

Biological Bases of Behaviour

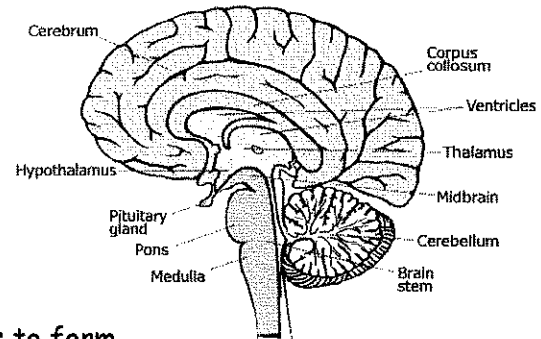
Unit 3: THE BRAIN

THE BRAIN

The brain is our most amazing organ and it was not until recently that we even knew how many parts of it work.

Tools of Brain Discovery:

- EEG
- CT Scan
- PET Scan
- MRI



LOWER LEVEL BRAIN STRUCTURES

The brainstem begins where the spinal cord swells to form the **Medulla**, which controls heartbeat and breathing. Within the brainstem, the reticular formation controls arousal. Atop the brainstem is the **Thalamus**, the brain's sensory switchboard. The **cerebellum**, attached to the rear of the brainstem, coordinates muscle movement.

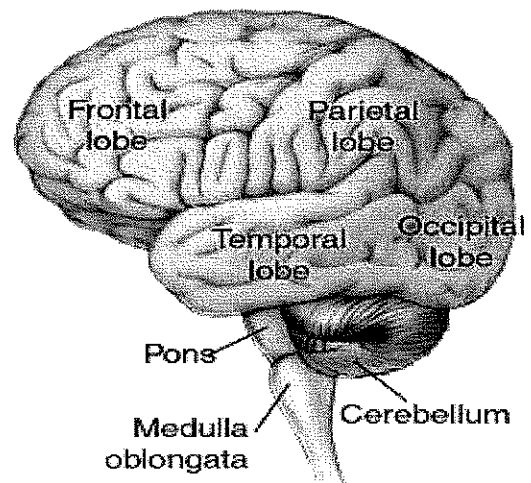
Between the brainstem and the cerebral cortex is the **limbic system**, which is linked to memory, emotions, and drives. One of its neural centers, the **amygdala**, is involved in responses of aggression and fear. Another, the **hypothalamus**, is involved in various bodily maintenance functions, pleasurable rewards, and the control of the hormonal system.

THE CEREBRAL CORTEX

Each hemisphere of the cerebral cortex, the neural fabric that covers the hemispheres, has **FOUR**

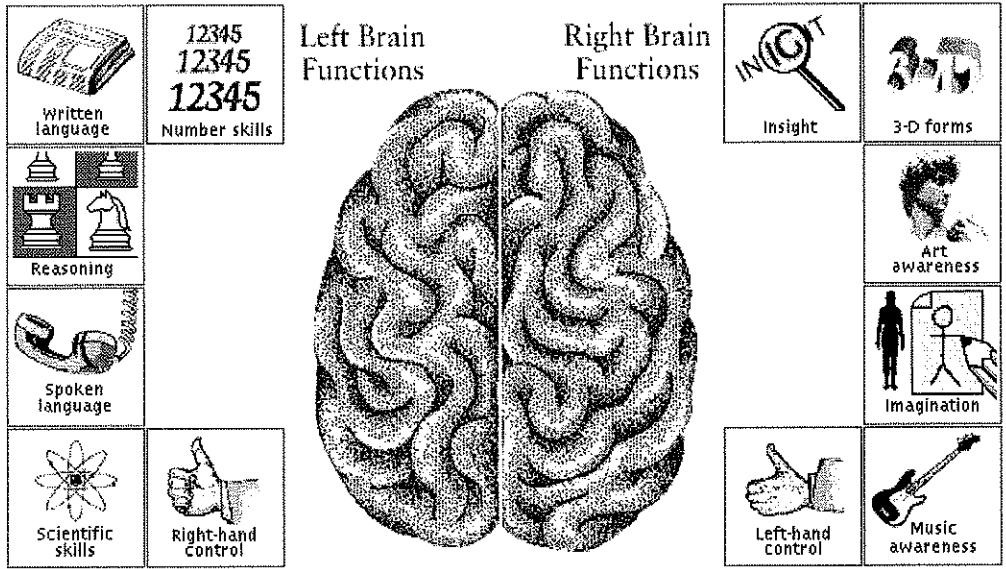
Geographic areas:

1. The Frontal Lobe
2. Parietal Lobe
3. Occipital Lobe
4. Temporal Lobe



Small, well-defined regions within these lobes control muscle movement and receive information from the body senses. However, most of the cerebral cortex-its association areas- is uncommitted to such functions and is therefore free to process other information.

OUR DIVIDED BRAINS:



Question: Within what brain region would damage be most likely to disrupt your ability to skip rope? Your ability to sense tastes and sounds? In what brain region would damage perhaps leave you in coma?

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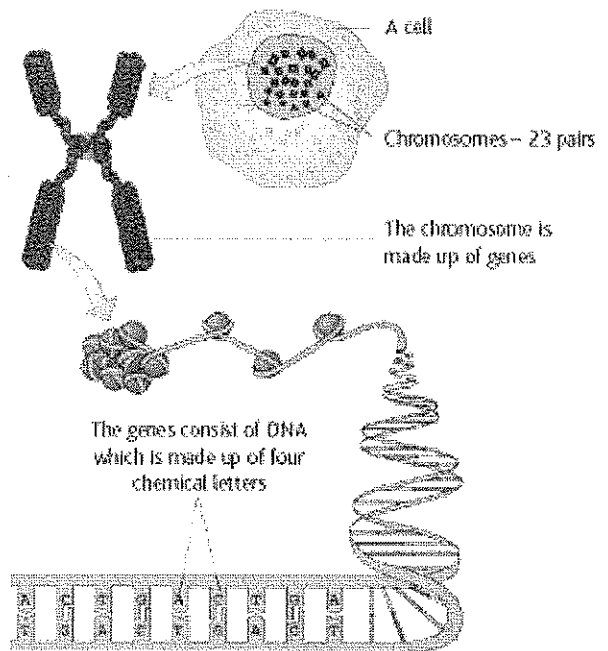
Unit 3: Genetics, Evolution and the Nature/Nurture Debate

What makes you you? To answer, we must first understand how you come to be so much like everyone else. To what extent are we shaped by our heredity (our nature) and by our life history (nurture)?

The current psychology conclusion: 50/50

A) Genes: Our Biological Footprint

- a. Our genes enable our biology, which in turn enables our behaviours.
- b. Chromosomes
- c. DNA
- d. Genes
- e. Genome



B) Evolutionary Psychology

Evolutionary Psychologists study how Natural Selection favoured behavioural tendencies that contributed to the survival and spread of our ancestors' genes.

- i. Natural Selection:
- ii. Mutations
- iii. Sexuality
- iv. Gender

- Evolutionary Psychologists study how natural selection has shaped our universal behaviour tendencies. They reason that if organisms vary, if only some mature to produce surviving offspring, and if certain inherited behaviour tendencies assist survival, then nature must select those tendencies. They believe this helps explain gender differences in sexuality. Critics maintain that they make too many hindsight explanations.

Question: Explain the relationship among chromosomes, DNA, genes, genome and nucleotides.

Behaviour Genetics vs. Environmental Influence

(Nature vs. Nurture)

- Twin Studies - Fraternal and Identical
- Separated Twin Studies
- Adoption Studies
- Temperament Studies (inborn emotions)
- Heritability
- Group Differences
- Molecular Genetics

- How much credit or blame of parents?
- Prenatal Environment
- Experience and Brain Development
- Peer Influence
- Culture and Upbringing

QUESTION:

Can you explain how twin studies are useful in determining our behaviour? Be able to explain how adoption studies of twins, and the genetics all work together in the nature vs. nurture debate. 😊 Hint Hint