affect neural activation in the cortex.

Vital need — Something without which a person cannot function as a human being.

Wisdom — Knowledge about what matters, why it matters, and how to achieve it.

Zombie argument — Claim that minds cannot be brains, because we can imagine beings (zombies) who are physically identical to us but lack consciousness.