

Psychology and the Brain

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Psychology is the science of mind and behavior. Psychology includes the study of conscious and unconscious phenomena, as well as feelings and thought. It is an academic discipline of immense scope. Psychologists also seek an understanding of the emergent properties of brains, linking the discipline to neuroscience. As a social science, psychologists aim to understand the behavior of individuals and groups.

A professional practitioner or researcher involved in the discipline is called a psychologist. Some psychologists can be classified as social, behavioral, or cognitive scientists. Some psychologists attempt to understand the role of mental functions in individual and social behavior. Others explore the physiological and biological processes that underlie cognitive functions and behaviors.

Psychologists explore behavior and mental processes, including perception, cognition, attention, emotion, intelligence, subjective experiences, motivation, brain functioning, and personality. Psychologists' interests extend to interpersonal relationships, psychological resilience, family resilience, and other areas within social psychology. Psychologists also consider the unconscious mind. Research psychologists employ empirical methods to infer causal and correlational relationships between psychosocial variables. Some, but not all, clinical and counseling psychologists rely on symbolic interpretation.

Studying the Brain

Understanding the brain is of vital importance to psychologists because of its influence over behavior and mental states.

While psychological knowledge is often applied to the assessment and treatment of mental health problems, it is also directed towards understanding and solving problems in several spheres of human activity. By many accounts, psychology ultimately aims to benefit society. Many psychologists are involved in some kind of therapeutic role, practicing in clinical, counseling, or school settings. Other psychologists conduct scientific research on a wide range of topics related to mental processes and behavior. Typically the latter group of psychologists work in academic settings. Another group of psychologists is employed in industrial and organizational settings. Yet others are involved in work on human development, aging, sports, health, forensics, and the media.

A brain is an organ that serves as the center of the nervous system in all vertebrate and most invertebrate animals. It is located in the head, usually close to the sensory organs for senses such as vision. It is the most complex organ in a vertebrate's body. In a human, the cerebral cortex contains approximately 14–16 billion neurons, and the estimated number of neurons in the cerebellum is 55–70 billion. Each neuron is connected by synapses to several thousand other neurons. These neurons typically communicate with one another by means of long fibers called axons, which carry trains of signal pulses called action potentials to distant parts of the brain or body targeting specific recipient cells.

Physiologically, brains exert centralized control over a body's other organs. They act on the rest of the body both by generating patterns of muscle activity and by driving the secretion of chemicals called hormones. This centralized control allows rapid and coordinated responses to changes in the environment. Some basic types of responsiveness such as reflexes can be mediated by the spinal cord or peripheral ganglia, but sophisticated purposeful control of behavior based on complex sensory input requires the information integrating capabilities of a centralized brain.

The operations of individual brain cells are now understood in considerable detail but the way they cooperate in ensembles of millions is yet to be solved. Recent models in modern neuroscience treat the brain as a biological computer, very different in mechanism from an electronic computer, but similar in the sense that it acquires information from the surrounding world, stores it, and processes it in a variety of ways.

This article compares the properties of brains across the entire range of animal species, with the greatest attention to vertebrates. It deals with the human brain insofar as it shares the properties of other brains. The ways in which the human brain differs from other brains are covered in the human brain article. Several topics that might be covered here are instead covered there because much more can be said about them in a human context. The most important is brain disease and the effects of brain damage that are covered in the human brain article.

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