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Central Teacher Eligibility Test

Central Board of Secondary Education (CBSE)

Volume - 1

Child Development and Pedagogy

SIERRA INNOVATIONS

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1 CHAPTER

Concept of development and its relation with learning

Concept and meaning of growth:

The word **growth** is made up of **abhi + vriddhi,** which means - **"spreading around."**

The general meaning of growth is to move forward.

In the context of a child's growth, it is seen as the increase in the size, weight, and functional capacity of the internal and external organs of the body. In the human body, this growth occurs only up to a certain age (18–20 years); after that, these organs do not grow further, meaning that by this age the person becomes fully adult. This growth can be observed and measured.

- It is a gradual process that continues from pregnancy until maturity is attained.
- Growth involves an increase in the length, weight, and size of the body and its cells.
- This process is visible and measurable. It can be seen, weighed, and measured.
- Growth occurs only up to a certain period—generally up to the age of 18–20 years.
- The functional capacity of the human body and the limits of growth are its two characteristics.
- Each stage has its own specific features, such as infancy, childhood, adolescence, etc.
- Along with growth, the process of development also continues continuously.

According to Frank, "Growth refers to the increase in cells, such as an increase in length and weight."

According to Lal and Joshi, "Human growth refers to the increase in the size, weight, and functional capacity of the external and internal organs of the body, which continues from the prenatal period to maturity."

Development:

Development is a process that continues continuously and includes both qualitative and quantitative changes.

- **Qualitative changes:** Style of functioning, efficiency
- **Quantitative changes:** Length, weight, and size
- **Continuous:** Continuous means proceeding without returning to a previous stage.

Growth < Development

Stops with Maturity

Womb to Tomb

Key Points:

- All changes that occur in the process of development are not the same.
  - ✓ In the early stages, there are constructive changes that bring maturity.
  - ✓ In the later stages, there are destructive changes that lead a person toward old age.
- Development is a series of gradual changes through which new characteristics emerge in a person while old ones disappear.

- The qualities possessed by a person in adulthood are the result of this long-term process of development.

According to Hurlock, development is not limited only to growth but is a systematic and sequential change that contains a progressive sequence of changes toward the goal of adulthood, resulting in the emergence of new characteristics and abilities in the individual.

According to Munroe, development is the phase in the chain of changes through which a child passes from the embryonic stage to adulthood, and this is called development.

According to James Drever, development is the state that is continuously expressed as progressive change. This progressive change occurs in any organism from the embryonic stage to adulthood. It generally regulates the developmental system. It is a measure of progress and starts from zero.

Characteristics of Development:

- Development is a qualitative change that also includes growth.
- Development is a lifelong process.
- In psychology, development is considered a process of gradual changes.
- Development cannot be measured but can be experienced.
- It includes not only physical but also mental changes.
- The pace of development varies and occurs at different rates in different stages.
- It results in the emergence of new characteristics and abilities in a person.
- It is a comprehensive process that includes all the changes occurring over the lifespan.
- Development is influenced by both environment and heredity.
- The direction of development is from general to specific.
- Development includes both quantitative and qualitative processes.

Difference Between Growth and Development

S.No	Growth	Development
1.	Growth refers to the increase in size, structure, and weight of a human being.	Development refers to personality-related changes such as mental, physical, social, and moral aspects.
2.	Growth is limited and occurs only up to the stage of maturity.	Development has no limit. It continues from birth till death.
3.	Growth is only quantitative.	Development is both quantitative and qualitative.
4.	Growth is sequential and measurable.	Development does not follow a fixed sequence.
5.	Growth is usually visible in physical form.	Development occurs in both visible and invisible forms.
6.	Growth influences development.	Development is hardly affected by growth.
7.	Growth is always positive.	Development can be both positive and negative.
8.	Growth is due only to hereditary factors.	Development is influenced by both heredity and environment.

Note: Generally, growth and development are complementary to each other.

Principles of Development

- **Principle of Continuity**
  - ✓ A child's development is a continuous process from prenatal stage to adulthood.
  - ✓ It is rapid in the first three years of life and slows down later.
- **Principle of Uniform Pattern**
  - ✓ Proposed by *Gesell* and *Hurlock*.
  - ✓ All beings develop according to the pattern of their species.
- **Principle of Individual Differences**
  - ✓ All children develop in a sequence, but the rate of development varies individually.
- **Principle of Different Rates of Development**
  - ✓ The pace of development varies from person to person and continues throughout life.
- **Principle of Sequential Development**
  - ✓ Development follows a fixed order: infancy → childhood → adolescence → youth → adulthood, etc.
- **Principle of Integration**
  - ✓ First, the child's whole body develops, then specific parts, and eventually coordination among all organs occurs.
- **Principle of General to Specific Responses**
  - ✓ A child's development proceeds from general responses to specific responses.
- **Principle of Interaction between Heredity and Environment**
  - ✓ A child's development results from the interaction of heredity and environment.
- **Principle of Interdependence**
  - ✓ Physical, mental, emotional, and other aspects of a child's development depend on each other.
- **Principle of Direction of Development**
  - ✓ Development moves from head to toe (cephalocaudal direction).
- **Centrifugal Development**
  - ✓ Development proceeds from the center of the body outward.
- **Principle of Circular (Cyclical) Development**
  - ✓ Development progresses in a circular manner, also known as the cyclical development principle.

Child Development

- In child psychology, the child is studied from birth to adolescence.
- In child development, the child is studied from the prenatal stage to adulthood. Therefore, child psychology came to be known as child development.

Brief History of Child Development

Child psychology came to be known as child development because it involved the study of all aspects, not just a single one.

- The study of child development was first initiated in **1629 A.D.** by **Comenius**, who founded the *School of Infancy*.
- **Pestalozzi** conducted scientific studies on child psychology and experimented on his three-and-a-half-year-old son, writing a *Baby Biography*.
- **Preyer** authored the book *Mind of Child* based on his study of children.
- In the **19th century**, **Stanley Hall** established the *Child Study Society* and *Child Welfare Organization* in America.
- Stanley Hall is considered the **father of child psychology**.
- **Taine** wrote *Infant Child Development* in **1869 A.D.**
- In **India**, the study of child development began in **1930 A.D.** at **Calcutta University**, initiated by **Tarabai Modak**.

Crow & Crow: "Child psychology is a scientific study in which the child is studied from the prenatal stage to adolescence."

Berk: "Child development is the branch of psychology that explains all the changes from the prenatal stage to the stage of maturity."

James Drever: "It involves the study of a developing human from birth to maturity."

Eysenck: "Child psychology relates to the development of psychological processes in children. It includes the study of a child's developmental responses from the prenatal stage, birth, infancy, childhood, adolescence, to maturity."

Need for Studying Child Development

- **To understand children's mental makeup**: It is essential to study child development to understand their mental state, interests, abilities, and problems.
- **To understand the process of development**: For a comprehensive understanding of the physical, mental, social, and emotional changes from birth to adulthood.
- **Helpful in child guidance and counseling**: To provide proper direction and counseling, it is important to know the child's developmental stage and level.
- **Helpful in predicting children's future behavior**: The present behavior and development of the child can help assess their future personality and behavior.
- **Helpful in modifying and controlling child behavior**: Knowledge of development is necessary to guide the child's behavior in a positive and disciplined direction.

Fields of Child Development:

- **Study of different developmental stages**: Analysis of physical, mental, social, and emotional development in stages like infancy, childhood, and adolescence.
- **Study of various aspects of development**: A comprehensive understanding of physical, mental, social, moral, emotional, and language development.
- **Study of children's abnormalities**: Analysis of physical, mental, social, and behavioral issues such as intellectual disability, blindness, hearing impairment, behavioral disorders, etc.
- **Study of mental health science**: Covers mental balance, stress management, adjustment capacity, and positive thinking.
- **Study of psychological processes in children**: Analysis of processes such as perception, memory, imagination, emotion, motivation, decision-making, and thinking.
- **Study of children's interests**: Understanding children's preferences, inclinations, and likings for capacity development.
- **Study of individual differences**: Evaluation of differences in intelligence, aptitude, temperament, learning pace, etc.
- **Evaluation of children's personality**: Observation and testing of various dimensions of personality such as self-confidence, leadership, adjustment, and behavior.

Importance of Studying Child Development:

- **Understanding developmental activities**: Helps to understand how children develop physically, mentally, socially, linguistically, and emotionally. It aids teachers, parents, and educators in knowing what kind of help and activities children need at each stage.

- **Knowledge of child nutrition methods**: Along with physical growth, balanced nutrition is essential for health. Studying child development provides information on age-appropriate and need-based nutrition methods, helping prevent weaknesses and diseases.
- **Understanding individual differences**: Every child is unique in interests, abilities, learning pace, and thinking style. Studying child development helps identify and accept these differences to provide personalized education and guidance.
- **Understanding developmental stages**: It clarifies how children develop in different phases—like infancy, childhood, adolescence—helping parents and teachers provide suitable care.
- **Useful in training and teaching children**: Helps teachers decide the appropriate subject matter, teaching methods, and activities for different ages, making education more effective, scientific, and child-centric.
- **Helpful in building children's personality**: Balanced and positive personality development begins in childhood. Studying child development helps understand the factors affecting personality and how proper environment, training, discipline, and motivation can ensure holistic growth.

Stages of Development

- Infancy - Birth to 5 years
- Childhood - 6 to 12 years
- Adolescence - 13 to 18 years
- Adulthood- 19 years and above

James Drever "The developing human is studied from birth to maturity."

According to Kolsanik

- **Infancy -** from birth to 3/4 weeks
- **Late infancy -** up to 2 years
- **Early childhood -** 2 to 6 years
- **Middle childhood -** 6 to 9 years
- **Late childhood -** 9 to 12 years
- **Humans -** 12 to 21 years

According to Hurlock

- **Prenatal Period** – Conception to birth
- **Neonatal Period** – Birth to 14 days
- **Babyhood** – 14 days to 2 years
- **Early Childhood** – 3 to 6 years
- **Late Childhood** – 7 to 12 years
- **Pubescence** – 12 to 14 years
- **Early Adolescence** – 13/14 to 17 years
- **Late Adolescence** – 18 to 21 years
- **Adulthood** – 21 to 40 years
- **Middle Age** – 41 to 60 years
- **Old Age** – After 60 years

According to Ross

- **Infancy** – 1 to 3 years
- **Early Childhood** – 3 to 6 years
- **Late Childhood** – 6 to 12 years
- **Adolescence** – 12 to 18 years

General Description of Different Stages:

- **Prenatal Stage:** This stage extends from conception to birth. For the convenience of studying developmental processes, this stage is divided into three sub-stages:
  - ✓ **Germinal Stage:** This stage lasts from conception to two weeks.
  - ✓ **Embryonic Stage:** This process continues from two weeks to eight weeks. The living being in this stage is called an embryo. During this stage, the major organs of the body are formed.
  - ✓ **Fetal Stage:** This stage extends from eight weeks to just before birth.

- **Infancy:** This is the stage from birth to 14 days. During this period, the child is referred to as a newborn.
- **Babyhood:** This stage extends from 2 weeks to 2 years. During this stage, the child is completely helpless and dependent on others for their needs. The pace of development during this stage is rapid.
- **Childhood:** This stage extends from the beginning of the third year to thirteen–fourteen years of age. For convenience in study, this stage is divided into two parts:
  - ✓ **Early Childhood**
  - ✓ **Late Childhood**
  - ✓ At this stage, new tendencies, curiosity, creativity, imitation, etc., begin to emerge in the child.
  - ✓ The child enters the social environment alone for the first time and begins attending school.
- **Pubescence or Pre-Adolescence:** This is the intermediate phase between late childhood and adolescence, which includes two years from each stage. Therefore, this stage is called a mixed stage. During this stage, sex organs develop. The rate of physical and mental development is faster than in childhood.
- **Adolescence:** This is the final stage of childhood. It lasts from 14–15 years to 21 years of age.
  - ✓ **Early Adolescence:** Up to 17 years of age
  - ✓ **Late Adolescence:** From 17 to 21 years of age
  - ✓ **Note:** Some scholars refer to this stage as the **Golden Age**. In this stage, attraction toward the opposite sex increases, and *sociability* and *sexuality* are two major characteristics.
- **Adulthood:** This stage extends from 21 to 40 years of age. During this time, the individual becomes capable of fulfilling duties and responsibilities. In various situations of public life, they are able to adjust healthily and achieve accomplishments.
- **Middle Age, Late Middle Age:** This stage extends from 41 to 64 years of age. During this stage, individuals undergo physical and mental changes. During this period, the person desires a happy and respectful life.
- **Old Age:** This stage is known as the stage after 65 years of age. It is considered the final stage of life. In this stage, memory becomes weak and physical and mental capabilities begin to decline.

Infancy (Shishu Avastha):

Age Range: 0 to 5 years / From birth to 5 years

Thorndike: "A child between the ages of 3 to 6 generally lives in a semi-dream state."
Freud: "Whatever a person is to become is formed within the first four to five years."
Strang: "In the first two years of life, the child lays the foundation of their future life."
Goodenough: "Half of a person's total development takes place by the age of three."
Valentine: "Infancy is the ideal age for learning."
Gesell: "Development in the first six years is twice as much as in the next twelve years."
Bridges: "By the age of two, all emotions are developed in the child."
Crow & Crow: "The 20th century is called the century of the child."
Rousseau: "A child's hands, feet, and eyes are their first teachers."
Dryden: "First we form our habits, then our habits form us."

Characteristics of Infancy:

- Rapid physical development
- Rapid mental development
- Vivid imagination
- Self-love / narcissism
- Development of moral qualities
- Instinct-based behavior
- Learning through imitation
- Curiosity-driven behavior
- Repetitive tendencies
- Introverted personality
- Expression of emotions
- Display of sexual energy
- High interest in toys
- Most lovable stage
- Age of preschool readiness
- Development of language skills

Nicknames for Infancy:

- **Ideal learning period** – *Valentine*
- Most important phase of life
- Foundation of future life
- Stage of learning through imitation
- Age of toys
- Pre-primary school age
- Stage of dependency
- Stage of illogical thinking
- Dangerous age
- "Bucky" age
- Age of kingship
- Golden age of learning
- Naming explosion stage
- Age of wandering in the world of imagination

Major Reflex States in Newborn Infants		
Reflex	**Description**	**Developmental Sequence**
Rooting Reflex	Turning the head and opening the mouth when the cheek is touched.	Disappears between 3 to 6 months.
Moro Reflex	In response to a sudden loud noise, the baby jerks its back, spreads out arms and legs, and then brings them back to the chest as if grasping something.	Disappears between 3 to 7 months (this indicates a reaction to noise).
Grasp Reflex	When the baby's palm is touched or an object is placed in it, the fingers grip tightly around it.	Disappears between 3 to 4 months (after which it becomes voluntary).
Babinski Reflex	When the sole of the baby's foot is stroked, the toes fan upward and then curl forward.	Disappears between 8 to 12 months.

Childhood (6 to 12 years)

Cole & Bruce: "Childhood is a unique period of life."
Ross: "Childhood is a period of false or pseudo-maturity."
Strang: "There is hardly any game left that a child hasn't played by the age of 10."
Kilpatrick: "Childhood is the age of competitive socialization."
Burt: "In childhood, the tendency for wandering and adventurous activities increases."
Blair & Jones: "From an educational perspective, no phase in life is more important than childhood."
Atkinson: "Childhood is the most delightful period of life."

Characteristics of Childhood:

- Stability in physical development
- Stability in mental development
- Connection with the real world
- Development of group feeling
- Development of moral traits
- Tendency to collect things
- Change in interests
- Extroverted personality
- Stage of intellectual activity
- Increased development of new skills and abilities
- Gross motor activity phase
- Sense of give-and-take
- Feelings of inferiority
- Tendency of favoritism
- Lack of diligence
- Behaviors like stealing, lying, fighting, etc.
- Strong curiosity
- Tendency toward aimless wandering
- Low sexual tendencies

Nicknames/Tags for Childhood:

- Stage of **concrete thinking**
- Stage of **primary schooling**
- **Most important phase** educationally
- **Group or gang age**
- **Collection/gathering phase**
- Period of **false maturity**
- **Pseudo-maturity stage**
- Age of **aspiration to become a leader**
- Period of **ideation**
- Tendency toward **accumulation/hoarding**
- **Dirty age**

Adolescence

- The Hindi word *"किशोरावस्था"* is derived from the English term **"Adolescence"**, which means **"maturity"**. This word originates from Latin.
- In **1904**, **Stanley Hall** wrote the book *"Adolescence"*. He is considered the **father of adolescence psychology**.
  - ✓ **Theory of Sudden Development** (*Stanley Hall*): According to this theory, changes in boys and girls during adolescence happen suddenly.
  - ✓ **Theory of Gradual Development** (*Thorndike*): According to this theory, changes during adolescence occur **gradually**, not suddenly.

- **Valentine:** "Adolescence is a delicate time for the development of criminal tendencies."
- **Ross/Joss:**
  - ✓ "Adolescence is a repetition of infancy."
  - ✓ "Adolescents develop and nurture ideals of social service."
- **Kilpatrick:** "Adolescence is the most difficult phase of life."
- **Stanley Hall:** "Adolescence is a period of conflict, stress, and storm."
- **Skinner:** "Adolescents have no experience of making decisions."
- **Crow & Crow:** "The adolescent represents the power of the present and the hope of the future."
- **Erikson:** "In adolescence, individuals seek clarification of their self-identity."

Characteristics of Adolescence:

- Stage of group loyalty
- Stage of social acceptance
- The golden age
- Period of turmoil and confusion
- Stage of logical thinking
- Stage of self-respect and self-acceptance
- Stage of personal and close friendships
- Stage of intense pressure and stress
- Period of emotional fluctuations
- Stage of rapid physical and mental development (*Bigg & Hunt*)

- Belief in God and religion
- Inclination toward social service
- Development of criminal tendencies
- Lack of stability and adjustment
- Behavioral inconsistencies
- All-round development
- Hero worship
- Attraction toward the opposite sex
- Frequent daydreaming
- Competitiveness and leadership
- Engagement in immoral acts and suicide

Nicknames of Adolescence:

- Spring season of life
- Golden period of life
- Teen Age
- Age of problem-solving
- Transitional phase
- Most difficult phase of life (Kilpatrick)
- Angel-like stage
- Tendency for hero worship
- Patriotic feeling
- Stage of pressure, storm, and conflict
- Peak of sexual drive
- Lack of adjustment

2 CHAPTER Principles of Child Development

Psychosocial Development Theory – Erik Erikson

- Erikson emphasized **social development** of the child in his book *"Childhood and Society."*
- In his theory, Erikson integrated **personal, emotional, cultural, and social development**.
- He stressed the importance of **social experiences** in personality development and gave more importance to **ego** than to *id*.

Key Foundations of Erikson's Psychosocial Theory

1. Each stage of development presents a **psychosocial challenge**, referred to as a *crisis*. Successful resolution enhances development.
2. Development passes through **various stages**.
3. **Basic human needs** remain the same for everyone.
4. The **motivation** of an individual differs at each stage.
5. The development of **self and identity** results from how a person responds to these challenges.
6. This theory is also known as the **Lifespan Development Theory**.
7. Erikson divided development into **eight stages**:

Erikson's Eight Stages of Psychosocial Development

Stage	Age Range	Conflict	Psychosocial Virtue
1.	Birth to 1 year	**Trust vs. Mistrust**	Hope
2.	1 to 3 years	**Autonomy vs. Shame & Doubt**	Will
3.	3 to 5 years	**Initiative vs. Guilt**	Purpose
4.	6 to 12 years	**Industry vs. Inferiority**	Competence
5.	12 to 18 years	**Identity vs. Role Confusion**	Fidelity
6.	18 to 35 years	**Intimacy vs. Isolation**	Love
7.	36 to 55 years	**Generativity vs. Stagnation**	Care
8.	55/60+ years	**Integrity vs. Despair**	Wisdom

Stage-wise Explanation:

1. **Trust vs. Mistrust (Birth to 2 years) :** If the child receives love and autonomy from parents, **trust** develops. If deprived of love and independence, **mistrust** develops. Successful resolution leads to the development of the **virtue of hope**.
2. **Autonomy vs. Shame & Doubt (2–3 years) :** When family members trust the child and validate their **behavior**, **autonomy** develops. Neglect leads to **shame**, and the child begins doubting themselves. Resolution leads to the development of **willpower**.

3. **Initiative vs. Guilt (3–5 years)b:** This is the **early childhood or preschool** phase. Children explore and show curiosity. Encouraging such initiatives develops **initiative**; discouragement or criticism leads to **guilt**. Successful resolution results in the virtue of **purpose**.
4. **Industry vs. Inferiority (5–12 years) :** This is the **late childhood** stage. Children strive to acquire knowledge, creativity, and intellectual skills. Success brings a sense of **industry**, while failure leads to **inferiority**. Successful resolution leads to the development of **competence**.
5. **Identity vs. Role Confusion (12–18 years) :** This is the **adolescence** phase. The primary outcome of this stage is the development of **fidelity** and a strong sense of **identity**.
6. **Intimacy vs. Isolation (18–40 years) :** This stage leads to the development of **love**. Individuals develop honesty and **loyalty** towards others.
7. **Generativity vs. Stagnation (40–65 years):** This is **adulthood**, where the quality of **care** is developed. Individuals contribute meaningfully to society and family.
8. **Integrity vs. Despair (65+ years) :** This is the **final stage** of psychosocial development. If the individual reflects on life with satisfaction, **wisdom** develops. Otherwise, **despair** and regret may arise.

Application of Psychosocial Theory in Education:

- In **primary school**, children should be encouraged to develop a sense of **industry** (hard work).
- At early stages, children should be motivated to take **initiative**.
- Adolescents should be guided to develop a **sense of identity**.

3 CHAPTER

Influence of heredity and environment

The general meaning of heredity is that the offspring are like their parents. Living beings give birth to others like themselves. A child inherits not only physical traits but also mental and social traits from the parents. However, there are exceptions, such as the children of scholars being of dull intelligence. This happens because the child also inherits traits from ancestors, which are transmitted through the parents. This process is called **heredity or inheritance**.

- The English word "HEREDITY" is derived from "HERITAGE," which means inheritance.
- Thus, the transfer of characteristics received from ancestors to offspring generation after generation is heredity.
- The inherited traits that determine the production of offspring are called heredity.

Woodworth: In heredity are included all those things present in a person at the beginning of life. These do not arise at birth but originate at conception, about nine months before birth.

J. A. Thompson: Heredity is a convenient term for the biological relationship between generations.

H. A. Peterson: A person receives traits from ancestors through their parents, which is called heredity.

P. Gisbert: The transfer of biological or psychological traits from parents to offspring is called heredity.

Douglas and Holland: All physical traits, functions, or abilities received from parents or ancestors are included in heredity.

Ruth Benedict: Heredity is the name of the traits received by the offspring from the parents.

Principles of Heredity:

1. **Theory of Continuity of Germplasm (Weismann)**

- According to Weismann, living matter gives rise to living beings. This living matter never ends.
- This living matter is transferred from generation to generation through ova and sperm. This process continues endlessly and never stops.
- Weismann described two types of cells during development:
  - ✓ **Somatic cells** – for building the body
  - ✓ **Germ cells** – for forming the reproductive cells
- Weismann considered the germ cells as primary in the origin of life.
- According to Weismann, the first unit of the origin of life is the **chromosome**.

2. **Theory of Transmission of Acquired Characters (Lamarck, Urwick, Harrison, McDougall)**

- Acquired traits from the environment can be transferred to offspring through heredity.
- Under environmental influence, changes made in an individual's body structure affect the offspring.

Darwin	Harrison		McDougall	Lamarck
Experiments on fish suggest that only the strong determine heredity because the nature of the strong ensures self-protection.	100 white butterflies		Experiments on mice	the giraffe's long neck.
	in a clean environment produce 50 white-colored offspring.	50 dull-colored offspring in a dirty environment.		

3. Theory of Continuity of Germinal Material (Francis Galton)

- To present his theory, Galton used the **regression method**, which always shows a declining order.
- According to Galton, the germinal material present in parents is transferred to offspring in a 50:50 ratio. This process never ends.
- Example calculation for generations:
- First generation: 100 x 1/2 x 1/4 x 1/8 x 1/16 x 1/32 x 1/64 x 1/128
  Results in: 50 : 25 : 12 : 6 : 3 : 1.5 : 0.35

4. Theory of Reversion / Fundamental Traits Theory

- According to this rule, children may possess traits opposite to those of their parents.
- According to Sorenson, the children of highly talented parents tend to show more average traits.
- Nature tries to keep members of a species at a similar level.
- Example: The sons of great people are usually not greater than them.
- **Reasons:**
  - ✓ One of the parental germinal factors may be stronger or weaker.
  - ✓ Some ancestral factors may become more dominant.

5. Law of Non-Inheritance of Acquired Traits

- According to this rule, traits acquired by parents are not passed onto offspring.
- The evolutionist Lamarck opposed this and claimed that traits acquired during life are transmitted generationally.
- Modern science rejects this theory because there is no evidence for such transmission.

6. Mendel's Law

- Hybrid organisms tend to revert to their original or typical form.
- Gregor John Mendel established this principle through experiments on peas and mice.
- According to Mendel, hybrids produce offspring resembling the pure types of their parental germ cells.
- According to B. N. Jha, this theory explains **reversion**, where dormant traits are suppressed by dominant traits.
- Example: Birth of a fair-skinned child to black-skinned parents.

Reversion

- The appearance of traits in offspring that are opposite to those of the parents is called **reversion**.
- **For example** – the offspring of tall parents being short, or the offspring of short parents being tall.

Mendel described two factors:

- Dominant factors (Active factors)
- Recessive factors (Dormant factors)

Dominant Factors (Active factors):

- Related to parents.

- If the dominant factors are active during the fertilization process of the parents, then the offspring will resemble the parents.
- Example – tall parents producing tall offspring, black-skinned parents producing black-skinned children.

Recessive Factors (Dormant factors):

- Related to ancestors.
- If the dormant factors are activated during the fertilization process of the parents, then the offspring will show traits similar to the ancestors or opposite to the parents.
- Example – tall parents producing short offspring, black-skinned parents producing fair-skinned children.
- According to Mendel, traits of the first generation may not appear in the second generation but reappear in the third generation.
  - ✓ The genetic ratio is **3:1** in the second generation.
  - ✓ In each third generation, this ratio becomes **9:3:3:1**.

Influence of Heredity on Child Development:

According to Western psychologists, heredity has a significant impact on every aspect of a child's personality. The views of major psychologists are as follows:

- **Effect on Basic Abilities:**
  - ✓ According to Thorndike, the main cause of a child's basic abilities is heredity.
- **Effect on Physical Traits:**
  - ✓ Karl Pearson believed that the height of parents affects the height of the child.
- **Effect on Racial Superiority:**
  - ✓ Klineberg maintained that the superiority of intelligence depends on race, for example, the white race in America is considered superior to the Negro race.
- **Effect on Occupational Ability:**
  - ✓ Cattell, through the study of 885 scientific families in America, concluded that the main cause of occupational ability is heredity.
  - ✓ Example: 2/5 families belonged to the professional class, 1/2 to the productive class, and 1/4 to the agricultural class.
- **Effect on Social Status:**
  - ✓ According to Winship, the children of talented and prestigious parents also tend to be prestigious.
  - ✓ For example, Richard Edwards's family shows that their descendants held high positions, such as the Vice President of the United States.
- **Effect on Character:**
  - ✓ Dugdale, through his 1877 study of the Jukes family, demonstrated that the children of parents with poor character also tended to have poor character.
  - ✓ In the study of approximately 1000 people over five generations:
    - 300 died in childhood
    - 310 spent time in poorhouses
    - 440 died of diseases
    - 130 were criminals
- **Effect on Greatness:**
  - ✓ According to Galton, a person's greatness is a result of heredity.
  - ✓ In his study, families of great judges, soldiers, and writers also included other distinguished members in the same fields.
- **Effect on Intelligence:**
  - ✓ Goddard's study of the descendants of a soldier named Kallikak showed that the children of parents with low intelligence were also of low intelligence, while the children of highly intelligent parents were highly intelligent.

- **Integrated Effect:**
  - ✓ According to Colesnik, a person's physical build, brain and nervous system, athletic ability, and mathematical ability depend on heredity, but the influence of the environment is even greater.
  - ✓ Psychological experiments prove that heredity makes a major contribution to both physical and mental development.
  - ✓ The children of parents with poor character tend to have poor character themselves, while healthy intellectual and mental conditions are gifts of heredity.

Environment:

- Environment is also called nurture or surroundings. The word "environment" is derived from "pari" (all around) and "aavaran" (covering), meaning that which surrounds a person on all sides.
- The collective conditions, elements, and events outside a person that affect their growth and development constitute their environment.
- The environment makes an important contribution to the development of a child's personality.
- A child receives many abilities through heredity, but their development depends on the environment.
- Environment includes all those elements that influence a person's life and behavior.

Gisbert: Environment is that which surrounds something else and affects it.
Anne Anastasi: Environment includes all things that affect all aspects of the person apart from heredity.
MacIver and Page: The living being, the structure of their life, their past life, and history are all products of the environment.

Boring, Langfield, and Weld: All the stimuli received by a person from birth to death are included in the environment.
J. S. Ross: Environment is an external force that affects us.
Woodworth: Environment includes those elements that affected the person at the beginning of life.
Douglas and Holland: Environment consists of all external forces, influences, and conditions that affect the life, nature, behavior, development, and maturity of living beings.

Effect of Environment on the Child:

Western psychologists have demonstrated that the geographical, social, and cultural environment has a broad impact on a child's personality. Some key studies are as follows:

- **Effect on Physical Differences:**
  - ✓ **Franz Boas:** Geographical environment affects physical height; for example, the height of Japanese and Jewish Americans increased.
- **Effect on Mental Development:**
  - ✓ **Gordon:** Mental development is slower in poor social and cultural environments; for example, children living by riverbanks.
- **Effect on Intelligence:**
  - ✓ **Kendall:** Intelligence is influenced less by heredity and more by environment; children from wealthy classes are more intelligent.
  - ✓ **Stephens:** Children raised in a good environment develop higher intelligence.
- **Effect on Personality:**
  - ✓ **Cooley:** Children raised in excellent environments develop well-rounded personalities; example of two writers from poor families.

- **Effect on Racial Superiority:**
  - ✓ **Clarke:** The superiority of intelligence is not due to heredity but to environment; in America, the Negro race lacks the proper environment compared to the white race.
- **Effect on Orphan Children:**
  - ✓ **Woodworth:** If orphan children are raised in a good environment, they also turn out well.
- **Effect on Twins:**
  - ✓ **Newman, Freeman, Holsinger:** Twins placed in different environments showed differences in personality, intelligence, and behavior.
- **Multifaceted Impact on Children:**
  - ✓ **Aveyron's Wild Boy:** A child raised among wild animals could not exhibit human-like behavior.
  - ✓ **Stephens:** Living in a good environment enhances a child's talent, while a poor environment leads to decline.

Relation Between Heredity and Environment:

Heredity and environment are not separate from each other. They are complementary. Their relationship is like that of seed and field. One has no meaning without the other. A healthy seed can only become a healthy plant if the environment is healthy and balanced. Good fertilizer, timely water, soil preparation, weeding, etc. create the environment. Landis therefore said:

Heredity provides us with the capacities to develop. The opportunities to develop these capacities come from the environment. Heredity gives us the working capital, and circumstances provide the opportunity to invest it.

MacIver and Page acknowledged the importance of both heredity and environment. They wrote: "Every event in life is the result of both. For any definite result, one is just as necessary as the other. Neither can be removed nor ever separated."

Woodworth and Marquis said: "A person is not the sum, but the product of heredity and environment."

In explaining the physical, mental, and emotional characteristics of a child or person at any stage of development, the words heredity and environment are commonly used. The question of how much influence heredity and environment have on a child's development has always been debated and still is. In ancient times it was believed that heredity and environment were separate and affected a child's personality and abilities in different ways. In modern times, this belief has changed considerably. There is a growing realization that whatever a person thinks, does, or experiences as a child, adolescent, or adult is the result of the interrelationship between hereditary factors and environmental influences.

This growing realization is due to tests related to heredity and environment. These tests have shown that even with the same heredity and the same environment, differences can be found among children. Therefore, a child's development is influenced not only by heredity but also by environment. Confirming this, **Crow and Crow wrote**: "A person is made not only by heredity nor only by environment. In fact, they are the product of the integration of biological inheritance and social heritage."