1. Details of Module and its structure

Module Detail	
Subject Name	Psychology
Course Name	Psychology 01 (Class XI, Semester - 1)
Module Name/Title	Prenatal Period; Infancy and Childhood (Physical Development) - Part 2
Module Id	kepy_10402
Pre-requisites	Understanding of various domains of development – biological, cognitive, socio-emotional
Objectives	After going through this lesson, the learners will be able to understand the following: • Identify various stages of development • Recognise the factors influencing development during prenatal period • Describe the characteristics of development during infancy • Identify the major accomplishments of physical development during childhood
Keywords	Prenatal period, Infancy, Teratogens, Reflexes, Object permanence, Cephalocaudal trend, Proximodistal trend, Sensorimotor stage, Attachment, Gross motor skills, Fine motor skills,

2. Development Team

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OVERVIEW OF DEVELOPMENTAL STAGES

Development is commonly described in terms of periods or stages. You must have observed that your younger brother or sister, or parents, and even yourself, all behave in different ways. If you observe people living in your neighbourhood, you would find that they too do not behave in a similar manner. This variation is partly because everyone is in a different stage of life. Human life proceeds through different stages. For example, you are at present in the stage of adolescence and after a few years you will enter the stage of adulthood. Developmental stages are assumed to be temporary and are often characterised by a dominant feature or a leading characteristic, which gives each period its uniqueness. During a particular stage, individual progresses towards an assumed goal - a state or ability that s/he must achieve in the same order as other persons before progressing to the next stage in the sequence. Of course, individuals do vary with respect to the time or rate of development from one stage to another. It may be noted that certain patterns of behaviour and certain skills are learned more easily and successfully during certain stages. These accomplishments of a person become the social expectations of that stage of development. They are known as developmental tasks. The table below provides you an overview of the different stages of development.

S.No.	**Stages**	**Time Period**	**Developmental Characteristics**
1	**Prenatal**	From conception to birth	Most rapid changes. One celled organism is transformed into a human baby with a brain and behavioural capabilities.

	 Source: https://geneticliteracyproject.org/wp-content/uploads/2015/04/embryo.jpg		
2	**Infancy**  Source: https://thumbs.dreamstime.com/x/baby-playing-8789984.jpg	From birth to two years	Marked changes in the motor, perceptual and intellectual capacities. Extreme dependence on parents/caregivers. Beginnings of many psychological activities towards the second year such as language, symbolic thought, social learning and intimate bonds with parents/caregivers.
3	**Early Childhood**  Source: https://s-media-cache-ak0.pinimg.com/originals/22/ac/b0/22acb04d3e3825cf80be1f1940cbc9a2.jpg	From 2 to 6 years	Longer and leaner bodies, refined motor skills leads to children becoming self-sufficient. Thought and language expands to a great degree; moral reasoning appears; peer relationships develops.

4	**Middle and Late Childhood**  Source: https://www.psychologynoteshq.com/wp-content/uploads/2013/09/childhood_development.jpg	From 6 to 11 years	Gain understanding of the wider world and its culture; learns to take responsibilities; improved athletic abilities and emergence of logical thought processes; increase in self-understanding and morality; stronger peer ties
5	**Adolescence**	From 11 to 18 years	Pubertal changes, abstract and idealistic thoughts which leads to personal values and goals; increased autonomy and independence from the family
6	**Early adulthood**  Source: https://thumbs.dreamstime.com/x/working-business-people-3236487.jpg	From late teens to early thirties	Establishing personal and economic independence; career development; marriage; starting a family and rearing children
7	**Late adulthood** Source: https://pixnio.com/free-images/people/family-participation-washing-their-labrador-retrieve.jpg	From approx. 35 t0 45 years till sixties	Expanding personal and social involvement and responsibility; to assist the next generation in becoming competent; reaching satisfaction in career
8	**Old age**	From sixties until death	Decreasing strength and health, retirement, adjusting to new

	 Source: https://thumbs.dreamstime.com/x/hand-holding-cane-9649853.jpg		social roles

(all images are from open sources)

STAGES OF DEVELOPMENT

You will now read about the different stages of development and their main features.

PRENATAL STAGE

The period from conception to birth is known as the prenatal period. Typically, it lasts for about 40 weeks. You know by now that the genetic blueprint guides our development during the prenatal period and after birth. Both genetic and environmental factors affect our development during different periods of prenatal stage. Some of the factors that influence prenatal development are:

Maternal characteristics, which include mother's age, nutrition, and emotional state. Prolonged stress experienced by mothers may lead to premature birth. Disease or infection carried by the mother can adversely affect prenatal development. For example, rubella (German measles) can cause blindness, deafness or heart diseases in the foetus. Genital herpes is transmitted during childbirth. It may produce many harmful effects such as paralysis, brain damage, blindness and can also be fatal for many newborns. Human Immunodeficiency Virus (HIV) is believed to cause genetic problems in the newborn.

Teratogens - Environmental agents that cause deviations in normal development that can lead to serious abnormalities or death. Common teratogens include drugs, infections, radiations, and pollution. Intake of drugs (marijuana, heroin, cocaine, etc.), alcohol, tobacco, etc. by women during pregnancy may have harmful effects on the foetus and increase the frequency of congenital abnormalities. Prenatal exposure to alcohol may lead to **Foetal alcohol syndrome** (FAS) - a disorder in which children are born with a smaller than average brain size, facial deformities, mental retardation, perceptual deficits, irritability and hyperactivity as major symptoms. Radiations (such as X-rays), and certain chemicals near industrial areas can cause

permanent change in the genes. Environmental pollutants and toxic wastes like carbon monoxide, mercury and lead are also sources of danger to the unborn child.

In conclusion, many factors can harmfully affect the course of development during prenatal period. Thus, the prospective mothers need to be careful about exposing themselves to such factors or engaging in behaviours that put their foetus at risk.

INFANCY

Infancy is the developmental period from birth to about 18 to 24 months of age.

Development of Brain

The brain develops at an amazing rate before and after birth. You have already read in Chapter 3 about the parts of the brain and the important role played by cerebrum in human functions, such as language, perception, and intelligence. Just before birth the newborns have most but not all brain cells. At birth, the weight of newborn's brain is about 25 percent of the adult brain. By age 6 months, the weight of brain reaches 50 percent of the adult weight. The neural connections among these cells develop at a rapid rate. The newborn is not as helpless as you might think. The activities needed to sustain life functions are present in the newborn — it breathes, sucks, swallows, and discharges the bodily wastes. The newborns in their first week of life are able to indicate what direction a sound is coming from, can distinguish their mother's voice from the voices of other women, and can imitate simple gestures like tongue protrusion and mouth opening.

Physical Development

Physical growth is also rapid during infancy. Early development follows two principles:

(i) development proceeds **cephalocaudally**, i.e. from the cephalic or head region to the caudal or tail region. Children gain control over the upper part of the body before the lower part. This is why you would notice that the infant's head is proportionately larger than her/his body during early infancy or if you see an infant crawling, s/he will use the arms first and then shift to using the legs

(ii) growth proceeds from the centre of body and moves towards the extremities or more distal regions — the **proximodistal** trend, i.e. children gain control over their torso before their extremities.

Initially infants reach for objects by turning their entire body, gradually they extend their arms to reach for things. These changes are the result of a maturing nervous system and not because of any limitation since even visually impaired children show the same sequence.

The newborn's movements are governed by **reflexes** — which are automatic, built-in responses to stimuli. They are genetically-carried survival mechanisms, and are the building blocks for subsequent motor development. Before the newborns have had the opportunity to learn, reflexes act as adaptive mechanisms. Some reflexes present in the newborn — coughing, blinking, and yawning persist throughout their lives. Others disappear as the brain functions mature and voluntary control over behaviour starts developing (see the table below).

Table: Some Major Reflexes in the Newborn

Reflex	**Description**	**Developmental Course**
Rooting	Turning the head and opening the mouth when touched on the cheek	Disappears between 3 and 6 months
Moro	If there is a loud noise, the baby will throw her/his arms outward while arching her/his back, and then bring the arms together as if grasping something	Disappears in 6 to 7 months (although reaction to loud noises is permanent)
Palmar Grasping	When a finger or some other object is pressed against the baby's palm, the baby's fingers close around it	Disappears in 3 to 4 months; replaced by voluntary grasping
Babinski	When the bottom of the baby's foot is stroked, the toes fan out and then curl	Disappears in 8 to 12 months

Video on newborn reflexes: https://www.youtube.com/watch?v=_JVINnp7NZ0 (not from open source)

Motor Development

As the brain is developing, physical development also progresses. As the infant grows, the muscles and nervous system mature which lead to the development of finer skills. Basic

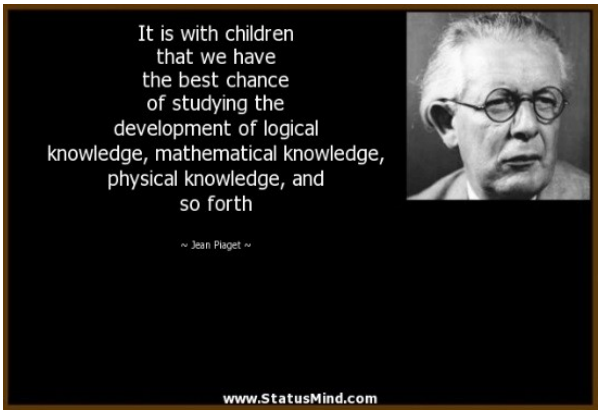
physical (motor) skills include grasping and reaching for objects, sitting, crawling, walking and running. The sequence of physical (motor) development is universal, with minor exceptions.

Sensory Abilities

You know by now that newborns are not as incompetent as they look. They can recognise their mother's voice just a few hours after birth and have other sensory capabilities.

- How well can infants see? Newborns prefer to look at some stimuli rather than others such as faces, although these preferences change over the first few months of life. The newborn's vision is estimated to be lower than the adult vision. By 6 months it improves and by about the first year, vision is almost the same as that of an adult (20/20).
- Can a newborn see colour? The current consensus is that they might be able to distinguish between red and white colours but in general they are colour deficient and full colour vision develops by 3 months of age.
- What is the nature of hearing in newborns? Infants can hear immediately after birth. As the infant develops, proficiency at localising sound improves.
- Newborns respond to touch and they can even feel pain.
- Both smell and taste capacities are also present in the newborn.

Cognitive Development



Does a 3 year old child understand things the same way as would an 8 year old? Jean Piaget stressed that children actively construct their understanding of the world. Information does not simply enter their minds from the environment. As children grow, additional information is acquired and they adapt their thinking to include new ideas, as this improves their understanding of the world. Piaget believed that a child's mind passes through a series of stages of thought from infancy to adolescence (see the table below).

Each stage is characterised by a distinct way of thinking and is age related. It is important to remember that it is the different way of thinking which makes one stage more advanced than the other and not the amount of information. This also shows why you at your age think differently from an 8 year old.

Piaget's Stages of Cognitive Development

Stage	**Approximate Age**	**Characteristics**
Sensorimotor	0-2 years	1. Infant explores the world through sensory experiences and physical actions 2. Lack object permanence till 8-9 months 3. Symbolic thought is not present
Preoperational	2-7 years	1. Symbolic thought develops which enables the child to engage in pretend play 2. Object permanence is established 3. The child cannot coordinate different physical attributes of an object – centration. 4. Thinking displays egocentrism, irreversibility, and animism
Concrete operational	7-11 years	1. The child can reason logically about concrete events and classify objects into different sets. 2. Is able to perform reversible mental operations on representations of objects. 3. Can grasp the concept of conservation.
Formal operational	11-15 years	1. The adolescent can apply logic more flexibly abstractly 2. Hypothetical thinking develops

Sensorimotor stage: The child during infancy, i.e. the first two years of life, experiences the world through senses and interactions with objects — through looking, hearing, touching, mouthing, and grasping. **Infants have not yet learned to use mental symbols to represent objects or events**. The newborn lives in the present. What is out of sight is out of mind. For example, if you hide the toy in front of the child with which the child has been playing, the young infant would react as if nothing has happened, i.e. s/he will not search for the toy. The child assumes the toy does not exist.

According to Piaget, children at this stage do not go beyond their immediate sensory experience, i.e. **lack object permanence** — the awareness that the objects continue to exist when not perceived. Gradually by 8 months of age the child starts pursuing the object partially covered in her/his presence. The basis of verbal communication seems to be present in infants. Vocalisation begins with the infant's babbling, sometime between 3 to 6 months of age. Towards the end of sensorimotor stage, infants begin to use words to communicate.

Socio-emotional Development

Babies from birth are social creatures. An infant starts preferring familiar faces and responds to parent's presence by cooing and gurgling. They become more mobile by 6 to 8 months of age and start showing a preference for their mother's company. When frightened by a new face or when separated from their mother, they show distress. On being reunited with the parent or caregiver they reciprocate with smiles or hugs. The close emotional bond of affection that develop between infants and their parents (caregivers) is called **attachment.** In a classic study by Harlow and Harlow (1962), baby monkeys were separated from their mothers approximately 8 hours after birth. The baby monkeys were placed in experimental chambers and reared for 6 months by surrogate (substitute) "mothers", one made of wire and the other of cloth. Half the baby monkeys were fed by the wire mother, half by the cloth mother. Regardless of whether they were fed by the wire or the cloth mother the baby monkeys showed a preference for the cloth mother and spent a lot more time with her. This study clearly demonstrates that providing nourishment or feeding was not crucial for attachment and contact-comfort is important. You too may have seen young children having a strong attachment to a favourite toy or blanket. There is nothing unusual in this, as the children know that the blanket or toy is not their mother. Yet it provides them comfort. As children grow and become more sure of themselves, they abandon these objects.

Human babies also form an attachment with their parents or caregivers who consistently and appropriately reciprocate to their signals of love and affection. According to **Erik Erikson** (1968), the first year of life is the key time for the development of attachment. It represents the stage of developing trust or mistrust. A sense of trust is built on a feeling of physical comfort which builds an expectation of the world as a secure and good place. An infant's sense of trust is developed by responsive and sensitive parenting. If the parents are sensitive, affectionate, and accepting, it provides the infant a strong base to explore the environment. Such infants are likely to develop a secure attachment. On the other hand, if parents are insensitive and show

dissatisfaction and find fault with the child, it can lead to creating feelings of self-doubt in the child. Securely attached infants respond positively when picked up, move freely, and play whereas insecurely attached infants feel anxious when separated and cry due to fear and get upset. A close interactive relationship with warm and affectionate adults is a child's first step towards healthy development.

CHILDHOOD

The child's growth slows down during early childhood as compared to infancy. The child develops physically, gains height and weight, learns to walk, runs, jumps, and plays with a ball. Socially, the child's world expands from the parents to the family and adults near home and at school. The child also begins to acquire the concepts of good and bad, i.e. develops a sense of morality. During childhood, children have increased physical capacities, can perform tasks independently, can set goals, and meet adult expectations. The increasing maturation of the brain along with opportunities to experience the world, contribute to development of children's cognitive abilities.

Physical Development:

As children grow older, they look slimmer as the trunk part of their bodies lengthens and body fat decreases. The brain and the head grow more rapidly than any other part of the body. The growth and development of the brain are important as they help in the maturation of children's abilities, such as eye-hand coordination, holding a pencil, and attempts made at writing. During middle and late childhood years, children increase significantly in size and strength; increase in weight is mainly due to increase in the size of the skeletal and muscular systems, as well as size of some body organs.

Motor Development:

Motor development refers to the child's ability to move and control his body.

Gross motor skills - a child's ability to use large groups of muscles.

Gross motor skills during the early childhood years involve the use of arms and legs, and moving around with confidence and more purposefully in the environment. During middle childhood, children continue to build on and improve gross motor skills; the large scale body movement skills such as walking and running. At this age, children run faster than previously possible. They can also jump higher and further. They are able to gain this improved control and coordination due to increase in flexibility (range of movement in joint and muscles),

balance, coordination, speed, reflexes and strength. They also learn to synchronise their body movements for coordinated whole body movements needed for organised sports.

Fine motor skills — finger dexterity and eye-hand coordination — improve substantially during early childhood. During these years the child's preference for left or right hand also develops. Middle childhood-aged children show dramatic improvements with regard to their handwriting and ability to write in cursive letters. They also learn to use their hands to successfully accomplish manual activities other than drawing or writing – craft oriented projects involving beading, sewing, building models. Skills at playing complicated games involving hand-eye coordination such as computer and video games develops.

The major accomplishments in gross and fine motor skills during early childhood years are given in the table below.

Table: Major Accomplishments in Gross and Fine Motor Skills

Age in years	**Gross Motor Skills**	**Fine Motor Skills**
3 years	Hopping, jumping, running	Build blocks, pick objects with forefinger and thumb
4 years	Climb up and downstairs with one foot on each step	Fit jigsaw puzzle precisely
5 years	Run hard, enjoy races	Hand, arm and body all coordinate with eye movement