Problems of Development & Learning

Development Study

8.1 What is Development?

Life begins at conception when a new organism is created with the mother's ovum fertilized by the father's sperm. From that point till death an individual keeps on growing and changing. Such changes are not random but orderly and they generally follow a pattern. Development is the process by which organisms grow and change systematically over the entire life period i.e., from conception till death. Developmental changes are not only growth or additions to human organisms, they also involve decay. A child loses the milk teeth in the process of development and an old person may show decay in several areas of functioning.

Development involves systematic changes in a direction in all aspects from size and proportion of the body to the ways of thinking, living and feeling. Thus, development is the total process of change in which all aspects of a person are interrelated and integrated. For example, a 13 year-old girl undergoes physical and biological changes in her body and such changes are related to her mental, social and emotional development also. So now we know that:

1) Development involves systematic changes throughout the entire life period.
2) Developmental changes are interrelated.
3) Development proceeds in a definite direction.

8.2 Development, Growth and Maturation

We must also distinguish between growth, maturation and development. Development necessarily involves growth. But, growth is simply quantitative addition or change. As we become older, the body size, height, weight, proportion of parts of our body and the appearance of different limbs and parts change in measurable ways. Development involves growth and other qualitative changes. Developmental changes also include changes due to maturation.

Maturation is the change which is biological in nature and which is due to our genetic endowment. The genes that we inherit contain blue prints for changes in an orderly and predetermined sequence following a sort of biological clock. Changes like falling

of milk teeth, graying of hair, a child's onset of walking, bodily changes during adolescence and even change as in the way we think and understand are affected by our maturational readiness. Our biological system follows a predetermined time table preparing us for developmental changes. Maturational changes in our body or behaviour are primarily due to the aging process rather than learning or other factors such as illness or injury. Maturation and our experience in the environment jointly bring about changes in our development.

8.3 Continuity and Discontinuity in Development

Have you noticed how a child develops from one day to the next? The process of development is slow. You may not notice any visible change in a child in a day. But, over a longer period all human beings change in a regular and continuous manner. At the same time, when a child surprises us by taking her first step to walk or by uttering her first word, it appears that development is a dramatic process and changes seem to occur rather abruptly. In fact, development is both a continuous and discontinuous process.

Changes occur gradually in a cumulative manner. Every little change is related in some way to the earlier changes. The first word spoken by a child is related to her earlier babblings and production of sounds of the language that she hears. The first step to walk is connected to earlier physical and motor development of the child. Developmental sequence is interrelated and connected to the earlier changes as well as the changes which are to occur in future. A child's first sentence is a continuation of all other earlier developments in respect of language and, at the same time, this is related to subsequent development of complex communication skills and other aspects of mental development later in life.

Continuity in development does not mean that we change in a linear process. Changes do not just continue to occur in a straight line. There are aspects of development which are also abrupt. Hold a month old baby upright with her feet touching the floor. Notice the baby move the feet paddling as if she is trying to walk. These muscular movements which closely resemble walking may disappear within two months and reappear when the child actually starts walking at around 9 months of age. There are also sudden changes in the way we think, in our emotions and in many other aspects of our development. Till now we read that:

1) Human development throughout life is broadly a continuous process with some discontinuities and abrupt changes.
2) Human development is an organized and orderly sequence.
3) Growth is quantitative change.

4) Development involves growth and qualitative change.
5) Maturity is a genetically programmed sequence of change.

8.4 Stages and Tasks of Development

When you examine the sequence of changes over the entire life span you find broad patterns in different phases of life. A baby shows patterns of behaviour which are different from a young adult who, in turn, is different from an old person, although, as we have discussed earlier, changes are very slow and unnoticeable from one day to the next. Development proceeds through different phases which exhibit typical patterns. Across the life-span, we develop in stages.

These stages are broad patterns of development characterized by some dominant features. In each stage of development a person shows typical capabilities, patterns of behaviour and characteristic modes of functioning. These, in turn, make the person ready to face typical challenges and events in life. Developments in early childhood, for example, prepare the child for formal education in case he can go to school. Biological development during adolescence prepares the individual for marriage and family roles.

Life events, such as schooling, marriage, job and social expectations of an individual vary from one stage of life to another. In order to face these challenges, for different life events and to meet the social demands or expectations, a person must accomplish the required skills or reach the expected level of development. As a result each stage of development involves different developmental tasks. The way one looks at the stages of development and the developmental tasks may vary from one society to another depending on how one conceptualizes human development and goals of life. Some of the important features of stages are as follows:

1) Each stage of life is based on the developments up to the previous stage and is also a preparation for the next phase of life. Thus, each stage shows consolidation of previous developmental changes and a preparation for development during the future stages of life.

2) Within a person, the rate of development of different aspects of his/her functioning varies from one stage to another. For example, growth of brain cells and physicalmotor skills are much faster during infancy compared to adulthood.

3) There are variations between individuals in the rate of their development and progression from one stage to another. Thus, the time or chronological age of

transition from one stage of development to another may vary from person to person.

Human development from conception to death, is generally viewed as occurring through eight stages. The major developments during each of these stages are described below:

a) Pre-natal Stage - The developments from conception till birth of a baby constitute the prenatal stage. The approximate period of prenatal development is taken to be 9 calendar months or 10 lunar months (i.e., 280 days), although babies are not born exactly after 280 days of conception. Biologically it takes about 266 days from conception for a fetus to become ready for the birth process. Actual birth of normal full term baby may take place any time after that.

1) Prenatal – The stage before taking birth Prenatal stage is further divided into three phases.

i. The first phase - the germinal period – is the period from conception until implantation. Conception occurs when a sperm penetrates the wall of a ripened ovum forming a zygote. In about 8-14 days, the zygote gets firmly attached to the wall of the mother's uterus. This is called implantation which brings the germinal period to end.

ii. The second phase of prenatal development is the period of the embryo which lasts from the beginning of the third week to the end of the eighth week. During this time all major organs are formed and the heart begins to beat.

iii. The third phase is the period of the fetus. It lasts from the third prenatal month until the baby is born. The major organ systems begin to function and the growth of the organism is quite rapid.

The rooting reflex disappears over the first few weeks of life and is replaced by voluntary head turning. The sucking reflex is also gradually modified over the first few months of life as sucking comes under voluntary control. Among many other reflexes, full term neonates display swimming reflex of active movements of the arms and legs and involuntary holding of breath when in the neonate is immersed in water. The swimming reflex keeps the infant floating in water for some time. Although this reflex disappears in the first 4-6 months, some swimming instructors have used this reflex to teach infants preliminary swimming long before they can walk.

Much before birth, the fetus responds to sounds and within few hours after birth, the neonate can discriminate between different sounds of language (e.g. /ba/ and /ga/ sounds) and between mother's voice and other human voice. This shows that human infants are remarkably well prepared to receive spoken language and learn the same. During infancy, the physical and motor development is quite rapid. Primarily due to maturation, children show regularity in development of locomotion and motor skills. They are able to raise their head by about 2 months, sit with support by 4 months, walk with support by 9 months and walk on their own by 10-12 months.

The rate of growth is very rapid during the first two years. A normal two year old infant grows to a height which is almost half of the adult height and the birth weight increase nearly four times by that age. The body proportion also changes dramatically from birth till adulthood. The head of a newborn baby is nearly one fourth its body length, almost as long as the legs. But, at adulthood, the length of the head is about 12% of adult height whereas legs account for 50% of total height.

8.5 The Locomotor Development during Infancy

This development proceeds in a cephalocaudal direction. This means that motor activities involving upper extremities - the head and neck regions - develop earlier than those involving legs and lower extremities. Another patter of motor development is called proximodistal pattern according to which development is faster in the region closer to the centre of the bodies *i.e. the trunk and shoulders compared to the outward extremities like hands and figures.* Thus, a baby develops control over arms much before developing control over finger movements.

The overall development of motor skills and its sequence can be viewed as result of genetically programmed sequence of maturation. But, practice also plays a crucial role in the development of motor skills. During infancy, initially the child tries to gain control over simple movements and then to coordinate visual and motor movements for more complex and coordinated movement. Still, a two-year-old is somewhat – crude in terms of his/ her locomotor skills.

- ✓ Are able to form permanent image of objects in their mind
- ✓ Able to remember their experiences, movements and information about objects and people.
- ✓ Are able to differentiate between familiar people and strangers
- ✓ Express various emotions such as happiness, anger and fear.

- ✓ Able to communicate with gestures and verbal expressions using single words and two-word utterances

As we pointed out earlier, most 1-2 year-olds or toddlers appear to be quite clumsy in their movements and physical motor activities. But as children mature their locomotion skills become refined and graceful. Body balance while walking and running improves noticeably. A 3-year-old can run in a straight line and can jump smoothly without falling down. A 4-year-old can skip, jump on one foot and catch a large ball thrown from adistance. By the age six, the child is physically quite capable of coordinated actions which require maintaining body balance. Small muscles coordination required for fine motor activities such as putting in shirt buttons or copying a simple figure improve quite dramatically during the early childhood years.

Capacity for sustained attention continues to improve during the early childhood as also during the middle childhood and early adolescent years. A 3-year-old child may persist on a task such as colouring with crayons, playing with toys or watching TV for no more than 15-20 minutes at a stretch. By contrast, a 6-year-old can be found to be working on an interesting task for an hour or more. Such improvements in attention may be, at least partly, due to maturational changes in the central nervous system.

An area of the brain called reticular formation (which is responsible for regulation of attention) continues to develop until puberty. Children also become more selective in their attention. They are able to concentrate and focus on relevant aspects of the total stimulation ignoring irrelevant or distracting stimuli. As children become more attentive, their perceptual skills or ability to identify finer aspects of objects also improves.

Middle Childhood - As children reach the age of schooling, growth becomes more gradual and rate of physical change becomes slower until puberty at about 11-13 years when there is again a rapid ***'growth spurt'***. However, during the middle childhood years, eye-hand and small muscle coordination continues to develop. Physical activities become more vigorous; children can run faster and jump higher and their reaction time (i.e. the time they need to respond to a stimulus) becomes quicker. This makes them more proficient at action games. With the improvements in small muscle coordination, 6-7 year-old children can copy complex figures (such as a diamond), colour patterns and figures and assemble tools and model toys.

Children can also engage in aesthetic activities such as music, art and dance and develop hobbies of their own. School age children have learned most of the social standards

regarding sex-roles and accept their gender as an unchanging aspect of themselves and their personality.

8.6 Cognitive Development

Children's cognitive process, continues to change during the early childhood period. Children become increasingly proficient in symbolic thought or in using symbols such as words and images to represent a variety of objects, situations and events. By the age of entry to schools, children do have a reasonably good understanding of their environment and people.

Beyond the early childhood years thinking becomes more logical and children's capacity to remember and process information also improves. In fact, children are very efficient at learning language and when they are exposed to multiple languages, such as when they hear one language at home and another outside . Such children grow up as bilingual or multilingual children (depending on the number of languages they can use). These children are cognitively more proficient and have a better understanding of language compared to monolingual children (who use only one language).

The early childhood is a crucial period of development also because during this period children learn a great deal about the norms, conventions and practices in their families and society. This process of learning the social practices and rules is called **socialization.** Through their interaction with parents, grandparents, family members, other adults and their peers, children acquire the social and cultural norms or learn the culture to which they belong.

a) Adolescence - Adolescence is a period of transition from childhood to adulthood and a period of significance for human development. It is the period from the onset of puberty till attainment of adulthood. Puberty marks the beginning of sexual maturity and reproductive capacity of an individual. Adolescence is characterized by rapid biological and physical change and these changes are associated with many psychological challenge.

i. Biologically, puberty is associated with release of sex hormones by the pituitary gland - estrogens or the female sex hormones and androgens or male sex hormones. These hormones and other biological factors are responsible for a growth spurt or rapid physiological changes as well as beginning of primary and secondary sexual characteristics.

The primary characteristics, such as ovulation and menstruation among the girls and production of semen among the boys, are directly related to reproduction and primary sex organs. The secondary sexual characteristics are associated changes visible on the body such as development of breast among the girls, beard among the boys and growth of underarm and pubic hair among the boys as well as girls. Physically adolescents show a sudden and rapid growth or a growth spurt. During a period of about nine years (from 10 to 19) boys in India gain over 36 cms in height and 25 kgs in weight where as Indian girls gain over 24 cms in height and 21 kgs in weight. By the end of adolescence growth spurt, 98% of adult growth is achieved.

b) Early Adulthood - The period from the end of adolescence, i.e., from approximately 19 years to about 35 years of age is generally viewed as the early adulthood period. This is the period in which social roles and relationships are materialized. The young adult becomes a fully functioning social being assuming the role of a married family person and developing intimate social and sexual relationships.

Although most of the physical growth is over by the end of the teen age, some developments do occur during the early adulthood. These are mostly related to the process of slow decline with the aging process. For example, lenses of the eyes begin to lose flexibility and tissues supporting the teeth weaken. Reaction time, strength of the body muscles and capacity of the sense organs reach their peak during the twenties and decline by the mid-thirties. On the whole, however, physical change is less dramatic and slow during this stage of life.

c) Middle Adulthood - The period of life from about thirty five years of age to sixty is viewed as the mid-life during which people become aware of some decline in their physiological functions. Muscular strength and performance of major organ systems such as digestive and circulatory systems deteriorate. Middle adulthood is characterized by some dramatic changes in the functioning of reproductive system and sexual activity. Such changes are called climacteric.

i. During the climacteric period, women experience menopause or cessation of menstrual cycle during the late forties or early fifties. For males, climacteric involves reduction in sex hormones and reduced functioning of the prostate gland all of which may result in reduced sexual drive.

There are also some cognitive changes during the adulthood. Short-term memory does not decline with age, but recall of information from long-term memory somewhat declines. Changes in intelligence are minimal, but they are compensated for by increase in wisdom and creativity. Midlife adults become more proficient in solving real life problems.

d) Old Age - The period of life from the sixties till death is the period of old age. However, with increasing life expectancy and longer work period there is a delayed onset of the actual feeling of old age. Besides retirement from active work life, the old people have to cope with many other challenges such as their own declining physical fitness, ill health, death of near ones in the family including possible loss of spouse and loneliness. As people grow old, body metabolism changes and there are wear-and-tear of the body parts and cells. There are also genetically determined changes in the biological clock in the body that limit the length of our lives.

As individuals approach the closing phase of life, there is also an appraisal of the extent to which their lives have become meaningful and worthwhile. According to Erickson, those who evaluate their life positively attain a sense of integrity and do not usually have much anxiety over death. Otherwise, old people may experience a sense of despair over not having been able to contribute much to the society and the limited time that is left for them to do something. Erickson characterizes this crisis as one of integrity and despair. There are wide individual variations in the way old people prepare to face death and other challenges of old age.