

Examrace

Developmental Psychology: Heredity and Cognitive Development of Cognition and Knowledge for Competitive Exams

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Heredity and Physical Development

- Researchers believe that although environment exerts an important influence on human development, physical traits are the ones more evidently influenced by heredity. Personality and intellectual characteristics are also affected by it.
- Mechanism of Heredity: Transmission of Genetic Characteristics.
- The process begins from the moment of conception; a sperm from the father unites with the ovum/egg of the mother to form zygote, a single-cell/one-celled product, containing the complete genetic package for the one to be born much later.
- The zygote contains 23 pairs of chromosomes.

Chromosomes

- Each sperm and ovum contains 23 chromosomes that are tiny rod- shaped particles.
- Containing genetic/heredity information.
- Genetic/heredity information is packed in the genes.
- Genes: parts of chromosome that are the transmitters of inheritance.
- Genes produce particular characteristics of the new being, either individually or in combination.

Genes May be Dominant or Recessive

- A dominant gene means that its characteristics will dominate those of the recessive one e. g. if father has brown eyes and mother has black eyes, and if the father's genes dominate then the baby will have brown eyes.
- Each zygote's 46 chromosomes contain about 30,000 segments strung along its beads i.e., "genes"
- Genes, made up of Deoxyribonucleic Acid (DNA,) determine all our heredity

Prenatal Stages

- **EMBRYO:** A developed zygote with a heart, a brain and other organs.
- **FETUS:** A developing child; 9 weeks after conception till birth.

Determination of the Sex of the Embryo

- A combination of chromosomes from the parents determines sex.
- An XX pair means a female will be born An XY pair means a male will be born.
- The mother's sex chromosome is always an 'X' but the father may be either 'X' or 'Y' .
If X chromosome is being contributed by the father's side then the new being has to be a female; and if the father is contributing a 'Y' chromosome then the new being is going to be a male

Genotype and Phenotype

- **Genotype:** genetic composition of a person.
- **Phenotype:** observable characteristics.
- The characteristics that can be observed and seen, make up our "phenotype" . They may not always be the same e. g. person may have brown eyes (phenotype) but carry genes for both brown and blue eyes (genotype) _____ dominant gene is brown

Alleles

- This difference in color is due to the fact that genes come in alternative forms called "Alleles" (alternative forms of a gene) . When alleles are identical, a person is homozygous for a trait; when alleles are dissimilar the person is heterozygous

Patterns of Transmission of Characteristics

i. Homozygous and Heterozygous

- When the person inherits identical alleles he is said to be "homozygous" (possessing two identical alleles for a trait) . When he inherits two different alleles then the person is "heterozygous" (possessing two different alleles for a trait) .
- Example: when a person is homozygous for brown eyes then he will transmit only genes for brown eyes to his offspring and if heterozygous for blue and brown eyes then although dominant one is brown, but he will transfer his both alleles to his offspring
 - **Autosomal Dominant Inheritance**
 - Patterns of inheritance in which a specific gene is dominant; if it is inherited; it manifests itself in the person.
 - **Autosomal Recessive Inheritance**
 - Patterns of inheritance in which trait appears only if a person inherits two genes for it, one from each parent. If the person inherits only one gene for a trait, it will not appear in a person but may be passed on to his children.

ii. Multi- Factorial Inheritance

- Patterns of inheritance in which a trait is expressed either by a combination of several genes or through the interaction of genes with environmental factors.
- More complicated combination of genes or an interaction between genetic predispositions and environmental factors that bring them out.
- Some characteristics follows one of these patterns, other genes another.
- Hair type (curly or straight) is either autosomal dominant or autosomal recessive, baldness is sex-linked; height and weight are probably multi- factorial.
- Some diseases and birth defect are inherited according to these patterns.

Most Prominent Examples Are

- Achondroplasia: a kind of dwarfism that is inherited by autosomal dominance.
- Tay- Sachs disease: body's inability to break down fat; results into death by 3 - 4 years of age.
- Huntington's disease: 99.9 % correlation between having the identified gene and the disease.
- The blood- clotting disorder hemophilia is a sex- linked condition.
- Spina bifida: a defect in the closure of the vertebral canal, that is believed to be the condition transmitted by sex- linked inheritance.
- The process of development continues throughout the life span
- While considering aspects of development, individuality and interactions are the key terms in understanding it.
- All beings bring their unique genetic package into this world and have unique sets of experiences too.
- An individual's strengths, abilities, and predispositions are affected by the influence of environment. These influences make a person act in ways that elicit new experiences.

Cognitive Development

- Cognitive development is the process of the development of children understanding of the world as a function of age and experience.

Development of Cognition and Cognitive Ability

- Cognition is the process of knowing as well as what is known. It includes "knowledge" which is innate/inborn and present in the form of brain structures and functions.
- We 'remember' the physical environment in which we were brought up and develop perceptual constructs or knowledge accordingly (seeing, hearing, sounds etc

Disciplines Interested in the Study and Use of Cognition

- The interest in human cognition and its development has been developed and applied in a variety of scientific disciplines:
- Anthropologists focus on, and measure, how cognition develops in different cultures.
- Sociologists study how cognitions are acquired and used in various groups and institutional settings.
- Computer scientists target to create 'artificial intelligence' .

Psychologists are interested in a better understanding of the human cognitive ability and potentials, how it is utilized in different situations and at different stages.

Nature of Cognition

The very word cognitive refers to the process of knowing as well as the known. Cognition thus, has at least two main aspects/features i.e. ,

- Cognition means 'mental processes' that people use to gather/acquire knowledge, and
- Cognition refers to the knowledge that has been gathered/acquired subsequently used in mental processes

Cognition and Knowledge

- There is probably no aspect of human life and behavior that is void of all sorts of cognition ... not even sleep
- All human intellectual activities and potentials, i.e.. thinking, communicating, problem solving, and learning require mental processes and knowledge

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