

A good way to start studying Psychology is to understand the human brain and how it works. Biological Psychology enables you to learn about the mental processes and how they are related to human thoughts and behavior. Read on and discover the wonders of what is considered the body's most complex organ.

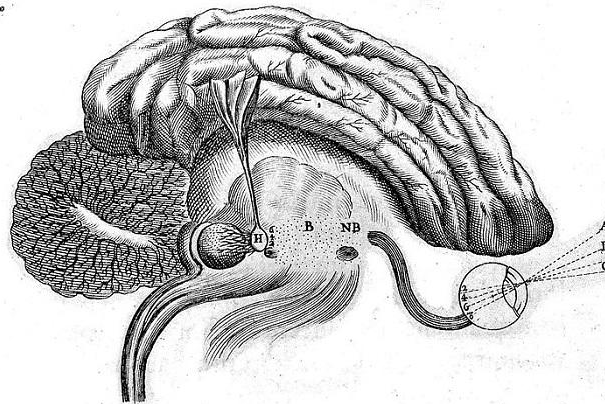
A Brief History of Biological Psychology.

The relationship between the mental and physical world has always been a topic of hot debate even in ancient times. While **Aristotle** argues that the heart is the source of one's thoughts and feelings, **Hippocrates** and **Plato** believed otherwise. For them, actions and thoughts come from the brain where the human mind can be found.

Charles Darwin made conclusions as well about the connection of genes and evolution to behaviors in his theory on natural selection. On the other hand, **Rene Descartes** likened the human mind and body to a machine, asserting that the brain is responsible for both behavior and thinking.

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XXXV.

Fig. xxxv.



Although some of these past ideas have already been refuted, it is with no doubt that these have helped establish the foundations of what is now known as biological psychology.

When the [structuralist and functionalist perspectives](#) became dominant during the 1800s, biological psychology came into the picture too.

Biological psychology (sometimes referred to as *physiological psychology* or *biopsychology*) states that actions are run by the central nervous system and its main goal is to seek to understand how the human mind works. Its interest is to discover how biology, genetics, and physiology bear an impact on the human mind and its behaviors. Moreover, it is particularly looking into biological processes that affect the individual's mental processes such as emotions and cognitions.

Subfields of Biological Psychology.

With the advancement of technologies came also the furtherance of research studies on the brain. There are other subfields under biological psychology and these are composed of cognitive neuroscience, behavioral neuroscience, and neuropsychology.

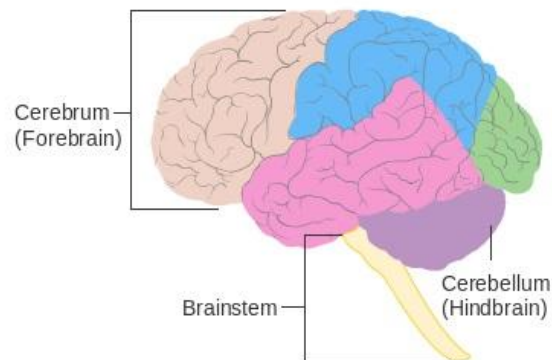
Cognitive neuroscience wants to know how the living brain works to support one's mental processes. As the name suggests, this field aims to trace the mechanisms (brain structures and activities) behind cognitive processes. In addition, it analyzes several psychiatric and neurodegenerative disorders by examining deficiencies in the neural systems.

Behavioral neuroscience combines **neurobiology** (study of cells in the nervous system and how it processes information and directs behavior) and **neurophysiology** (concerned with how the nervous system functions) in studying the influence of the brain on an individual's behavior. Central focus covers the nerve cells, neurotransmitters, and neural circuits, which are crucial in investigating the biological processes that reinforce behavior.

Neuropsychology inspects in greater detail the brain components and how each of them performs its tasks instead of just concentrating on the nervous system as a whole. By looking at the brain elements one by one, it will be able to make conclusions on how it relates to human thoughts and behaviors. A trained person in this field is able to treat a list of neuropsychological conditions like learning and attention deficit disorders.

Understanding the Human Brain.

Cerebrum, cerebellum, and brainstem are the three main parts of the human brain. The largest brain component is the **cerebrum** and it helps in doing higher functions like problem-solving, thinking, emotions, and learning. Sitting under the **cerebrum** is the cerebellum, which coordinates muscle movements and controls posture and balance. The last part is the **brainstem** that connects the brain and the spinal cord while assisting automatic functions.

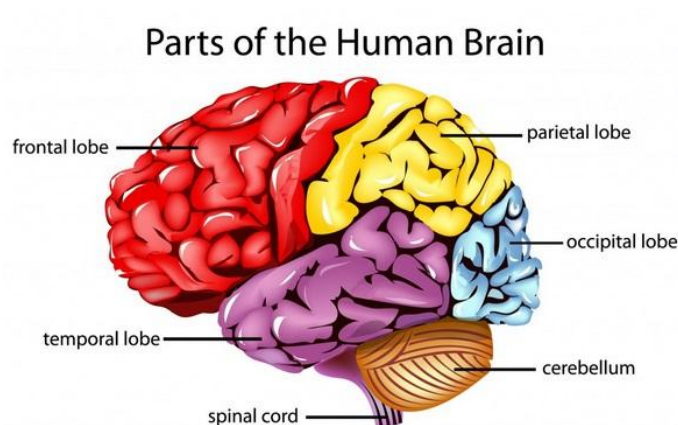


The brain and spinal cord make up the human's **central nervous system**. It is called central for the very reason that it plays a major role in controlling most, if not all of the bodily functions that

are essential in one's day-to-day living. The **spinal cord** acts as the channel from and to the brain but it can also respond on its own through reflexes.

The **brain** is composed of billions of **neurons** (nerve cells) and **glia**. The former is responsible for transmitting signals and commands while the latter provides support and protection to the neurons.

The surface of the brain (**cerebral cortex**) has distinct bumps or folds (**gyri**) and grooves (**sulci**) that serve as dividers that separate the functional centers. A sulcus termed as **longitudinal fissure** parts the brain into two halves: the left and right hemispheres. The right hemisphere controls the body muscles on the left side and the left hemisphere manages the opposite side. These two hemispheres communicate through neural fibers called the **corpus callosum**.

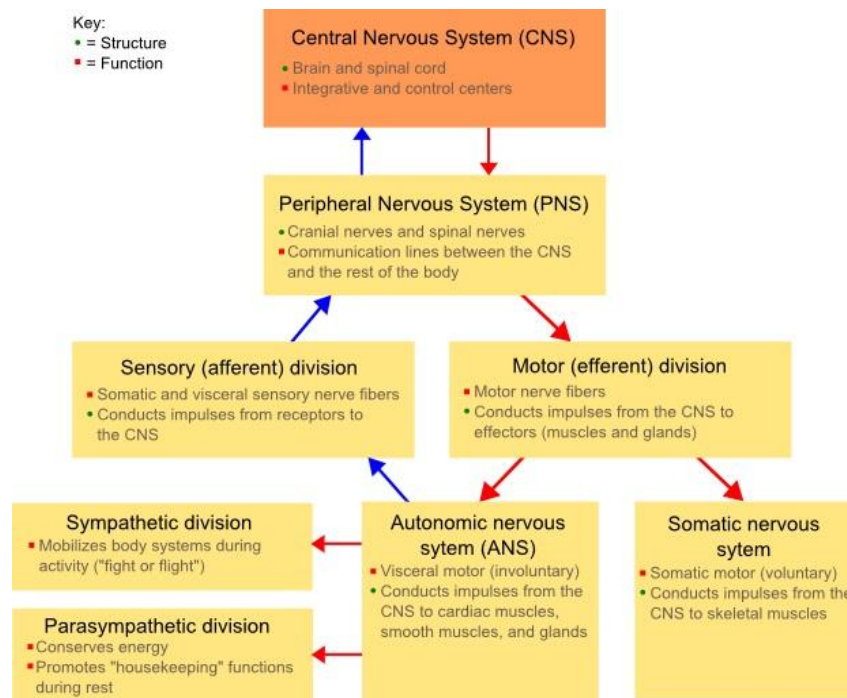


Aside from the hemispheres, the brain has four lobes, each with unique tasks: frontal lobe, occipital lobe, parietal lobe, and temporal lobe.

- **Frontal lobe** (motor cortex): for expressive language, motor skills, and higher levels of cognition
- **Occipital lobe** (visual cortex): for visual stimuli interpretation and information

- **Parietal lobe** (somatosensory cortex): for tactile sensory processing like touch, pain, and pressure
- **Temporal lobe** (auditory cortex): for sounds and language interpretation

All the nerves coming from the brain and spinal cord that extend to the rest of the part of the body are part of the **peripheral nervous system**. Its two parts are the **somatic nervous system** whose main work is to control the skeletal muscles and the other part is the **autonomic nervous system** (ANS). The ANS guides the body's automatic processes (such as breathing and blood pressure) and it is further subdivided into the **sympathetic nervous system** (for the fight-or-flight response of the body) and **parasympathetic nervous system** (for bringing the normal state of the body).



Other deep structures of the brain are the following:

- **Hypothalamus:** interferes with behaviors like hunger, sexual responses, and emotions
- **Medulla oblongata:** respiratory, digestive, and cardiovascular control center
- **Pituitary gland:** for the body's endocrine glands
- **Pineal gland:** secretes melatonin for the internal body clock and other circadian rhythms
- **Thalamus:** regulates emotional behavior, attention, and alertness as it is the “way station” for sensory information
- **Basal ganglia:** for motor behaviors
- **Limbic system:** for learning, emotion, and memory, combines higher mental functions with emotions that are primitive
- **Hippocampus:** for memory formation
- **Amygdala:** the brain's emotional center