

# Development of the Human Brain

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The human brain is the central organ of the human nervous system, and with the spinal cord makes up the central nervous system. The brain consists of the cerebrum, the brainstem and the cerebellum. It controls most of the activities of the body, processing, integrating, and coordinating the information it receives from the sense organs, and making decisions as to the instructions sent to the rest of the body. The brain is contained in, and protected by, the skull bones of the head.

The mental processes and behaviors studied by psychology are directly controlled by the brain, one of the most complex systems in nature.

The human brain is one of the most complex systems on earth. Every component of the brain must work together in order to keep its body functioning. The brain and the spinal cord make up the central nervous system, which alongside the peripheral nervous system is responsible for regulating all bodily functions.

The central nervous system: 1. Brain 2. Brain stem 3. Spinal cord

Psychology seeks to explain the mental processes and behavior of individuals by studying the interaction between mental processes and behavior on a systemic level. Therefore, the field of psychology is tightly intertwined with the study of the brain.

## The Structure of the Brain

The developing brain goes through many stages. In the embryos of vertebrates, the predecessor to the brain and spinal cord is the neural tube. As the fetus develops, the grooves and folds in the neural tube deepen, giving rise to different layers of the brain. The human brain is split up into three major layers: the hindbrain, the midbrain, and the forebrain.

### Hindbrain

The hindbrain is the well-protected central core of the brain. It includes the cerebellum, reticular formation, and brain stem, which are responsible for some of the most basic autonomic functions of life, such as breathing and movement. The brain stem contains the pons and medulla oblongata. Evolutionarily speaking, the hindbrain contains the oldest parts of the brain,

which all vertebrates possess, though they may look different from species to species.

### Midbrain

The midbrain makes up part of the brain stem. It is located between the hindbrain and forebrain. All sensory and motor information that travels between the forebrain and the spinal cord passes through the midbrain, making it a relay station for the central nervous system.

### Forebrain

The forebrain is the most anterior division of the developing vertebrate brain, containing the most complex networks in the central nervous system. The forebrain has two major divisions: the diencephalon and the telencephalon. The diencephalon is lower, containing the thalamus and hypothalamus (which together form the limbic system); the telencephalon is on top of the diencephalon and contains the cerebrum, the home of the highest-level cognitive processing in the brain. It is the large and complicated forebrain that distinguishes the human brain from other vertebrate brains.

The cerebellum is a separate region of the brain located behind the medulla oblongata and pons. It is attached to the rest of the brain by three stalks (called pedunculi), and coordinates skeletal muscles to produce smooth, graceful motions. The cerebellum receives information from our eyes, ears, muscles, and joints about the body's current positioning (referred to as proprioception). It also receives output from the cerebral cortex about where these body parts should be. After processing this information, the cerebellum sends motor impulses from the brain stem to the skeletal muscles so that they can move. The main function of the cerebellum is this muscle coordination. However, it is also responsible for balance and posture, and it assists us when we are learning a new motor skill, such as playing a sport or musical instrument. Recent research shows that apart from motor functions the cerebellum also has some role in emotional sensitivity.

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