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Child Psychology
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Unit: I Introduction to Child Psychology In this unit, you will learn about, • Introduction to Child Psychology ◦ Importance ◦ Areas of Development •
Nature- Is Development Continuous • History of Child Psychology • Nature vs Nurture Theory
Introduction Psychology Psychology is the

100%	**MATCHING BLOCK 2/54**	W

science dealing with human nature, function and phenomenon of his soul in the main.

Child Psychology Child psychology is the science that
deals with the mental power or interaction between the conscious and subconscious element in a child.
Child

psychology is the study of subconscious and conscious childhood development. Child psychologists observe how a child interacts with their parents, themselves, and the world, to understand their mental

development. Why Is It Important? Everyone wants

their child to have healthy development, but it's not always clear if a child's behaviour is a symptom of a normal stage in development or a sign of an abnormality. Child psychologists can help you understand the difference. Understanding the normal and abnormal psychological patterns of a child can help parents understand how to best communicate and connect with their child, teach their child coping mechanisms for managing emotions, and help their child progress and thrive in each new developmental stage.

Child psychologists can also identify abnormal behaviours early, help detect the root of common behavioural issues such as learning issues, hyperactivity, or anxiety, and help children work through early childhood trauma. They can also help to prevent, evaluate, and diagnose developmental delays or abnormalities such as autism. Child psychology studies the interaction of a few main areas of development: 1

Physical Development Physical development in children is typically a predictable sequence of events. Your child holds their head up, rolls over, crawls, walks, and runs, in that order. Your Child Psychologist can aid your paediatrician in observing your child's physical development, and if there are any abnormalities that could indicate developmental irregularities. Child Psychologists

will observe your child's progression toward the milestones of development to ensure that your child is physically developing normally. Major delays in physical development may reveal other underlying developmental issues that can then be addressed early on. Cognitive Development

The medical understanding of childhood cognitive development has greatly changed over the recent years. We now know that even new born babies are aware of their environment and are interested in it, even before they have the language to express that.

Cognitive development refers to the intellectual learning and thought processes of a child. It includes the observation and understanding of the world around them, language learning, memory, decision-making, problem-solving, how the child uses their imagination, and how the child uses basic reasoning.

All of these factors are influenced by a child's genetics and environment. 2

Emotional (Social) Development

Emotional and social development are deeply intertwined. Emotional development refers to how the child feels, understands, and expresses their emotions. Emotional development is expressed in very young children through the expression of basic emotions like fear, joy, anger, and sadness. As the child develops,

more complex emotions such as confidence, hope, guilt, and pride

emerge. Emotional development also includes a child's

ability to feel and understand the emotions of other people

through empathy. Learning to regulate and express emotions appropriately is difficult for many children. Helping children understand their emotions early can have a powerful impact on current and future emotional development.

A Child Psychologist can

help your child understand and express their emotions in a healthy, positive way.

Emotional development highly informs social development. This is true because the way a child feels, understands, and expresses

their feelings has a direct impact on how they interact with other people. Social development is about how the child develops the values, awareness, and social skills necessary to relate to the people around them;

their parents, peers, authority figures, and animals.

A child's early relationships can have a huge impact on

their development of age-appropriate social skills.

Trust, friendship, conflict management, and respect for authority are examples of social development. 3

Nature- Is Development Continuous? The concept of development presupposes that there is a continuity in development. This continuity is lawful and is observed between successive stages of an ongoing growth process and that properties of earlier phase contributes to the properties of subsequent phase. These changes are progressive. Both the hereditary predisposition and environmental facilities contribute to the process of change. There is also reciprocal change between organism and the environment. Child development is a natural science. The child psychologists observe, describe, measure and relate phenomena as they occur naturally in uncontrived situations. For example, parent-child relationships, assimilation of cultural values, relationship with peers over extended period of time and under variety of situations cannot be studied experimentally. It has to be based on naturalistic observations. Ethically and practically it is undesirable to manipulate emotions, attitudes, and values among children. One cannot ask mothers to deliberately reject her children or reward and like her children according to instructions in order to study parent child relationships. Children cannot be subjected to physical frustration, deprivation with a view to studying their effects on children behaviour.

History of Child Psychology

Prescientific Period in Child Psychology Child psychology has now become a more important and vigorous discipline in the

Western world. But until 17th century there was no special emphasis on childhood as a separate phase of the life cycle. Plato became interested in the growth of the child and recognised the importance of early childhood training in the determination of the individual's aptitudes, adjustments. He emphasized child-centered education. Within a short span, child 4

psychology has progressed much. It is worthwhile, therefore, to trace the history of such developments. In early days, the child was not considered as a child. He was regarded just as some living organism in transition. In the late 15th and 16th century they were considered as miniature adults. Philip Aries, a French historian has mentioned this in his writing "Centuries of Childhood". The seventeenth century marked a great change in attitude toward children and their morals. Parents and teachers considered children as more lively and delicate organisms. In the Greek period the child was seen as future citizen and as a member of family. A conception that 'Spare the rod, spoil the child' was in practice then. An opposite view was gradually practised by British and other contemporary philosophers. John Locke, the British philosopher viewed the child's experience and education as determinants to his development. Rousseau, the French philosopher believed that child is endowed with an innate moral sense. The child according to him is active. He can adjust to the environment according to the abilities. As a result of these two new ideas and attitudes, children became proper subject of study. Pestalozzi, like Rousseau emphasized the innate goodness of the child and the role of his own activity in his development. In 1774Johann Pestalozzi published observations, he had written on the development of his three and a half year old son. For the first time, an account of sensory, motor, language, and intellectual development of the infant upto 2.5 years of age was published by Tiderman in 1787. He was his son. But nearly a century passed before any appreciable volume of work on the subject of the child appeared. For centuries, concern had been expressed for the education and proper upbringing of children starting with infancy. Some influential works in eighteenth and nineteenth centuries were: John Locke's some thoughts concerning Education (1693), Jean Jacques Rousseau's Ernile(1762), Johann Pestalozzi's How Gertrude Teaches Her Children (1801) and Froebel's Education of Man (1826). In the 19th century, the works of Charles Darwin on 'origin of species' stimulated greater interest in the study of child. Quite in line with evolutionary process series ontogenetic stages were also conceived in the development of the child. Child psychology then appeared. With Darwin the child became a part of the scientific endeavour. Darwin suggested that by observing the development of infant, one could catch a glimpse of the development of the species itself. His own notes on his infant son also drew attention to a newly emerging method of child study. In 1840, Charles Darwin started a journal on the development of his son in 1877, almost a hundred years after Pestalozzi's 1774 publication. Baby biography became an important method of child study since then. Wilhelm Preyer, who was a physiologist originally, contributed most to biographies. Basing the observations on his son's mental development the first year, Preyer wrote about development of reflexes, and influence of learning and experience on development of behaviour. His book" The mind of the Child" is the greatest classic in the field of child development. These baby biographies inspite of their weaknesses of being subjective, prepared the groundwork for a scientific child psychology to be developed later. Systematic study of children began towards the and of the 19th century by G. Stanley Hall (1846-1924) in United States of America. He was influenced by the idea that child is a 5

developing organism in accordance with certain sequential stages. He devised the questionnaire method to collect data about children. He collected written responses to questionnaires from both parent and children and the papers were published in 1882 and 1883. His method of obtaining responses and analysing them was definitely superior to his predecessors. Hall observed the relationships between the child's personality characteristics and background experience. In this sense, Hallmarks the beginning of scientific and systematic study of child in the United States. In fact, Hall was the fore-runner of modern psychological tests. In1883, Dr. Hall wrote a book entitled "The Content of Children's Minds" an early scientific study of the child. Hall became the President of Clark University in 1889 and made it a famous centre for child study. One of his student John Dewey, advocated educational reforms within a movement known as Progressive education. Arnold Gessel was another student, who became paediatrician and established the norms of development of children from early childhood. A third student, Lewis Terman, became a leader in the area of mental testing who later on developed the intelligence quotient as a standard index of intellectual ability. He also introduced European leaders to the American educators and hosted Sigmund Freud's only visit to the United States in 1909. The French Scholar, Binet also devised intelligence test to measure IQ in Children although it remained until 1908 and 1911for the revised versions to appear. This is a great contribution to mental testing especially with children. Concurrently a major effort was initiated by Watson, who experimented on the conditioning technique and its use for developing emotional response in infants. In rejecting introspection, Watson made infants and children legitimate subjects for psychological experiments. During the 1920's and 1930's many psychologists got interested in child psychology. Intelligence, learning, language and thinking processes, etc. were studied with sophisticated methods. Many of the studies during this period were normative, Studying the child was relegated to the back-ground, instead, study of individual differences became prominent. Normative data gathering was more in focus. Lawrence Frank (1890-1968) who was a young economist gave a vigorous push to the scientific study of the child. In 1920's he became in charge of the Spelman Rockefeller Memorial Child Development Grants. Under this grant a child study institute was established in 1924 at the University of Columbia followed by Minnessota and California at Berkeleyin addition to the Gessel Clinic of Child Development at Yale and Iowa Child Welfare Station. With Rockefeller Grants the focus of child study moved from the home to the University Centre where pre-school children were observed. Infants and Pre-schoolers became the focus of search studies in the 1920's. His idea was to "Bring the best from all the human sciences-biology, sociology, anthropology, phychiatiy, medicine and physiology and effect joint effort to understand the normal development of an individual". This step contributed to interdisciplinary research in the next decades. From other field of psychology and allied sciences, came greater influences for the development of child psychology. Psychologists for example, had the greater influence in the area of motivation, understanding the dynamics of behaviour, etc. But no less important sources of influences were the areas of child guidance, clinical psychology, pediatrics, education, and educational psychology without exception to cultural 6 anthropology. These fields virtually contributed to the development of child psychology during modem times. Modern Period in Child Psychology In the modern period, the child is seen as an individual in a total situation. The child functions as a result of innate disposition and environmental forces. This has resulted in multidisciplinary child development research. The physiologists, nutrition specialists, child guidance experts, psychiatrists, all contribute to our understanding of the child, his behaviour and growth. Long term research projects have become the order of the day. In recent years there has been emphasis on the process of development rather than merely observing the pattern of development as a function of age, sex, socio-economic status, etc. The developmental emphasis also stresses the personality development of the child, in which the child psychologists have an important role to play. Basically, advancement child psychology in the modem period can be understood in terms of: (a) Methodology of studying children behaviour (b) Contents of child study. Looking from the points of view of objective standards in methodology, it seems that child psychology of today has become stubbornly empirical. The greatest virtues are objective observation, description, measurement and use of experimental designs in child study. Since 1900 remarkable progress have occurred in various fields of child development. Norms for social, intellectual, physical, and emotional developments have also been available. It is possible now to predict intelligence. Analysis of the major developments can also be statistically analysed and then interpreted. There is also in increasing recognition on the part of psychologists to unify the various developments occurring in the field of child psychology and develop a comprehensive theory of personality, social learning, motivation, and the like. Various theoretical stances have also contributed quite amazingly to the above unification of ideas. Piaget's description of cognitive development, Sear's social learning theory, Freud's psychoanalytic orientations have enriched the field beyond expectations. However, during the last twenty five years certain trends in child development have become quite obvious. They are (a) Establishment of norms of thinking, reasoning, creative behaviour of children, (b) Mechanisms underlying various changes occurring in the life of children. (c) Antecedents and consequents of behaviour change. (d) Studies of socialization and personality development and the factors associated with them. (e) Parent child relationship. (f)

Cognitive development of children. (g) Use of experimental approach to child forsaking the traditional correlational designs. 7

(h) Intervention programmes for enriching personality, linguistic and cognitive development from early childhood. The twentieth century has, therefore, become known as the 'Century of the Child'.

Nature Verses Nurture Theory Introduction The debate on which of the two, nurture and nature has the most effect on the early development of the child is never ending. Arguments have always been based on the fact that either the environment or genetics plays an important role in the early development of the child. So the question is, which is it? Is one more important than the other or are they both equally important for the development of the child. The argument has always been based on the fact that to what extent does the environment and inherited factors affect the behaviour of an individual. Debate also revolves around the fact that whether the development of the chills governed by a pattern the child has been born with or it is shaped through the experiences that the child encounters as he grows. 8

Discussion Early childhood development is essential for the normal growth of any child. Essentially it can be defined as the time period between birth and the time the child begins to attend pre- school at around four years of age. The development period is the most critical part of any child's development. Studies have always been conducted to find out whether the child's environment i.e. nurture and the child's genetics i.e. nature are both equally influential in the development of the child or one of them is more influential than another (Watts, & Cockcroft, 2009). Development include the physical development when the child is developing, he/she is able to overcome many obstacles over the years, first the child is unable to turn over by himself, later he crawls, walks and finally runs by him/herself. Development further involves the mental growth of the child, at birth the child cannot express himself but when he grows gradually he is able to mumble a few sounds so as to express different emotions, as the child grows older he /she is able to speak clear and comprehensible sentences and can be able to tell stories. Most psychologists agree that the crucial periods of brain development also begin within the first years of the child's development. There are five specific developmental domains of children that relate to each other. They are known as the SPICE of life. They are: social development, physical development, intellectual development, creative development and emotional development (Richmond, 2009). 9

Social development can be defined as the ability to form attachment with those around, play with others, share and cooperate with them. With social dev elopement the child is able to form lasting relationships with those that they encounter in their life. Physical development refers to the growth of fine and motor skills whereas intellectual development refers to the process were the child is able to make sense of the things that are around him/her. Creative development is on the other hand defined as the developing of special abilities and talents. Talents can be nurtured from hobbies. Emotional development refers to the development of self-awareness and confidence and the ability to cope with the various feelings that the child experiences. The early childhood development of the child is a crucial determinant of whom and how he/she will end up being in future. Events and situations that occur in the early childhood can affect the child for his/her lifetime. Children must therefore have stable, responsive, nurturing relationships and rich experiences early in their lifetime so as to have long term and lifelong benefits for learning behaviour and for the growth of both physical and mental health (Slentz, & Krogh,2001). There has always been debate on which of the two, nature or nurture theory affects the way the child develops and grows. Nurture theorists hold the opinion that children learn as they grow and in the process of growing they are able to develop their different personalities based on the lessons that life has to offer with regards to the environmental experiences that they encounter. It is believed that environmental factors play a critical role in enabling children to grow and fully realise their potential. It is through nurture that man is able to figure out who he is. Nurture i.e. the environment has always played an important role in the personality and behaviour development of children. However, this stand has over time been questioned after analysing situations such as a child grows up in a poor broken home where he is exposed to all manner of vices such as alcohol and drugs. Though the child grows up in this harsh environment he/ she is able to overcome the challenges and become a bright student in class as well as a reputable individual in the society. This means that nurture did not influence his development; he/ she probably had it in him to work hard so as to have a better life (Plomin, & Spinath, 2004). Studies have produced evidence that supports that the environmental factors have an effect on a child IQ. IQ refers to the Intelligence quotient and it is a score that is derived from the tests that have been designed to test and assess the level of intelligence of an individual. Studies on adoptive siblings also tend to indicate that the siblings are no more similar in IQ than any other stranger. Siblings that are related have an IQ correlation of 0.6. In the study on heritability of IQ the relative importance of genetics and the environment for differences in IQ in siblings is studied. Though IQ is a polygenic trait it has been found out that certain gene disorders can affect the IQ of a child as he grows up to be adult (Penn, 2003). Geneticists hold the notion that nature plays an important role in the development of the child. They state that children inherit lots of traits and looks from their parents and as a result the children will turn out to be a combination of the behaviour trait and personality of the parents. Supporters of nurture as influential for development state that the parent is 10

in a position to control how his/her child will end up like in future. Parents are in a position to alter the behaviour, skills and personality of their children for their good. This is possible through different parenting techniques, home environment as well as interactions (Plomin, & Spinath, 2004). Nature can be defined as the genetic material that controls an individual's looks, temper, and abilities. The factors of nature cannot be altered as they are inherited form the parents. They include factors such as the colour of the eyes, the height, patience and an individual temperament. When a child is born the first sign of genes portrayed through emotions is when it cries minutes after birth. It has been established that children empathise and sympathise with each other and as a result they all tend to cry when one cries around them. This emotion are natural and the child has been born with them (Plomin, & Spinath, 2004). It is also believed that brain and physical development are also inborn, and man cannot alter/change their course of development. Physical development is determined by nature, in which the child first gains control of the head, neck, sits without support, crawls and gradually is able to get up and walk by himself. It is expected that by the time the child turns two years, he/she can climb and use basic utensils such as cups and spoons. This shows that the chid has developed his hand eye coordination. By the time the child turns 2- 2 and half years he/she can be able to jump, dance and play around. These physical developments occur concurrently with corresponding brain development (Westen, 2002). Language is also affected by nature. It has been proven that a baby can recognise his/her native language once he/she is exposed to it. The language however has to spoken regularly and often around the child so that he/she can hear and learn them. The same can be said of the other languages that the child will be frequently exposed. The child has the ability to also learn the other languages that are beings spoken around him/her often. It is therefore apparent that language contrary to previous thoughts does is not taught by naturally acquired through exposure to the language (Richmond, 2009). Nurture theory on the other hand states that genetics determine the personality of the child in future only and nothing else. Supporters of nurture theory claim that when children are born, they are a clean slate. However, the environment where they are raised in, the experiences they encounter and the people that are around them influence and determine who they will end up being. The nurture theorists claim that as much as genetics determine the personality of an individual, environmental factors determine who an individual becomes in future. For example, they have been evidence that children from abusive families and those that have been abused have a higher chance of turning out to be abusers themselves. Environment factors include style of parenting, exposure to early schooling, home exposure, eating modes and interaction with those around the children. It has therefore been stated that the way a parents nurtures a child determines how the child develops (Plomin, & Spinath, 2004). For the brain to develop, stimulation is a key factor. It is anything that causes the brain to function via the senses. The brain to therefore develop it has to be stimulated to function and since the brain increase in size as the child grows it is important that he/she is stimulated to develop his/her brain at a young age. Stimulation can entail the playing with toys, talking to the child to enhance his/her listening skills, indicating to the child objects 11

and people around to see whether the child recognises them. It will also help the child as he grows to make associations between speech and objects. They are able to associate objects to certain names. The vision of the child should also be stimulated so as to sharpen his/her sense of sight. Exposing babies to new people and environment enhances the interaction skills of the child when he grows up (Sigelman, & Rider, 2008). It can therefore not been said with certainty that either nurture or nature best affects the early development of the child. Both arguments have a levelling ground. For example, emotions are said to be pre –programmed but the circumstances that elicit this emotion are nurtured. So, for one nature action to occur, a nurtured action has to have preceded it. More studies have also been done with reference to language. It has been said that due to lack of exposure (nurture), the children later in, life lose the ability to hear the phonetics of other languages other than their native language. They are born with the ability, nature, but due to nurture they lose it (Keating,2010). Studies have been done with reference to identical twins that have been raised in different setups. Though the twins are genetically the same, (nature), it is their environmental factors(nurture) with regards to where they have been brought up that makes the difference between the two. Recent studies have indicated that twin that have been raise separately have more similarities than those that have been raised together. This phenomenon is explained by the fact that twins that have been raised together have the need to divide their territories and also compete to be different as compared to twins that have been raised separately as they grow up knowing they are a single unit (Richmond, 2009). Conclusion Both nature and nurture are both important in the growth and early development of the child. Factors related to nurture and nature are both intertwined in areas of development such as language development and emotional development. Physical development is pre- programmed and it is interrelated to mental development which develops through nature. Nurture

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plays an important role in the development of the brain

as well. Nature and nurture cannot be separated from each other with relation to development of the child. Since it has been figured out that both nature and nurture play an important role in the development of an individual it is important for the parents to ensure that their children are raised in the best environment that they can manage so that the young minds of the children can be cultivated and curved towards achieving their highest potential. 12

Unit: II Biology of Behaviour In this unit, you will learn about, • Introduction to the Behaviour • Biological Basis of Behaviour ◦ Neurons ◦ Nerve Impulse ◦ Synapse •

Structure and Functions of Nervous System and Endocrine System and their Relationship with Behaviour and Experience ◦

The Nervous System ◦ The Brain and Behaviour ◦ The Endocrine System • Heredity: Genes and Behaviour • Sensation and Perception ◦ Sensory Processed ◦ Perceptual Processed ◦ Attention Introduction Human beings, the homo sapiens, are the most developed organisms among all creatures on this earth. Their ability to walk upright, larger brain size relative to body weight, and the proportion of specialised brain tissues make them distinct from other species. These features have evolved through millions of years and have enabled them to engage in several complex behaviours. Scientists have attempted to study the relationship of complex human behaviour with the processes of the nervous system, particularly the brain. They have tried to discover the neural basis of thoughts, feelings, and actions. By understanding the biological aspects of human beings, we will be able to appreciate how the brain, environment and behaviour interact to generate unique forms of behaviour. Evolutionary Perspective You must have observed that people differ with respect to their physical and psychological characteristics. The uniqueness of individuals results from the interaction of their genetic endowments and environmental demands. In this world, there are millions of different species of organisms differing in a variety of ways. Biologists believe that these species were not always like this; they have evolved to their present form from their pre-existing forms. Itis estimated that the characteristics of modern human beings developed some 2,00,000 years ago as a result of their continuous interaction with the environment. 13

Evolution refers to gradual and orderly biological changes that result in a species from their pre- existing forms in response to the changing adaptational demands of their environment. Physiological as well as behavioural changes that occur due to the evolutionary process are so slow that they become visible after hundreds of generations. Evolution occurs through the process of natural selection. The members of each species vary greatly in their physical structure and behaviour. The traits or characteristics that are associated with high rate of survival and reproduction of those species are the most likely ones to be passed on to the next generations. When repeated generation after generation, natural selection leads to the evolution of new species that are more effectively adapted to their particular environment. This is very similar to the selective breeding of horses or other animals these days. Breeders select the fittest and the fastest male and female horses from their stock and promote them for selective breeding so that they can get the fittest horses. Fitness is the ability of an organism to survive and contribute its genes to the next generation. Three important features of modern human beings differentiate them from their ancestors: ? a bigger and developed brain with increased capacity for cognitive behaviours like perception, memory, reasoning, problem solving, and use of language for communication, ? ability to walk upright on two legs, and ? a free hand with a workable opposing thumb. These features have been with us for several thousand years. Our behaviours are highly complex and more developed than those of other species because we have got a large and highly developed brain. Human brain development is evidenced by two facts. Firstly, the weight of the brain is about 2.35 per cent of the total body weight, and it is the highest among all species (in elephant it is 0.2 per cent). Secondly, the human cerebrum is more evolved than other parts of the brain. These evolutions have resulted due to the influence of environmental demands. Some behaviours play an obvious role in evolution. For example, the ability to find food, avoid predators, and defend one's young are the objectives related to the survival of the organisms as well as their species. The biological and behavioural qualities, which are helpful in meeting these objectives, increase an organism's ability to pass it on to the future generation through its genes. The environmental demands lead to biological and behaviour changes over a long period of time. Biological and Cultural Roots An important determinant of our behaviour is the biological structures that we have inherited from our ancestors in the form of developed body and brain. The importance of such a biological bases becomes obvious when we observe cases in which brain cells have been destroyed by any disease, use of drug or an accident. Such cases develop various kinds of physical and behavioural disabilities. Many children develop mental retardation and other abnormal symptoms due to transmission of a faulty gene from the parents. As human beings, we not only share a biological system, but also certain cultural systems. These systems are quite varied across human populations. All of us negotiate our lives with the culture in which we are born and brought up. Culture provides us with different experiences and opportunities of learning by putting us in a variety of situations or placing different demands on our lives. Such experiences, opportunities and demands also influence our behaviour considerably. These influences become more potent and visible as we move from infancy to later years of life. Thus, besides biological bases, there are cultural bases of behaviour also. 14

Biological Basis of Behaviour Neurons Neuron is the basic unit of our nervous system. Neurons are specialised cells, which possess the unique property of converting various forms of stimuli into electrical impulses. They are also specialised for reception, conduction and transmission of information in the form of electrochemical signals. They receive information from sense organs or from other adjacent neurons, carry them to the central nervous system (brain and spinal cord), and bring motor information from the central nervous system to the motor organs (muscles and glands). Nearly 12 billion neurons are found in the human nervous system. They are of many types and vary considerably in shape, size, chemical composition, and function. Despite these differences, they share three fundamental components, i.e. soma, dendrites, and axon. The soma or cell body is the main body of the nerve cell. It contains the nucleus of the cell as well as other structures common to living cells of all types in the figure mentioned below. The genetic material of the neuron is stored inside the nucleus and it becomes actively engaged during cell reproduction and protein synthesis. The soma also contains most of the cytoplasm (cell-fluid) of the neuron. Dendrites are the branch-like specialised structures emanating from the soma. They are the receiving ends of a neuron. Their function is to receive the incoming neural impulses from adjacent neurons or directly from the sense organs. On dendrites are found specialised receptors, which become active when a signal arrives in electrochemical or biochemical form. The received signals are passed on to soma and then to axon so that the information is relayed to another neuron or to muscles. The axon conducts the information along its length, which can be several feet in the spinal cord and less than a millimetre in the brain. At the terminal point the axon branches into small structures, called terminal buttons. These buttons have the capability for transmitting information to another neuron, gland and muscle. Neurons generally conduct information in one direction, that is, from the dendrites through soma and axon to the terminal buttons. The conduction of information from one place to another in the nervous system is done through nerves, which are bundles of axons. Nerves are mainly of two types: sensory and motor. Sensory nerves, also called afferent nerves, carry information from sense organs to central nervous system. On the other hand, motor nerves, also called efferent nerves, carry information from central nervous system to muscles or glands. A motor nerve conducts neural commands which direct, control, and regulates our movements and other responses. There are some mixed nerves also, but sensory and motor fibres in these nerves are separate. Fig: The Structure of Neuron 15

Nerve Impulse Information travels within the nervous system in the form of a nerve impulse. When stimulus energy comes into contact with receptors, electrical changes in the nerve potential start. Nerve potential is a sudden change in the electrical potential of the surface of a neuron. When the stimulus energy is relatively weak, the electrical changes are so small that the nerve impulse is not generated, and we do not feel that stimulus. If the stimulus energy is relatively strong, electrical impulses are generated and conducted towards the central nervous system. The strength of the nerve impulse, however, does not depend on the strength of the stimulus that started the impulse. The nerve fibers work according to the "all or none principle", which means that they either respond completely or do not respond at all. The strength of the nerve impulse remains constant along the nerve fiber. Synapse Information is transmitted from one place to another within the nervous system in the form of a neural impulse. A single neuron can carry a neural impulse up to a distance covered by the length of its axon. When the impulse is to be conducted to a distant part of the body, a number of neurons participate in the process. In this process, one neuron faithfully relays the information to a neighbouring neuron. The axon tip of a preceding neuron make functional connections or synapse with dendrites of the other neuron. A neuron is never physically connected with another neuron; rather there is a small gap between the two. This gap is known as synaptic cleft. The neural impulse from one neuron is transmitted by a complex synaptic transmission process to another neuron. The conduction of neural impulse in the axon is electrochemical, while the nature of synaptic transmission is chemical (shown in the figure mentioned below). The chemical substances are known as neurotransmitters. Fig: Transmission of Nerve Impulse through Synapse

Structure and Functions of Nervous System and Endocrine System and their Relationship with Behaviour and Experience Since our biological structures play an important role in organisation and execution of behaviour, we shall look at these structures in some detail. In particular, you will read about the nervous system and the endocrine system, which work together in giving a shape to human behaviour and experience. 16

The Nervous System Human nervous system is the most complex and most developed of all living creatures. Though the nervous system functions as a whole, for the ease of study, we can divide it into many parts depending on its location or functions. Based on location, the nervous system can be divided into two parts: Central Nervous System (CNS) and Peripheral Nervous System (PNS). The part of the nervous system found inside the hard bony cases (cranium and backbone) is classified as CNS. Brain and spinal cord are the organs of this system. The parts of the nervous system other than central nervous system are placed in the PNS. PNS can be further classified into Somatic and Autonomic nervous system. Somatic nervous system is concerned with voluntary actions, while the autonomic nervous system performs functions on which we have no voluntary control. The organisation of the nervous system is schematically presented in the Figure. Fig: Schematic Representation of the Nervous System The Peripheral Nervous System The PNS is composed of all the neurons and nerve fibers that connect the CNS

autonomic nervous system is
further divided into Sympathetic and Parasympathetic systems. The PNS provides information to the CNS from sensory receptors (eyes, ears, skin, etc.) and relays back motor commands from the brain to the muscles and glands. a. The Somatic Nervous System This system consists of two types of nerves, called cranial nerves and spinal nerves. There are twelve sets of cranial nerves which either emanate from or reach different locations of the brain. There are three 17 types of cranial nerves – sensory, motor, and mixed. Sensory nerves collect sensory information from receptors of the head region (vision, audition, smell, taste, touch, etc.) and carry them to the brain. The motor nerves carry motor impulses originating from the brain to muscles of the head region. For example, movements of the eyeballs are controlled by motor cranial nerves. Mixed nerves have both sensory and motor fibers, which conduct sensory and motor information to and from the brain. There are thirty one sets of spinal nerves coming out of or reaching to the spinal cord. Each set has sensory and motor nerves. Spinal nerves have two functions. The sensory fibers of the spinal nerves collect sensory information from all over the body (except the head region) and send them to the spinal cord from where they are then carried out to the brain. In addition, motor impulses coming down from the brain are sent to the muscles by the motor fibers of the spinal nerves. b. The Autonomic Nervous System This system governs activities which are normally not under direct control of individuals. It controls such internal functions as breathing, blood circulation, salivation, stomach contraction, and emotional reactions (shown in the Figure). These activities of the autonomic system are under the control of different structures of the brain. The Autonomic Nervous System has two divisions: Sympathetic division and Parasympathetic division. Although the effect of one division is opposite to the effect of the other, both works together to maintain a state of equilibrium. The sympathetic division deals with emergencies when the action must be quick and powerful, such as in situations of fight or flight. During this period, the digestion stops, blood flows from internal organs to the muscles, and breathing rate, oxygen supply, heart rate, and blood sugar level increases. The Parasympathetic division is mainly concerned with conservation of energy. It monitors the routine functions of the internal system of the body. When the emergency is over, the parasympathetic division takes over; it decelerates the sympathetic activation and calms down the individual to a normal condition. As a result, all body functions like heart beat, breathing, and blood flow return to their normal levels. Fig: The Functions of the Autonomic Nervous System 18 The Central Nervous System The central nervous system (CNS) is the centre of all neural activity. It integrates all incoming sensory information, performs all kinds of cognitive activities, and issues motor commands to muscles and glands. The CNS comprises of the (a) brain and (b) spinal cord. Now we will read about the functions of the major parts of the brain and for what behaviours are each part responsible. The Brain and Behaviour It is believed that the human brain has evolved over millions of years from the brains of lower animals, and this evolutionary process still continues. We can examine the levels of structures in the brain, from its earliest to the most recent form in the process of evolution. The limbic system, brain stem and cerebellum are the oldest structures, while Cerebral Cortex is the latest development in the course of evolution. An adult brain weighs about 1.36 kg and contains around 100 billion neurons. However, the most amazing thing about the brain is not its number of neurons but its ability to guide human behaviour and thought. The brain is organised into structures and regions that perform specific functions. Brain scanning reveals that while some mental functions are distributed among different areas of the brain, many activities are localised also. For example, the occipital lobe of the brain is a specialised area for vision. Structure of the Brain For the convenience of study, the brain can be divided into three parts: Hindbrain, Midbrain and Forebrain (shown in the Figure). Fig: Structure of the Brain Hindbrain This part of the brain consists of the following structures: i. Medulla Oblongata: It is the lowest part of the brain that exists in continuation of the spinal cord. It contains neural centres, which regulate basic life supporting activities like breathing, heart rate, and blood pressure. This is why medulla is known as the vital centre of the brain. It has some centres of autonomic activities also. 19

ii. Pons: It is connected with medulla on one side and with the midbrain on the other. A nucleus (neural centre) of pons receives auditory signals relayed by our ears. It is believed that pons is involved in sleep mechanism, particularly the sleep characterised by dreaming. It contains nuclei affecting respiratory movement and facial expressions also. iii. Cerebellum: This highly developed part of the hindbrain can be easily recognised by its wrinkled surface. It maintains and controls posture and equilibrium of the body. Its main function is coordination of muscular movements. Though the motor commands originate in the forebrain, the cerebellum receives and coordinates them to relay to the muscles. It also stores the memory of movement patterns so that we do not have to concentrate on how to walk, dance, or ride a bicycle. Midbrain The midbrain is relatively small in size and it connects the hindbrain with the forebrain. A few neural centres related to some special reflexes and visual and auditory sensations are found here. An important part of midbrain, known as Reticular Activating System (RAS), is responsible for our arousal. It makes us alert and active by regulating sensory inputs. It also helps us in selecting information from the environment. Forebrain It is considered to be the most important part of the brain because it performs all cognitive, emotional, and motor activities. The four major parts of the forebrain are: hypothalamus, thalamus, limbic system, and cerebrum. i. Hypothalamus: The hypothalamus is one of the smallest structures in the brain but plays a vital role in our behaviour. It regulates physiological processes involved in emotional and motivational behaviour, such as eating, drinking, sleeping, temperature regulation, and sexual arousal. It also regulates and controls the internal environment of the body (e.g., heart rate, blood pressure, temperature) and regulates the secretion of hormones from various endocrine glands. ii. Thalamus: It consists of an egg-shaped cluster of neurons situated on the ventral (upper) side of the hypothalamus. It is like a relay station that receives all incoming sensory signals from sense organs and sends them to appropriate parts of the cortex for processing. It also receives all outgoing motor signals coming from the cortex and sends them to appropriate parts of the body. iii. The Limbic System: This system is composed of a group of structures that form part of the old mammalian brain. It helps in maintaining internal homeostasis by regulating body temperature, blood pressure, and blood sugar level. It has close links with the hypothalamus. Besides hypothalamus, the limbic system comprises the Hippocampus and Amygdala. The hippocampus plays an important role in long-term memory. The amygdala plays an important role in emotional behaviour. iv. The Cerebrum: Also known as Cerebral Cortex, this part regulates all higher levels of cognitive functions, such as attention, perception, learning, memory, language behaviour, reasoning, and problem solving. The cerebrum makes two-third of the total mass of the human brain. Its thickness varies from 1.5 mm to 4 mm, which covers the entire surface of the brain and contains neurons, neural nets, and bundles of axons. All these make it possible for us to perform organised actions and create images, symbols, associations, and memories. The cerebrum is divided into two symmetrical halves, called the Cerebral Hemispheres. Although the two hemispheres appear identical, functionally one hemisphere usually dominates the other. For example, the left hemisphere usually controls language behaviour. The right hemisphere is usually specialised to 20

deal with images, spatial relationships, and pattern recognition. These two hemispheres are connected by a white bundle of myelinated fibers, called Corpus Callosum that carries messages back and forth between the hemispheres. Cerebral cortex has also been divided into four lobes - Frontal lobe, Parietal lobe, Temporal lobe, and Occipital lobe. The Frontal lobe is mainly concerned with cognitive functions, such as attention, thinking, memory, learning, and reasoning, but it also exerts inhibitory effects on autonomic and emotional responses. The Parietal lobe is mainly concerned with cutaneous sensations and their coordination with visual and auditory sensations. The Temporal lobe is primarily concerned with the processing of auditory information. Memory for symbolic sounds and words resides here. Understanding of speech and written language depends on this lobe. The Occipital lobe is mainly concerned with visual information. It is believed that interpretation of visual impulses, memory for visual stimuli and colour visual orientation is performed by this lobe. Physiologists and psychologists have tried to identify specific functions associated with specific brain structures. They have found that no activity of the brain is performed only by a single part of the cortex. Normally, other parts are involved, but it is also correct that there is some localisation of functions, i.e. for a particular function, a particular part of the cortex plays a more important role than the other parts. For example, if you are driving a car, you see the road and other vehicles by the function of your occipital lobe, hear the horns by the function of your temporal lobe, do many motor activities controlled by parietal lobe, and make decisions by the help of frontal lobe. The whole brain acts as a well- coordinated unit in which different parts contribute their functions separately. Spinal Cord The spinal cord is a long rope-like collection of nerve fibers, which run along the full length inside the spine. Its one end is connected with the medulla of the brain and another is free at the tail end. Its structure all along its length is similar. The butterfly shaped mass of grey matter present in the centre of the spinal cord contains association neurons and other cells. Surrounding the grey matter is the white matter of the spinal cord, which is composed of the ascending and descending neural tracts. These tracts (collections of nerve fibers) connect the brain with the rest of the body. The spinal cord plays the role of a huge cable, which exchanges innumerable messages with the CNS. There are two main functions of the spinal cord. Firstly, it carries sensory impulses coming from the lower parts of the body to the brain; and motor impulses originating from the brain to all over the body. Secondly, it performs some simple reflexes that do not involve the brain. Simple reflexes involve a sensory nerve, a motor nerve, and the association neurons of the grey matter of the spinal cord. Reflex Action A reflex is an involuntary action that occurs very quickly after its specific kind of stimulation. The reflex action takes place automatically without conscious decision of the brain. Reflex actions are inherited in our nervous system through evolutionary processes, for example, the eye-blinking reflex. Whenever any object suddenly comes near our eyes, our eyelids blink. Reflexes serve to protect the organism from potential threats and preserve life. Though several reflex actions are performed by our nervous system, the familiar reflexes are the knee jerk, pupil constriction, pulling away from very hot or cold objects, breathing and stretching. Most reflex actions are carried out by the spinal cord and do not involve the brain. 21

The Endocrine System The endocrine glands play a crucial role in our development and behaviour. They secrete specific chemical substances, called hormones, which control some of our behaviours. These glands are called ductless glands or endocrine glands, because they do not have any duct (unlike other glands) to send their secretions to specific places. Hormones are circulated by the bloodstream. The endocrine glands form the endocrine system of the body. This system works in conjunction with different parts of the nervous system. The whole system is thus known as neuroendocrine system. Figure shows the major endocrine glands of the body. Fig: Major Endocrine Glands i) Pituitary Gland This gland is situated within the cranium just below the hypothalamus. The pituitary gland is divided into anterior pituitary and posterior pituitary. The anterior pituitary is directly connected with hypothalamus, which regulates its hormonal secretions. The pituitary gland secretes the growth hormone and many other hormones, which direct and regulate the secretions of many other endocrine glands found in our body. This is why the pituitary gland is known as the "master gland". Some hormones are secreted at a steady rate throughout life, while others are secreted at an appropriate time in life. For example, the growth hormone is released steadily through childhood, with some spurt during adolescence, but gonadotropic hormones are secreted at the age of puberty, which stimulates the secretion of appropriate sex hormones among boys and girls. As a result, primary and secondary sexual changes take place. ii) Thyroid Gland This gland is located in the neck. It produces thyroxin that influences the body's metabolic rate. Optimum amount of thyroxin is secreted and regulated by an anterior pituitary hormone, the Thyroid Stimulating Hormone. (TSH). The steady secretion of this hormone maintains the production of energy, consumption of oxygen and elimination of wastes in body cells. On the other hand, underproduction of thyroxin leads to physical and psychological lethargy. If thyroid gland is removed in young animals, their growth is stunted and they fail to develop sexually. 22

iii) Adrenal Gland This gland is located above each kidney. It has two parts, adrenal cortex and adrenal medulla, each secreting different hormones. The secretion of adrenal cortex is controlled and regulated by Adrenocorticotrophic Hormone (ACTH) secreted by anterior pituitary gland. When the secretion of adrenal cortex goes down, anterior pituitary gets the message and increases the secretion of ACTH, which stimulates the adrenal cortex to secrete more hormones. The adrenal cortex secretes a group of hormones, called corticoids, which are utilised by the body for a number of physiological purposes, e.g., regulation of minerals in the body, particularly sodium, potassium, and chlorides. Any disturbance in its function seriously affects the functions of the nervous system. Adrenal medulla secretes two hormones, namely epinephrine and norepinephrine (also known as adrenaline and noradrenaline, respectively). Sympathetic activation, such as increased heart rate, oxygen consumption, metabolic rate, muscle tone, etc., take place through the secretion of these two hormones. Epinephrine and norepinephrine stimulate the hypothalamus, which prolongs emotions in an individual even when the stressor has been removed. iv) Pancreas The pancreas, lying near the stomach, has a primary role in digestion of food, but it also secretes a hormone known as insulin. Insulin helps the liver to break down glucose for use by the body or for storage as glycogen by the liver. When insulin is not secreted in proper amount, people develop a disease, called diabetic mellitus or simply diabetes. v) Gonads Gonads refer to testes in males and ovaries in females. The hormones secreted by these glands control and regulate sexual behaviours and reproductive functions of males and females. Secretion of hormones of these glands is initiated, maintained and regulated by a hormone, called gonadotrophic hormone (GTH) secreted by the anterior pituitary. The secretion of GTH starts at the age of puberty (10 to 14 years in human beings) and stimulates gonads to secrete hormones, which in turn stimulates development of primary and secondary sexual characteristics. The ovaries in females produce estrogens and progesterone. Estrogens guide the sexual development of the female body. Primary sexual characteristics related with reproduction, such as development of ovum or egg cell, appear on every 28 days or so in the ovary of a sexually mature female. Secondary sexual characteristics, such as breast development, rounded body contours, widened pelvis, etc., also depend on this hormone. Progesterone has no role in sexual development. Its function is related with preparation of uterus for the possible reception of fertilised ovum. The hormonal system for reproductive behaviour is much simpler in the male because there is no cyclic pattern. Testes in males produce sperm continuously and secrete male sex hormones called androgens. The major androgen is testosterone. Testosterone prompts secondary sexual changes such as physical changes, growth of facial and body hairs, deepening of voice, and increase in sexually oriented behaviour. Increased aggression and other behaviours are also linked with testosterone production. The normal functioning of all hormones is crucial to our behavioural well-being. Without a balanced secretion of hormones, the body would be unable to maintain the state of internal equilibrium. Without the increased secretion of hormones during the times of stress, we would not be able to react 23

effectively to potential dangers in our environment. Finally, without the secretion of hormones at specific times in our lives, we would not be able to grow, mature and reproduce. Heredity: Genes and Behaviour We inherit characteristics from our parents in the form of genes. A child at birth possesses a unique combination of genes received from both parents. This inheritance provides a distinct biological blueprint and timetable for an individual's development. The study of the inheritance of physical and psychological characteristics from ancestors is referred to as genetics. The child begins life as a single zygote cell (mother's ovum fertilised by father's sperm). Zygote is a tiny cell with a nucleus in its centre containing chromosomes. These chromosomes with all genes are inherited from each parent in equal numbers. Chromosomes Chromosomes are the hereditary elements of the body. They are threadlike-paired structures in the nucleus of each cell. The number of chromosomes per nucleus is distinctive and is constant for each living organism. The gametic cells (sperm and ovum) have 23 chromosomes but not in pairs. A new generation results from the fusion of a sperm cell and an egg cell. At the time of conception, the organism inherits 46 chromosomes from parents, 23 from the mother and 23 from the father. Each of these chromosomes contains thousands of genes. However, the sperm cell (fathers') differs from the egg cell (mother's) in one important respect. The 23rd chromosome of the sperm cell can be either the capital X or Y type of the English alphabet. If the X type sperm fertilises the egg cell, the fertilised egg will have an XX 23rd chromosome pair, and the child will be a female. On the other hand, if a Y type sperm fertilises the egg, the 23rd chromosome pair will be XY, and the child will be a male. Chromosomes are composed mainly of a substance called Deoxyribonucleic Acid (DNA). Our genes are composed chiefly of DNA molecules. The two genes that control the development of each trait are situated at the same locus, one on each chromosome of a particular pair. The exception is the sex chromosomes, i.e. the pair of chromosomes that determines an individual's sex. Genes Every chromosome stores thousands of genetic commands in the form of genes. These genes dictate much of the course of an organism's development. They contain instructions for the production of specific proteins, which regulate the body's physiological processes and the expression of phenotypic traits. The observable traits of an organism are called phenotype (e.g., body built, physical strength, intelligence, and other behavioural traits). The traits, which can be passed on to the offspring through genetic material are called its genotype. All biological and psychological characteristics that a modern man possesses are the result of genotype inheritance with phenotypical variations. A given gene can exist in several different forms. Change of a gene from one form to another is called mutation. The type of mutation that occurs spontaneously in nature provides variation in genotypes and permits the evolution of new species. Mutation permits recombination of new genes with the genes already present. This new combination of genes structure is then put to test in the environment, which can select out those genotypes that turn out to be best fitted for the environment. Sensation and Perception The world in which we live is full of variety of objects, people, and events. Look at the room you are sitting in. You will find so many things around. Just to mention a few, you may see your table, your chair, your 24

books, your bag, your watch, pictures on the wall and many other things. Their sizes, shapes, and colours are also different. If you move to other rooms of your house, you will notice several other new things (e.g., pots and pans, almirah, TV). If you go beyond your house, you will find still many more things that you generally know about (trees, animals, buildings). Such experiences are very common in our day-today life. We hardly have to make any efforts to know them. If someone asks you, "How can you say that these various things exist in your room, or house, or in the outside environment?", you will most probably answer that you see or experience them all around you. In doing so, you are trying to tell the person that the knowledge about various objects becomes possible with the help of our sense organs (e.g., eyes, ears). These organs collect information not only from the external world, but also from our own body. The information collected by our sense organs forms the basis of all our knowledge. The sense organs register several kinds of information about various objects. However, in order to be registered, the objects and their qualities (e.g., size, shape, colour) must be able to draw our attention. The registered information must also be sent to the brain that constructs some meaning out of them. Thus, our knowledge of the world around us depends on three basic processes, called sensation, attention, and perception. These processes are highly interrelated; hence, they are often considered as different elements of the same process, called cognition. Nature and Varieties of Stimulus The external environment that surrounds us contains a wide variety of stimuli. Some of them can be seen (e.g., a house), while some can be heard only (e.g., music). There are several others that we can smell (e.g., fragrance of a flower) or taste (e.g., sweets). There are still others that we can experience by touching (e.g., softness of a cloth). All these stimuli provide us with various kinds of information. We have very specialised sense organs to deal with these different stimuli. As human beings we are bestowed with a set of seven sense organs. These sense organs are also known as sensory receptors or information gathering systems, because they receive or gather information from a variety of sources. Five of these sense organs collect information from the external world. These are eyes, ears, nose, tongue, and skin. While our eyes are primarily responsible for vision, ears for hearing, nose for smell, and tongue for taste, skin is responsible for the experiences of touch, warmth, cold, and pain. Specialised receptors of warmth, cold, and pain are found inside our skin. Besides these five external sense organs, we have also got two deep senses. They are called kinesthetic and vestibular systems. They provide us with important information about our body position and movement of body parts related to each other. With these seven sense organs, we register ten different variety of stimuli. For example, you may notice whether a light is bright or dim, whether it is yellow, red or green, and so on. With sound you may notice whether it is loud or faint, whether it is melodious or distracting, and so on. These different qualities of stimuli are also registered by our sense organs. Sense Modalities

Our sense organs provide us with first-hand information about our external or internal world. The initial experience of a stimulus or an object registered by a particular sense organ is called sensation. It is a process through which we detect and encode a variety of physical stimuli. Sensation also refers to immediate basic experiences of stimulus attributes, such as "hard", "warm", "loud", and "blue", which result from appropriate stimulation of a sensory organ. Different sense organs deal with different forms of stimuli and serve different purposes. Each sense organ is highly specialised for dealing with a particular kind of information. Hence, each one of them is known as a sense modality. 25

Functional Limitations of Sense Organs Before we move on to a discussion of sense organs, it is important to note that our sense organs function with certain limitations. For example, our eyes cannot see things which are very dim or very bright. Similarly, our ears cannot hear very faint or very loud sounds. The same is true for other sense organs also. As human beings, we function within a limited range of stimulation. For being noticed by a sensory receptor, a stimulus has to be of an optimal intensity or magnitude. The relationship between stimuli and the sensations they evoke has been studied in a discipline, called psychophysics. In order to be noticed a stimulus has to carry a minimum value or weight. The minimum value of a stimulus required to activate a given sensory system is called absolute threshold or absolute limen (AL). For example, if you add a granule of sugar to a glass of water, you may not experience any sweetness in that water. Addition of a second granule to water may also not make it taste sweet. But if you go on adding sugar granules one after another, there will come a point when you will say that the water is now sweet. The minimum number of sugar granules required to say that the water is sweet will be the AL of sweetness. It may be noted at this point that the AL is not a fixed point; instead it varies considerably across individuals and situations depending on the people's organic conditions and their motivational states. Hence, we have to assess it on the basis of a number of trials. The number of sugar granules that may produce the experience of "sweetness" in water on 50 per cent of occasions will be called the AL of sweetness. If you add more number of sugar granules, the chances are greater that the water will be reported more often as sweet than plain. As it is not possible for us to notice all stimuli, it is also not possible to differentiate between all stimuli. In order to notice two stimuli as different from each other, there has to be some minimum difference between the value

of those stimuli. The smallest difference in the value of two stimuli that is necessary to notice them as different is called difference threshold or difference limen (DL). To understand it, we may continue with our "sugar water" experiment. As we have seen, the plain water is experienced as sweet after the addition of certain number of sugar granules. Let us remember this sweetness. The next question is: how many sugar granules will be needed in the water in order to experience its sweetness as different from the previous sweetness. Go on adding sugar granules one after another tasting the water each time. After addition of a few granules, you will notice at a point that the water is now sweeter than the previous one. The number of sugar granules added to the water to generate an experience of sweetness that is different from the previous sweetness on 50 per cent of the occasions will be called the DL of sweetness. Thus, difference threshold is the minimum amount of change in a physical stimulus that is capable of producing a sensation difference on 50 per cent of the trials. You may realise by now that understanding of sensations is not possible without understanding the AL and DL of different types of stimuli (for example, visual, auditory), but that is not enough. Sensory processes do not depend only on the stimulus characteristics. Sense organs and the neural pathways connecting them to various brain centres also play a vital role in this process. A sense organ receives the stimulus and encodes it as an electrical impulse. For being noticed this electrical impulse must reach the higher brain centres. Any structural or functional defect or damage in the receptor organ, its neural pathway, or the concerned brain area may lead to a partial or complete loss of sensation. Visual Sensation Among all sense modalities, vision is the most highly developed in human beings. Various estimates indicate that we use it in approximately 80 per cent of our transactions with the external world. Audition and other senses also contribute significantly to information gathering from the external world. We shall discuss vision and audition in some detail. 26

Visual sensation starts when light enters the eyes and stimulates our visual receptors. Our eyes are sensitive to a spectrum of light, the wavelength of which ranges from 380 nm to 780 nm (nm refers to nanometer, which is one billionth of a meter). No sensation is registered beyond this range of light. The Human Eye A diagram of the human eye is shown in Figure. As you can see, our eye is made up of three layers. In the outer layer, there is a transparent cornea and a tough sclera that surrounds the rest of the eye. It protects the eye and maintains its shape. The middle layer is called choroid, which is richly supplied with blood vessels. The inner layer is known as retina. It contains the photoreceptors (rods and cones) and an elaborate network of interconnecting neurons. The eye is generally compared with a camera. For example, the eye and camera have a lens. The lens divides the eye into two unequal chambers, namely aqueous chamber and vitreous chamber. The aqueous chamber is located between the cornea and the lens. It is smaller in size and is filled with a water like substance, called aqueous humor. The vitreous chamber is located between the lens and the retina. It is filled with a jelly like protein, called vitreous humor. These fluids help in holding the lens at its appropriate place and in proper shape. They also allow enough flexibility for the occurrence of accommodation— a process through which the lens changes its shape in order to focus the objects at varying distances. This process is regulated by ciliary muscles, which are attached to the lens. These muscles flatten the lens to focus the distant objects and thicken it to focus the near objects. Like a camera, the eye also has a mechanism to control the amount of light entering into it. The iris serves this purpose. It is a disc-like coloured membrane lying between the cornea and the lens. It controls the amount of light entering the eye by regulating pupil dilation. In dim light the pupil dilates; in bright light it contracts. Retina is the inner most layer of an eye. It is made up of five types of photosensitive cells among which rods and cones are most important. Rods are the receptors for scotopic vision (night vision). They operate at low intensities of light, and lead to achromatic (colourless) vision. Cones are the receptors for photopic (day light) vision. They operate at high levels of illumination, and lead to chromatic

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it on to the retina. Retina is divided into two parts: the nasal half and the temporal half. The inner half portion of the eye (towards the nose), taking the centre of fovea as mid-point, is called the nasal half. The outer half portion of the eye (towards the temple) from the centre of fovea is called the temporal half. Light from the right visual field stimulates the left half of each eye (i.e. the nasal half of the right eye and the temporal half of the left eye), and light from the left visual field stimulates the right half of each eye (i.e. the nasal half of the left eye and the temporal half of the right eye). An inverted image of the object is formed on the retina. The neural impulse is transmitted to the visual cortex through the optic nerve where the image is re-inverted and processed.

The Fig. mentioned below, shows

that the optic nerve leaves the retina from the area that has no photoreceptors. In this area visual sensitivity is completely absent. Therefore, it is called the blind spot. 27

Fig: Structure of the Human Eye

Adaptation The human eye can function at a very large range of light intensities. Sometimes we have to undergo a rapid change in illumination levels. For example, when we go to a matinee show movie, we find it difficult to see things in the hall on entering into it. However, after spending about 15 to 20 minutes there, we are able to see everything. After the show when we go out into the open, we find the light outside the hall too bright to see things, or sometimes even to keep our eyes open. However, within a minute or so we feel comfortable, and are able to see things properly. This adjustment is faster than the one made on entering the hall. The process of getting adjusted to different intensities of light is called 'visual adaptation'. Light adaptation refers to the process of adjusting to bright light after exposure to dim light. This process takes nearly a minute or two. On the other hand, dark adaptation refers to the process of adjusting to a dimly illuminated environment after exposure to bright light. This may take half an hour or even longer depending on the previous level of exposure of the eye to light. There are certain ways in which these processes can be facilitated. An interesting activity is given below to demonstrate this process to you. Photochemical Basis of Light and Dark Adaptation: You may wonder why the light and dark adaptations take place. According to the classical view, light and dark adaptations occur due to certain photochemical processes. The rods have a photo-sensitive chemical substance, called rhodopsin or visual purple. By the action of light, the molecules of this chemical substance get bleached or broken down. Under such conditions the light adaptation takes place in the eyes. On the other hand, the dark adaptation is achieved by the removal of light, and thereby allowing for restorative processes to regenerate the pigment in the rods with the help of vitamin A. The regeneration of rhodopsin in rods is a time consuming process. That is why dark adaptation is a slower process than light adaptation. It has been found that people who suffer from vitamin A deficiency do not achieve dark adaptation at all and find it really difficult to move in the dark. This condition is generally known as night blindness. A parallel chemical believed to be found in cones is known as iodopsin. 28

Colour Vision In our interaction with the environment we not only experience a variety of objects, but also their colours. It may be noted that colour is a psychological property of our sensory experience. It is created when our brain interprets the information received from the external world. It may be remembered that light is described physically in terms of wavelength, not in terms of colour. As we have read earlier, the visible spectrum is a range of energy (380-780 nm) that our photoreceptors can detect. The energy lower or higher than the visible spectrum is harmful to the eyes. The sun light is a perfect mixture of seven colours just like a rainbow. The colours observed are violet, indigo, blue, green, yellow, orange, and red, abbreviated as 'VIBGYOR'. The Dimensions of Colour A person with normal colour vision can distinguish more than seven million different shades of colour. Our experiences of colour can be described in terms of three basic dimensions, called hue, saturation, and brightness. Hue is a property of chromatic colours. In simple words, it refers to the name of the colour, e.g., red, blue, and green. Hue varies with wavelength, and each colour is identified with a specific wavelength. For example, blue has a wavelength of about 465 nm, and green of about 500 nm. Achromatic colours like black, white or grey are not characterised by hues. Saturation is a psychological attribute that refers to the relative amount of hue of a surface or object. The light of single wavelength (monochromatic) appears to be highly saturated. As we mix different wavelengths, the saturation decreases. The colour grey is completely unsaturated. Brightness is the perceived intensity of light. It varies across both chromatic and achromatic colours. White and black represent the top and bottom of the brightness dimension. White has the highest degree of brightness, whereas black has the lowest degree. Colour Mixtures There is an interesting relationship among colours. They form complementary pairs. When mixed in correct proportions the complementary colours yield an achromatic grey or white. Examples of complementary colours are red-green and yellow-blue. Red, green and blue are called primary colours, because on mixing, the light of these three colours can produce almost any colour. The most common example is the television screen. It contains spots of blue, red and green colours. The combinations of these three produce different colours and shades that we see on the TV screen. After Images This is quite an interesting phenomenon related to visual sensations. The effect of a visual stimulus persists for some time even after the removal of that stimulus from the visual field. This effect is called after image. After images are positive and negative. Positive after images resemble the original stimulus in terms of hue, saturation, and brightness. They usually occur after a brief intense stimulation of dark adapted eyes. On the other hand, negative after images appear in complementary colours. These images appear when a person stares at the patch of a particular colour for at least 30 seconds, and then transfers the gaze to a neutral background (e.g., a white or grey surface). If the person looks at the blue colour, the negative after image will appear in yellow. Similarly, a red stimulus will yield a negative after image of green colour. 29

Auditory Sensation Audition or hearing is also an important sense modality that carries great value for us. It provides us with reliable spatial information. Besides orienting us to certain objects or individuals, it plays a vital role in spoken communication also. Auditory sensation begins when sound enters our ear and stimulates the chief organs of hearing.

The Human Ear Ear is the primary receptor of auditory stimuli. While its well-known function is hearing, it also helps us in maintaining our body balance. The structure of an ear is divided into three segments, called the external ear, the middle ear, and the inner ear (shown in Fig). External Ear: It contains two main structures, namely pinna and auditory meatus. Pinna is a cartilaginous funnel-shaped structure that collects sound waves from the surroundings. Auditory meatus is a canal protected by hair and wax that carries sound waves from pinna to the tympanum or ear drum. Middle Ear: The middle ear starts with tympanum, a thin membrane highly sensitive to sound vibrations. This is followed by the tympanic cavity. It is connected to the pharynx with the help of Eustachian tube, which maintains the air pressure in tympanic cavity. From the cavity the vibrations pass to three ossicles known as malleus (hammer), incus (anvil), and stapes (stirrup). They increase the intensity of sound vibrations about 10 times and send them to the inner ear. Inner Ear: The inner ear has a complicated structure known as membranous labyrinth, which is encapsulated in a bony shell called bony labyrinth. A lymph-like fluid is found in the space between bony labyrinth and membranous labyrinth. This is called perilymph. The bony labyrinth has three semi-circular canals at right angle to each other, a cavity, called vestibule, and a coiled structure, called cochlea. The semi-circular canals have fine hair cells, which are highly sensitive to postural changes as well as changes in the body orientation. Inside the bony cochlea, there is a membranous cochlea, which is also known as scala media. It is filled with endolymph, and has a spirally coiled membrane, called basilar membrane. It has got fine hair cells arranged in a series to form the organ of corti. This is the main organ for hearing. 30

Fig: Structure of the Human Ear Working of the Ear Pinna collects the sound vibrations and serves them to the tympanum through the auditory meatus. From the tympanic cavity the vibrations are transferred to the three ossicles, which increase their strength and transmit them to the inner ear. In the inner ear the cochlea receives the sound waves. Through vibrations the endolymph is set in motion, which also vibrates the organ of corti. Finally, the impulses are sent to the auditory nerve, which emerges at the base of cochlea and reaches the auditory cortex where the impulse is interpreted. Sound as a Stimulus We all know that sound is the stimulus for ears. It results from pressure variations in the external environment. Any physical movement disturbs the surrounding medium (i.e. air) and pushes the air molecules back and forth. This results in changes in pressure that spread outward in the form of sound waves, travelling at a rate of about 1,100 ft/sec. These changes travel in waves much like the ripples set up by a stone thrown into a pond. When these sound waves strike our ears, they initiate a set of mechanical pressure changes that ultimately trigger the auditory receptors. The simplest kind of sound wave is one that causes successive pressure changes over time in the form of a single repeating sine wave (shown in the above Fig.). Sound waves vary in amplitude as well as in wavelength. Amplitude is a general measure of stimulus magnitude. It is the amount of change in pressure, i.e. the extent of displacement of the molecules from the position of rest. In Fig. below, the amplitude of sound wave is represented as the distance of the crest or trough from its mean position. Wavelength is the distance between the two crests. Sound waves are basically formed due to alternate compression and decompression (rarefaction) of air molecules. A complete change in pressure from compression to rarefaction and again to compression makes a cycle of the wave. 31

Fig: Sound Waves Sound waves are described in terms of their frequency, which is measured in terms of cycles per second. Its unit is called Hertz (Hz). Frequency and wavelength have an inverse relationship. When the wavelength increases, the frequency decreases, and when the wavelength decreases, the frequency increases. Amplitude and frequency both are physical dimensions. Besides these, there are three psychological dimensions of sound, namely loudness, pitch and timbre. Loudness of the sound is determined by its amplitude. Sound waves with large amplitude are perceived as loud; those with small amplitude are perceived as soft. Loudness is measured in decibels (db). Pitch refers to highness or lowness of a sound. The seven notes used in Indian classical music represent a gradual increase in their pitch. Frequency determines the pitch of a sound wave. The higher the frequency, the higher will be the pitch. The range of hearing is generally 20 Hz-20,000 Hz. Timbre refers to the nature or quality of a sound. For example, the sound of a car engine and a person talking differ with respect to quality or timbre. The timbre of a sound reflects the complexity of its sound waves. Most of the sounds found in natural environments are complex. Attentional Processes We have already discussed some sensory modalities that help us in collecting information from the external world and also from our internal system. A large number of stimuli impinge upon our sense organs simultaneously, but we do not notice all of them at the same time. Only a selected few of them are noticed. For example, when you enter your classroom you encounter several things in it, such as doors, walls, windows, paintings on walls, tables, chairs, students, schoolbags, water bottles, and soon, but you selectively focus only on one or two of them at one time. The process through which certain stimuli are selected from a group of others is generally referred to as attention. At this point it may be noted that besides selection, attention also refers to several other properties like alertness, concentration, and search. Alertness refers to an individual's readiness to deal with stimuli that appear before her/him. While participating in a race in your school, you might have seen the participants on the starting line in an alert state waiting for the whistle to blow in order to run. Concentration refers to focusing of awareness on certain specific objects while excluding others for the moment. For example, in the classroom, a student concentrates on the teacher's lecture and ignores all sorts of noises coming from different corners of the school. In search an observer looks for some specified subset of objects among a set of objects. For example, when you go to fetch your younger sister and 32

brother from the school, you just look for them among innumerable boys and girls. All these activities require some kind of effort on the part of people. Attention in this sense refers to "effort allocation". Attention has a focus as well as a fringe. When the field of awareness is centred on a particular object or event, it is called focus or the focal point of attention. On the contrary, when the objects or events are away from the centre of awareness and one is only vaguely aware of them, they are said to be at the fringe of attention. Attention has been classified in a number of ways. A process-oriented view divides it into two types, namely selective and sustained. Sometimes we can also attend to two different things at the same time. When this happens, it is called divided attention. Selective Attention Selective attention is concerned mainly with the selection of a limited number of stimuli or objects from a large number of stimuli. We have already indicated that our perceptual system has a limited capacity to receive and process information. This means that it can deal only with a few stimuli at a given moment of time. The question is, which of those stimuli will get selected and processed? Psychologists have identified a number of factors that determine the selection of stimuli. Factors Affecting Selective Attention Several factors influence selective attention. These generally relate to the characteristics of stimuli and the characteristics of individuals. They are generally classified as "external" and "internal" factors. External factors are related to the features of stimuli. Other things held constant, the size, intensity, and motion of stimuli appear to be important determinants of attention. Large, bright, and moving stimuli easily catch our attention. Stimuli, which are novel and moderately complex, also easily get into our focus. Studies indicate that human photographs are more likely to be attended to than the photographs of inanimate objects. Similarly, rhythmic auditory stimuli are more readily attended to than verbal narrations. Sudden and intense stimuli have a wonderful capacity to draw attention. Internal factors lie within the individual. These may be divided into two main categories, viz. motivational factors and cognitive factors. Motivational factors relate to our biological or social needs. When we are hungry, we notice even a faint smell of food. A student taking an examination is likely to focus on a teacher's instructions more than other students. Cognitive factors include factors like interest, attitude, and preparatory set. Objects or events, which appear interesting, are readily attended by individuals. Similarly, we pay quick attention to certain objects or events to which we are favourably disposed. Preparatory set generates a mental state to act in a certain way and readiness of the individual to respond to one kind of stimuli and not to others. Theories of Selective Attention A number of theories have been developed to explain the process of selective attention. We will briefly discuss three of these theories. Filter theory was developed by Broadbent (1956). According to this theory, many stimuli simultaneously enter our receptors creating a kind of "bottleneck" situation. Moving through the short- term memory system, they enter the selective filter, which allows only one stimulus to pass through for higher levels of processing. Other stimuli are screened out at that moment of time. Thus, we become aware of only that stimulus, which gets access through the selective filter. Filter-attenuation theory was developed by Triesman (1962) by modifying Broadbent's theory. This theory proposes that the stimuli not getting access to the selective filter at a given moment of time 33

are not completely blocked. The filter only attenuates (weakens) their strength. Thus some stimuli manage to escape through the selective filter to reach higher levels of processing. It is indicated that personally relevant stimuli (e.g., one's name in a collective dinner) can be noticed even at a very low level of sound. Such stimuli, even though fairly weak, may also generate response occasionally by slipping through the selective filter. Multimode theory was developed by Johnston and Heinz (1978). This theory believes that attention is a flexible system that allows selection of a stimulus over others at three stages. At stage one the sensory representations (e.g., visual images) of stimuli are constructed; at stage two the semantic representations (e.g., names of objects) are constructed; and at stage three the sensory and semantic representations enter the consciousness. It is also suggested that more processing requires more mental effort. When the messages are selected on the basis of stage one processing (early selection), less mental effort is required than when the selection is based on stage three processing (late selection). Sustained Attention While selective attention is mainly concerned with the selection of stimuli, sustained attention is concerned with concentration. It refers to our ability to maintain attention on an object or event for longer durations. It is also known as "vigilance". Sometimes people have to concentrate on a particular task for many hours. Air traffic controllers and radar readers provide us with good examples of this phenomenon. They have to constantly watch and monitor signals on screens. The occurrence of signals in such situations is usually unpredictable, and errors in detecting signals may be fatal. Hence, a great deal of vigilance is required in those situations. Factors Influencing Sustained Attention Several factors can facilitate or inhibit an individual's performance on tasks of sustained attention. Sensory modality is one of them. Performance is found to be superior when the stimuli (called signals) are auditory than when they are visual. Clarity of stimuli is another factor. Intense and long lasting stimuli facilitate sustained attention and result in better performance. Temporal uncertainty is a third factor. When stimuli appear at regular intervals of time they are attended better than when they appear at irregular intervals. Spatial uncertainty is a fourth factor. Stimuli that appear at a fixed place are readily attended, whereas those that appear at random locations are difficult to attend. Attention has several practical implications. The number of objects one can readily attend to in a single glance is used to design the number plates of motorbikes and cars so that the traffic police can easily notice them in the case of traffic rule violations. A number of children fail to perform well in school simply due to the problem of attention. Perceptual Processes In the previous section we have examined that the stimulation of sensory organs leads us to experience something such as, a flash of light or a sound, or a smell. This elementary experience, called sensation, does not provide us with any understanding of the stimulus that stimulated the sense organ. For example, it does not inform us about the source of the light, sound or fragrance. In order to make sense out of the raw material provided by the sensory system, we process it further. In doing so, we give meaning to stimuli by using our learning, memory, motivation, emotions, and other psychological processes. The process by which we recognise, interpret or give meaning to the information provided by sense organs is called perception. In interpreting stimuli or events, individuals often construct them in their own ways. Thus perception is not merely an interpretation of objects or events of the external or internal world as 34

they exist, instead it is also a construction of those objects and events from one's own point of view. The process of meaning-making involves certain sub-processes. These are shown in Fig. Fig: Sub-processes of Perception Processing Approaches in Perception How do we identify an object? Do we identify a dog because we have first recognised its furry coat, its four legs, its eyes, ears, and so on, or do we recognise these different parts because we have first identified a dog? The idea that recognition process begins from the parts, which serve as the basis for the recognition of the whole is known as bottom-up processing. The notion that recognition process begins from the whole, which leads to identification of its various components is known as top down processing. The bottom-up approach lays emphasis on the features of stimuli in perception and considers perception as a process of mental construction. The top-down approach lays emphasis on the perceiver and considers perception as a process of recognition or identification of stimuli. Studies show that in perception both the processes interact with each other to provide us with an understanding of the world. The Perceiver Human beings are not just mechanical and passive recipients of stimuli from the external world. They are creative beings and try to understand the external world in their own ways. In this process their motivations and expectations, cultural knowledge, past experiences, and memories as well as values, beliefs, and attitudes play an important role in giving meaning to the external world. Some of these factors are described here. Motivation The needs and desires of a perceiver strongly influence her/his perception. People want to fulfil their needs and desires through various means. One way to do this is to perceive objects in a picture as something that will satisfy their need. Experiments were conducted to examine the influence of hunger on perception. When hungry persons were shown ambiguous pictures, they were found to perceive them as pictures of food objects more often than satiated (non-hungry) persons. Expectations or Perceptual Sets The expectations about what we might perceive in a given situation also influence our perception. This phenomenon of perceptual familiarisation or perceptual generalisation reflects a strong tendency to see what we expect to see even when the results do not accurately reflect external reality. For example, if your milkman delivers you milk daily at about 5.30 A.M., any knocking at the door around that time is likely to be perceived as the presence of the milkman even if it is someone else. 35

Cognitive Styles Cognitive style refers to a consistent way of dealing with our environment. It significantly affects the way we perceive the environment. There are several cognitive styles that people use in perceiving their environment. One most extensively used in studies is the "field dependent and field independent" cognitive style. Field dependent people perceive the external world in its totality, i.e. in a global or holistic manner. On the other hand, field independent people perceive the external world by breaking it into smaller units, i.e. in an analytic or differentiated manner. Look at Fig. mentioned below. Can you find out the triangle hidden in the picture? How much time do you take to locate it? Try to find out the time other students of your class take to locate the triangle. Those who can do it quickly will be called "field independent"; those who take long time will be called "field dependent". Fig: An Item to test the 'Field Dependent' and 'Field Independent' Cognitive Style Principles of Perceptual Organisation Our visual field is a collection of different elements, such as points, lines, and colours. However, we perceive these elements as organised wholes or complete objects. For example, we see a bicycle as a complete object, not as a collection of different parts (e.g., saddle, wheel, handle). The process of organising visual field into meaningful wholes is known as form perception. You may wonder how different parts of an objects are organised into a meaningful whole. You may also ask if there are certain factors that facilitate or inhibit this process of organisation. Several scholars have tried to answer such questions, but the most widely accepted answer has been given by a group of researchers, called Gestalt psychologists. Prominent among them are Köhler, Koffka, and Wertheimer. Gestalt means a regular figure or a form. According to Gestalt psychologists, we perceive different stimuli not as discrete elements, but as an organised "whole" that carries a definite form. They believe that the form of an object lies in its whole, which is different from the sum of their parts. For example, a flower pot with a bunch of flowers is a whole. If the flowers are removed, the flower pot still remains a whole. It is the configuration of the flower pot that has changed. Flower pot with flowers is one configuration; without flowers it is another configuration. The Gestalt psychologists also indicate that our cerebral processes are always oriented towards the perception of a good figure or pragnanz. That is the reason why we perceive everything in an organised form. The most primitive organisation takes place in the form of figure-ground segregation. When we look at a surface, certain aspects of the surface clearly stand out as separate entities, whereas 36

others do not. For example, when we see words on a page, or a painting on a wall, or birds flying in the sky, the words, the painting, and the birds stand out from the background, and are perceived as figures, while the page, wall, and sky stay behind the figure and are perceived as background. To test this experience, look at the Fig. given below. You will see either the white part of the figure, which looks like a vase (flower pot), or the black part of the figure, which looks like two faces. Fig: Rubin's Vase We distinguish figure from the ground on the basis of the following characteristics: 1. Figure has a definite form, while the background is relatively formless. 2. Figure is more organised as compared to its background. 3. Figure has a clear contour (outline), while the background is contourless. 4. Figure stands out from the background, while the background stays behind the figure. 5. Figure appears clearer, limited, and relatively nearer, while the background appears relatively unclear, unlimited, and away from us. The discussion presented above indicates that human beings perceive the world in organised wholes rather than in discrete parts. The Gestalt psychologists have given us several laws to explain how and why different stimuli in our visual field are organised into meaningful whole objects. Let us look at some of these principles. The Principle of Proximity Objects that are close together in space or time are perceived as belonging together or as a group. For example, Fig. mentioned below does not look like a square pattern of dots, but as a series of columns of dots. Similarly, Fig. also looks like a group of dots together in rows. Fig: Proximity 37

The Principle of Similarity Objects that are similar to one another and have similar characteristics are perceived as a group. In Fig. mentioned below, the little circles and squares are evenly spaced both horizontally and vertically so that the proximity does not come into play. Instead, we tend to see alternating columns of circles and squares. Fig: Similarity The Principle of Continuity This principle states that we tend to perceive objects as belonging together if they appear to form a continuous pattern. For instance, we are more likely to identify two lines a-b and c-d crossing than to identify four lines meeting at the centre p. Fig: Continuity The Principle of Smallness According to this principle, smaller areas tend to be seen as figures against a larger background. In Fig. mentioned below, we are more likely to see a black cross rather than a white cross within the circle because of this principle. Fig: Smallness The Principle of Symmetry This principle suggests that symmetrical areas tend to be seen as figures against asymmetrical backgrounds. For example, in Fig. mentioned below, the black areas are seen as figures (as they have symmetrical properties) against their white asymmetrical background. 38

Fig: Symmetry The Principle of Surroundedness According to this principle, the areas surrounded by others tend to be perceived as figures. For example, the image in Fig. shows, looks like five figures against the white background rather than the word 'LIFT'. Fig: Surroundedness The Principle of Closure We tend to fill the gaps in stimulation and perceive the objects as whole rather than their separate parts. For example, in Fig. shows, the small angles are seen as a triangle due to our tendency to fill the gaps in the object provided by our sensory input. Fig: Closure Perceptual Constancies The sensory information that we receive from our environment constantly changes as we move around. Yet we form a stable perception of an object seen from any position and in any intensity of light. Perception of the objects as relatively stable in spite of changes in the stimulation of sensory receptors is called perceptual constancy. Here we will examine three types of perceptual constancies that we commonly experience in our visual domain. Size Constancy The size of an image on our retina changes with the change in the distance of the object from the eye. The further away it is, the smaller is the image. On the other hand, our experience shows that within limits the object appears to be about the same size irrespective of its distance. For example, when you approach 39

your friend from a distance, your perception of the friend's size does not change much despite the fact that the retinal image (image on retina) becomes larger. This tendency for the perceived size of objects to remain relatively unchanged with changes in their distance from the observer and the size of the retinal image is called size constancy. Shape Constancy In our perceptions the shapes of familiar objects remain unchanged despite changes in the pattern of retinal image resulting from differences in their orientation. For example, a dinner plate looks the same shape whether the image that it casts on the retina is a circle, or an ellipse, or roughly a short line (if the plate is viewed from the edge). It is also called form constancy. Brightness Constancy Visual objects not only appear constant in their shape and size, they also appear constant in their degree of whiteness, greyness, or blackness even though the amount of physical energy reflected from them changes considerably. In other words, our experience of brightness does not change in spite of the changes in the amount of reflected light reaching our eyes. The tendency to maintain apparent brightness constant under different amount of illumination is called brightness constancy. For example, surface of a paper which appears white in the sunlight, is still perceived as white in the room light. Similarly, coal that looks black in the sun also looks black in room light. Illusions Our perceptions are not always veridical. Sometimes, we fail to interpret the sensory information correctly. This results in a mismatch between the physical stimuli and its perception. These misperceptions resulting from misinterpretation of information received by our sensory organs are generally known as illusions. These are experienced more or less by all of us. They result from an external stimulus situation and generate the same kind of experience in each individual. That is why illusions are also called "primitive organisations". Although illusions can be experienced by the stimulation of any of our senses, psychologists have studied them more commonly in the visual than in other sense modalities. Some perceptual illusions are universal and found in all individuals. For example, the rail tracks appear to be converging to all of us. These illusions are called universal illusions or permanent illusions as they do not change with experience or practice. Some other illusions seem to vary from individual to individual; these are called personal illusions. In this section, we will describe some important visual illusions. Geometrical Illusions In Fig. below, the Muller-Lyer illusion has been shown. All of us perceive line A as shorter than line B, although both the lines are equal. This illusion is experienced even by children. There are some studies that suggest that even Fig: Muller-Lyer Illusion 40

animals experience this illusion more or less like us. Besides Muller-Lyer illusion, several other visual illusions are experienced by human beings (also birds and animals). In Fig. below, you can see the illusion of vertical and horizontal lines. Although both the lines are equal, we perceive the vertical line as longer than the horizontal line. Fig: Vertical-Horizontal Illusion Apparent Movement Illusion This illusion is experienced when some motionless pictures are projected one after another at an appropriate rate. This illusion is referred to as "phi-phenomenon". When we see moving pictures in a cinema show, we are influenced by this kind of illusion. The succession of flickering electrical lights also generate this illusion. This phenomenon can be experimentally studied with the help of an instrument by presenting two or more lights in a succession. For the experience of this illusion, Wertheimer had reported the presence of appropriate level of brightness, size, spatial gap, and temporal contiguity of different lights to be important. In the absence of these, the light points will not appear as moving. They will appear either as one point, or as different points appearing one after another, without any experience of motion. Experience of illusions indicates that people do not always perceive the world as it is; instead they engage in its construction, sometimes based on the features of stimuli and sometimes based on their experiences in a given environment. 41

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Unit: III Theories of Psychology In this unit, you will learn about, •

An Overview of Child Development Theories • Development Channels • Child Development Stages Vs. Continuous Development • Development Stages and Milestones of Child Development • Sensitive Periods in Child Development • Major Child Development Theories and Theorists ◦ Sigmund Freud- Psychoanalytic Theory ◦ Jean Piaget- Theory of Cognitive Development ◦ Lev Vygotsky- Theory of Socio- Cognitive Development ◦ Erik Erikson- Theory of Social Development ◦ Lawrence Kohlberg- Theory of Moral Development ◦ John Bowlby- Attachment Theory ◦ B.F. Skinner- Behaviour Theory

An Overview of Child Development Theories When babies arrive in the world, they are tiny, helpless people who depend entirely on adults to take care of all their needs and wants. Somehow, with the proper loving nurturing and care over the next 22 years, they grow to become independent adults who can take care of themselves and others. The journey from infancy to adulthood is an amazing time when children soak up everything in the world around them and mix it with the qualities, they are born with in order to mature bit by bit, in every way. Over the years, people who study children have created theories to explain how children develop. While these theorists realize that every child is special and grow in his or her unique way, they also have recognized that there are general patterns children tend to follow as they grow up, and they have documented these patterns in their theories. This introductory document, which is the first in a series, which will cover child developmental theory and applications such as parenting skills, will attempt to explain these fascinating but detailed theories so as to make them more understandable. Specifically, this document will outline the various areas, or channels, of child development that have been recognized, to explain how children tend to develop through each of these channels over time, and to state in simple language the observations of the child development field's most important theorists. 43

Development Channels It is important to understand that children have to grow and develop in many different areas in order to become healthy, happy, productive members of adult society. There are four main areas or channels in which children grow: physical, psychological and cognitive, social and emotional, and sexuality and gender identity. First, the physical channel is most obvious. Children's bodies grow in height and weight over the years and change appearance during puberty. Children also develop certain physical abilities during their progression towards adulthood, including crawling, walking, running and (possibly) writing or shooting a basketball. Secondly, children also develop psychologically and cognitively as their brains absorb more information and they learn how to use that information. Literally, children have to learn how to think on purpose and to process or organize all the information that comes to them from the environment. They must learn how to solve problems, to talk, and to complete mental tasks such as remembering telephone numbers or using computers. Thirdly, children grow socially and emotionally. They learn how to interact, play, work, and live with other people such as family, friends, teachers, and employers. They learn how to understand both their own feelings and others' emotions. They also learn ways of dealing with strong emotions. In order to function well as independent adults, children must develop a sense of self-esteem as they go through the long process of figuring out what shape their identity, or who they are, will take. They develop a sense of morality as they learn the difference between right and wrong. Finally, children have to develop sexually and form a gender identity. This developmental channel is unique because it spans developments across the other physical, psychological, and social channels. Early on, children learn how their bodies work and look and what it means to be a boy or a girl; they learn how boys and girls are different. As they grow older and enter adolescence and puberty, they continue to learn how their bodies work sexually and how to responsibly handle their sexuality so as to balance their sexual desires and appropriate behavior. They continue to decide for themselves what it means to be masculine or feminine throughout their lifespan. Child Development Stages Vs. Continuous Development Different theorists have come to different conclusions concerning how exactly children develop across the various developmental channels. Some theorists believe that children develop smoothly and continuously, but other theorists believe that children develop more discretely in a series of stages, each of which is fairly stable. Theorists who believe children grow continuously believe that kids constantly add new lessons and skills on top of old lessons and skills as they get older. They believe that children grow at a steady, uniform speed. Even though parents can't see it with their eyes, children are growing all the time right in front of them. Their bodies make new cells. Their minds learn new skills as they play and interact with other people every day. On the other hand, theorists who believe children do not grow continuously believe children grow in stages as they seem to develop chunks of abilities and to experience events at certain times in life. To some parents, it may seem that their children learn to do things all of the sudden, like when a baby goes from only being able to crawl to being able to toddle around on two feet almost over night. Or, parents of young teenagers may say that they were amazed how their children went from thinking that kids of the 44

opposite sex had "cooties" to constantly daydreaming about them. It seems as if these kids are growing lots in spurts at special times and then are not growing so fast for a while in between the spurts. Both camps, continuous development and staged development, are correct in its own way, of course. While it is true that development is a continuous process that never stops, it is also true that there are stages to growth and that developments unfold at predictable times across the life span. The real difference between the two camps is likely the degree of magnification that each applies to its study, with the stage theorists taking a more distant but broader stance and the continuous theorists viewing things from up close. This document and the following documents in this series will present child development as though it happens in stages. By thinking about stages, child development can be summarized in general groupings that can be more easily understood. Development Stages and Milestones of Child Development Often, developmental stages are defined by milestones. A milestone is a sort of marker that tells you where you are while traveling. The term is drawn from literal stone markers that were used to mark the passage of each mile on early roads. Today, the term milestone is used more figuratively, to indicate that a developmental stage has been achieved. Often, special milestones mark children's accomplishments, such as walking in infancy and entering school in early childhood, and these milestones can help mark children's movement inside and between developmental stages. Children build new skills and developments on top of old skills and developments from stage to stage; each stage is cumulative. A child is able to run bases in a game of baseball in the middle childhood phase because she was first able to walk near the end of her infancy stage. Entry and exit from the various developmental stages tends to occur at particular ages. Often, a child's stage of development can be figured out by a child's age because children generally experience the same stages at the same ages. However, a child's age only provides a clue as to his stage; it does not determine it. Every child develops at his or her own speed. It is the tasks and skills children master that truly identify what stage they are in. Because of this, different children of the same age can be expected to be at different developmental stages. Children's development does not happen uniformly, but rather, it progresses along at its own rate. Just because one child is potty trained at age three and his neighbor is potty trained at age three and a half does not mean that one is brighter than the other. Furthermore, children can develop the different channels at different rates. For example, a twelve-year-old's body may have already gone through puberty and look like an adolescence's body, but that child may not have the cognitive and social abilities of an adolescent quite yet. It will take a little longer for their mind to catch up with her body. Keep this lack of developmental sameness in mind as you read the documents in this series. Whenever a document suggests ages that children reach specific milestones, keep in mind that these are general average ages that research has found children develop these skills. In reality, children reach milestones across a wide range of ages. Sometimes children will appear to even skip an entire developmental stage in some channels as they advance quickly in a short amount of time. Also keep in mind that there are some situations in which children become severely inhibited and unable to reach certain milestones within an acceptable time frame. Developmental delays in a child's functioning caused by disease, injury, mental disability, problems developing in the womb, environmental reasons, trauma or unknown causes can keep some children from developing properly or can even cause children to regress and go backward into some stages in some channels. 45

Sensitive Periods in Child Development In order to understand how children, move between stages, it's important to understand how children take in stimuli from the environment and use it to grow. Most theorists agree that there are periods in children's lives in which they become biologically mature enough to gain certain skills that they could not have easily picked up prior to that maturation. For example, research has shown that babies and toddlers' brains are more flexible with regard to learning to understand and use language than are older children's brains. Children are ready and open to develop certain things during specific stages; however, it doesn't just happen. Instead, they need proper environmental stimuli to develop these abilities. For example, babies have the ability to grow in length and weight in amazing amounts during the first year, but if they're not fed and nurtured enough during that time, they will not have the tools and building blocks to grow and will not grow and thrive. This is why it's so important for parents and caregivers to understand how their children are growing in all ways and channels and to know what stimuli, or stuff, they need to give their children to help them thrive. From time to time children without any cognitive or physical problems at birth may not be able to develop certain milestones during the stage or time period they are most receptive. There may be an injury, illness, caregiver neglect or abuse, or a shortage of needs such as food or medical care, that make it difficult for a child to absorb all the basic building blocks and stimulation they need to gain certain abilities at certain times in life. When this occurs, affected children will generally have a harder time gaining those abilities even if they later get special attention and resources designed to help them compensate. It's like children have a window of opportunity when they are ready to grow in certain ways if they have the right stuff and tools in their environment. When that window closes, it will never be as easy to grow in those ways again. Theorists disagree about how important it is for children to have that special stimuli at each growing stage in order to reach their milestones. Some theorists call these times critical periods, but other theorists call them sensitive periods. The difference between critical periods and sensitive periods is subtle. Theorists who believe in critical periods believe that children who do not get special stimulation during their window of receptivity are going to be "stuck" forever and never gain the abilities they should have gained in that period. However, other theorists believe that those very sensitive times in a child's life are just sensitive periods. They agree that children who do not get the right nurturing at the right times to jumpstart their developmental potential are going to have problems later in life, but they do not think that this inability to develop is permanent. For example, infancy is the time when children first learn they can trust an adult or parent to take care of all their needs, keep them safe, and give them love. Some infants live in orphanages where there are far too many babies for the few nurses and staff members to take care of them. These children go through their first years with hardly any touch or affection that would teach them to trust and to show affection to caregivers. If these children are eventually adopted by a loving family later on in their childhood, they often have trouble adjusting to having an affectionate, loving parent. There have been many cases in which children who start out in that kind of orphanage environment never gain the ability to show affection and emotion toward family or even the ability to show remorse or compassion toward other people, no matter how loving and nurturing their adoptive family was being in their middle childhood and on. Such a child's ability to trust and love would have essentially become "stuck" in infancy, even though the rest of their body continued to grow. The question of whether the critical period idea or the sensitive period idea is more correct boils down to whether this stuckness can be overcome, in full or in part, in the child's later life. 46

Theorists who support sensitive periods believe that while it will be far more difficult for the child and the child's teachers and caregivers to learn what was not learned during the window of opportunity, these children can still develop the missing capacities and skills later that they did not develop earlier. While some children do seem to get stuck permanently, there is evidence to support the sensitive period idea as well. Some children born in the same understaffed orphanages who are later adopted do go on to learn to love, to trust, and to show affection to their family and friends. In these situations, the families have to have extreme patience and perseverance as they nurture these older children because they are not going to be able to learn that trust and love as fast and as easily as infants. However, it's also important to remember that critical or sensitive periods can also affect children in other ways than just neglect or deprivation. For example, there is a critical or sensitive period for language acquisition that occurs during infancy. Children begin learning how to understand and create language from the time they're born. They will absorb and copy the language they hear all around them during that critical or sensitive period early in life. However, for many different reasons, children, and adults, may leave their original home and move to a new country or region where people speak a different language. They will need to learn to understand and create the new language, even though they were not exposed to it during that early important period. However, while it will take more time and special tutoring, many children, and adults, can learn a new language proficiently later in life. (different parts of the brain are used for sensitive period learning, vs. later learning, but both can get the job done). Major Child Development Theories and Theorists Though many scientists and researchers have approached the study of child development over the last hundred or so years, only a few of the theories that have resulted have stood the test of time and have proven to be widely influential. Among this core group of theories are five that will serve as the basis for the documents in this series. These are: ? Freud's psychosexual stage theory ? Piaget's cognitive development stage theory ? Lev Vygotsky socio-cognitive development theory ? Erikson's psychosocial stage theory ? Kohlberg's moral understanding stage theory ? John Bowlby attachment theory ? B.F. Skinner behaviour theory 1. Sigmund Freud- Psychoanalytic Theory Sigmund Freud (1856 to 1939) was the founding father of psychoanalysis, a method for treating mental illness and also a theory which explains human behavior. Freud believed that events in our childhood have a great influence on our adult lives, shaping our personality. For example, anxiety originating from traumatic experiences in a person's past is hidden from consciousness and may cause problems during adulthood (in the form of neuroses). Thus, when we explain our behavior to ourselves or others (conscious mental activity), we rarely give a true account of our motivation. This is not because we are deliberately lying. While human beings are great deceivers of others; they are even more adept at self-deception. Freud's life work was dominated by his attempts to find ways of penetrating this often subtle and elaborate camouflage that obscures the hidden structure and processes of personality. 47

His lexicon has become embedded within the vocabulary of Western society. Words he introduced through his theories are now used by everyday people, such as anal (personality), libido, denial, repression, cathartic, Freudian slip, and neurotic. The Case of Anna O The case of Anna O (real name Bertha Pappenheim) marked a turning point in the career of a young Viennese neuropathologist by the name of Sigmund Freud. It even went on to influence the future direction of psychology as a whole. Anna O. suffered from hysteria, a condition in which the patient exhibits physical symptoms (e.g., paralysis, convulsions, hallucinations, loss of speech) without an apparent physical cause. Her doctor (and Freud's teacher) Josef Breuer succeeded in treating Anna by helping her to recall forgotten memories of traumatic events. During discussions with her, it became apparent that she had developed a fear of drinking when a dog she hated drank from her glass. Her other symptoms originated when caring for her sick father. She would not express her anxiety for her his illness but did express it later, during psychoanalysis. As soon as she had the opportunity to make these unconscious thoughts conscious her paralysis disappeared. Breuer discussed the case with his friend Freud. Out of these discussions came the germ of an idea that Freud was to pursue for the rest of his life. In Studies in Hysteria (1895) Freud proposed that physical symptoms are often the surface manifestations of deeply repressed conflicts. However, Freud was not just advancing an explanation of a particular illness. Implicitly he was proposing a revolutionary new theory of the human psyche itself. This theory emerged "bit by bit" as a result of Freud's clinical investigations, and it led him to propose that there were at least three levels of the mind. The Unconscious Mind Freud (1900, 1905) developed a topographical model of the mind, whereby he described the features of the mind's structure and function. Freud used the analogy of an iceberg to describe the three levels of the mind. 48

On the surface is consciousness, which consists of those thoughts that are the focus of our attention now, and this is seen as the tip of the iceberg. The preconscious consists of all which can be retrieved from memory. The third and most significant region is the unconscious. Here lie the processes that are the real cause of most behavior. Like an iceberg, the most important part of the mind is the part you cannot see. The unconscious mind acts as a repository, a 'cauldron' of primitive wishes and impulse kept at bay and mediated by the preconscious area. For example, Freud (1915) found that some events and desires were often too frightening or painful for his patients to acknowledge and believed such information was locked away in the unconscious mind. This can happen through the process of repression. Sigmund Freud emphasized the importance of the unconscious mind, and a primary assumption of Freudian theory is that the unconscious mind governs behavior to a greater degree than people suspect. Indeed, the goal of psychoanalysis is to make the unconscious conscious. The Psyche Freud (1923) later developed a more structural model of the mind comprising the entities id, ego, and superego (what Freud called "the psychic apparatus"). These are not physical areas within the brain, but rather hypothetical conceptualizations of important mental functions. The id, ego, and superego have most commonly been conceptualized as three essential parts of the human personality. Freud assumed the id operated at an unconscious level according to the pleasure principle (gratification from satisfying basic instincts). The id comprises two kinds of biological instincts (or drives) which Freud called Eros and Thanatos. Eros, or life instinct, helps the individual to survive; it directs life-sustaining activities such as respiration, eating, and sex (Freud, 1925). The energy created by the life instincts is known as libido. In contrast, Thanatos or death instinct, is viewed as a set of destructive forces present in all human beings (Freud, 1920). When this energy is directed outward on to others, it is expressed as aggression and violence. Freud believed that Eros is stronger than Thanatos, thus enabling people to survive rather than self-destruct. 49

The ego develops from the id during infancy. The ego's goal is to satisfy the demands of the id in a safe a socially acceptable way. In contrast to the id, the ego follows the reality principle as it operates in both the conscious and unconscious mind. The superego develops during early childhood (when the child identifies with the same sex parent) and is responsible for ensuring moral standards are followed. The super ego operates on the morality principle and motivates us to behave in a socially responsible and acceptable manner. The basic dilemma of all human existence is that each element of the psychic apparatus makes demands upon us that are incompatible with the other two. Inner conflict is inevitable. For example, the superego can make a person feel guilty if rules are not followed. When there is a conflict between the goals of the id and superego, the ego must act as a referee and mediate this conflict. The ego can deploy various defense mechanisms (Freud, 1894, 1896) to prevent it from becoming overwhelmed by anxiety. Defense Mechanisms Mechanism Description Example Repression Repression is an unconscious mechanism employed by the ego to keep disturbing or threatening thoughts from becoming conscious. During the Oedipus complex aggressive thoughts about the same sex parents are repressed. Denial Denial involves blocking external events from awareness. If some situation is just too much to handle, the person just refuses to experience it. For example, smokers may refuse to admit to themselves that smoking is bad for their health. Projection This involves individuals attributing their own unacceptable thoughts, feelings and motives to another person.

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You might hate someone, but your superego tells you that

such hatred is unacceptable. You can 'solve' the problem by believing that they hate you. Displacement Satisfying an impulse (e.g. aggression) with a substitute object. Someone who is frustrated by his or her boss at work may go home and kick the dog. Regression This is a movement back in psychological time when one is faced with stress. A child may begin to suck their thumb again or wet the bed when they need to spend some time in the hospital. Sublimation Satisfying an impulse (e.g. aggression) with a substitute object. In a socially acceptable way. Sport is an example of putting our emotions (e.g. aggression) into something constructive. 50

Psychosexual Stages In the highly repressive "Victorian" society in which Freud lived and worked women, in particular, were forced to repress their sexual needs. In many cases, the result was some form of neurotic illness. Freud sought to understand the nature and variety of these illnesses by retracing the sexual history of his patients. This was not primarily an investigation of sexual experiences as such. Far more important were the patient's wishes and desires, their experience of love, hate, shame, guilt and fear – and how they handled these powerful emotions. It was this that led to the most controversial part of Freud's work – his theory of psychosexual development and the Oedipus complex. Freud believed that children are born with a libido – a sexual (pleasure) urge. There are a number of stages of childhood, during which the child seeks pleasure from a different 'object'. To be psychologically healthy, we must successfully complete each stage. Mental abnormality can occur if a stage is not completed successfully and the person becomes 'fixated' in a particular stage. This particular theory shows how adult personality is determined by childhood experiences. 51

Dream Analysis Freud (1900) considered dreams to be the royal road to the unconscious as it is in dreams that the ego's defenses are lowered so that some of the repressed material comes through to awareness, albeit in distorted form. Dreams perform important functions for the unconscious mind and serve as valuable clues to how the unconscious mind operates. On 24 July 1895, Freud had his own dream that was to form the basis of his theory. He had been worried about a patient, Irma, who was not doing as well in treatment as he had hoped. Freud, in fact, blamed himself for this, and was feeling guilty. Freud dreamed that he met Irma at a party and examined her. He then saw a chemical formula for a drug that another doctor had given Irma flash before his eyes and realized that her condition was caused by a dirty syringe used by the other doctor. Freud's guilt was thus relieved. Freud interpreted this dream as wish-fulfilment. He had wished that Irma's poor condition was not his fault and the dream had fulfilled this wish by informing him that another doctor was at fault. Based on this dream, Freud (1900) went on to propose that a major function of dreams was the fulfilment of wishes. Freud distinguished between the manifest content of a dream (what the dreamer remembers) and the latent content, the symbolic meaning of the dream (i.e., the underlying wish). The manifest content is often based on the events of the day. The process whereby the underlying wish is translated into the manifest content is called dream-work. The purpose of dream work is to transform the forbidden wish into a non-threatening form, thus reducing anxiety and allowing us to continue sleeping. Dream work involves the process of condensation, displacement, and secondary elaboration. The process of condensation is the joining of two or more ideas/images into one. For example, a dream about a man may be a dream about both one's father and one's lover. A dream about a house might be the condensation of worries about security as well as worries about one's appearance to the rest of the world. Displacement takes place when we transform the person or object, we are really concerned about to someone else. For example, one of Freud's patients was extremely resentful of his sister-in-law and used to refer to her as a dog, dreamed of strangling a small white dog. 52

Freud interpreted this as representing his wish to kill his sister-in-law. If the patient would have really dreamed of killing his sister-in-law, he would have felt guilty. The unconscious mind transformed her into a dog to protect him. Secondary elaboration occurs when the unconscious mind strings together wish-fulfilling images in a logical order of events, further obscuring the latent content. According to Freud, this is why the manifest content of dreams can be in the form of believable events. In Freud's later work on dreams, he explored the possibility of universal symbols in dreams. Some of these were sexual in nature, including poles, guns, and swords representing the penis and horse riding and dancing representing sexual intercourse. However, Freud was cautious about symbols and stated that general symbols are more personal rather than universal. A person cannot interpret what the manifest content of a dream symbolized without knowing about the person's circumstances. 'Dream dictionaries', which are still popular now, were a source of irritation to Freud. In an amusing example of the limitations of universal symbols, one of Freud's patients, after dreaming about holding a wriggling fish, said to him 'that's a Freudian symbol - it must be a penis! Freud explored further, and it turned out that the woman's mother, who was a passionate astrologer and a Pisces, was on the patient's mind because she disapproved of her daughter being in analysis. It seems more plausible, as Freud suggested, that the fish represented the patient's mother rather than a penis! 2. Jean

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Piaget- Theory of Cognitive Development Piaget's (1936) theory of cognitive development

explains how a child constructs a mental model of the world. He disagreed with the idea that intelligence was a fixed trait and regarded cognitive development as a process which occurs due to biological maturation and interaction with the environment. Piaget was employed at the Binet Institute in the 1920s, where his job was to develop French versions of questions on English intelligence tests. He became intrigued with the reasons, children gave for their wrong answers to the questions that required logical thinking. He believed that these incorrect answers revealed important differences between the thinking of adults and children. Piaget (1936) was the first psychologist to make a systematic study of cognitive development. His contributions include a

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stage theory of child cognitive development, detailed observational studies of cognition in children, and a series of simple but ingenious tests to reveal different cognitive abilities.

What Piaget wanted to do was not to measure how well children could count, spell or solve problems as a way of grading their I.Q. What he was more interested in was the way in which fundamental concepts like the very idea of number, time, quantity, causality, justice and so on emerged. Before Piaget's work, the common assumption in psychology was that children are merely less competent thinkers than adults. Piaget showed that young children think in strikingly different ways compared to adults. According to Piaget, children are born with a very basic mental structure (genetically inherited and evolved) on which all subsequent learning and knowledge are based. Piaget's Theory Differs from Others in Several Ways: ? It is concerned with children, rather than all learners. ? It focuses on development, rather than learning per se, so it does not address learning of information or specific behaviors. 53

? It proposes discrete stages of development, marked by qualitative differences, rather than a gradual increase in number and complexity of behaviors, concepts, ideas, etc. The goal of the theory is to explain the mechanisms and processes by which the infant, and then the child, develops into an individual who can reason and think using hypotheses. To Piaget, cognitive development was a progressive reorganization of mental processes as a result of biological maturation and environmental experience. Children construct an understanding of the world around them, then experience discrepancies between what they already know and what they discover in their environment. There are Three Basic Components to Piaget's Cognitive Theory: ? sensorimotor, ? preoperational, ? concrete operational, ? formal operational. Schemas Imagine what it would be like if you did not have a mental model of your world. It would mean that you would not be able to make so much use of information from your past experience or to plan future actions. Schemas are the basic building blocks of such cognitive models and enable us to form a mental representation of the world. Piaget defined a schema as: "a cohesive, repeatable action sequence possessing component actions that are tightly interconnected and governed by a core meaning." In more simple terms Piaget called the schema the basic building block of intelligent behavior – a way of organizing knowledge. Indeed, it is useful to think of schemas as "units" of knowledge, each relating to one aspect of the world, including objects, actions, and abstract (i.e., theoretical) concepts. Wadsworth (2004) suggests that schemata (the plural of schema) be thought of as 'index cards' filed in the brain, each one telling an individual how to react to incoming stimuli or information. When Piaget talked about the development of a person's mental processes, he was referring to increases in the number and complexity of the schemata that a person had learned. When a child's existing schemas are capable of explaining what it can perceive around it, itis said to be in a state of equilibrium, i.e., a state of cognitive (i.e., mental) balance. Piaget emphasized the importance of schemas in cognitive development and described how they were developed or acquired. A schema can be defined as

a set of linked mental representations of the world, which we use both to understand and to respond to situations. The

assumption is that we store these mental representations and apply them when needed. For example, a person might have a schema about buying a meal in a restaurant. The schema is a stored form of the pattern of behavior which includes looking at a menu, ordering food, eating it and paying the bill. This is an example of a type of schema called a 'script.' Whenever they are in a restaurant, they retrieve this schema from memory and apply it to the situation. The schemas Piaget described tend to be simpler than this - especially those used by infants. He described how - as a child gets older - his or her schemas become more numerous and elaborate. Piaget believed that new born babies have a small number of innate schemas - even before they have had many opportunities to experience the world. These neonatal schemas are the cognitive structures underlying innate reflexes. These reflexes are genetically programmed into us. 54

For example, babies have a sucking reflex, which is triggered by something touching the baby's lips. A baby will suck a nipple, a comforter (dummy), or a person's finger. Piaget, therefore, assumed that the baby has a 'sucking schema.' Similarly, the grasping reflex which is elicited when something touches the palm of a baby's hand, or the rooting reflex, in which a baby will turn its head towards something which touches its cheek, are innate schemas. Shaking a rattle would be the combination of two schemas, grasping and shaking. Assimilation and Accommodation Jean Piaget (1952; see also Wadsworth, 2004) viewed intellectual growth as a process of adaptation (adjustment) to the world. This happens through: Assimilation: Which is using an existing schema to deal with a new object or situation. Accommodation: This happens when the existing schema (knowledge) does not work and needs to be changed to deal with a new object or situation. Equilibration: This is the force which moves development along. Piaget believed that cognitive development did not progress at a steady rate, but rather in leaps and bounds. Equilibrium occurs when a child's schemas can deal with most new information through assimilation. However, an unpleasant state of disequilibrium occurs when new information cannot be fitted into existing schemas (assimilation). Equilibration is the force which drives the learning process as we do not like to be frustrated and will seek to restore balance by mastering the new challenge(accommodation). Once the new information is acquired the process of assimilation with the new schema will continue until the next time, we need to make an adjustment to it. Example of Assimilation A 2-year-old child sees a man who is bald on top of his head and has long frizzy hair on the sides. To his father's horror, the toddler shouts "Clown, clown" (Siegler et al., 2003). Example of Accommodation In the "clown" incident, the boy's father explained to his son that the man was not a clown and that even though his hair was like a clown's, he wasn't wearing a funny costume and wasn't doing silly things to make people laugh. With this new knowledge, the boy was able to change his schema of "clown" and make this idea fit better to a standard concept of "clown". 55

Stages of Development Piaget proposed four stages of cognitive development which reflect the increasing sophistication of children's thought: 1. Sensorimotor stage (birth to age 2) 2. Pre-operational stage (from age 2 to age 7) 3. Concrete operational stage (from age 7 to age 11) 4. Formal operational stage (age 11+ - adolescence and adulthood). Each child goes through the stages in the same order, and child development is determined by biological maturation and interaction with the environment. Although no stage can be missed out, there are individual differences in the rate at which children progress through stages, and some individuals may never attain the later stages. Piaget did not claim that a particular stage was reached at a certain age – although descriptions of the stages often include an indication of the age at which the average child would reach each stage. Sensorimotor Stage (Birth-2 yrs) The main achievement during

i.e., a schema) of the object. Preoperational Stage (2-7 years) During this stage,

stand for something other than itself. Thinking is still egocentric, and the infant has difficulty taking the viewpoint of others. Concrete Operational Stage (7-11 years) Piaget considered the concrete stage a major turning point in the child's cognitive development because it marks the beginning of logical or operational thought. 56

This means the child can work things out internally in their head (rather than physically try things out in the real world). Children can conserve number (age 6), mass (age 7), and weight (age 9). Conservation is the understanding that something stays the same in quantity even though its appearance changes. Formal Operational Stage (11 years and over)

and logically test hypotheses. 3. Lev Vygotsky- Theory of Socio- Cognitive Development The work of Lev Vygotsky (1934) has become the foundation of much research and theory in cognitive development over the past several decades, particularly of what has become known as Social Development Theory. Vygotsky's theories stress the fundamental role of social interaction in the development of cognition (Vygotsky, 1978), as he believed strongly that community plays a central role in the process of "making meaning." Unlike Piaget's notion that children's development must necessarily precede their learning, Vygotsky argued, "learning is a necessary and universal aspect of the process of developing culturally organized, specifically human psychological function". In other words, social learning tends to precede (i.e., come before) development. Vygotsky has developed a sociocultural approach to cognitive development. He developed his theories at around the same time as Jean Piaget was starting to develop his ideas (1920's and 30's), but he died at the age of 38, and so his theories are incomplete -although some of his writings are still being translated from Russian. No single principle (such as Piaget's equilibration) can account for development. Individual development cannot be understood without reference to the social and cultural context within which it is embedded. Higher mental processes in the individual have their origin in social processes. Vygotsky's theory differs from that of Piaget in a number of important ways: 1: Vygotsky places more emphasis on culture affecting cognitive development. This contradicts Piaget's view of universal stages and content of development (Vygotsky does not refer to stages in the way that Piaget does). Hence Vygotsky assumes cognitive development varies across cultures, whereas Piaget states cognitive development is mostly universal across cultures. 2: Vygotsky places considerably more emphasis on social factors contributing to cognitive development. i. Vygotsky states cognitive development stems from social interactions from guided learning within the zone of proximal development as children and their partner's co-construct knowledge. In contrast, Piaget maintains that cognitive development stems largely from independent explorations in which children construct knowledge of their own. ii. For Vygotsky, the environment in which children grow up will influence how they think and what they think about. 57

3: Vygotsky places more (and different) emphasis on the role of language incognitive development. According to Piaget, language depends on thought for its development (i.e., thought comes before language). For Vygotsky, thought and language are initially separate systems from the beginning of life, merging at around three years of age, producing verbal thought (inner speech). For Vygotsky, cognitive development results from an internalization of language. 4: According to Vygotsky adults are an important source of cognitive development. Adults transmit their culture's tools of intellectual adaptation that children internalize. In contrast, Piaget emphasizes the importance of peers as peer interaction promotes social perspective taking. Effects of Culture: - Tools of intellectual adaptation Like Piaget,

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Vygotsky claimed that infants are born with the basic materials/abilities for intellectual development -

Piaget focuses on motor reflexes and sensory abilities. Lev Vygotsky refers to 'elementary mental functions' – ? Attention ? Sensation ? Perception ? Memory Eventually, through interaction within the sociocultural environment, these are developed into more sophisticated and effective mental processes/strategies which he refers to as 'higher mental functions.' For example, memory in young children this is limited by biological factors. However, culture determines the type of memory strategy we develop. E.g., in our culture, we learn note-taking to aid memory, but in pre-literate societies, other strategies must be developed, such as tying knots in a string to remember, or carrying pebbles, or repetition of the names of ancestors until large numbers can be repeated. Vygotsky refers to tools of intellectual adaptation - these allow children to use the basic mental functions more effectively/adaptively, and these are culturally determined (e.g., memory mnemonics, mind maps). Vygotsky, therefore, sees cognitive functions, even those carried out alone, as affected by the beliefs, values, and tools of intellectual adaptation of the culture in which a person develops and therefore socio-culturally determined. The tools of intellectual adaptation, therefore, vary from culture to culture - as in the memory example. Social Influences on Cognitive Development Like Piaget, Vygotsky believes that young children are curious and actively involved in their own learning and the discovery and development of new understandings/schema. However, Vygotsky placed more emphasis on social contributions to the process of development, whereas Piaget emphasized self-initiated discovery. According to Vygotsky (1978), much important learning by the child occurs through social interaction with a skilful tutor. The tutor may model behaviors and/or provide verbal instructions for the child. Vygotsky refers to this as cooperative or collaborative dialogue. The child seeks to understand the actions or instructions provided by the tutor (often the parent or teacher) then internalizes the information, using it to guide or regulate their own performance. 58

Shaffer (1996) gives the example of a young girl who is given her first jigsaw. Alone, she performs poorly in attempting to solve the puzzle. The father then sits with her and describes or demonstrates some basic strategies, such as finding all the corner/edge pieces and provides a couple of pieces for the child to put together herself and offers encouragement when she does so. As the child becomes more competent, the father allows the child to work more independently. According to Vygotsky, this type of social interaction involving cooperative or collaborative dialogue promotes cognitive development. In order to gain an understanding of Vygotsky's theories on cognitive development, one must understand two of the main principles of Vygotsky's work: The More Knowledgeable Other (MKO) and the Zone of Proximal Development (ZPD). More Knowledgeable Other The more knowledgeable other (MKO) is somewhat self-explanatory; it refers to someone who has a better understanding or a higher ability level than the learner, with respect to a particular task, process, or concept. Although the implication is that the MKO is a teacher or an older adult, this is not necessarily the case. Many times, a child's peers or an adult's children may be the individuals with more knowledge or experience. For example, who is more likely to know more about the newest teenage music groups, how to win at the most recent PlayStation game, or how to correctly perform the newest dance craze - a child or their parents? In fact, the MKO need not be a person at all. Some companies, to support employees in their learning process, are now using electronic performance support systems. Electronic tutors have also been used in educational settings to facilitate and guide students through the learning process. The key to MKOs is that they must have (or be programmed with) more knowledge about the topic being learned than the learner does. Zone of Proximal Development The concept of the More Knowledgeable Other is integrally related to the second important principle of Vygotsky's work, the Zone of Proximal Development. This is an important concept that relates to the difference between what a child can achieve independently and what a child can achieve with guidance and encouragement from as killed partner. 59

For example, the child could not solve the jigsaw puzzle (in the example above) by itself and would have taken a long time to do so (if at all) but was able to solve it following interaction with the father and has developed competence at this skill that will be applied to future jigsaws. Vygotsky (1978) sees the Zone of Proximal Development as the area where the most sensitive instruction or guidance should be given - allowing the child to develop skills they will then use on their own - developing higher mental functions. Vygotsky also views interaction with peers as an effective way of developing skills and strategies. He suggests that teachers use cooperative learning exercises where less competent children develop with help from more skilful peers - within the zone of proximal development. Evidence for Vygotsky and the ZPD Freund (1990) conducted a study in which children had to decide which items of furniture should be placed in particular areas of a dolls house. Some children were allowed to play with their mother in a similar situation before they attempted it alone (zone of proximal development) while others were allowed to work on this by themselves (Piaget's discovery learning). Freund found that those who had previously worked with their mother (ZPD) showed the greatest improvement compared with their first attempt at the task. The conclusion being that guided learning within the ZPD led to greater understanding/performance than working alone (discovery learning). Vygotsky and Language Vygotsky believed that language develops from social interactions, for communication purposes. Vygotsky viewed language as man's greatest tool, a means for communicating with the outside world. According to Vygotsky (1962) language plays two critical roles in cognitive development: 1: It is the main means by which adults transmit information to children. 2: Language itself becomes a very powerful tool of intellectual adaptation. 60

Vygotsky (1987) differentiates between three forms of language: social speech which is external communication used to talk to others (typical from the age of two); private speech(typical from the age of three) which is directed to the self and serves an intellectual function; and finally private speech goes underground, diminishing in audibility as it takes on a self-regulating function and is transformed into silent inner speech (typical from the age of seven). For Vygotsky, thought and language are initially separate systems from the beginning of life, merging at around three years of age. At this point speech and thought become interdependent: thought becomes verbal, speech becomes representational. When this happens, children's monologues internalized to become inner speech. The internalization of language is important as it drives cognitive development. 'Inner speech is not the interior aspect of external speech - it is a function in itself. It still remains speech, i.e., thought connected with words. But while in external speech thought is embodied in words, in inner speech words dies as they bring forth thought. Inner speech is to a large extent thinking in pure meanings. Vygotsky (1987) was the first psychologist to document the importance of private speech. He considered private speech as the transition point between social and inner speech, the moment in development where language and thought unite to constitute verbal thinking. Thus, private speech, in Vygotsky's view, was the earliest manifestation of inner speech. Indeed, private speech is more similar (in its form and function) to inner speech than social speech. Private speech is 'typically defined, in contrast to social speech, as speech addressed to the self (not to others) for the purpose of self-regulation (rather than communication).' Unlike inner speech which is covert (i.e., hidden), private speech is overt. In contrast to Piaget's (1959) notion of private speech representing a developmental dead-end, Vygotsky (1934, 1987) viewed private speech as: 'A revolution in development which is triggered when preverbal thought and pre intellectual language come together to create fundamentally new forms of mental functioning.' In addition to disagreeing on the functional significance of private speech, Vygotsky and Piaget also offered opposing views on the developmental course of private speech and the environmental circumstances in which it occurs most often (Berk & Garvin, 1984). Theoretical Predictions Piaget Vygotsky Developmental significance of private speech Represents an inability to take the perspective of another and therefore to engage in truly relational and reciprocal communication. Represents externalized thought: its function is to communicate with the self for the purpose of self-guidance and self-direction. Course of development Declines monotonically with age. Curvilinear, increasing at the younger ages but gradually decreasing as it loses its audible quality and becomes internal thought. Relationship to social speech Negative: is eventually replaced by social speech. Positive at the younger ages. Influence of environmental contexts: Task difficulty Increases with task difficulty: the greater effort needed to reach a solution necessitates the action regulating the role of private speech. 61

Through private speech, children begin to collaborate with themselves in the same way a more knowledgeable other (e.g., adults) collaborate with them in the achievement of a given function. Vygotsky sees "private speech" as a means for children to plan activities and strategies and therefore aid their development. Private speech is the use of language for self-regulation of behavior. Language is, therefore, an accelerator to thinking/understanding (Jerome Bruner also views language in this way). Vygotsky believed that children who engaged in large amounts of private speech are more socially competent than children who do not use it extensively. Vygotsky (1987) notes that private speech does not merely accompany a child's activity but acts as a tool used by the developing child to facilitate cognitive processes, such as overcoming task obstacles, enhancing imagination, thinking, and conscious awareness. Children use private speech most often during intermediate difficulty tasks because they are attempting to self-regulate by verbally planning and organizing their thoughts (Winsler al., 2007). The frequency and content of private speech are then correlated with behavior or performance. For example, private speech appears to be functionally related to cognitive performance: It appears at times of difficulty with a task. For example, tasks related to executive function (Fernyhough & Fradley, 2005), problem-solving tasks (Behrend et al., 1992), schoolwork in both language (Berk & Landau, 1993), and mathematics (Ostad & Sorensen, 2007). Berk (1986) provided empirical support for the notion of private speech. She found that most private speech exhibited by children serves to describe or guide the child's actions. Berk also discovered than child engaged in private speech more often when working alone on challenging tasks and also when their teacher was not immediately available to help them. Furthermore, Berk also found that private speech develops similarly in all children regardless of cultural background. Vygotsky (1987) proposed that private speech is a product of an individual's social environment. This hypothesis is supported by the fact that there exist high positive correlations between rates of social interaction and private speech in children. Children raised in cognitively and linguistically stimulating environments (situations more frequently observed in higher socioeconomic status families) start using and internalizing private speech faster than children from less privileged backgrounds. Indeed, children raised in environments characterized by low verbal and social exchanges exhibit delays in private speech development. Children's use of private speech diminishes as they grow older and follows a curvilinear trend. This is due to changes in ontogenetic development whereby children are able to internalize language (through inner speech) in order to self-regulate their behavior (Vygotsky, 1987). For example, research has shown that children's private speech usually peaks at 3–4 years of age, decreases at 6–7 years of age, and gradually fades out to be mostly internalized by age 10 (Diaz, 1992). Vygotsky proposed that private speech diminishes and disappears with age not because it becomes socialized, as Piaget suggested, but rather because it goes underground to constitute inner speech or verbal thought" (Frauenglass & Diaz, 1985). 4. Erik Erikson- Theory of Social Development Erikson's (1959) theory of psychosocial development has eight distinct stages, taking in five stages up to the age of 18 years and three further stages beyond, well into adulthood. Like Freud and many others, Erik Erikson maintained that personality develops in a predetermined order, and builds upon each previous stage. This is called the epigenetic principle. 62

During each stage, the person experiences a psychosocial crisis which could have a positive or negative outcome for personality development. For Erikson (1963), these crises are of a psychosocial nature because they involve psychological needs of the individual (i.e. psycho) conflicting with the needs of society (i.e. social). According to the theory, successful completion of each stage results in a healthy personality and the acquisition of basic virtues. Basic virtues are characteristic strengths which the ego can use to resolve subsequent crises. Failure to successfully complete a stage can result in a reduced ability to complete further stages and therefore an unhealthier personality and sense of self. These stages, however, can be resolved successfully at a later time. Stage Psychosocial Crisis Basic Virtue Age 1.

48%	**MATCHING BLOCK 13/54**	**SA**	submission.docx (D118456479)

Trust vs. Mistrust Hope 0 - 1½ 2. Autonomy vs. Shame Will 1½ - 3 3. Initiative vs. Guilt Purpose 3 - 5 4. Industry vs. Inferiority Competency 5 - 12 5. Identity vs. Role Confusion Fidelity 12 - 18 6. Intimacy vs. Isolation Love 18-40 7. Generativity vs. Stagnation Care 40-65 8. Ego Integrity vs. Despair

Wisdom 65+ 1. Trust vs. Mistrust Is the world a safe place or is it full of unpredictable events and accidents waiting to happen? Erikson's first psychosocial crisis occurs during the first year or so of life (like Freud's oral stage of psychosexual development). The crisis is one of trust vs. mistrust. During this stage, the infant is uncertain about the world in which they live. To resolve these feelings of uncertainty, the infant looks towards their primary caregiver for stability and consistency of care. If the care the infant receives is consistent, predictable and reliable, they will develop a sense of trust which will carry with them to other relationships, and they will be able to feel secure even when threatened. 63

Success in this stage will lead to the virtue of hope. By developing a sense of trust, the infant can have hope that as new crises arise, there is a real possibility that other people will be there as a source of support. Failing to acquire the virtue of hope will lead to the development of fear. For example, if the care has been harsh or inconsistent, unpredictable and unreliable, then the infant will develop a sense of mistrust and will not have confidence in the world around them or in their abilities to influence events. This infant will carry the basic sense of mistrust with them to other relationships. It may result in anxiety, heightened insecurities, and an over feeling of mistrust in the world around them. Consistent with Erikson's views on the importance of trust, research by Bowlby and Ainsworth has outlined how the quality of the early experience of attachment can affect relationships with others in later life. 2. Autonomy vs. Shame and Doubt Autonomy versus shame and doubt is the second stage of Erik Erikson's stages of psychosocial development. This stage occurs between the ages of 18 months to approximately 3 years. The child is developing physically and becoming more mobile, and discovering that he or she has many skills and abilities, such as putting on clothes and shoes, playing with toys, etc. Such skills illustrate the child's growing sense of independence and autonomy. For example, during this stage children begin to assert their independence, by walking away from their mother, picking which toy to play with, and making choices about what they like to wear, to eat, etc. Erikson states it is critical that parents allow their children to explore the limits of their abilities within an encouraging environment which is tolerant of failure. For example, rather than put on a child's clothes a supportive parent should have the patience to allow the child to try until they succeed or ask for assistance. So, the parents need to 64

encourage the child to become more independent while at the same time protecting the child so that constant failure is avoided. A delicate balance is required from the parent. They must try not to do everything for the child, but if the child fails at a particular task, they must not criticize the child for failures and accidents (particularly when toilet training). The aim has to be "self-control without a loss of self- esteem" (Gross, 1992). Success in this stage will lead to the virtue of will. If children in this stage are encouraged and supported in their increased independence, they become more confident and secure in their own ability to survive in the world. If children are criticized, overly controlled, or not given the opportunity to assert themselves, they begin to feel inadequate in their ability to survive, and may then become overly dependent upon others, lack self-esteem, and feel a sense of shame or doubt in their abilities. 3. Initiative vs. Guilt Initiative versus guilt is the third stage of Erik Erikson's theory of psychosocial development. During the initiative versus guilt stage, children assert themselves more frequently. These are particularly lively, rapid-developing years in a child's life. According to Bee (1992), it is a "time of vigor of action and of behaviors that the parents may see as aggressive." During this period the primary feature involves the child regularly interacting with other children at school. Central to this stage is play, as it provides children with the opportunity to explore their interpersonal skills through initiating activities. Children begin to plan activities, make up games, and initiate activities with others. If given this opportunity, children develop a sense of initiative and feel secure in their ability to lead others and make decisions. Conversely, if this tendency is squelched, either through criticism or control, children develop a sense of guilt. They may feel like a nuisance to others and will, therefore, remain followers, lacking in self-initiative. The child takes initiatives which the parents will often try to stop in order to protect the child. The child will often overstep the mark in his forcefulness, and the danger is that the parents will tend to punish the child and restrict his initiatives too much. 65

It is at this stage that the child will begin to ask many questions as his thirst for knowledge grows. If the parents treat the child's questions as trivial, a nuisance or embarrassing or other aspects of their behavior as threatening then the child may have feelings of guilt for "being a nuisance". Too much guilt can make the child slow to interact with others and may inhibit their creativity. Some guilt is, of course, necessary; otherwise the child would not know how to exercise self-control or have a conscience. A healthy balance between initiative and guilt is important. Success in this stage will lead to the virtue of purpose. 4. Industry vs. Inferiority Erikson's fourth psychosocial crisis, involving industry vs. inferiority occurs during childhood between the ages of five and twelve. Children are at the stage where they will be learning to read and write, to do sums, to do things on their own. Teachers begin to take an important role in the child's life as they teach the child specific skills. It is at this stage that the child's peer group will gain greater significance and will become a major source of the child's self-esteem. The child now feels the need to win approval by demonstrating specific competencies that are valued by society

If children are encouraged and reinforced for their initiative, they begin to feel industrious (competent) and feel confident in their ability to achieve goals. If this initiative is not encouraged, if it is restricted by parents or teacher, then the child begins to feel inferior, doubting his own abilities and therefore may not reach his or her potential. If the child cannot develop the specific skill, they feel society is demanding (e.g., being athletic) then they may develop a sense of inferiority. Some failure may be necessary so that the child can develop some modesty. Again, a balance between competence and modesty is necessary. Success in this stage will lead to the virtue of competence. 5. Identity vs. Role Confusion During adolescence, the transition from childhood to adulthood is most important. Children are becoming more independent, and begin to look at the

47%	**MATCHING BLOCK 15/54**	SA	Human Growth Development .docx (D164166915)

future in terms of career, relationships, families, housing, etc. The individual wants to belong to a society and fit in. The

fifth stage is identity vs. role confusion, and it occurs during adolescence, from about 12-18 years. During this stage, adolescents search for a sense of self and personal identity, through an intense exploration of personal values, beliefs, and goals. The adolescent mind is essentially a mind or moratorium, a psychosocial stage between childhood and adulthood, and between the morality learned by the child, and the ethics to be developed by the adult (Erikson, 1963). This is a major stage of development where the child has to learn the roles he will occupy as an adult. It is during this stage that

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the adolescent will re-examine his identity and try to find 66 out exactly who he or she is. Erikson suggests that two identities are

involved: the sexual and the occupational. According to Bee (1992), what should happen at the end of this stage is "a reintegrated sense of self, of what one wants to do or be, and of one's appropriate sex role". During this stage the body image of the adolescent changes. Erikson claims that the adolescent may feel uncomfortable about their body for a while until they can adapt and "grow into" the changes. Success in this stage will lead to the virtue of fidelity. Fidelity involves being able to commit one's self to others on the basis of accepting others, even when there may be ideological differences. During this period, they explore possibilities and begin to form their own identity based upon the outcome of their explorations. Failure to establish a sense of identity within society ("I don't know what I want to be when I grow up") can lead to role confusion. Role confusion involves the individual not being sure about themselves or their place in society. In response to role confusion or identity crisis, an adolescent may begin to experiment with different lifestyles (e.g., work, education or political activities). Also pressuring someone into an identity can result in rebellion in the form of establishing a negative identity, and in addition to this feeling of unhappiness. 6. Intimacy vs. Isolation Intimacy versus isolation is the sixth stage of Erik Erikson's theory of psychosocial development. This stage takes place during young adulthood between the ages of approximately 18 to 40 yrs. During this period, the major conflict centers on forming intimate, loving relationships with other people. During this period, we begin to share ourselves more intimately with others. We explore relationships leading toward longer-term commitments with someone other than a family member. Successful completion of this stage can result in happy relationships and a sense of commitment, safety, and care within a relationship. 67

Avoiding intimacy, fearing commitment and relationships can lead to isolation, loneliness, and sometimes depression. Success in this stage will lead to the virtue of love. 7. Generativity vs. Stagnation Generativity versus stagnation is the seventh of eight stages of Erik Erikson's theory of psychosocial development. This stage takes place during middle adulthood (ages 40 to 65 yrs). Generativity refers to "making your mark" on the world through creating or nurturing things that will outlast an individual. People experience a need to create or nurture things that will outlast them, often having mentees or creating positive changes that will benefit other people.

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We give back to society through raising our children, being productive at work, and

becoming involved in community activities and organizations. Through generativity we develop a sense of being a part of the bigger picture. Success leads to feelings of usefulness and accomplishment, while failure results in shallow involvement in the world. By failing to find a way to contribute, we become stagnant and feel unproductive. These individuals may feel disconnected or uninvolved with their community and with society as a whole. Success in this stage will lead to the virtue of care. 8. Ego Integrity vs. Despair Ego integrity versus despair is the eighth and final stage of Erik Erikson's stage theory of psychosocial development. This stage begins at approximately age 65 and ends at death. As we grow older (65+ yrs) and become senior citizens, we tend to slow down our productivity and explore life as a retired person. It is during this time that we contemplate our accomplishments and can develop integrity if we see ourselves as leading a successful life. Erikson described ego integrity as "the acceptance of one's one and only life cycle as something that had to be" (1950, p. 268) and later as "a sense of coherence and wholeness" (1982). Erik Erikson believed if we see our lives as unproductive, feel guilty about our past, or feel that we did not accomplish our life goals, we become dissatisfied with life and develop despair, often leading to depression and hopelessness. Success in this stage will lead to the virtue of wisdom. Wisdom enables a person to look back on their life with a sense of closure and completeness, and also accept death without fear. Wise people are not characterized by a continuous state of ego integrity, but they experience both ego integrity and despair. Thus, late life is characterized by both integrity and despair as alternating states that need to be balanced. 5. Lawrence Kohlberg- Theory of Moral Development Lawrence Kohlberg (1958) agreed with Piaget's (1932) theory of moral development in principle but wanted to develop his ideas further. 68

He used Piaget's storytelling technique to tell people stories involving moral dilemmas. In each case, he presented a choice to be considered, for example, between the rights of some authority and the needs of some deserving individual who is being unfairly treated. One of the best known of Kohlberg's (1958) stories concerns a man called Heinz who lived somewhere in Europe. Heinz's wife was dying from a particular type of cancer. Doctors said a new drug might save her. The drug had been discovered by a local chemist, and the Heinz tried desperately to buy some, but the chemist was charging ten times the money it cost to make the drug, and this was much more than the Heinz could afford. Heinz could only raise half the money, even after help from family and friends. He explained to the chemist that his wife was dying and asked if he could have the drug cheaper or pay the rest of the money later. The chemist refused, saying that he had discovered the drug and was going to make money from it. The husband was desperate to save his wife, so later that night he broke into the chemist's and stole the drug. Kohlberg asked a series of questions such as: 1. Should Heinz have stolen the drug? 2. Would it change anything if Heinz did not love his wife? 3. What if the person dying was a stranger, would it make any difference? 4. Should the police arrest the chemist for murder if the woman died? By studying the answers from children of different ages to these questions, Kohlberg hoped to discover how moral reasoning changed as people grew older. The sample comprised 72 Chicago boys aged 10–16 years, 58 of whom were followed up at three-yearly intervals for 20 years (Kohlberg, 1984). Each boy was given a 2-hour interview based on the ten dilemmas. What Kohlberg was mainly interested in was not whether the boys judged the action right or wrong, but the reasons given for the decision. He found that these reasons tended to change as the children got older. He identified three distinct levels of moral reasoning each with two sub-stages. People can only pass through these levels in the order listed. Each new stage replaces the reasoning typical of the earlier stage. Not everyone achieves all the stages. Level 1 - Pre-conventional morality At the pre-conventional level (most nine-year-olds and younger, some over nine), we don't have a personal code of morality. Instead, our moral code is shaped by the standards of adults and the consequences of following or breaking their rules. Authority is outside the individual and reasoning is based on the physical consequences of actions. • Stage 1. Obedience and Punishment Orientation. The child/individual is good in order to avoid being punished. If a person is punished, they must have done wrong. 69

• Stage 2. Individualism and Exchange. At this stage, children recognize that there is not just one right view that is handed down by the authorities. Different individuals have different viewpoints. Level 2 - Conventional morality At the conventional level (most adolescents and adults), we begin to internalize the moral standards of valued adult role models. Authority is internalized but not questioned, and reasoning is based on the norms of the group to which the person belongs. • Stage 3. Good Interpersonal Relationships. The child/individual is good in order to be seen as being a good person by others. Therefore, answers relate to the approval of others. • Stage 4. Maintaining the Social Order. The child/individual becomes aware of the wider rules of society, so judgments concern obeying the rules in order to uphold the law and to avoid guilt. Level 3 - Post-conventional morality Individual judgment is based on self-chosen principles, and moral reasoning is based on individual rights and justice. According to Kohlberg this level of moral reasoning is as far as most people get. Only 10-15% are capable of the kind of abstract thinking necessary for stage 5 or 6 (postconventional morality). That is to say, most people take their moral views from those around them and only a minority think through ethical principles for themselves. • Stage 5. Social Contract and Individual Rights. The child/individual becomes aware that while rules/laws might exist for the good of the greatest number, there are times when they will work against the interest of particular individuals. The issues are not always clear-cut. For example, in Heinz's dilemma, the protection of life is more important than breaking the law against stealing. • Stage 6. Universal Principles. People at this stage have developed their own set of moral guidelines which may or may not fit the law. The principles apply to everyone. E.g., human rights, justice, and equality. The person will be prepared to act to defend these principles even if it means going against the rest of society in the process and having to pay the consequences of disapproval and or imprisonment. Kohlberg doubted few people reached this stage. Problems with Kohlberg's Methods 1. The dilemmas are artificial (i.e., they lack ecological validity) Most of the dilemmas are unfamiliar to most people (Rosen, 1980). For example, it is all very well in the Heinz dilemma asking subjects whether Heinz should steal the drug to save his wife. 70

However, Kohlberg's subjects were aged between 10 and 16. They have never been married, and never been placed in a situation remotely like the one in the story. How should they know whether Heinz should steal the drug? 2. The sample is biased According to Gilligan (1977), because Kohlberg's theory was based on an all-male sample, the stages reflect a male definition of morality (it's androcentric). Mens' morality is based on abstract principles of law and justice, while womens' is based on principles of compassion and care. Further, the gender bias issue raised by Gilligan is a reminded of the significant gender debate still present in psychology, which when ignored, can have a large impact on the results obtained through psychological research. 3. The dilemmas are hypothetical (i.e., they are not real) In a real situation, what course of action a person takes will have real consequences – and sometimes very unpleasant ones for themselves. Would subjects reason in the same way if they were placed in a real situation? We just don't know. The fact that Kohlberg's theory is heavily dependent on an individual's response to an artificial dilemma brings a question to the validity of the results obtained through this research. People may respond very differently to real life situations that they find themselves in than they do with an artificial dilemma presented to them in the comfort of a research environment. 4. Poor research design The way in which Kohlberg carried out his research when constructing this theory may not have been the best way to test whether all children follow the same sequence of stage progression. His research was cross-sectional, meaning that he interviewed children of different ages to see what level of moral development they were at. A better way to see if all children follow the same order through the stages would have been to carry out longitudinal research on the same children. However, longitudinal research on Kohlberg's theory has since been carried out by Colby et al. (1983) who tested 58 male participants of Kohlberg's original study. She tested them six times in the span of 27 years and found support for Kohlberg's original conclusion, which we all pass through the stages of moral development in the same order. Problems with Kohlberg's Theory 1. Are there distinct stages of moral development? Kohlberg claims that there are, but the evidence does not always support this conclusion. For example, a person who justified a decision on the basis of principled reasoning in one situation (post-conventional morality stage 5 or 6) would frequently fall back on conventional reasoning (stage 3 or 4) with another story. In practice, it seems that reasoning about right and wrong depends more upon the situation than upon general rules. 71

What is more, individuals do not always progress through the stages and Rest (1979) found that one in fourteen actually slipped backward. The evidence for distinct stages of moral development looks very weak, and some would argue that behind the theory is a culturally biased belief in the superiority of American values over those of other cultures and societies. 2. Does moral judgment match moral behavior? Kohlberg never claimed that there would be a one to one correspondence between thinking and acting (what we say and what we do) but he does suggest that the two are linked. However, Bee (1994) suggests that we also need to take account of: a) habits that people have developed over time. b) whether people see situations as demanding their participation. c) the costs and benefits of behaving in a particular way. d) competing motive such as peer pressure, self-interest and so on. Overall Bee points out that moral behavior is only partly a question of moral reasoning. It is also to do with social factors. 3. Is justice the most fundamental moral principle? This is Kohlberg's view. However, Gilligan (1977) suggests that the principle of caring for others is equally important. Furthermore, Kohlberg claims that the moral reasoning of males has been often in advance of that of females. Girls are often found to be at stage 3 in Kohlberg's system (good boy-nice girl orientation) whereas boys are more often found to be at stage 4 (Law and Order orientation). Gilligan replies: "The very traits that have traditionally defined the goodness of women, their care for and sensitivity to the needs of others, are those that mark them out as deficient in moral development". In other words, Gilligan is claiming that there is a sex bias in Kohlberg's theory. He neglects the feminine voice of compassion, love, and non-violence, which is associated with the socialization of girls. Gilligan concluded that Kohlberg's theory did not account for the fact that women approach moral problems from an 'ethics of care', rather than an 'ethics of justice' perspective, which challenges some of the fundamental assumptions of Kohlberg's theory. 6. John Bowlby- Attachment Theory Attachment is a deep and enduring emotional bond that connects one person to another across time and space (Ainsworth, 1973; Bowlby, 1969). Attachment does not have to be reciprocal. One person may have an attachment to an individual which is not shared. Attachment is characterized by specific behaviors in children, such as seeking proximity with the attachment figure when upset or threatened (Bowlby, 1969). Attachment behavior in adults towards the child includes responding sensitively and appropriately to the child's needs. Such behavior appears universal across cultures. Attachment theory provides an explanation of how the parent-child relationship emerges and influences subsequent development. 72

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Attachment theory in psychology originates with the seminal work of John Bowlby (1958). In the 1930's John Bowlby worked as a psychiatrist in a Child Guidance Clinic in London, where he treated many emotionally disturbed children. This experience led Bowlby to consider the importance of the child's relationship with their mother in terms of their social, emotional and cognitive development. Specifically, it shaped his belief about the link between early infant separations with the mother and later maladjustment and led Bowlby to formulate his attachment theory.

John Bowlby, working alongside James Robertson (1952) observed that children experienced intense distress when separated from their mothers. Even when such children were fed by other caregivers, this did not diminish the child's anxiety. These findings contradicted the dominant behavioral theory of attachment (Dollard and Miller, 1950) which was shown to underestimate the child's bond with their mother. The behavioral theory of attachment stated that the child becomes attached to the mother because she fed the infant.

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Bowlby defined attachment as a "lasting psychological connectedness between human beings".

Bowlby (1958) proposed that attachment can be understood within an evolutionary context in that the caregiver provides safety and security for the infant. Attachment is adaptive as it enhances the infant's chance of survival. This is illustrated in the work of Lorenz (1935) and Harlow (1958). According to Bowlby infants have a universal need to seek close proximity with their caregiver when under stress or threatened (Prior & Glaser, 2006). Most researchers believe that attachment develops through a series of stages. Stages of Attachment Rudolph Schaffer and Peggy Emerson (1964) studied 60 babies at monthly intervals for the first 18 months of life (this is known as a longitudinal study). The children were all studied in their own home and a regular pattern was identified in the development of attachment. The babies were visited monthly for approximately one year, their interactions with their carers were observed, and carers were interviewed. A diary was kept by the mother to examine evidence for the development of an attachment. Three measures were recorded: ? Stranger Anxiety - response to arrival of a stranger. ? Separation Anxiety - distress level when separated from carer, degree of comfort needed on return. ? Social Referencing - degree that child looks at carer to check how they should respond to something new (secure base). They discovered that baby's attachments develop in the following sequence: Asocial (0 - 6 weeks) Very young infants are asocial in that many kinds of stimuli, both social and non-social, produce a favourable reaction, such as a smile. 73

Indiscriminate Attachments (6 weeks to 7 months) Infants indiscriminately enjoy human company and most babies respond equally to any caregiver. They get upset when an individual cease to interact with them. From 3 months infants smile more at familiar faces and can be easily comfortable by a regular caregiver. Specific Attachment (7 - 9 months) Special preference for a single attachment figure. The baby looks to particular people for security, comfort and protection. It shows fear of strangers (stranger fear) and unhappiness when separated from a special person (separation anxiety). Some babies show stranger fear and separation anxiety much more frequently and intensely than others, but nevertheless, they are seen as evidence that the baby has formed an attachment. This has usually developed by one year of age. Multiple Attachment (10 months and onwards) The baby becomes increasingly independent and forms several attachments. By 18 months the majority of infants have form multiple attachments. The results of the study indicated that attachments were most likely to form with those who responded accurately to the baby's signals, not the person they spent more time with. Schaffer and Emerson called this sensitive responsiveness. Intensely attached infants had mothers who responded quickly to their demands and, interacted with their child. Infants who were weakly attached had mothers who failed to interact. Many of the babies had several attachments by 10 months old, including attachments to mothers, fathers, grandparents, siblings and neighbors. The mother was the main attachment figure for about half of the children at 18 months old and the father for most of the others. The most important fact in forming attachments is not who feeds and changes the child but who plays and communicates with him or her. Therefore, responsiveness appeared to be the key to attachment. Attachment Theory Psychologists have proposed two main theories that are believed to be important in forming attachments. Learning / behaviorist theory of attachment (e.g. Dollard & Miller, 1950) suggest that attachment is a set of learned behaviors. The basis for the learning of attachments is the provision of food. An infant will initially form an attachment to whoever feeds it. They learn to associate the feeder (usually the mother) with the comfort of being fed and through the process of classical conditioning, come to find contact with the mother comforting. They also find that certain behaviors (e.g. crying, smiling) bring desirable responses from others (e.g. attention, comfort), and through the process of operant conditioning learn to repeat these behaviors in order to get the things they want. 74

Evolutionary theory of attachment (e.g. Bowlby, Harlow, Lorenz) suggests that children come into the world biologically pre-programmed to form attachments with others, because this will help them to survive. The infant produces innate 'social releaser' behaviors such as crying and smiling that stimulate innate caregiving responses from adults. The determinant of attachment is not food, but care and responsiveness. Bowlby suggested that a child would initially form only one primary attachment (monotropy) and that the attachment figure acted as a secure base for exploring the world. The attachment relationship acts as a prototype for all future social relationships so disrupting it can have severe consequences. This theory also suggests that there is a critical period for developing an attachment (about 0 -5 years). If an attachment has not developed during this period, then the child will suffer from irreversible developmental consequences, such as reduced intelligence and increased aggression. Harlow's Monkeys (1958) Harlow wanted to study the mechanisms by which new born rhesus monkeys bond with their mothers. These infants were highly dependent on their mothers for nutrition, protection, comfort and socialization. What, exactly, though, was the basis of the bond? The behavioral theory of attachment would suggest that an infant would form an attachment with a carer that provides food. In contrast Harlow's explanation was that attachment develops as a result of the mother providing "tactile comfort", suggesting that infants have an innate (biological) need to touch and cling to something for emotional comfort. Harry Harlow did a number of studies on attachment in rhesus monkeys during the 1950's and 1960's. His experiments took several forms: 1. Infant monkeys reared in isolation He took babies and isolated them from birth. They had no contact with each other or anybody else. He kept some this way for three months, some for six, some for nine and some for the first year of their lives. He then put them back with other monkeys to see what effect their failure to form attachment had on behaviour. Results: The monkeys engaged in bizarre behaviour such as clutching their own bodies and rocking compulsively. They were then placed back in the company of other monkeys. To start with the babies were scared of the other monkeys, and then became very aggressive towards them. They were also unable to communicate or socialise with other monkeys. The other monkeys bullied them. They indulged in self-mutilation, tearing hair out, scratching, and biting their own arms and legs. Harlow concluded that privation (i.e. never forming an attachment bond) is permanently damaging (to monkeys). The extent of the abnormal behaviour reflected the length of the isolation. Those kept in isolation for 3 months were the least affected, but those in isolation for a year never recovered the effects of privation. 75 2. Infant monkeys reared with surrogate mothers 8 monkeys were separated from their mothers immediately after birth and placed in cages with access to two surrogate mothers, one made of wire and one covered in soft terry toweling cloth. Four of the monkeys could get milk from the wire mother and four from the cloth mother. The animals were studied for 165 days. Both groups of monkeys spent more time with the cloth mother (even if she had no milk). The infant would only go to the wire mother when hungry. Once fed it would return
to the cloth mother for most of the day. If a frightening object was placed in the cage the infant
took refuge with the cloth mother (its safe base). This surrogate was more effective in decreasing the youngsters fear. The infant would explore more when the cloth mother was present. This supports the evolutionary theory of attachment, in that it is the sensitive response and security of the caregiver that is important (as opposed to the provision of food). The behavioral differences that Harlow observed between the monkeys who had grown up with surrogate mothers and those with normal mothers were; a) They were much more timid. b) They didn't know how to act with other monkeys. c) They were easily bullied and wouldn't stand up for themselves. d) They had difficulty with mating. e) The females were inadequate mothers. These behaviours were observed only in the monkeys who were left with the surrogate mothers for more than 90 days. For those left less than 90 days the effects could be reversed if placed in a normal environment where they could form attachments. Harlow concluded that for a monkey to develop normally s/he must have some interaction with an object to which they can cling during the first months of life (critical period). Clinging is a natural response - in times of stress the monkey runs to the object to which it normally clings as if the clinging decreases the stress. He also concluded that early maternal deprivation leads to emotional damage but that its impact could be reversed in monkeys if an attachment was made before the end of the critical period. However, if maternal deprivation lasted after the end of the critical period then no amount of exposure to mothers or peers could alter the emotional damage that had already occurred. Harlow found therefore that it was social deprivation rather than maternal deprivation that the young monkeys were suffering from. When he brought some other infant monkeys up on their own, but with 20 minutes a day in a playroom with three other monkeys, he found they grew up to be quite normal emotionally and socially. Ethics of Harlow's Study Harlow's work has been criticized. His experiments have been seen as unnecessarily cruel (unethical) and of limited value in attempting to understand the effects of deprivation on human infants. 76

It was clear that the monkeys in this study suffered from emotional harm from being reared in isolation. This was evident when the monkeys were placed with a normal monkey (reared by a mother), they sat huddled in a corner in a state of persistent fear and depression. In addition, Harlow created a state of anxiety in female monkeys which had implications once they became parents. Such monkeys became so neurotic that they smashed their infant's face into the floor and rubbed it back and forth. Harlow's experiment is sometimes justified as providing a valuable insight into the development of attachment and social behavior. At the time of the research there was a dominant belief that attachment was related to physical (i.e. food) rather than emotional care. It could be argued that the benefits of the research outweigh the costs (the suffering of the animals). For example, the research influenced the theoretical work of John Bowlby, the most important psychologist in attachment theory. It could also be seen a vital in convincing people about the importance of emotional care in hospitals, children's homes and day care. Lorenz's Imprinting Theory Lorenz (1935) took a large clutch of goose eggs and kept them until they were about to hatch out. Half of the eggs were then placed under a goose mother, while Lorenz kept the other half beside himself for several hours. When the geese hatched Lorenz imitated a mother duck's quacking sound, upon which the young birds regarded him as their mother and followed him accordingly. The other group followed the mother goose. Lorenz found that geese follow the first moving object they see, during a 12-17 hour critical period after hatching. This process is known as imprinting and suggests that attachment is innate and programmed genetically. Imprinting has consequences, both for short term survival, and in the longer term forming internal templates for later relationships. Imprinting occurs without any feeding taking place.

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If no attachment has developed within 32 hours it's unlikely any attachment will ever develop.

To ensure imprinting had occurred Lorenz put all the goslings together under an upturned box and allowed them to mix. When the box was removed the two groups separated to go to their respective 'mothers' - half to the goose, and half to Lorenz. Imprinting does not appear to be active immediately after hatching, although there seems to be a critical period during which imprinting can occur. Hess (1958) showed that although the imprinting process could occur as early as one hour after hatching, the strongest responses occurred between 12 and 17 hours after hatching, and that after 32 hours the response was unlikely to occur at all. Lorenz and Hess believe that once imprinting has occurred it cannot be reversed, nor can a gosling imprint on anything else. 77

7. B.F. Skinner- Behaviour Theory Operant conditioning is a method of learning that occurs through rewards and punishments for behavior. Through operant conditioning, an individual makes an association between a particular behavior and a consequence (Skinner, 1938). By the 1920s, John B. Watson had left academic psychology, and other behaviorists were becoming influential, proposing new forms of learning other than classical conditioning. Perhaps the most important of these was Burrhus Frederic Skinner. Although, for obvious reasons, he is more commonly known as B.F. Skinner. Skinner's views were slightly less extreme than those of Watson (1913). Skinner believed that we do have such a thing as a mind, but that it is simply more productive to study observable behavior rather than internal mental events. The work of Skinner was rooted in a view that classical conditioning was far too simplistic to be a complete explanation of complex human behavior. He believed that the best way to understand behavior is to look at the causes of an action and its consequences. He called this approach operant conditioning. Skinner is regarded as the father of Operant Conditioning, but his work was based on Thorndike's (1898) law of effect. According to this principle, behavior that is followed by pleasant consequences is likely to be repeated, and behavior followed by unpleasant consequences is less likely to be repeated. Skinner introduced a new term into the Law of Effect - Reinforcement. Behavior which is reinforced tends to be repeated (i.e., strengthened); behavior which is not reinforced tends to die out-or be extinguished (i.e., weakened). Skinner (1948) studied operant conditioning by conducting experiments using animals which he placed in a 'Skinner Box' which was similar to Thorndike's puzzle box. Skinner identified three types of responses, or operant, that can follow behavior. • Neutral operants: responses from the environment that neither increase nor decrease the probability of a behavior being repeated. • Reinforcers: Responses from the environment that increase the probability of a behavior being repeated. Reinforcers can be either positive or negative. 78

• Punishers: Responses from the environment that decrease the likelihood of a behavior being repeated. Punishment weakens behavior. We can all think of examples of how our own behavior has been affected by reinforcers and punishers. As a child you probably tried out a number of behaviors and learned from their consequences. For example, if when you were younger you tried smoking at school, and the chief consequence was that you got in with the crowd you always wanted to hang out with, you would have been positively reinforced (i.e., rewarded) and would be likely to repeat the behavior. If, however, the main consequence was that you were caught, caned, suspended from school and your parents became involved you would most certainly have been punished, and you would consequently be much less likely to smoke now. Positive Reinforcement Skinner showed how positive reinforcement worked by placing a hungry rat in his Skinner box. The box contained a lever on the side, and as the rat moved about the box, it would accidentally knock the lever. Immediately it did so a food pellet would drop into a container next to the lever. The rats quickly learned to go straight to the lever after a few times of being put in the box. The consequence of receiving food if they pressed the lever ensured that they would repeat the action again and again. Positive reinforcement strengthens a behavior by providing a consequence an individual find rewarding. For example, if your teacher gives you £5 each time you complete your homework (i.e., a reward) you will be more likely to repeat this behavior in the future, thus strengthening the behavior of completing your homework. Negative Reinforcement The removal of an unpleasant reinforcer can also strengthen behavior. This is known as negative reinforcement because it is the removal of an adverse stimulus which is 'rewarding' to the animal or person. Negative reinforcement strengthens behavior because it stops or removes an unpleasant experience. For example, if you do not complete your homework, you give your teacher £5. You will complete your homework to avoid paying £5, thus strengthening the behavior of completing your homework. Skinner showed how negative reinforcement worked by placing a rat in his Skinner box and then subjecting it to an unpleasant electric current which caused it some discomfort. As the rat moved about the box it would accidentally knock the lever. Immediately it did so the electric current would be switched off. The rats quickly learned to go straight to the lever after a few times of being put in the box. The consequence of escaping the electric current ensured that they would repeat the action again and again. In fact, Skinner even taught the rats to avoid the electric current by turning on a light just before the electric current came on. The rats soon learned to press the lever when the light came on because they knew that this would stop the electric current being switched on. 79

These two learned responses are known as Escape Learning and Avoidance Learning. Punishment (weakens behavior) Punishment is defined as the opposite of reinforcement since it is designed to weaken or eliminate a response rather than increase it. It is an aversive event that decreases the behavior that it follows. Like reinforcement, punishment can work either by directly applying an unpleasant stimulus like a shock after a response or by removing a potentially rewarding stimulus, for instance, deducting someone's pocket money to punish undesirable behavior. Note: It is not always easy to distinguish between punishment and negative reinforcement. There are many problems with using punishment, such as: ? Punished behavior is not forgotten, it's suppressed - behavior returns when punishment is no longer present. ? Causes increased aggression - shows that aggression is a way to cope with problems. ? Creates fear that can generalize to undesirable behaviors, e.g., fear of school. ? Does not necessarily guide toward desired behavior - reinforcement tells you what to do, punishment only tells you what not to do. Schedules of Reinforcement Imagine a rat in a "Skinner box." In operant conditioning, if no food pellet is delivered immediately after the lever is pressed then after several attempts the rat stops pressing the lever (how long would someone continue to go to work if their employer stopped paying them?). The behavior has been extinguished. Behaviourists discovered that different patterns (or schedules) of reinforcement had different effects on the speed of learning and extinction. Ferster and Skinner (1957) devised different ways of delivering reinforcement and found that this had effects on 1. The Response Rate – The rate at which the rat pressed the lever (i.e., how hard the rat worked). 2. The Extinction Rate – The rate at which lever pressing dies out (i.e., how soon the rat gave up). 80

Skinner found that the type of reinforcement which produces the slowest rate of extinction (i.e., people will go on repeating the behavior for the longest time without reinforcement) is variable- ratio reinforcement. The type of reinforcement which has the quickest rate of extinction is continuous reinforcement. (A) Continuous Reinforcement An animal/human is positively reinforced every time a specific behavior occurs, e.g., every time a lever is pressed a pellet is delivered, and then food delivery is shut off. ? Response rate is SLOW ? Extinction rate is FAST (B) Fixed Ratio Reinforcement Behavior is reinforced only after the behavior occurs a specified number of times. e.g., one reinforcement is given after every so many correct responses, e.g., after every 5 th response. For example, a child receives a star for every five words spelled correctly. ? Response rate is FAST ? Extinction rate is MEDIUM (C) Fixed Interval Reinforcement One reinforcement is given after a fixed time interval providing at least one correct response has been made. An example is being paid by the hour. Another example would be every 15 minutes (half hour, hour, etc.) a pellet is delivered (providing at least one lever press has been made) then food delivery is shut off. ? Response rate is MEDIUM ? Extinction rate is MEDIUM 81

(D) Variable Ratio Reinforcement Behavior is reinforced after an unpredictable number of times. For examples gambling or fishing. ? Response rate is FAST ? Extinction rate is SLOW (very hard to extinguish because of unpredictability) (E) Variable Interval Reinforcement Providing one correct response has been made, reinforcement is given after an unpredictable amount of time has passed, e.g., on average every 5 minutes. An example is a self-employed person being paid at unpredictable times. ? Response rate is FAST ? Extinction rate is SLOW Behavior Modification Behavior modification is a set of therapies / techniques based on operant conditioning (Skinner, 1938, 1953). The main principle comprises changing environmental events that are related to a person's behavior. For example, the reinforcement of desired behaviors and ignoring or punishing undesired ones. This is not as simple as it sounds — always reinforcing desired behavior, for example, is basically bribery. There are different types of positive reinforcements. Primary reinforcement is when a reward strength a behavior by itself. Secondary reinforcement is when something strengthens a behavior because it leads to a primary reinforcer. Examples of behavior modification therapy include token economy and behavior shaping. Token Economy Token economy is a system in which targeted behaviors are reinforced with tokens (secondary reinforcers) and later exchanged for rewards (primary reinforcers). Tokens can be in the form of fake money, buttons, poker chips, stickers, etc. While the rewards can range anywhere from snacks to privileges or activities. For example, teachers use token economy at primary school by giving young children stickers to reward good behavior. Token economy has been found to be very effective in managing psychiatric patients. However, the patients can become over reliant on the tokens, making it difficult for them to adjust to society once they leave prison, hospital, etc. Staff implementing a token economy programme have a lot of power. It is important that staff do not favor or ignore certain individuals if the programme is to work. Therefore, staff need to be trained to give tokens fairly and consistently even when there are shift changes such as in prisons or in a psychiatric hospital. Behavior Shaping A further important contribution made by Skinner (1951) is the notion of behavior shaping through successive approximation. Skinner argues that the principles of operant conditioning can be used to produce extremely complex behavior if rewards and punishments are delivered in 82

such a way as to encourage move an organism closer and closer to the desired behavior each time. To do this, the conditions (or contingencies) required to receive the reward should shift each time the organism moves a step closer to the desired behavior. According to Skinner, most animal and human behavior (including language) can be explained as a product of this type of successive approximation. 83

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Unit: IV Child Development In this unit, you will learn about, •

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Meaning of Development • Life-Span Perspective on Development • Context of Development • Developmental Stages ◦ Prenatal Development and the Newborn ◦ Infancy and Childhood ◦ Adolescence ◦ Adulthood and Old Age

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Meaning of Development When we think of development, invariably we think of physical changes, as these are commonly observed at home with younger siblings, with parents and grandparents, in school with peers or others around us. From conception until the moment of death, we not only change physically, but we also change in the way we think, use language, and develop social relationships. Remember that, changes are not confined to any one area of a person's life; they occur in the person in an integrated manner. Development is the pattern of progressive, orderly, and predictable changes that begin at conception and continue throughout life. Development mostly involves changes both growth and decline, as observed during old age. Development is influenced by an interplay of biological, cognitive, and socio emotional processes. Development due to genes inherited from parents, such as in height and weight, brain, heart, and lungs development, etc. all point towards the role of biological processes. The role of cognitive processes in development relate to mental activities

associated with the processes of knowing, and experiencing, such as thought, perception, attention, problem solving, etc. Socio- emotional processes that influence development refer to changes in an individual's interactions with other people, changes in emotions, and in personality. A child's hug to her/his mother, a young girl's affectionate gesture to her/his sibling, or an adolescent's sorrow at losing a match are all reflections of socio emotional processes deeply involved in human development.

It is important to remember that the biological, cognitive, and socio-emotional processes are interwoven. These processes influence changes in the development of the individual as a whole throughout the human life-span. Life-Span Perspective on Development The study of development according to the Life-Span Perspective (LSP) includes the following assumptions: 85 1. Development is lifelong, i.e. it takes place across all age groups starting from

conception to old age. It includes both gains and losses, which interact in dynamic (change in one aspect goes with changes in others) ways throughout the life-span. 2. The various processes of human development, i.e. biological, cognitive, and socio- emotional are interwoven in the development of a person throughout the life-span. 3. Development is multi-directional. Some dimensions or components of a given dimension of development may increase, while others show decrement. For example, the experiences of adults may make them wiser and guide their decisions. However, with an increase in age, one's performance is likely to decrease on tasks requiring speed, such as running. 4. Development is highly plastic, i.e. within person, modifiability is found in psychological development, though plasticity varies among individuals. This means skills and abilities can be improved or developed throughout the life-span. 5. Development is influenced by historical conditions. For example, the experiences of 20- year olds who lived through the freedom struggle in India would be very different from the experiences of 20 year olds of today. The career orientation of school students today is very different from those students who were in schools 50 years ago. 6. Development is the concern of a number of disciplines. Different disciplines like psychology, anthropology, sociology, and neuro-sciences study human development, each trying to provide answers to development throughout the life-span. 7. An individual responds and acts on contexts, which include what was inherited, the physical environment, social, historical, and cultural contexts. For example, the life events in everyone's life are not the same, such as, death of a parent, accident, earthquake, etc., affect the course of one's life as also the positive

influences such as winning an award or getting a good job. People keep on changing with changing contexts.

Context of Development Development does not take place in a vacuum. It is always embedded in a particular socio-cultural context.

We will learn about the

transition during one's lifetime such as entering school, becoming an adolescent, finding jobs, marrying, having children, retirement, etc. all are joint functions of the biological changes and changes in one's environment. The environment can change or alter during any time of the individual's lifespan. Urie Bronfenbrenner's contextual view of development emphasises the role of environmental factors in the development of an individual. The microsystem is the immediate environment/setting in which the individual lives. It is in these settings where the child directly interacts with social agents – the family, peers, teachers, and neighbourhood. The mesosystem consists of relations between these contexts. For instance, how a child's parents relate to the teachers, or how the parents view the adolescent's friends, are

experiences likely to influence an individual's relationships with others. The exosystem includes events in social settings where the child does not participate directly, but they influence the childs' experiences in the immediate context. For example, the transfer of father or mother may cause tension among the parents which might affect their interactions with the child or the 86 general amenities available to the child like quality of schooling, libraries, medical care, means of entertainment, etc. Macrosystem includes the culture in which the individual lives.

Chronosystem involves events in the individual's life course, and socio-historical circumstances of the time such as, divorce of parents or parents' economic setback, and their effect on the child. In a nutshell, Bronfenbrenner's view is that a child's development is significantly affected by the complex world that envelops her/him – whether it be the minutiae of the conversations s/he has with her/his playmates, or the social and economic life circumstances into which s/he is born. Research has shown that children in impoverished environments have unstimulating environment devoid of books, magazines, toys, etc., lack experiences such as visits to library, museum, zoo, etc., have parents who are ineffective as role models, and live in overcrowded and noisy surroundings. As a result of these conditions children are at a disadvantage and have difficulties in learning. Durganand Sinha (1977) has presented an ecological model for understanding the development of children in Indian context. Ecology of the child could be viewed in terms of two concentric layers. The "upper and the more visible layers" consist of home, school, peer groups, and so on. The most important ecological factors influencing development of the child in the visible upper layer constitute the: (i) home, its conditions in terms of overcrowding, space available to each member, toys, technological devices used, etc., (ii) nature and quality of schooling, facilities to which the child is exposed, and (iii) nature of interactions and activities undertaken with peer groups from childhood onwards. These factors do not operate independently but constantly interact with one another. Since these are also embedded in a larger and a more pervasive setting, the "surrounding layers" of the child's ecology constantly influence the "upper layer" factors. However, their influences are not always clearly visible. The elements of the surrounding layer of ecology constitute the: (i) general geographical environment. It includes space and facilities for play and other activities available outside the home including general congestion of the locality and density of population, (ii) institutional setting provided by caste, class, and other factors, and (iii) general amenities available to the child like drinking water, electricity, means of entertainment and so on. The visible and the surrounding layer factors interact with one another and may have different consequences for development in different people. The ecological environment can change or alter during any time of the individual's life-span. Therefore, to understand differences in the functioning of an individual, it is important to see the individual in the context of her/ his experiences.

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 87 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 different stages of development and their main features

are: Prenatal Development and the New Born

Prenatal development refers to the process in which a baby develops from a single cell after conception into an embryo and later a fetus.

The average length of time for prenatal development to complete is 38 weeks from the date of conception. During this time, a single-celled zygote develops in a series of stages into a full-term baby. The three primary stages of prenatal development are: ? Germinal stage, ? Embryonic stage, ? Fetal stage. Germinal Stage Conception occurs when the female egg (ovum) is fertilized by the male sperm. Under normal circumstances, one egg is released approximately once a month from a woman's ovary during a process called ovulation. The egg makes its way into a fall opian tube, a structure that guides the egg away from the ovary toward the uterus. For fertilization to occur, sperm ejaculated during sexual intercourse (or introduced during artificial insemination) in a substance called semen must have made their way from the vagina into the uterus and subsequently into the fall opian tube where the ovum has been released. This process can take up to ten hours after ejaculation. For fertilization to occur, a sperm must penetrate the tough outer membrane of the egg called the zona pellucida. When one sperm successfully binds with the zona pellucida, a series of chemical reactions occurs to allow only that sperm to penetrate. Fertilization occurs when the sperm successfully enters the ovum's membrane. The genetic material of the sperm and egg then combine to form a single cell called a zygote and the germinal stage of prenatal development commences. The zygote soon begins to divide rapidly in a process called cleavage, first into two identical cells called blastomeres, which further divide to four cells, then into eight, and so on. The group of diving cells begins to move along the fallopian tube toward the uterus. About sixty 88

hours after fertilization, approximately sixteen cells have formed to what is called a morula, still enclosed by the zona pellucida; three days after fertilization, the morula enters the uterus. As cell division continues, a fluid-filled cavity called a blastocoele forms in the center of the group of cells, with the outer shell of cells called trophoblasts and an inner mass of cells called embryoblasts. The zona pellucida disappears and the morula becomes a blastocyst. At this stage the blastocyst consists of 200 to 300 cells and is ready for implantation. Implantation, the process in which the blastocyst implants into the uterine wall, occurs approximately six days after conception. Hormones secreted from the mother's ovaries and a chemical secreted by the trophoblasts begin to prepare the uterine wall. The blastocyst first adheres to the wall then moves into the uterine tissue. Implantation marks the end of the germinal stage and the beginning of the embryonic stage. Embryonic Stage The embryonic stage begins after implantation and lasts until eight weeks after conception. Soon after implantation, the cells continue to rapidly divide, and clusters of cells begin to take on different functions (called differentiation). A process (gastrulation) leads to the formation of three distinct layers called germ layers: the ectoderm (outer layer), the mesoderm (middle layer), and the endoderm (inner layer). As the embryo develops, each germ layer differentiates into different tissues and structures. For example, the ectoderm eventually forms skin, nails, hair, brain, nervous tissue and cells, nose, sinuses, mouth, anus, tooth enamel, and other tissues. The mesoderm develops into muscles, bones, heart tissue, lungs, reproductive organs, lymphatic tissue, and other tissues. The endoderm forms the lining of lungs, bladder, digestive tract, tongue, tonsils, and other organs. Embryo: During the germinal stage of prenatal development, the cells necessary for the placenta, umbilical cord, and amniotic fluid will differentiate to form the embryo. 89

The process of differentiation takes place over a period of weeks with different structures forming simultaneously. Some of the major events that occur during the embryonic stage are as follows: ? Week 3: Beginning development of the brain, heart, blood cells, circulatory system, spinal cord, and digestive system. ? Week 4: Beginning development of bones, facial structures, and limbs (presence of arm and leg buds); continuing development of the heart (which begins to beat), brain, and nervous tissue. ? Week 5: Beginning development of eyes, nose, kidneys, lungs; continuing development of the heart (formation of valves), brain, nervous tissue, and digestive tract. ? Week 6: Beginning development of hands, feet, and digits; continuing development of brain, heart, and circulation system. ? Week 7: Beginning development of hair follicles, nipples, eyelids, and sex organs (testes or ovaries); first formation of urine in the kidneys and first evidence of brain waves. ? Week 8: Facial features more distinct, internal organs well developed, the brain can signal for muscles to move, heart development ends, external sex organs begin to form. By the end of the embryonic stage, all essential external and internal structures have been formed. The embryo is now referred to as a fetus. Fetal Stage Prenatal development is most dramatic during the fetal stage. When an embryo becomes a fetus at eight weeks, it is approximately 3 centimetres (1.2 inches) in length from crown to rump and weighs about 3 grams (0.1 ounce). By the time the fetus is considered full-term at 38 weeks gestation, he or she may be 50 centimetres (20 inches) or 3.3 kilograms (7.3 pounds). Although all of the organ systems were formed during embryonic development, they continue to develop and grow during the fetal stage. Examples of some of the major features of fetal development by week are as follows: ? Weeks 9–12: The fetus reaches approximately 8 cm. (3.2 in.) in length; the head is approximately half the size of the fetus. External features such as the face, neck, eyelids, limbs, digits, and genitals are well formed. The beginnings of teeth appear, and red blood cells begin to be produced in the liver. The fetus is able to make a fist. ? Weeks 13–15: The fetus reaches approximately 15 cm. (6 in.) in length. Fine hair called lanugo first develops on the head; structures such as the lungs, sweat glands, muscles, and bones continue to develop. The fetus is able to swallow and make sucking motions. ? Weeks 16–20: The fetus reaches approximately 20 cm. (8 in.) in length. Lanugo begins to cover all skin surfaces, and fat begins to develop under the skin. Features such as finger and toenails, eyebrows, and eyelashes appear. The fetus becomes more active, and the mother can sometimes begin to feel fetal movements at this stage. 90
? Weeks 21–24: The fetus reaches approximately 28.5 cm. (11.2 in.) in length and weighs approximately 0.7 kg (1 lb. 10 oz.). Hair grows longer on the head, and the eyebrows and eye lashes finish forming. The lungs continue to develop with the formation of air sac (alveoli); the eyes finish developing. A startle reflex develops at this time. ? Weeks 25–28: The fetus reaches approximately 38 cm. (15 in.) in length and weighs approximately 1.2 kg (2 lb. 11 oz.). The next few weeks mark a period of rapid brain and nervous system development. The fetus gains greater control over movements such as opening and closing eyelids and certain body functions. The lungs have developed sufficiently that air breathing is possible. ? Weeks 29–32: The fetus reaches approximately 38–43 cm. (15–17 in.) in length and weighs approximately 2 kg (4 lb. 6 oz.). Fat deposits become more pronounced under the skin. The lungs remain immature but breathing movements begin. The fetus's bones are developed but not yet hardened. ? Weeks 33–36: The fetus reaches approximately 41–48 cm. (16–19 in.) in length and weighs 2.6–3.0 kg (5 lb. 12 oz. to 6 lb. 12 oz.). Body fat continues to increase, lanugo begins to disappear, and fingernails are fully grown. The fetus has gained a high degree of control over body functions. ? Weeks 36–38: The fetus reaches 48–53 cm. (19–21 in.) in length is considered to be full- term by the end of this period. Lanugo has mostly disappeared and is replaced with thicker hair on the head. Fingernails have grown past the tips of the fingers. In a healthy fetus, all organ systems are functioning. ? Stages of development:

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During the fetal stage, the brain develops, and the body adds size and weight, until the fetus reaches full-term development. 91

Common problems Although 90 percent of babies born in the United States are considered healthy, abnormalities may arise during prenatal development that are considered congenital (inherited or due to a genetic abnormality) or environmental (such as material derived abnormalities). In other cases, problems may arise when a fetus is born prematurely. Congenital Abnormalities In some cases, abnormalities may arise during prenatal development that cause physical malformations or developmental delays or affect various parts of the body after the child is born. The cause may be a small mutation in or damage to the genetic material of cells, or a major chromosomal abnormality (each normal cell has two copies each of 23 strands [called chromosomes] of genetic material, and abnormalities can arise if there are three copies of a strand or only one). Sometimes the abnormality is inherited from one or both parents; in other cases, the defect occurs because of an error in prenatal development. Some abnormalities are minor and do not affect the long-term prognosis once the child is born. At the other end of the spectrum, abnormalities may be so severe that fetal demise is inevitable. Approximately 10 to 15 percent of pregnancies end before the twentieth week, a process called miscarriage or spontaneous abortion; congenital abnormalities account for a significant proportion of miscarriages. Genetic abnormalities account for approximately 5 percent of miscarriages. Maternal Derived Abnormalities The age, health status, nutritional status, and environment of the mother are all closely tied to the health of a growing embryo or fetus. Some examples of environmental factors that may lead to developmental abnormalities include: ? Age: As of 2004, research showed that babies born to mothers between the ages of seventeen and thirty-five tend to be healthier. One reason is that the risk of certain congenital abnormalities such as Down syndrome increases with mother's age (particularly mothers over forty). Another reason is that the risk of having pregnancy or birth complications is greater with women over the age of thirty-five. ? Health status: In some cases, a mother may pass a viral or bacterial infection to the fetus, such as in human immunodeficiency virus (HIV). In other cases, a mother's illness may cause congenital malformations; an example is rubella, which can cause heart defects, deafness, developmental delays, and other problems in a fetus if the mother contracts it during pregnancy. ? Nutritional status: A well-balanced diet rich in nutrients such as folic acid , calcium, iron, zinc, vitamin D, and the B vitamins is recommended for pregnant women. Certain vitamin and mineral deficiencies can interfere with normal prenatal development. For example, a deficiency in folic acid during the early stages of pregnancy may lead to neural tube defects such as spina bifida . Mothers are recommended to eat approximately 300 additional calories a day (above and beyond a normal non-pregnancy diet) to support the fetus's growth and development. 92

? Other environmental factors: Exposure to certain substances called teratogens (agents that may interfere with prenatal development) during pregnancy may cause embryonic or fetal malformations. Examples of teratogens include alcohol, thalidomide, cocaine, certain seizure medications, diethylstilbestrol (DES), and the anti-acne drug Accutane. Prematurity Advances in medical care have made it possible for many infants born prematurely to survive and develop normally. The earlier the gestational age, the greater the chance of death or significant medical problems. Whether or not a premature infant will survive is intimately tied to his or her gestational age: ? 21 weeks or less: 0 percent survival rate ? 22 weeks: 0–10 percent survival rate ? 23 weeks: 10–35 percent survival rate ? 24 weeks: 40–70 percent survival rate ? 25 weeks: 50–80 percent survival rate ? 26 weeks: 80–90 percent survival rate ? 27 weeks: greater than 90 percent survival rate Parental Concerns Many parents have questions or concerns about the prenatal development of an existing or anticipated child and what steps they should take to ensure their child's health. During prenatal visits to an obstetrician, a pregnant mother should be educated in proper nutrition and prenatal care; often, prenatal vitamins are prescribed to avoid nutritional deficiencies. Prenatal testing is often recommended to parents-to-be as a means of assessing the fetus's health and the risk of developing certain conditions. Some common prenatal tests that relate to prenatal development are as follows: ? blood tests to check for diseases that could affect the fetus, such as HIV, hepatitis B, or other sexually transmitted diseases ? blood tests to check if the mother carries a protein called Rh factor on her red blood cells; if she does not and her baby does (determined by whether the father is Rh-positive or not), she will require treatment to prevent a potentially damaging reaction to the baby ? chorionic villus sampling, a prenatal test that takes a tiny sample of the placenta with a needle to test for chromosomal abnormalities ? nuchal fold or nuchal translucency screening test, which measures a small space at the back of the fetus's neck using ultrasound; fetuses with larger nuchal folds have a greater risk of having a chromosomal abnormality ? amniocentesis, a test that takes a sample of the fluid that surrounds the fetus in the uterus to identify certain genetic disorders, congenital malformations, or the maturity of the fetus's lungs. New Born Baby Coming into the world is a very big and scary adventure for babies. At first, they don't know that you are there to comfort, feed and care for them. They can feel comfortable or uncomfortable, but 93

they don't know that this is because they are full, safe, afraid, or hungry. They quickly learn to recognise the smell and voice of the person who feeds them and holds them most often (possibly the smell of their mother's milk) but they do not know this is their 'mother'. However, even from birth, they start to communicate with you and give you little signals when they are tired or hungry or awake and alert. They are learning all the time, and the job of parents is to help them to know that the world is a welcoming place for them to be in, where their needs will be met and they will learn to feel safe and loved. Remember that for a new baby everything is new and scary at first, even a nappy change. ? Social and emotional development ? Newborn babies cannot understand what is happening to them. ? They do not know that they are people. ? They do not know who helps when they cry. ? They feel happy when they feed, but they do not know what 'happy' is. ? They cry when they are hungry or need to sleep, but they do not know that they are being cared for. The first and perhaps most important thing to understand about new born babies is that they do not have any understanding of being a separate person inside their own skin, and certainly not a person in relationship with other people. ? Newborn babies do not cry 'for attention' or to 'get at' their parents. A new baby in the first three months cannot decide to cry. They cry because of something that is happening inside them. They don't understand what is happening and they don't understand that you might be able to help them feel better. They like the feelings they have when they feed successfully or hear your soothing voice or are cuddled, and they don't like feeling hungry or frightened - but they don't actually know that the feeling is caused by a full tummy or hunger. ? Because babies feel but are not yet able to think, they will pick up your feelings and be calm when you are calm, and unhappy if you are unhappy. If you feel upset, it will be impossible to hide it from your baby - she will think it's her feeling and respond as if it was! So, when you are tired and frazzled your baby may be hard to settle! ? Each baby is different, and each grows and develops in the way that is right for this baby. Every baby is very different. You have heard that before, but it is really true. Each baby has a different personality. They may be easy going and placid, or shy and worried, or easily upset, and you will get to know this over the early months. ? The human face is the first and most important shape that babies learn, and the sounds of human voices are very important to them, even though they do not understand them. Your baby is interested in you - especially in your voice and your face. Looking into someone's eyes is a necessity for 'falling in love' and forming a close and warm relationship. Show them your face and talk to them soothingly right from the start. Don't feel rejected if they sometimes turn away; tiny babies often get tired when they interact and need a rest. ? Babies need to feel safe, that someone is looking after them. They often begin to smile at a familiar face by around four to six weeks and will look at you carefully from around the same time. 94

Physical development ? Although babies are ready to exist and grow outside of their mother's womb, most parts of their bodies are still immature. All new babies are very busy with their body. All brand new and never been used before – it takes the first three months to get the digestive system cranked up and running smoothly. You can tell by your baby's face that she is preoccupied a lot of the time with whatever is going on inside herself. ? Since babies do not understand anything about what is happening around them, they can become upset if they are given too much to see or do. They can easily feel overwhelmed by sounds, colours, shapes and touch in the world outside the womb. Sometimes it's just too much! Loud noises will frighten most babies in their first months but they are soothed by crooning and the sound of gentle voices and sometimes even music they heard before they were born. Hearing and Seeing ? Newborn babies can hear, and they have been hearing noises from well before they were born. ? Newborn babies have immature eye muscles, and while they can see, they can only clearly see things that are close by. Newborns do not understand what they see. In the first three months they are attracted by faces, bright light, primary colours, stripes, dots and patterns. The human face is the first 'object' they recognise by learning that the shapes of eyes, nose and mouth form a face. Over the first three months they begin to recognise particular faces and other things (like their teddy bear) in their world. Hanging pictures of faces and simple toys above their cot will give them practice at looking and learning. Speech and Language ? Babies show how they feel by what their face, voice and body does. ? For the newborn, crying is the main way your baby has to let you know something is wrong, and soon your baby may start having different cries for different things - hunger, pain, wet, cold, fear and loneliness. ? You will begin to recognise these different cries in the first few weeks. Babies have no understanding about time so all their needs are immediate and urgent. It is important to respond to your tiny baby as quickly as you can so he begins to understand that you will be there for him when he calls out for you. This develops the feeling of security, which is very important. ? By seven or eight weeks babies will begin to discover their voice and make cooing noises and vowel sounds. ? Even by about eight weeks they will listen to what you say, then make noises back as they 'talk' to you. Activities for Young Babies ? make a face mobile and hang it, facing them, above their cot ? stroke different parts of their body to see how they like to be touched ? speak to them gently and use their name ? play them music ? sing to them 95

? hold them a lot ? let them look at your face as you talk to them ? copy their little gestures ? rock them gently ? lots of feeding and hopefully sleeping. Social Emotional: ? watches parent's face when being talked to, average six weeks (range four to eight weeks) ? smiles by five to seven weeks ? by three months baby is gurgling and laughing aloud. Talk with your doctor or child health nurse if: ? you feel unable to meet your baby's needs most of the time ? you see your baby in a negative way (as difficult) or are disappointed with your child ? you do not feel able to respond to the baby ? your baby does not usually calm, at least momentarily, most of the time when picked up ? your baby has a high pitched cry ? your baby has no social smile by eight weeks. Motor skills, vision and hearing: ? when cheek touched, turns to same side to suckle (from birth) ? lifts head when prone (on tummy), average six weeks (four to eight weeks) ? kicks legs vigorously by two months ? arms, fingers and legs move freely ? follows a moving light with eyes for a couple of seconds by one month ? watches a moving face by two to three months ? eyes are lined up most of the time by six weeks Talk with your doctor or child health nurse if your baby: ? is unusually 'floppy' or stiff ? has an arm and leg on one side stiffer, floppier, stronger or weaker than on the other. One side is moving more than the other ? has unusually 'good' head control (neck and back muscles stiff) ? always holds their fingers in a tight fist ? is not watching faces by two to three months ? is not startling to noise ? is not chuckling and smiling at three months. 96

Daily activities: ? usually feeds well after a couple of weeks ? often has no clear day and night pattern of wakeful and sleep times. Talk with your doctor or child health nurse if your baby: ? is still having difficulties with feeding after a couple of weeks ? is crying for long times each day ? is hard to settle ? seems quite different to other babies (too tense, too calm). Speech and language: ? startled by loud sounds by one month ? makes sounds other than crying by two months ? begins listening to voices and making sounds when talked to by seven to eight weeks. Talk with your doctor or child health nurse if your baby: ? is not watching your face when being spoken to by two to three months ? seems not to react to sounds

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Infancy The brain develops at an amazing rate before and after birth. The part of the brain i.e. Cerebrum played an important role in human functions, such as language, perception, and intelligence. Just before birth the newborns have most but not all brain cells. 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. Motor Development: 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 (table mentioned below) 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. 97 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.

Some Major Reflexes in the New Born

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Reflex Description Developmental Course Rooting Turning the head and opening the mouth when touched on the cheek

Disappears in 6 to 7 months outward (although reaction to loud noises is permanent)

Disappears in 8 to 12 months

cry or 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. 99

Piaget's Stages of Cognitive Development

Stage Approximate Age Characteristics Sensorimotor 0-2 years Infant explores the world by coordinating sensory experiences with physical actions. Preoperational 2-7 years Symbolic thought develops; object permanence is established; the child cannot coordinate different physical attributes of an object. Concrete operational 7-11 years The child can reason logically about concrete events and classify objects into different sets. Is able to perform reversible mental operations on representations of objects. Formal operational 11-15 years The adolescent can apply logic more abstractly; hypothetical thinking develops.

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 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. 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. 100 Motor Development 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. 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. The major accomplishments in gross and fine motor skills during early childhood years are given in (

shown

in Table) Cognitive Development The child's ability to acquire the concept of object permanence enables her/him to use mental symbols to represent objects. However, the child at this stage lacks the ability that allows her/him to do mentally what was done physically before. Cognitive development in early childhood focuses on Piaget's stage of preoperational thought (see Table). The child gains the ability to mentally represent an object that is not physically present. You may have observed children draw designs/ figures to represent people, trees, dog, house,

etc. This ability of the child to engage in symbolic thought helps to expand her/his mental world. The progress in symbolic thought continues. A salient feature of preoperational thought is egocentrism (self focus), i.e. children see the world only in terms of their own selves and are not able to appreciate others' point of view. Children because of egocentrism, engage in animism -thinking that all things are living, like oneself. They attribute life-like qualities to inanimate objects. For example, if a child while running slips on the road, s/he might show animism by saying "road hurt me". As children grow and are approximately between 4 and 7 years of age they want answers to all their questions like: Why is the sky blue? How do trees grow? and so on. Such questions help the child to know why things are as they are. Piaget called this the stage of intuitive thought. Another feature of thought during preoperational stage is characterised by children having a tendency for centration, i.e. focusing on a single characteristic or feature for understanding an event. For example, a child may insist on drinking a "big glass" of juice, preferring a tall narrow glass to a short broad one, even though both might be holding the same amount of juice. As the child grows and is approximately between 7 and 11 years of age (the period of middle and late childhood) intuitive thought is replaced by logical thought. This is the stage of concrete operational thought, which is made up of operations — mental actions that allow the child to do mentally what was done physically before. Concrete operations are also mental actions that are reversible. In a well known test, the child is presented with two identical balls of clay. One ball is rolled by the experimenter into a long thin strip and the other ball remains in its original shape. On being asked which has more clay, the child of 7 or 8 years, would answer that, both have the same amount of clay. This is because the child imagines the ball rolled into thin strip and then into a ball, that means s/he is able to imagine reversible mental action on concrete/real objects. What do you think a preoperational child would have done? S/he is likely to focus on only one aspect-length or height. Concrete operations allow the child to focus on different characteristics and not focus on one aspect of the object. This helps the child to appreciate that there are different ways of looking at things, which also results in the decline of 101 her/his egocentrism. Thinking becomes more flexible, and children can think about alternatives when solving problems, or mentally retrace their steps if required. Even though the preoperational child develops the ability to see relationships between different properties of an object, s/he cannot do abstract thinking, i.e. s/he still cannot manipulate ideas in the absence of objects. For example, steps required to complete algebraic equations, or imagining line of longitude or latitude of the earth. The growing cognitive abilities of children facilitate the acquisition of language.

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

Socio-emotional Development The important dimensions of children's socio-emotional development are the self, gender and moral development. During the early years of childhood, some important developments in the self take place. The child due to socialisation has developed a sense of who s/he is and whom s/he wants to be identified with. The developing sense of independence makes children do things in their own way. According to Erikson, the way parents respond to their self-initiated activities leads to developing a sense of initiative or sense of guilt. For example, giving freedom and opportunities for play like cycling, running, skating, etc. and answering children's questions will create a sense of support for the initiative taken. In contrast, if they are made to feel that their questions are useless, and games played by them are stupid, the children are likely to develop feelings of guilt over self-initiated activities, which may persist through the children's later life also. Self-understanding in early childhood is limited to defining oneself through physical characteristics: I am tall, she has black hair, I am a girl, etc. During middle and late childhood, the child is likely to define oneself through internal characteristics such as, "I am smart and I am popular" or "I feel proud when teachers assign me responsibility in school". In addition to defining oneself through psychological characteristics, children's self-descriptions also include social aspects of self,

such as references to social groups like being a member of school's music club, environment club, or any religious group. Children's self-understanding also includes social comparison. Children are likely to think about what they can do or cannot do in comparison with others. For example, "I got more marks than Atul" or "I can run faster than others in the class". This developmental shift leads to establishing one's differences from others as an individual. Once the children enter school their social world expands beyond their families. They also spend greater amount of time with their age mates or peers. Thus the increased time that children spend with their peers shapes their development. 102

Moral Development: Another important aspect of the child's development is learning to differentiate between the rightness or wrongness of human acts. The way children come to distinguish right from wrong, to feel guilty, to put themselves in other people's position, and to help others when they are in trouble, are all components of moral development. Just as children pass through the various stages of cognitive development, according to Lawrence Kohlberg, they pass through the various stages of moral development, which are age related. Kohlberg interviewed children in which they were presented with stories in which the characters face moral dilemmas. Children were asked what the characters in the dilemma should do, and why. According to him, children approach thinking about right and wrong differently at different ages. The young child, i.e. before 9 years of age, thinks in terms of external authority. According to her/ him,

actions are wrong because s/he is punished, and right because s/he is rewarded. As the child grows, i.e. by early adolescence, s/he develops moral reasoning through set of rules of others, such as parents or laws of the society. These rules are accepted by the children as their own. These are "internalised" in order to be virtuous and to win approval from others (not to avoid punishment). Children view rules as absolute guidelines, which should be followed. Moral thinking at this stage is relatively inflexible. As they grow, they gradually develop a personal moral code. You have seen that by the end of childhood a more gradual growth rate enables the child to develop skills of coordination and balance. Language develops and the child can reason logically. Socially the child has become more involved in social systems, such as family and peer group. The next section traces changes in human development during adolescence and adulthood.

Adolescence

The term adolescence derives from the Latin word adolescere, meaning "to grow into maturity". It is the transitional period in a person's life between childhood and adulthood. Adolescence is commonly defined as the stage of life that begins at the onset of puberty, when sexual maturity, or the ability to reproduce is attained. It has been regarded as a period of rapid change, both biologically and psychologically. Though the physical changes that take place during this stage are universal, the social and psychological dimensions of the adolescent's experiences depend on the cultural context. For example, in cultures where the adolescent years are viewed as problematic or confusing, the adolescent will have very different experiences from someone who is in a culture, where adolescent years are viewed as beginning of adult behaviour and, therefore, undertaking responsible tasks. Although most societies have at least a brief period of adolescence, it is not universal across cultures.

Physical development during adolescence is also accompanied by a number of psychological changes. Around puberty adolescents show an increase in interest in members of the opposite sex and in sexual matters and a new awareness of sexual feelings develops. This increased attention to sexuality is caused by factors such as individual's awareness of the biological changes taking place and the emphasis placed on sexuality by peers, parents, and society. Even then, many adolescents lack adequate knowledge or have misconceptions about sex and sexuality. Sex is a topic parents find difficult to discuss with children, so adolescents tend to become secretive about sexual concerns which make exchange of information and 103 communication difficult. The concern over adolescent sexuality has become intense in recent times because of the risk of AIDS, and other sexually transmitted diseases. The development of a sexual identity defines the sexual orientation and guides sexual behaviour. As such it becomes an important developmental task for adolescents. How did you think of yourself at the beginning of puberty? Adolescents are preoccupied with what they are like and develop individual images of what they look like. Another important developmental task during adolescence is accepting one's physical self/ maturity. Adolescents need to develop a realistic image of their physical appearance, which is acceptable to them. It is important to keep in mind that puberty also involves cognitive and social changes along with physical changes. Cognitive Developmental Changes: Adolescents' thought becomes more abstract, logical, and idealistic; they become more capable of examining their own thoughts, others' thoughts, and what others are thinking about them. Adolescents' developing ability to reason gives them a new level of cognitive and social awareness. Piaget believed that formal operational thought appears between the age of 11 and 15. During this stage adolescent thinking expands beyond actual concrete experiences and they begin to think more in abstract terms and reason about them. In addition to being abstract, adolescent thought is also idealistic. Adolescents begin to think about ideal characteristics for themselves and others and compare themselves and others with these ideal standards. For example, they may think what an ideal parent is like and compare their parents with these ideal standards. This may at times make adolescents wonder which of the new-found ideal standards they should adopt. In contrast to trial and error approach used by children in earlier stages of development, adolescent thinking becomes more systematic in solving problems — they think of possible courses of action, why something is happening the way it is, and systematically seek solutions. Piaget called this type of logical thinking — hypothetical deductive reasoning. Logical thought also influences the development of moral reasoning. Social rules are not considered as absolute standards and moral thinking shows some flexibility. The adolescent recognises alternative moral courses, explores options, and then decides on a personal moral code. For example, should I smoke as everyone I know does? Is it ethical to copy answers in the examinations? This also lends the possibility of adolescents not following society's norms if they conflict with personal code of ethics. For example, individuals at this age might participate in a protest march for a cause rather than adhere/ conform to college norm. Adolescents also develop a special kind of egocentrism. According to David Elkind, imaginary audience and personal fable are two components of adolescents' egocentrism. Imaginary audience is adolescent's belief that others are as preoccupied with them as they are about themselves. They imagine that people are always noticing them and are observing each and every behaviour of theirs. Imagine a boy who thinks that all will notice the ink spot on his shirt, or a girl with a pimple feels, all people would think how bad her skin is. It is this imaginary audience, which makes them extremely self-conscious. The personal fable is part of the adolescents' egocentrism that involves their sense of uniqueness. Adolescents' sense of uniqueness makes them think that no one understands them or their feelings. For example, an adolescent girl thinks that none can sense the hurt that she feels because of being betrayed by a friend. It is quite 104 common to hear the adolescent say to the parents; 'you don't understand me'. To retain their sense of personal uniqueness they may weave stories filled with fantasy around them to create a world that is away from reality. Personal fables are often part of adolescent diaries. Forming an Identity: You must have sought answers to questions such as: Who am I? Which subjects should I study? Do I believe in God? The answers to all these questions involve the quest to define one's sense of self or the search for identity. Identity is who you are and what your values, commitments and beliefs are. The primary task of adolescence is to establish an identity separate from the parents. During adolescence a detachment process enables the individual to develop a personalised set of beliefs that are uniquely her or his own. In the process of achieving an identity the adolescent could experience conflict with parents and within herself or himself. Those adolescents who can cope with the conflicting identities develop a new sense of self. Adolescents who are not able to cope with this identity crisis are confused. This "identity confusion", according to Erikson, can lead to individuals isolating themselves from peers and family; or they may lose their identity in the crowd. Adolescents on one hand, may desire independence but may also be afraid of it and show a great deal of dependence on their parents. Rapid fluctuations between self-confidence and insecurity are typical of this stage. Adolescents may at one time complain of being "treated like a baby" whereas on other occasions they may seek comfort by depending on their parents. Seeking an identity involves searching for continuity and sameness in oneself, greater responsibility and trying to get a clear

sense of who one is, i.e. an identity. The formation of identity during adolescence is influenced by several factors. The cultural background, family and societal values, ethnic background, and socioeconomic status all prevail upon the adolescents' search for a place in society. Family relationships become less important as the adolescent spends more time outside the home and develops a strong need for peer support and acceptance. Increased interactions with peers provide them with opportunities for refining their social skills and trying out different social behaviours. Peers and parents are dual forces having major influences on adolescents. At times conflicting situations with parents lead to increased identification with peers. But generally, parents and peers serve complementary functions and fulfil different needs of the adolescents. Vocational commitment is another factor influencing adolescent identity formation. The question "What are you going to be when you grow up?", requires the ability to think about the future and to be able to set realistic and achievable goals. In some cultures, freedom is given to the young people to choose an occupation, whereas in certain other cultures the option of making this choice is not given to the children. Here, parents' decision is likely to be accepted by the children. What has been your experience while making a choice in the selection of subjects? Career counselling in schools offers information regarding appraisal of the students for various courses and jobs and provides guidance in making a decision about career choices. 105 Some Major Concerns: As adults when we reflect on our adolescent years and recall the conflicts, uncertainties, occasional loneliness, group pressures, we feel it was definitely a vulnerable period. During adolescence peer influence, new gained freedom, unresolved problems may create difficulties for many of you. Conforming to peer pressure can be both positive and negative. Adolescents are often confronted with decisions regarding smoking, drugs, alcohol, and breaking parental rules, etc. These decisions are taken without much regard to the effect they can have. Adolescents may face periods of uncertainty, loneliness, self-doubt, anxiety, and concern about themselves and their future, they are also likely to experience excitement, joy, and feelings of competence as they overcome the developmental challenges. You will now read about some of the major challenges faced by adolescents like delinquency, substance abuse, and eating disorders. Delinquency: Delinquency refers to a variety of behaviours, ranging from socially unacceptable behaviour, legal offences, to criminal acts. Examples include truancy, running away from home, stealing or burglary or acts of vandalism. Adolescents with delinquency and behavioural problems tend to have a negative self-identity, decreased trust, and low level of achievement. Delinquency is often associated with low parental support, inappropriate discipline, and family discord. Often adolescents from communities characterised by poverty, unemployment, and having feelings of alienation from the middle class perform antisocial acts to gain attention and to be popular with their peers. However, most delinquent children do not remain delinquent forever. Change in their peer group, becoming more aware of their social responsibilities and developing feelings of selfworth, imitating positive behaviour of the role models, breaking negative attitudes, and overcoming poor self-concept help in reduction of delinquent behaviour. Substance Abuse: Adolescent years are especially vulnerable to smoking, alcohol and drug abuse. Some adolescents take recourse to smoking and drugs as a way of coping with stress. This can interfere with the development of coping skills and responsible decision making. The reasons for smoking and drug use could be peer pressure and the adolescents' need to be accepted by the group, or desire to act more like adults, or feel a need to escape the pressure of school work or social activities. The addictive powers of nicotine make it difficult to stop smoking. It has been found that adolescents who are more vulnerable to drugs, alcohol, and nicotine use, are impulsive, aggressive, anxious, depressive, and unpredictable, have low self-esteem, and low expectation for achievement. Peer pressure and the need to be with their peer group make the adolescent either go along with their demands to experiment with drugs, alcohol, and smoking or be ridiculed. Drug use if continued long enough can lead to physiological dependency, i.e. addiction to drugs, alcohol or nicotine may seriously jeopardise the rest of the adolescents' lives. Positive relationships with parents, peers, siblings, and adults play an important role in preventing drug abuse. In India, a successful anti-drug programme is the Society for Theatre in Education Programme in New Delhi. It uses street performances to entertain people between 13 to 25 years of age while teaching them how to say no to drugs. The United Nations International 106 Drug Control Programme (UNDCP) has chosen the programme as an example to be adopted by other nongovernmental organisations in the region. Eating Disorders: Adolescents' obsession with self, living in fantasy world and peer comparisons lead to certain conditions where they become obsessed with their own bodies. Anorexia nervosa is an eating disorder that involves relentless pursuit of thinness through starvation. It is quite common to see adolescents eliminate certain foods from their diets or to eat slimming foods only. The media also projects thinness, as the most desirable image and copying such fashionable image of thinness leads to anorexia nervosa. Bulimia is another form of an eating disorder in which the individual follows a binge-and-purge eating pattern. The bulimic goes on an eating binge, then purges by self-induced vomiting or using a laxative at times alternating it with fasting. Anorexia nervosa and bulimia are primarily female disorders more common in urban families. Adulthood and Old Age Adulthood An adult is generally defined as someone who is responsible, mature, self-supporting, and well- integrated into society. There is a variation in developing these attributes, which suggests that there is a shift in timing when an individual becomes an adult or assumes adult roles. Some people take up jobs along with their college studies or may get married and not pursue their

studies. Others may continue to live with their parents even after getting married and being financially independent. The assumption of adult roles is directed by an individual's social context. The best time for some of the most important life events (i.e. marriage, job, having children) might be quite different in different cultures but within a culture there is similarity in the course of adult development. In early adulthood, two major tasks are, exploring the possibilities for adult living and developing a stable life structure. The twenties represent the novice phase of adult development. Gradually, a transition from dependence to independence should occur. This could be marked by an image of the kind of life the young person wants, especially in terms of marriage and a career. Career and Work: Earning a living, choosing an occupation, and developing a career are important themes for people in their twenties and thirties. Entering work life is a challenging event in anyone's life. There are apprehensions regarding different adjustments, proving one's competence, performance, dealing with competition, and coping with expectations both of the employers and oneself. It is also the beginning of new roles and responsibilities. Developing and evaluating a career becomes an important task of adulthood. Marriage, Parenthood, and Family: The adjustments that young adults have to make when entering a marriage relate to knowing the other person if not known earlier, coping with each other's likes, dislikes, tastes, and choices. If 107 both the partners are working, adjustments are required regarding sharing and performing roles and responsibilities at home. In addition to getting married, becoming a parent can be a difficult and stressful transition in young adults, even though it is usually accompanied by the feeling of love for the baby. How adults experience parenting is affected by different situations such as the number of children in the family, the availability of social support, and the happiness or unhappiness of the married couple. Death of a spouse or divorce creates a family structure in which a single parent either the mother or the father has to take up the responsibility of the children. In recent times, women are increasingly seeking employment outside the home thus creating another type of family in which both parents work. The stressors when both parents are working are quite same as of a single working parent, namely, taking care of children, their schoolwork, illness, and coping with workload at home and in the office, etc. Despite the stresses associated with parenting, it provides a unique opportunity for growth and satisfaction and is perceived as a way of establishing concern and guiding the next generation. Physical changes during middle ages are caused by maturational changes in the body. Though individuals may vary in the rate at which these changes occur, almost all middle aged people notice gradual deterioration in some aspects of their physical functioning such as decline in vision, sensitivity to glare, hearing loss and changes in physical appearance (e.g., wrinkles, grey hair or thinning of hair, weight gain). Do cognitive abilities change during adulthood? It is believed that some cognitive abilities decline with age while others do not. Decline in memory is more in tasks involving long-term memory than short-term memory. For example, a middle-aged person can remember the telephone number immediately after s/he has heard it but may not remember it so efficiently after a few days. Memory tends to show greater decline, while wisdom may improve with age. Remember that individual differences exist in intelligence at every age and as not all children are exceptional, neither do all adults show wisdom. Old Age Just when "old age" begins, is not easy to determine. Traditionally, the age of retirement was linked to old age. Now that people are living longer, age of retiring from work is changing, and the cut-off point for the definition of "old age" is moving upward. Some of the challenges, which the aged have to cope with include retirement, widowhood, illness, or death in the family. The image of old age is changing in certain ways. Now there are people who have crossed seventy years of age or so and are quite active, energetic, and creative. They are competent and are therefore, valued by society in many walks of life. In particular, we have aged people in politics, literature, business, art and science. The myth of old age as an incapacitating and therefore, frightening phase of life is changing. Of course, the experience of old age also depends on the socio-economic conditions, availability of health care, attitude of people, expectations of society and the available support system. Work is most importantduring early adult years, then family becomes most important and beyond that health becomes the most important issue in the person's life. Clearly, successful ageing for much of our adult life focuses on how effective we are at work, how loving our 108 relationships are in our family, how good our friendships are, how healthy we are, and how cognitively fit we are. Retirement from active vocational life is quite significant. Some people perceive retirement as a negative change. They consider it as a separation from an important source of satisfaction and self-esteem. Others view it as a shift in life with more time to pursue their own interests. It is seen that older adults who show openness to new experiences, more striving and achievement oriented behaviour prefer to keep busy and are better adjusted. Older adults also need to adjust to changes in the family structure and new roles (grand parenting) that have to be learnt. Children usually are busy in their careers and families and may set up independent homes. Older adults may depend on their children for financial support and to overcome their loneliness (after children have moved out). This might trigger-off feelings of hopelessness and depression in some people. In old age feeling of loss of energy, and dwindling of health and financial assets, lead

to insecurity and dependency. The elderly tends to look towards others to lean on and to care for them. Indian culture favours dependency of elderly on their children, for old age needs caring. In fact, parents in most oriental cultures rear their children with the fond hope that they will care for them during old age. It is important to give the elderly a sense of security and belonging, a feeling that people care for them (especially in the time of crisis), and to remember that we all have to grow old one day.

Although death is more likely to occur in late adulthood, death can come at any point in development. The deaths, especially of children and younger adults, are often perceived to be more tragic than those of others. In children and younger adults, death is more likely to occur because of accidents but in older adults it is more likely to occur because of chronic disease. The death of a

spouse is usually seen as the most difficult loss. Those left behind after the death of their partner suffer deep grief, cope with loneliness, depression, financial loss and are also at risk of many health related problems. Widows by far outnumber widowers, because studies show that women live longer than men and tend to marry men older than themselves. During such times, support from children, grandchildren, and friends can help the individual cope with the loss of spouse. People in different cultures view death differently. In the Gond culture in our country, it is believed that death is caused by magic and demon. In the Tanala culture of Madagascar, natural forces are thought to cause death. Human development as you have read in this chapter thus, helps you to understand the influence of various factors in an individual's lifetime. 109 110

Unit: V Childhood Disorders In this unit, you will learn about, • Introduction • Childhood Mental and Behavioral Disorders • Pervasive Development Disorder ◦ Definition ◦ Symptoms of PDD ◦ Pervasive Development Disorder Not Otherwise Specified ◦ Commonly Associated Problems and Disorders • Learning Disability ◦ Definition ◦ Signs and Symptoms of Learning Disabilities and Disorders ◦ Common Types of Learning Disabilities Introduction Childhood mental and developmental disorders encompass neurodevelopmental, emotional and behavioral disorders that have broad and serious adverse impacts on psychological and social well-being. Children with these disorders require significant additional support from families and educational systems; the disorders frequently persist into adulthood (Nevo and Manassis, 2009, Polanczyk and Rohde, 2007, Shaw and others, 2012). These children are more likely to experience a compromised developmental trajectory, with increased need for medical and disability services, as well as increased risk of contact with law enforcement agencies (Fergusson and others, 1993). Childhood Mental and Behavioral Disorders The following five conditions of childhood disorders are: childhood anxiety disorders, attention deficit hyperactivity disorder(ADHD), conduct disorder, autism, and intellectual disability (intellectual developmental disorder). ? Anxiety disorders are characterized by excessive or inappropriate fear, with associated behavioral disturbances that impair functioning (American Psychiatric Association, 2013). Children with anxiety disorders have clinical symptoms, such as excessive anxiety; severe physiological anxiety symptoms; behavioral disturbances, such as avoidance of feared objects; and associated distress or impairment (Beesdo and others, 2009). 111

? ADHD is a neurodevelopmental disorder characterized by in attention and disorganization, with or without hyperactivity-impulsivity, causing impairment of functioning (American Psychiatric Association, 2013). ADHD persists into adulthood in approximately 20percentof individuals (Polanczyk and Rohde, 2007). ? Conduct Disorder diagnosed in children under the age of 18years is characterized by a pattern of antisocial behaviors that violate the basic rights of others or major age-appropriate societal norms. ? Autism is a neurodevelopmental disorder characterized by severe impairment in reciprocal social interactions and communication skills, as well as the presence of restricted and stereotypical behaviors. ? Intellectual disability is a generalized disorder that is characterized by significantly impaired cognitive functioning and deficits in two or more adaptive behaviors (American Psychiatric Association, 2013). Pervasive Development Disorder Pervasive developmental disorders (PDDs) are a group of neurobiological disorders characterized by fundamental deficits in social interaction skills or communication skills, or by the presence of stereotyped (purposeless and repetitive) behaviors, interests, or activities (American Psychiatric Association, 2000). Common features include difficulty with transitions or change, unusual sensory interests or sensitivities, an extremely narrow and intense focus of interest, and stereotyped behaviors (e.g., hand flapping, rocking, twirling). Cognitive deficits or uneven skill development are often present. The spectrum of symptoms can range from a limited desire or ability to interact with others to the more severe symptoms seen with autistic disorder. While the symptoms of autistic disorder may be quite evident, children and adolescents with more subtle difficulties (e.g., those with social withdrawal problem; Asperger's disorder, or a pervasive developmental disorder, not otherwise specified [PDD, NOS]) often go undiagnosed and untreated. Missed opportunities for treatment can adversely affect long-term outcomes and quality of life for these children and adolescents and their families. Symptoms of PDD Children with a PDD typically begin experiencing difficulties by or before age 3. 1. Social Withdrawal Problem- Children and adolescents differ in their ability to interact socially and in their desire to do so. Some demonstrate an inability or lack of desire to interact with others. When this inability interferes with their development and functioning, it qualifies as a problem. Infancy- ? May be irritable and difficult to console ? May exhibit repetitive behavior, such as head banging ? May show low levels of social responsiveness; may withdraw in the absence of persistent efforts by parents to encourage social interaction. 112 Early Childhood- ? Appears self-absorbed, preferring solitary play to interacting with others ? May exhibit some mildly compulsive or rigid behaviors Middle Childhood- ? Rarely initiates peer interactions; prefers solitary play to group activities ? May be increasingly concerned about following rules and maintaining routines Adolescence- ? Has few friendships; has difficulty in social situations ? May be viewed as a loner; is socially isolated ? May have eccentric hobbies and interests ? Shows little concern for popular styles of dress or behaviour 2. Autistic Disorder- The most important clinical manifestations of autistic disorder are markedly abnormal development in social interaction and communication skills, and patterns of restrictive, repetitive, and stereotyped behavior and interests. These manifestations are evident in the first 3 years of life but may present differently at various developmental stages. Children and adolescents with autistic disorder may be unable to understand that others have needs or may not be aware of others' feelings or distress. They may treat others as objects, tools, or mechanical aids. In addition, children and adolescents with autistic disorder may show impairment in their nonverbal social behaviors (e.g., lack of eye-to-eye gaze, reciprocal smiling, and affectionate contact) and in their ability mid to engage in symbolic or imaginative play. Their erratic sleep patterns and aversion to certain foods may disrupt family life. Self-injurious behavior (e.g., head banging, self-biting, hair pulling) can occur in more severely affected children and adolescents. Some children and adolescents with autistic disorder may have "islets of special abilities" (i.e., highly developed skills in very narrow and specific areas, such as the ability to decode numbers, list things from memory, or draw or play music exceptionally well) that contrast markedly with the level of their general cognitive functioning (Volkmar and Klin, 2000). Infancy ? Infants with autistic disorder may show little interest in being held, or they may not be comforted by physical closeness with their parents. They have significant limitations in social smiling, eye contact, vocalization, and social play. ? Infants with autistic disorder display little interest in the human face. Early Childhood- ? Children may not follow (shadow) their parents at home, preferring to be alone. They may not show anxiety in being separated from their parents but may become noticeably agitated in response to minor changes in their environment or routine. They often display echolalia (stereotyped repetition of another person's words or phrases), repetitive motor behavior, and unusual attachments to objects. As they grow older, they tend not to make friends and do not exhibit social or emotional reciprocity. ? Children commonly demonstrate delays in or total lack of development of spoken language. 113

Middle Childhood- ? Children rarely share pleasure or excitement with others, and their social and vocal expressions and interactions are limited. Adolescence- ? Adolescents show significant deficits in understanding social expectations and have few or no friendships. They may exhibit unusual affect and perseverative (persistent and repetitive), ritualistic speech or behaviors. 3. Rett's Disorder- Rett's disorder shares the same diagnostic code as pervasive developmental disorders, not otherwise specified (PDDs, NOS) and Asperger's disorder. This X-linked dominant disorder has been reported only in females and is usually associated with severe to profound mental retardation (MR). Rett's disorder is characterized by normal functioning through the first 5 months of life, with subsequent development of the following severe deficits: ? Deceleration of head growth between 5 and 48 months ? Loss of purposeful hand movements between 5 and 30 months, and development of stereotyped mid line hand movements (e.g., hand wringing, hand washing) ? Cessation of social engagement ? Poorly coordinated gait or trunk movements ? Severe impairments in language development, with severe psychomotor retardation By age 5, MR is frequently severe. Serious medical concerns include seizures, respiratory problems (including periods of apnea and hyperventilation), and risk of sudden cardiac death. Motor problems and scoliosis may also be present. Individuals with Rett's disorder have progressive neurodegeneration but can survive to adulthood (Volkmar and Klin, 2000). 4. Childhood Disintegrative Disorder- This disorder is characterized by normal development until at least age 2 and thereafter by progressive loss (before age 10) of skills in communication, social interaction, behavior, self-help, and adaptive functioning. Childhood disintegrative disorder is associated with severe mental retardation (MR) and with an increased risk of seizure disorder. The majority of children and adolescents with childhood disintegrative disorder eventually stabilize and cease to deteriorate. Occasionally, they may recover some previously attained developmental skills. A minority of children and adolescents with childhood disintegrative disorder have progressive neurodegeneration and die early, but most have a normal life expectancy (Volkmar and Klin, 2000). 5. Asperger's Disorder- Asperger's disorder shares the same diagnostic code as pervasive developmental disorder, not otherwise specified (PDD, NOS), but children and adolescents with Asperger's disorder can be identified by the following symptoms: ? Impaired social interaction ? Restricted, repetitive, and stereotyped patterns of behavior, interests, and activities ? No significant delay in language or cognitive development (may be cognitively high functioning), adaptive skills (other than in social interactions), or curiosity about their environment ? Clumsiness (in many but not all cases) 114 Long-term outcomes of Asperger's disorder are not well defined, but impairment in social interaction is believed to be a lifelong problem for individuals with this disorder. Pervasive Development Disorder Not Otherwise Specified A wide range of developmental patterns are currently diagnosed as pervasive developmental disorder, not otherwise specified (PDD, NOS), which is considered a residual diagnostic category. Compared with children and adolescents who have social withdrawal problem, children and adolescents with PDD, NOS exhibit more extensive impairment in reciprocal social interactions; such impairment is associated with impaired verbal or nonverbal communication skills and/or stereotyped interests or behaviors that can interfere with developmental activities. Commonly Associated Problems and Disorders Table: Comparison of Pervasive Developmental Disorder Diagnoses

Features	Autistic Disorder	Asperger's Disorder	Rett's Disorder	Child Disintegrative Disorder
Age at Onset	> 3 years, usually in first year	Typically < 3 years; no delays in language and cognitive development	Deceleration of head growth, 5–48 months; loss of purposeful hand skills, 5–30 months	2–10 years; normal development prior to 2 years of age
Gender	4–5 times more likely in males than in females	At least 5 times more likely in males than in females	Reported almost exclusively in females	Occurs in slightly more males than females
Relationship to mental retardation (MR)	Typically mild to profound MR; females likely to exhibit more severe MR	None	Severe to profound MR	Severe MR

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Degenerative No No Yes In most children, degeneration stabilizes; occasionally some skills regained Seizures Occur in up to 25% of children and adolescents; more common in adolescence No Yes Increased risk of seizures Examples of associated conditions Fragile X syndrome; tuberous sclerosis; neurofibromatosis; chromosomal aberrations Chromosomal aberrations; obsessive compulsive disorder; depression; attention deficit hyperactivity disorder Not applicable Metachromatic leukodystrophy; Schilder's disease Interventions Early identification and intensive early intervention during early childhood result in improved outcomes for most children with PDDs (Lovaas, 1987; McEachin et al., 1993; Ozonoff and Cathcart, 1998; Rogers, 1998; Sheinkopf and Siegel, 1998, as cited in Filipek et al., 2000). Interventions should be informed by an ongoing assessment of each child's or adolescent's needs and level of functioning, as these characteristics will change as the child or adolescent develops. Children and adolescents with PDDs usually require interventions from a team of professionals that can include neurologists, psychiatrists, psychologists, social workers, audiologists, speech and language therapists, physical therapists, and occupational therapists (Volkmar et al., 1999). The primary care health professional plays a critical role in coordinating services and working with the child or adolescent and family over time to support the child's or adolescent's development and functioning. The following guidelines can help the primary care health professional identify and support children and adolescents with PDDs. Child or Adolescent 1. At health supervision visits, assess all children and adolescents for developmental delays. Obtain a detailed history, including a developmental and family history, from parents as soon as impairments in social interaction or communication skills are noted. See Table 16: Signs of Autism in Infancy and Later. Screening tools such as the Ages and Stages Questionnaire (ASQ) (Bricker and Squires, 1999), the Child Development Inventories (CDIs) (Ireton, 1992), and the Parents' Evaluation of Developmental Status (PEDS) (Glascoe, 1997) can provide baseline information (Filipek et al., 1999, 2000). Reviewing family-made home videos may also be helpful. 116

2. PDDs can co-occur with a variety of medical conditions. In particular, autistic disorder can be associated with genetic disorders such as fragile X syndrome, neurofibromatosis, tuberous sclerosis, and phenylketonuria. PDDs can also be confused with other conditions such as schizophrenia and syndrome of acquired aphasia with seizure disorder. Consider further medical evaluation as indicated (e.g., genetic screening; neurological, auditory, and ophthalmological assessments). 3. If initial assessment of a child or adolescent raises concerns about PDDs, refer the child or adolescent for neuropsychological testing and psychiatric evaluation of cognitive functioning, adaptive behavior, and social and communicative skills. 4. Assess the quality of social interactions for each child or adolescent as she develops over time, as children with subtler social withdrawal problems or milder forms of a PDD may not manifest symptoms until they are older. 5. Monitor the child or adolescent for any evidence of underlying psychiatric difficulties (e.g., anxiety, mood disorders), especially if behavioural problems appear suddenly. 6. Collaborate with a mental health professional (e.g., child psychologist, child psychiatrist, social worker) or a developmental-behavioral paediatrician about ongoing management of associated behavioral and emotional difficulties (e.g., aggression, hyperactivity, self- injurious behaviors, anxiety symptoms, emotional distress with transitions). 7. If behavioral or self-injurious behaviors, anxiety, or mood symptoms persist, consult with a child psychiatrist or a developmental-behavioral paediatrician about pharmacological interventions. 8. Refer the child or adolescent for a comprehensive speech and language assessment. Advocate for ongoing speech and language services as indicated. 9. Refer the child or adolescent for physical therapy and occupational therapy evaluations, including assessment of any sensory sensitivities. 10.Incorporate an understanding of the child's or adolescent's communicative abilities into dealings with the child or adolescent (e.g., a child or adolescent whose receptive language skills exceed her expressive abilities may not be able to verbalize questions or distress but can benefit from an explanation of each step of the physical exam). 11.Identify the child's or adolescent's strengths and focus on these when trying to find ways to help him interact more with his environment. Table: Signs of Autism in Infancy and Later Signs in Infancy Motor Perceptual Socioemotional Language Mental Representation Inactive • Flaccid muscle tone • Rarely cries • Irritable • Inconsolable • Mix of hyper and hypo sensitivities to sensory stimuli Auditory • Appears deaf to voices, but jolts or • Unresponsive • Late, rare, or absent social smile • Avoids eye contact when held • Fleeting eye Delayed or absent coo and/or expressive vocalization • Failure to imitate sounds or babble • Decreased visual pursuit of objects or people • Object permanence develops slowly 117

• Soothed only when in constant motion • Rigid when held • Arches away from close physical contact • May have lost an acquired skill panics at environmental sounds Tactile • Prefers smooth surfaces • Refuses food with rough texture • Adverse reaction to wool fabrics and seams Visual • Sensitive to light • May panic at changes in light levels • Preoccupied with observing own hand and finger movements contact at a distance • Lack of anticipatory response to being picked up • Fails to show normal 8-month stranger anxiety • Lack of gaze monitoring • Does not follow a point • Seems to dislike being held • Seems content to be left alone • Fails to visually follow comings and goings of parents • Doesn't play peeka-boo or pat-a- cake or wave good- bye • Fails to form strong personal attachments • Little use of communicative gestures • Lack of pointing and pointing to obtain an object; instead brings adult's hand to desired object or tries to get desired object on own • May have lost an acquired skill Signs Beyond Infancy Motor Perceptual Socioemotional Language Mental Representat ion • Toe-walking • Rocking • Head banging • Whirling without dizziness • Perseverative movements • Sniffing •Other stereotypics • Withdraws from environmental stimulation • Engages in self stimulation • Becomes preoccupied with spinning objects • Suddenly ceases activity and stares into space, often with neck hyperextended • Moves adult's hand like a tool • Insists on sameness and ritualizes routines • Unable to identify with another's feelings or point of view • Lack of pointing to direct another's attention to an interesting object or event • Speech is delayed or absent, or shows precocious advances followed by failure to use previously learned words • Limited ability to follow directions • Unable to point to body parts, objects, or pictures when named • Lack of pointing and pointing to obtain an object; instead leads adult to desired object or gets desired object on own • Immediate echolalia • No representational play • Little appropriate use of toys • Preoccupied with impersonal invariant information (e.g., television commercials) • Unable to solve false-belief problems ("Sally and Ann Test") 118

• Delayed echolalia unrelated to social context • Pronoun reversals • Atonal, hollow, rhythmic voice Family 1. Help families engage long-term supports, for example, ? Community supports (e.g., family members and friends) ? Agency and organizational supports (e.g., the Department of Developmental Disabilities, state and local agencies, Supplemental Social Security Income, the Autism Society of America) ? Physical and mental health professionals 2. Help families develop behavioral modification programs in the home setting (usually with the collaboration of a behavioral therapist specializing in developmental disorders) to strengthen adaptive behaviors (e.g., increased social interactions) and to decrease maladaptive behaviors (e.g., aggression, self-injurious behaviors). 3. For children and adolescents whose symptoms are less severe and involve more subtle difficulties with social communication and interactions, help families structure activities to maximize their child's or adolescent's opportunities to engage in positive social experiences (e.g., suggest that the child or adolescent participate in organized clubs or sports that have close adult supervision and in structured activities with one or two supportive peers). Friends 1. In addition to encouraging the types of day-today social opportunities described above, consider making a referral for social skills training via programs such as weekly social skills groups or peer tutoring programs. Community and School 1. Support families in requesting appropriate educational interventions. Children and adolescents with PDDs are eligible for early intervention and special education services through the Individuals with Disabilities Education Act (IDEA). Legal mandates specify that all children and adolescents ages 3–21 who are diagnosed with a PDD receive appropriate educational services at no cost based on the child's or adolescent's Individualized Education Program (IEP). Before age 3, services may be provided by other agencies through an Individualized Family Service Plan. Parents should be aware that their child or adolescent may also qualify for services under Section 504 of the Rehabilitation Act. 2. Be aware of how to help the family and the school access information about meeting the child's or adolescent's educational and developmental needs. An individualized intervention program should be carried out by professionals experienced in working with children and adolescents with PDDs. A child or adolescent with a PDD may require 119

intensive and individualized instruction and interventions. Educational programs based on the Treatment and Education of Autistic and Related Communication Handicapped Children (TEACCH) system (Campbell et al., 1995) have shown promise for children and adolescents with PDDs and are based on the following principles: • Improving each child's or adolescent's overall adaptation by improving skills and developing appropriate environmental adaptations • Using both formal measures (e.g., the Psychoeducational Profile-Revised [PEP-R] [Schopler et al., 1990]) and informal observation to design individualized educational programs • Using cognitive and behavioral theory to inform interventions • Assessing and enhancing skills, while recognizing areas of weakness • Using visual teaching techniques • Using a multidisciplinary team to address the child's or adolescent's needs, and engaging consultants as indicated 3. Support the school and the family in maximizing a child's or adolescent's communication skills and in generalizing these skills to multiple settings. 4. Refer for additional services (e.g., speech and language therapy, occupational therapy, vocational training) as indicated. Learning Disability Definition Learning disability (LD) is a general term that describes specific kinds of learning problems. A learning disability can cause a person to have trouble learning and using certain skills. The skills most often affected are reading, writing, listening, speaking, reasoning, and doing math. Learning disabilities vary from person to person. One person with LD may not have the same kind of learning problems as another person with LD. One person may have trouble with reading and writing. Another person with LD may have problems understanding math. Still another person may have trouble in each of these areas, as well as with understanding what people are saying (National Dissemination Center for Children and Youth with Disabilities [NICHCY], 2004). LD is a group of disorders that affects people's ability to either interpret what they see and hear or to link information from different parts of the brain. These limitations can show up in many ways: as specific difficulties with spoken and written language, coordination, self-control, or attention. Such difficulties extend to schoolwork and can impede learning to read, write, or do math. A learning disability is a neurological disorder that affects the brain's ability to receive, process, store, and respond to information. The term learning disability is used to describe the seemingly unexplained difficulty a person of at least average intelligence has in acquiring basic academic skills. These skills are essential for success at school and work, and for coping with life in general. "LD" does not stand for a single disorder. It is a term that refers to a group of disorders. 120 Interestingly, there is no clear and widely accepted definition of learning disabilities. Because of the multidisciplinary nature of the field, there is ongoing debate on the issue of definition, and currently at least twelve definitions appear in the professional literature. There are several technical definitions offered by various health and education sources. Overall, most experts agree on the following descriptions: ? Individuals with LD have difficulties with academic achievement and progress. ? Discrepancies exist between a person's potential for learning and what that person actually learns. ? Individuals with LD show an uneven pattern of development (language development, physical development, academic development, and/or perceptual development). ? Learning problems are not due to environmental disadvantage. ? Learning problems are not due to mental retardation or emotional disturbance. ? Learning disabilities can affect one's ability to read, write, speak, spell, compute math, and reason. They also can affect a person's attention, memory, coordination, social skills, and emotional maturity. ? Individuals with LD have normal intelligence or are sometimes even intellectually gifted. ? Individuals with LD have differing capabilities, with difficulties in certain academic areas but not in others. Learning disabilities have an effect on either input (the brain's ability to process incoming information) or output (the person's ability to use information in practical skills, such as reading, math, spelling, etc.). Research suggests that learning disabilities are caused by differences in how a person's brain works and how it processes information. Children with LD are not stupid or lazy. In fact, they usually have average or above average intelligence, but their brains process information differently. A learning disability affects the way kids of average to above average intelligence receives, process, or express information. Even if the person learns to compensate and, in effect, overcomes the disorder, the difference in brain processing lasts throughout life. Children with learning disabilities can, and do, succeed It can be tough to face the possibility that your child has a learning disorder. No parents want to see their children suffer. You may wonder what it could mean for your child's future or worry about how your kid will make it through school. Perhaps you're concerned that by calling attention to your child's learning problems he or she might be labeled "slow" or assigned to a less challenging class. But the important thing to remember is that most kids with learning disabilities are just as smart as everyone else. They just need to be taught in ways that are tailored to their unique learning styles. By learning more about learning disabilities in general, and your child's learning difficulties in particular, you can help pave the way for success at school and beyond. Signs and Symptoms of Learning Disabilities and Disorders Learning disabilities look very different from one child to another. One child may struggle with reading and spelling, while another loves books but can't understand math. Still another child 121

may have difficulty understanding what others are saying or communicating out loud. The problems are very different, but they are all learning disorders. It's not always easy to identify learning disabilities. Because of the wide variations, there is no single symptom or profile that you can look to as proof of a problem. However, some warning signs are more common than others at different ages. If you're aware of what they are, you'll be able to catch a learning disorder early and quickly take steps to get your child help. The following checklist lists some common red flags for learning disorders. Remember that children who don't have learning disabilities may still experience some of these difficulties at various times. The time for concern is when there is a consistent unevenness in your child's ability to master certain skills. Signs and symptoms of learning disabilities: Preschool age ? Problems pronouncing words ? Trouble finding the right word ? Difficulty rhyming ? Trouble learning the alphabet, numbers, colors, shapes, days of the week ? Difficulty following directions or learning routines ? Difficulty controlling crayons, pencils, and scissors, or coloring within the lines ? Trouble with buttons, zippers, snaps, learning to tie shoes Signs and symptoms of learning disabilities: Ages 5-9 ? Trouble learning the connection between letters and sounds ? Unable to blend sounds to make words ? Confuses basic words when reading ? Slow to learn new skills ? Consistently misspells words and makes frequent errors ? Trouble learning basic math concepts ? Difficulty telling time and remembering sequences Signs and symptoms of learning disabilities: Ages 10-13 • Difficulty with reading comprehension or math skills • Trouble with open-ended test questions and word problems • Dislikes reading and writing; avoids reading aloud • Poor handwriting • Poor organizational skills (bedroom, homework, desk is messy and disorganized) • Trouble following classroom discussions and expressing thoughts aloud • Spells the same word differently in a single document Problems with Reading, Writing, and Math Learning disabilities are often grouped by school-area skill set. If your child is in school, the types of learning disorders that are most conspicuous usually revolve around reading, writing, or math. 122

Learning disabilities in reading (dyslexia) There are two types of learning disabilities in reading. Basic reading problems occur when there is difficulty understanding the relationship between sounds, letters and words. Reading comprehension problems occur when there is an inability to grasp the meaning of words, phrases, and paragraphs. Signs of reading difficulty include problems with: ? letter and word recognition ? understanding words and ideas ? reading speed and fluency ? general vocabulary skills Learning disabilities in math (dyscalculia) Learning disabilities in math vary greatly depending on the child's other strengths and weaknesses. A child's ability to do math will be affected differently by a language learning disability, or a visual disorder or a difficulty with sequencing, memory or organization. A child with a math-based learning disorder may struggle with memorization and organization of numbers, operation signs, and number "facts" (like 5+5=10 or 5x5=25). Children with math learning disorders might also have trouble with counting principles (such as counting by twos or counting by fives) or have difficulty telling time. Learning disabilities in writing (dysgraphia) Learning disabilities in writing can involve the physical act of writing or the mental activity of comprehending and synthesizing information. Basic writing disorder refers to physical difficulty forming words and letters. Expressive writing disability indicates a struggle to organize thoughts on paper. Symptoms of a written language learning disability revolve around the act of writing. They include problems with: a) neatness and consistency of writing b) accurately copying letters and words c) spelling consistency d) writing organization and coherence Other Types of Learning Disabilities and Disorders Reading, writing, and math aren't the only skills impacted by learning disorders. Other types of learning disabilities involve difficulties with motor skills (movement and coordination), understanding spoken language, distinguishing between sounds, and interpreting visual information. Learning disabilities in motor skills (dyspraxia) Motor difficulty refers to problems with movement and coordination whether it is with fine motor skills (cutting, writing) or gross motor skills (running, jumping). A motor disability is 123

sometimes referred to as an "output" activity meaning that it relates to the output of information from the brain. In order to run, jump, write or cut something, the brain must be able to communicate with the necessary limbs to complete the action. Signs that your child might have a motor coordination disability include problems with physical abilities that require hand-eye coordination, like holding a pencil or buttoning a shirt. Learning disabilities in language (aphasia/dysphasia) Language and communication learning disabilities involve the ability to understand or produce spoken language. Language is also considered an output activity because it requires organizing thoughts in the brain and calling upon the right words to verbally explain something or communicate with someone else. Signs of a language-based learning disorder involve problems with verbal language skills, such as the ability to retell a story and the fluency of speech, as well as the ability to understand the meaning of words, parts of speech, directions, etc. Auditory and Visual Processing Problems: The Importance of the Ears and Eyes The eyes and the ears are the primary means of delivering information to the brain, a process sometimes called "input." If either the eyes or the ears aren't working properly, learning can suffer. Auditory processing disorder – Professionals may refer to the ability to hear well as "auditory processing skills" or "receptive language." The ability to hear things correctly greatly impacts the ability to read, write and spell. An inability to distinguish subtle differences in sound or hearing sounds at the wrong speed make it difficult to sound out words and understand the basic concepts of reading and writing. Visual processing disorder – Problems in visual perception include missing subtle differences in shapes, reversing letters or numbers, skipping words, skipping lines, misperceiving depth or distance, or having problems with eye–hand coordination. Professionals may refer to the work of the eyes as "visual processing." Visual perception can affect gross and fine motor skills, reading comprehension, and math. Common types of learning disabilities Dyslexia – Difficulty with reading (a) Problems reading, writing, spelling, speaking Dyscalculia – Difficulty with math (b)Problems doing math problems, understanding time, using money Dysgraphia – Difficulty with writing (c) Problems with handwriting, spelling, organizing ideas 124

Dyspraxia (Sensory Integration Disorder) – Difficulty with fine motor skills (d)Problems with hand-eye coordination, balance, manual dexterity Dysphasia/Aphasia – Difficulty with language (e) Problems understanding spoken language, poor reading comprehension Auditory Processing Disorder – Difficulty hearing differences between sounds (f) Problems with reading, comprehension, language Visual Processing Disorder – Difficulty interpreting visual information (g) Problems with reading, math, maps, charts, symbols, pictures Other Disorders that Make Learning Difficult Difficulty in school doesn't always stem from a learning disability. Anxiety, depression, stressful events, emotional trauma, and other conditions affecting concentration make learning more of a challenge. In addition, ADHD and autism sometimes co-occur or are confused with learning disabilities. ADHD – Attention deficit hyperactivity disorder (ADHD) (/articles/add-adhd/attention deficit- disorder-adhd-in-children.htm), while not considered a learning disability, can certainly disrupt learning. Children with ADHD often have problems sitting still, staying focused, following instructions, staying organized, and completing homework. Autism – Difficulty mastering certain academic skills can stem from pervasive developmental disorders such as autism and Asperger's syndrome. Children with autism spectrum disorders (/articles/autism/autism-spectrum-disorders.htm) may have trouble communicating, reading body language, learning basic skills, making friends, and making eye contact. Hope for learning disabilities: The brain can change Science has made great strides in understanding the inner workings of the brain, and one important discovery that brings new hope for learning disabilities and disorders is called neuroplasticity. Neuroplasticity refers to the brain's natural, lifelong ability to change. Throughout life, the brain is able to form new connections and generate new brain cells in response to experience and learning. This knowledge has led to ground breaking new treatments for learning disabilities that take advantage of the brain's ability to change. Innovative programs, such as the Arrowsmith program, use strategic brain exercises to identify and strengthen weak cognitive areas. For example, for children who have difficulty distinguishing between different sounds in a word, there are new computer-based learning programs that slow down the sounds so that children can understand them and gradually increase their speed of comprehension. 125

These discoveries about neuroplasticity provide hope to all students with learning disorders, and further research may lead to additional new treatments that target the actual causes of learning disabilities, rather than simply offering coping strategies to compensate for weaknesses. Diagnosis and Testing for Learning Disabilities and Disorders As you've already learned, diagnosing a learning disability isn't always easy. Don't assume you know what your child's problem is, even if the symptoms seem clear. It's important to have your child tested and evaluated by a qualified professional. That said, you should trust your instincts. If you think something is wrong, listen to your gut. If you feel that a teacher or doctor is minimizing your concerns, seek a second opinion. Don't let anyone tell you to "wait and see" or "don't worry about it" if you see your child struggling. Regardless of whether or not your child's problems are due to a learning disability, intervention is needed. You can't go wrong by looking into the issue and taking action. Keep in mind that finding someone who can help may take some time and effort. Even experts mix up learning disabilities with ADHD and other behavioral problems sometimes. You may have to look around a bit or try more than one professional. In the meantime, try to be patient, and remember that you won't always get clear answers. Try not to get too caught up in trying to determine the label for your child's disorder. Leave that to the professionals. Focus instead on steps you can take to support your child and address his or her symptoms in practical ways. The Diagnosis and Testing Process for Learning Disabilities Diagnosing a learning disability is a process. It involves testing, history taking, and observation by a trained specialist. Finding a reputable referral is important. Start with your child's school, and if they are unable to help you, ask your insurance company, doctor, or friends and family who have dealt successfully with learning disabilities. Types of specialists who may be able to test for and diagnose learning disabilities include: 1. Clinical psychologists 2. School psychologists 3. Child psychiatrists 4. Educational psychologists 5. Developmental psychologists 6. Neuropsychologist 7. Psychometrist 8. Occupational therapist (tests sensory disorders that can lead to learning problems) 9. Speech and language therapist 126

Sometimes several professionals coordinate services as a team to obtain an accurate diagnosis. They may ask for input from your child's teachers. Recommendations can then be made for special education services or speech-language therapy within the school system. A non-public school that specializes in treating learning disabilities might be a good alternative if the public school is not working out. For a list of non-public schools in your area go to the website for your state's Department of Education. Getting Help for Children with Learning Disabilities When it comes to learning disabilities, it's not always easy to know what to do and where to find help. Turning to specialists who can pinpoint and diagnose the problem is, of course, important. You will also want to work with your child's school to make accommodations for your child and get specialized academic help. But don't overlook your own role. You know your child better than anyone else, so take the lead in looking into your options, learning about new treatments and services, and overseeing your child's education. Learn the specifics about your child's learning disability. Read and learn about your child's type of learning disability. Find out how the disability affects the learning process and what cognitive skills are involved. It's easier to evaluate learning techniques if you understand how the learning disability affects your child. Research treatments, services, and new theories. Along with knowing about the type of learning disability your child has, educate yourself about the most effective treatment options available. This can help you advocate for your child at school and pursue treatment at home. Pursue treatment and services at home. Even if the school doesn't have the resources to treat your child's learning disability optimally, you can pursue these options on your own at home or with a therapist or tutor. Nurture your child's strengths. Even though children with learning disabilities struggle in one area of learning, they may excel in another. Pay attention to your child's interests and passions. Helping children with learning disorders develop their passions and strengths will probably help them with the areas of difficulty as well. Social and Emotional Skills: How You Can Help Learning disabilities can be extremely frustrating for children. Imagine having trouble with a skill all of your friends are tackling with ease, worrying about embarrassing yourself in front of the class, or struggling to express yourself. Things can be doubly frustrating for exceptionally bright children with learning disabilities—a scenario that's not uncommon. Kids with learning disabilities may have trouble expressing their feelings, calming themselves down, and reading nonverbal cues from others. This can lead to difficulty in the classroom and with their peers. The good news is that, as a parent, you can have a huge impact in these areas. Social and emotional skills are the most consistent indicators of success for all 127

children—and that includes kids with learning disorders. They outweigh everything else, including academic skills, in predicting lifelong achievement and happiness. Learning disabilities, and their accompanying academic challenges, can lead to low self- esteem, isolation, and behavior problems, but they don't have to. You can counter these things by creating a strong support system for children with learning disabilities and helping them learn to express themselves, deal with frustration, and work through challenges. By focusing on your child's growth as a person, and not just on academic achievements, you'll help him or her learn good emotional habits that set the stage for success throughout life. Finding Support while Helping a Child with Learning Disabilities All children can be both exhilarating and exhausting, but it may seem that your child with a learning disability is especially so. You may experience some frustration trying to work with your child, and it can seem like an uphill battle when you don't have the information you need. After you learn what their specific learning disability is and how it is affecting their behavior, you will be able to start addressing the challenges in school and at home. If you can, be sure to reach out to other parents who are addressing similar challenges as they can be great sources of knowledge and emotional support.

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Meaning of Development Life-Span Perspective on Development Growth, Development, Maturation, and Evolution (Box 4.1) Factors Influencing Development Context of Development Overview of Developmental Stages Prenatal Stage Infancy Childhood Gender and Sex Roles (Box 4.2) Challenges of Adolescence Adulthood and Old Age

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to the rest of the body. The PNS is divided into Somatic Nervous System and Autonomic Nervous System. The

to the rest of the body; includes all sensory and motor neurons; divided into somatic nervous system and autonomic nervous system phenotype the

W   https://quizlet.com/587383172/ap-psych-exam-prep-ap-psychology-exam-review-flash-cards/

| 5/54 | **SUBMITTED TEXT** | 10 WORDS | **100%** | **MATCHING TEXT** | 10 WORDS |

You might hate someone, but your superego tells you that

you might hate someone, but your superego tells you that

W   https://quizlet.com/287356973/human-growth-and-development-diagram/

| 6/54 | **SUBMITTED TEXT** | 11 WORDS | **95%** | **MATCHING TEXT** | 11 WORDS |

Piaget- Theory of Cognitive Development Piaget's (1936) theory of cognitive development

SA   [OPEN THIS] Chitra Anand 19-2849 PRACTICAL FILE.docx (D154536183)

| 7/54 | **SUBMITTED TEXT** | 20 WORDS | **97%** | **MATCHING TEXT** | 20 WORDS |

a set of linked mental representations of the world, which we use both to understand and to respond to situations. The

A set of linked mental representations of the world, which we use both to understand and to respond to situations. · Both the

W   https://quizlet.com/287356973/human-growth-and-development-diagram/

| 8/54 | **SUBMITTED TEXT** | 25 WORDS | **75%** | **MATCHING TEXT** | 25 WORDS |

stage theory of child cognitive development, detailed observational studies of cognition in children, and a series of simple but ingenious tests to reveal different cognitive abilities.

SA   Alternative Assignment in Lieu with Exan (AutoRecovered).pdf (D133430849)

| 9/54 | SUBMITTED TEXT | 25 WORDS | 74% | MATCHING TEXT | 25 WORDS |

this stage is object permanence - knowing that an object still exists, even if it is hidden. It requires the ability to form a mental representation (

SA Human Growth Development .docx (D164166915)

| 10/54 | SUBMITTED TEXT | 22 WORDS | 67% | MATCHING TEXT | 22 WORDS |

young children can think about things symbolically. This is the ability to make one thing - a word or an object -

SA Human Growth Development .docx (D164166915)

| 11/54 | SUBMITTED TEXT | 25 WORDS | 86% | MATCHING TEXT | 25 WORDS |

The formal operational stage begins at approximately age eleven and lasts into adulthood. During this time, people develop the ability to think about abstract concepts,

SA GE-PSY-01_Block 3.edited.docx (D44253053)

| 12/54 | SUBMITTED TEXT | 14 WORDS | 89% | MATCHING TEXT | 14 WORDS |

Vygotsky claimed that infants are born with the basic materials/abilities for intellectual development -

SA TODDLERHOOD PHYSICAL, MENTAL AND SOCIAL DEVELOPMENT.docx (D154536147)

| 13/54 | SUBMITTED TEXT | 51 WORDS | 48% | MATCHING TEXT | 51 WORDS |

Trust vs. Mistrust Hope 0 - 1½ 2. Autonomy vs. Shame Will 1½ - 3 3. Initiative vs. Guilt Purpose 3 - 5 4. Industry vs. Inferiority Competency 5 - 12 5. Identity vs. Role Confusion Fidelity 12 - 18 6. Intimacy vs. Isolation Love 18-40 7. Generativity vs. Stagnation Care 40-65 8. Ego Integrity vs. Despair

SA submission.docx (D118456479)

| 14/54 | SUBMITTED TEXT | 10 WORDS | 95% | MATCHING TEXT | 10 WORDS |

and begin to develop a sense of pride in their accomplishments.

SA Human Growth Development .docx (D164166915)

| 20/54 | SUBMITTED TEXT | 25 WORDS | 38% MATCHING TEXT | 25 WORDS |

Meaning of Development • Life-Span Perspective on Development • Context of Development • Developmental Stages ◦ Prenatal Development and the Newborn ◦ Infancy and Childhood ◦ Adolescence ◦ Adulthood and Old Age

Meaning of Development Life-Span Perspective on Development Growth, Development, Maturation, and Evolution (Box 4.1) Factors Influencing Development Context of Development Overview of Developmental Stages Prenatal Stage Infancy Childhood Gender and Sex Roles (Box 4.2) Challenges of Adolescence Adulthood and Old Age

W https://ncert.nic.in/ncerts/l/kepy104.pdf

| 21/54 | SUBMITTED TEXT | 157 WORDS | 100% MATCHING TEXT | 157 WORDS |

Meaning of Development When we think of development, invariably we think of physical changes, as these are commonly observed at home with younger siblings, with parents and grandparents, in school with peers or others around us. From conception until the moment of death, we not only change physically, but we also change in the way we think, use language, and develop social relationships. Remember that, changes are not confined to any one area of a person's life; they occur in the person in an integrated manner. Development is the pattern of progressive, orderly, and predictable changes that begin at conception and continue throughout life. Development mostly involves changes both growth and decline, as observed during old age. Development is influenced by an interplay of biological, cognitive, and socio emotional processes. Development due to genes inherited from parents, such as in height and weight, brain, heart, and lungs development, etc. all point towards the role of biological processes. The role of cognitive processes in development relate to mental activities

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W https://ncert.nic.in/ncerts/l/kepy104.pdf

| 22/54 | SUBMITTED TEXT | 67 WORDS | 100% MATCHING TEXT | 67 WORDS |

associated with the processes of knowing, and experiencing, such as thought, perception, attention, problem solving, etc. Socio- emotional processes that influence development refer to changes in an individual's interactions with other people, changes in emotions, and in personality. A child's hug to her/his mother, a young girl's affectionate gesture to her/his sibling, or an adolescent's sorrow at losing a match are all reflections of socio emotional processes deeply involved in human development.

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W https://ncert.nic.in/ncerts/l/kepy104.pdf

It is important to remember that the biological, cognitive, and socio-emotional processes are interwoven. These processes influence changes in the development of the individual as a whole throughout the human life-span. Life-Span Perspective on Development The study of development according to the Life-Span Perspective (LSP) includes the following assumptions: 85 1. Development is lifelong, i.e. it takes place across all age groups starting from

it is important to remember that the biological, cognitive, and socio-emotional processes are interwoven. These processes influence changes in the development of the individual as a whole throughout the human life-span. Life-Span Perspective on Development The study of development according to the Life-Span Perspective (LSP) includes the following assumptions : 1. Development is lifelong, i.e. it takes place across all age groups starting from

W   https://ncert.nic.in/ncerts/l/kepy104.pdf

conception to old age. It includes both gains and losses, which interact in dynamic (change in one aspect goes with changes in others) ways throughout the life-span. 2. The various processes of human development, i.e. biological, cognitive, and socio- emotional are interwoven in the development of a person throughout the life-span. 3. Development is multi-directional. Some dimensions or components of a given dimension of development may increase, while others show decrement. For example, the experiences of adults may make them wiser and guide their decisions. However, with an increase in age, one's performance is likely to decrease on tasks requiring speed, such as running. 4. Development is highly plastic, i.e. within person, modifiability is found in psychological development, though plasticity varies among individuals. This means skills and abilities can be improved or developed throughout the life-span. 5. Development is influenced by historical conditions. For example, the experiences of 20- year olds who lived through the freedom struggle in India would be very different from the experiences of 20 year olds of today. The career orientation of school students today is very different from those students who were in schools 50 years ago. 6. Development is the concern of a number of disciplines. Different disciplines like psychology, anthropology, sociology, and neuro- sciences study human development, each trying to provide answers to development throughout the life-span. 7. An individual responds and acts on contexts, which include what was inherited, the physical environment, social, historical, and cultural contexts. For example, the life events in everyone's life are not the same, such as, death of a parent, accident, earthquake, etc., affect the course of one's life as also the positive

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25/54	SUBMITTED TEXT	17 WORDS	100%	MATCHING TEXT	17 WORDS

influences such as winning an award or getting a good job. People keep on changing with changing contexts.

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26/54	SUBMITTED TEXT	20 WORDS	100%	MATCHING TEXT	20 WORDS

Context of Development Development does not take place in a vacuum. It is always embedded in a particular socio- cultural context.

CONTEXT OF DEVELOPMENT Development does not take place in a vacuum. It is always embedded in a particular socio- cultural context.

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27/54	SUBMITTED TEXT	112 WORDS	96%	MATCHING TEXT	112 WORDS

transition during one's lifetime such as entering school, becoming an adolescent, finding jobs, marrying, having children, retirement, etc. all are joint functions of the biological changes and changes in one's environment. The environment can change or alter during any time of the individual's lifespan. Urie Bronfenbrenner's contextual view of development emphasises the role of environmental factors in the development of an individual. The microsystem is the immediate environment/setting in which the individual lives. It is in these settings where the child directly interacts with social agents – the family, peers, teachers, and neighbourhood. The mesosystem consists of relations between these contexts. For instance, how a child's parents relate to the teachers, or how the parents view the adolescent's friends, are

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W https://ncert.nic.in/ncerts/l/kepy104.pdf

28/54	SUBMITTED TEXT	80 WORDS	100%	MATCHING TEXT	80 WORDS

experiences likely to influence an individual's relationships with others. The exosystem includes events in social settings where the child does not participate directly, but they influence the childs' experiences in the immediate context. For example, the transfer of father or mother may cause tension among the parents which might affect their interactions with the child or the 86 general amenities available to the child like quality of schooling, libraries, medical care, means of entertainment, etc. Macrosystem includes the culture in which the individual lives.

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W https://ncert.nic.in/ncerts/l/kepy104.pdf

Chronosystem involves events in the individual's life course, and socio-historical circumstances of the time such as, divorce of parents or parents' economic setback, and their effect on the child. In a nutshell, Bronfenbrenner's view is that a child's development is significantly affected by the complex world that envelops her/him – whether it be the minutiae of the conversations s/he has with her/his playmates, or the social and economic life circumstances into which s/he is born. Research has shown that children in impoverished environments have unstimulating environment devoid of books, magazines, toys, etc., lack experiences such as visits to library, museum, zoo, etc., have parents who are ineffective as role models, and live in overcrowded and noisy surroundings. As a result of these conditions children are at a disadvantage and have difficulties in learning. Durganand Sinha (1977) has presented an ecological model for understanding the development of children in Indian context. Ecology of the child could be viewed in terms of two concentric layers. The "upper and the more visible layers" consist of home, school, peer groups, and so on. The most important ecological factors influencing development of the child in the visible upper layer constitute the: (i) home, its conditions in terms of overcrowding, space available to each member, toys, technological devices used, etc., (ii) nature and quality of schooling, facilities to which the child is exposed, and (iii) nature of interactions and activities undertaken with peer groups from childhood onwards. These factors do not operate independently but constantly interact with one another. Since these are also embedded in a larger and a more pervasive setting, the "surrounding layers" of the child's ecology constantly influence the "upper layer" factors. However, their influences are not always clearly visible. The elements of the surrounding layer of ecology constitute the: (i) general geographical environment. It includes space and facilities for play and other activities available outside the home including general congestion of the locality and density of population, (ii) institutional setting provided by caste, class, and other factors, and (iii) general amenities available to the child like drinking water, electricity, means of entertainment and so on. The visible and the surrounding layer factors interact with one another and may have different consequences for development in different people. The ecological environment can change or alter during any time of the individual's life-span. Therefore, to understand differences in the functioning of an individual, it is important to see the individual in the context of her/ his experiences.

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| 30/54 | SUBMITTED TEXT | 212 WORDS | 97% MATCHING TEXT | 212 WORDS |

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 87 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 different stages of development and their main features

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 © NCERT not to be republished Psychology 70 developmental tasks. You will now read about the different stages of development and their main features.

| 31/54 | SUBMITTED TEXT | 14 WORDS | 100% MATCHING TEXT | 14 WORDS |

If no attachment has developed within 32 hours it's unlikely any attachment will ever develop.

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Infancy The brain develops at an amazing rate before and after birth. The part of the brain i.e. Cerebrum played an important role in human functions, such as language, perception, and intelligence. Just before birth the newborns have most but not all brain cells. 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. Motor Development: 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 (table mentioned below) 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. 97 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.

INFANCY 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. 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. Motor Development : 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 Table 4.1). 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 © NCERT not to be republished Chapter 4 Human Development 71 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.

| 33/54 | SUBMITTED TEXT | 16 WORDS | 88% | MATCHING TEXT | 16 WORDS |

Reflex Description Developmental Course Rooting Turning the head and opening the mouth when touched on the cheek

Reflex Description Developmental Course Rooting Turning the head and opening the Disappears between 3 and 6 months mouth when touched on the cheek

| 34/54 | SUBMITTED TEXT | 32 WORDS | 75% | MATCHING TEXT | 32 WORDS |

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 between 3 and 6 months mouth when touched on the cheek Moro If there is a loud noise, the baby Disappears in 6 to 7 months will throw her/his arms outward (although reaction to loud noises is while arching her/his back, and permanent) then bring the arms together as if grasping something

| 35/54 | SUBMITTED TEXT | 18 WORDS | 81% | MATCHING TEXT | 18 WORDS |

Grasp When a finger or some other object is pressed against the baby's palm, the baby's fingers close around it

Grasp When a finger or some other object is Disappears in 3 to 4 months; pressed against the baby's palm, the replaced by voluntary grasping baby's fingers close around it

| 36/54 | SUBMITTED TEXT | 24 WORDS | 67% | MATCHING TEXT | 24 WORDS |

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 3 to 4 months; pressed against the baby's palm, the replaced by voluntary grasping baby's fingers close around it Babinski When the bottom of the baby's foot Disappears in 8 to 12 months is stroked, the toes fan out and then curl

| 37/54 | SUBMITTED TEXT | 24 WORDS | 97% | MATCHING TEXT | 24 WORDS |

Prenatal development refers to the process in which a baby develops from a single cell after conception into an embryo and later a fetus.

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 Table). 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. 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. 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 98 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. Socio-emotional Development: Babies from birth are social creatures. An infant start 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

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 Table 4.2). 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. 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. 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. You will read about early language development in Chapter 8. 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

cry or 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. 99

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Stage Approximate Age Characteristics Sensorimotor 0-2 years Infant explores the world by coordinating sensory experiences with physical actions. Preoperational 2-7 years Symbolic thought develops; object permanence is established; the child cannot coordinate different physical attributes of an object. Concrete operational 7-11 years The child can reason logically about concrete events and classify objects into different sets. Is able to perform reversible mental operations on representations of objects. Formal operational 11-15 years The adolescent can apply logic more abstractly; hypothetical thinking develops.

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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 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. 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. 100 Motor Development 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. 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. The major accomplishments in gross and fine motor skills during early childhood years are given in (

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in Table) Cognitive Development The child's ability to acquire the concept of object permanence enables her/him to use mental symbols to represent objects. However, the child at this stage lacks the ability that allows her/him to do mentally what was done physically before. Cognitive development in early childhood focuses on Piaget's stage of preoperational thought (see Table). The child gains the ability to mentally represent an object that is not physically present. You may have observed children draw designs/ figures to represent people, trees, dog, house,

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etc. This ability of the child to engage in symbolic thought helps to expand her/his mental world. The progress in symbolic thought continues. A salient feature of preoperational thought is egocentrism (self focus), i.e. children see the world only in terms of their own selves and are not able to appreciate others' point of view. Children because of egocentrism, engage in animism - thinking that all things are living, like oneself. They attribute life-like qualities to inanimate objects. For example, if a child while running slips on the road, s/he might show animism by saying "road hurt me". As children grow and are approximately between 4 and 7 years of age they want answers to all their questions like: Why is the sky blue? How do trees grow? and so on. Such questions help the child to know why things are as they are. Piaget called this the stage of intuitive thought. Another feature of thought during preoperational stage is characterised by children having a tendency for centration, i.e. focusing on a single characteristic or feature for understanding an event. For example, a child may insist on drinking a "big glass" of juice, preferring a tall narrow glass to a short broad one, even though both might be holding the same amount of juice. As the child grows and is approximately between 7 and 11 years of age (the period of middle and late childhood) intuitive thought is replaced by logical thought. This is the stage of concrete operational thought, which is made up of operations — mental actions that allow the child to do mentally what was done physically before. Concrete operations are also mental actions that are reversible. In a well known test, the child is presented with two identical balls of clay. One ball is rolled by the experimenter into a long thin strip and the other ball remains in its original shape. On being asked which has more clay, the child of 7 or 8 years, would answer that, both have the same amount of clay. This is because the child imagines the ball rolled into thin strip and then into a ball, that means s/he is able to imagine reversible mental action on concrete/real objects. What do you think a preoperational child would have done? S/he is likely to focus on only one aspect-length or height. Concrete operations allow the child to focus on different characteristics and not focus on one aspect of the object. This helps the child to appreciate that there are different ways of looking at things, which also results in the decline of 101 her/his egocentrism. Thinking becomes more flexible, and children can think about alternatives when solving problems, or mentally retrace their steps if required. Even though the preoperational child develops the ability to see relationships between different properties of an object, s/he cannot do abstract thinking, i.e. s/he still cannot manipulate ideas in the absence of objects. For example, steps required to complete algebraic equations, or imagining line of longitude or

latitude of the earth. The growing cognitive abilities of children facilitate the acquisition of language.

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45/54	SUBMITTED TEXT	48 WORDS	84%	MATCHING TEXT	48 WORDS

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

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46/54	SUBMITTED TEXT	214 WORDS	98%	MATCHING TEXT	214 WORDS

Socio-emotional Development The important dimensions of children's socio-emotional development are the self, gender and moral development. During the early years of childhood, some important developments in the self take place. The child due to socialisation has developed a sense of who s/he is and whom s/he wants to be identified with. The developing sense of independence makes children do things in their own way. According to Erikson, the way parents respond to their self-initiated activities leads to developing a sense of initiative or sense of guilt. For example, giving freedom and opportunities for play like cycling, running, skating, etc. and answering children's questions will create a sense of support for the initiative taken. In contrast, if they are made to feel that their questions are useless, and games played by them are stupid, the children are likely to develop feelings of guilt over self-initiated activities, which may persist through the children's later life also. Self-understanding in early childhood is limited to defining oneself through physical characteristics: I am tall, she has black hair, I am a girl, etc. During middle and late childhood, the child is likely to define oneself through internal characteristics such as, "I am smart and I am popular" or "I feel proud when teachers assign me responsibility in school". In addition to defining oneself through psychological characteristics, children's self-descriptions also include social aspects of self,

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actions are wrong because s/he is punished, and right because s/he is rewarded. As the child grows, i.e. by early adolescence, s/he develops moral reasoning through set of rules of others, such as parents or laws of the society. These rules are accepted by the children as their own. These are "internalised" in order to be virtuous and to win approval from others (not to avoid punishment). Children view rules as absolute guidelines, which should be followed. Moral thinking at this stage is relatively inflexible. As they grow, they gradually develop a personal moral code. You have seen that by the end of childhood a more gradual growth rate enables the child to develop skills of coordination and balance. Language develops and the child can reason logically. Socially the child has become more involved in social systems, such as family and peer group. The next section traces changes in human development during adolescence and adulthood.

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Physical development during adolescence is also accompanied by a number of psychological changes. Around puberty adolescents show an increase in interest in members of the opposite sex and in sexual matters and a new awareness of sexual feelings develops. This increased attention to sexuality is caused by factors such as individual's awareness of the biological changes taking place and the emphasis placed on sexuality by peers, parents, and society. Even then, many adolescents lack adequate knowledge or have misconceptions about sex and sexuality. Sex is a topic parents find difficult to discuss with children, so adolescents tend to become secretive about sexual concerns which make exchange of information and 103 communication difficult. The concern over adolescent sexuality has become intense in recent times because of the risk of AIDS, and other sexually transmitted diseases. The development of a sexual identity defines the sexual orientation and guides sexual behaviour. As such it becomes an important developmental task for adolescents. How did you think of yourself at the beginning of puberty? Adolescents are preoccupied with what they are like and develop individual images of what they look like. Another important developmental task during adolescence is accepting one's physical self/ maturity. Adolescents need to develop a realistic image of their physical appearance, which is acceptable to them. It is important to keep in mind that puberty also involves cognitive and social changes along with physical changes. Cognitive Developmental Changes: Adolescents' thought becomes more abstract, logical, and idealistic; they become more capable of examining their own thoughts, others' thoughts, and what others are thinking about them. Adolescents' developing ability to reason gives them a new level of cognitive and social awareness. Piaget believed that formal operational thought appears between the age of 11 and 15. During this stage adolescent thinking expands beyond actual concrete experiences and they begin to think more in abstract terms and reason about them. In addition to being abstract, adolescent thought is also idealistic. Adolescents begin to think about ideal characteristics for themselves and others and compare themselves and others with these ideal standards. For example, they may think what an ideal parent is like and compare their parents with these ideal standards. This may at times make adolescents wonder which of the new-found ideal standards they should adopt. In contrast to trial and error approach used by children in earlier stages of development, adolescent thinking becomes more systematic in solving problems — they think of possible courses of action, why something is happening the way it is, and systematically seek solutions. Piaget called this type of logical thinking — hypothetical deductive

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reasoning. Logical thought also influences the development of moral reasoning. Social rules are not considered as absolute standards and moral thinking shows some flexibility. The adolescent recognises alternative moral courses, explores options, and then decides on a personal moral code. For example, should I smoke as everyone I know does? Is it ethical to copy answers in the examinations? This also lends the possibility of adolescents not following society's norms if they conflict with personal code of ethics. For example, individuals at this age might participate in a protest march for a cause rather than adhere/ conform to college norm. Adolescents also develop a special kind of egocentrism. According to David Elkind, imaginary audience and personal fable are two components of adolescents' egocentrism. Imaginary audience is adolescent's belief that others are as preoccupied with them as they are about themselves. They imagine that people are always noticing them and are observing each and every behaviour of theirs. Imagine a boy who thinks that all will notice the ink spot on his shirt, or a girl with a pimple feels, all people would think how bad her skin is. It is this imaginary audience, which makes them extremely self-conscious. The personal fable is part of the adolescents' egocentrism that involves their sense of uniqueness. Adolescents' sense of uniqueness makes them think that no one understands them or their feelings. For example, an adolescent girl thinks that none can sense the hurt that she feels because of being betrayed by a friend. It is quite 104 common to hear the adolescent say to the parents; 'you don't understand me'. To retain their sense of personal uniqueness they may weave stories filled with fantasy around them to create a world that is away from reality. Personal fables are often part of adolescent diaries. Forming an Identity: You must have sought answers to questions such as: Who am I? Which subjects should I study? Do I believe in God? The answers to all these questions involve the quest to define one's sense of self or the search for identity. Identity is who you are and what your values, commitments and beliefs are. The primary task of adolescence is to establish an identity separate from the parents. During adolescence a detachment process enables the individual to develop a personalised set of beliefs that are uniquely her or his own. In the process of achieving an identity the adolescent could experience conflict with parents and within herself or himself. Those adolescents who can cope with the conflicting identities develop a new sense of self. Adolescents who are not able to cope with this identity crisis are confused. This "identity confusion", according to Erikson, can lead to individuals isolating themselves from peers and family; or they may lose their identity in the crowd. Adolescents on one hand, may desire independence but may also be afraid of it and show a great deal of dependence on their parents. Rapid fluctuations between self-confidence and insecurity are

typical of this stage. Adolescents may at one time complain of being "treated like a baby" whereas on other occasions they may seek comfort by depending on their parents. Seeking an identity involves searching for continuity and sameness in oneself, greater responsibility and trying to get a clear sense of who one is, i.e. an identity. The formation of identity during adolescence is influenced by several factors. The cultural background, family and societal values, ethnic background, and socioeconomic status all prevail upon the adolescents' search for a place in society. Family relationships become less important as the adolescent spends more time outside the home and develops a strong need for peer support and acceptance. Increased interactions with peers provide them with opportunities for refining their social skills and trying out different social behaviours. Peers and parents are dual forces having major influences on adolescents. At times conflicting situations with parents lead to increased identification with peers. But generally, parents and peers serve complementary functions and fulfil different needs of the adolescents. Vocational commitment is another factor influencing adolescent identity formation. The question "What are you going to be when you grow up?", requires the ability to think about the future and to be able to set realistic and achievable goals. In some cultures, freedom is given to the young people to choose an occupation, whereas in certain other cultures the option of making this choice is not given to the children. Here, parents' decision is likely to be accepted by the children. What has been your experience while making a choice in the selection of subjects? Career counselling in schools offers information regarding appraisal of the students for various courses and jobs and provides guidance in making a decision about career choices. 105 Some Major Concerns: As adults when we reflect on our adolescent years and recall the conflicts, uncertainties, occasional loneliness, group pressures, we feel it was definitely a vulnerable period. During adolescence peer influence, new gained freedom, unresolved problems may create difficulties for many of you. Conforming to peer pressure can be both positive and negative. Adolescents are often confronted with decisions regarding smoking, drugs, alcohol, and breaking parental rules, etc. These decisions are taken without much regard to the effect they can have. Adolescents may face periods of uncertainty, loneliness, self-doubt, anxiety, and concern about themselves and their future, they are also likely to experience excitement, joy, and feelings of competence as they overcome the developmental challenges. You will now read about some of the major challenges faced by adolescents like delinquency, substance abuse, and eating disorders. Delinquency: Delinquency refers to a variety of behaviours, ranging from socially unacceptable behaviour, legal offences, to criminal acts. Examples include truancy, running away from home, stealing or

burglary or acts of vandalism. Adolescents with delinquency and behavioural problems tend to have a negative self-identity, decreased trust, and low level of achievement. Delinquency is often associated with low parental support, inappropriate discipline, and family discord. Often adolescents from communities characterised by poverty, unemployment, and having feelings of alienation from the middle class perform antisocial acts to gain attention and to be popular with their peers. However, most delinquent children do not remain delinquent forever. Change in their peer group, becoming more aware of their social responsibilities and developing feelings of selfworth, imitating positive behaviour of the role models, breaking negative attitudes, and overcoming poor self-concept help in reduction of delinquent behaviour. Substance Abuse: Adolescent years are especially vulnerable to smoking, alcohol and drug abuse. Some adolescents take recourse to smoking and drugs as a way of coping with stress. This can interfere with the development of coping skills and responsible decision making. The reasons for smoking and drug use could be peer pressure and the adolescents' need to be accepted by the group, or desire to act more like adults, or feel a need to escape the pressure of school work or social activities. The addictive powers of nicotine make it difficult to stop smoking. It has been found that adolescents who are more vulnerable to drugs, alcohol, and nicotine use, are impulsive, aggressive, anxious, depressive, and unpredictable, have low self-esteem, and low expectation for achievement. Peer pressure and the need to be with their peer group make the adolescent either go along with their demands to experiment with drugs, alcohol, and smoking or be ridiculed. Drug use if continued long enough can lead to physiological dependency, i.e. addiction to drugs, alcohol or nicotine may seriously jeopardise the rest of the adolescents' lives. Positive relationships with parents, peers, siblings, and adults play an important role in preventing drug abuse. In India, a successful anti-drug programme is the Society for Theatre in Education Programme in New Delhi. It uses street performances to entertain people between 13 to 25 years of age while teaching them how to say no to drugs. The United Nations International 106 Drug Control Programme (UNDCP) has chosen the programme as an example to be adopted by other nongovernmental organisations in the region. Eating Disorders: Adolescents' obsession with self, living in fantasy world and peer comparisons lead to certain conditions where they become obsessed with their own bodies. Anorexia nervosa is an eating disorder that involves relentless pursuit of thinness through starvation. It is quite common to see adolescents eliminate certain foods from their diets or to eat slimming foods only. The media also projects thinness, as the most desirable image and copying such fashionable image of thinness leads to anorexia nervosa. Bulimia is another form of an eating

disorder in which the individual follows a binge-and-purge eating pattern. The bulimic goes on an eating binge, then purges by self-induced vomiting or using a laxative at times alternating it with fasting. Anorexia nervosa and bulimia are primarily female disorders more common in urban families. Adulthood and Old Age Adulthood An adult is generally defined as someone who is responsible, mature, self-supporting, and well-integrated into society. There is a variation in developing these attributes, which suggests that there is a shift in timing when an individual becomes an adult or assumes adult roles. Some people take up jobs along with their college studies or may get married and not pursue their studies. Others may continue to live with their parents even after getting married and being financially independent. The assumption of adult roles is directed by an individual's social context. The best time for some of the most important life events (i.e. marriage, job, having children) might be quite different in different cultures but within a culture there is similarity in the course of adult development. In early adulthood, two major tasks are, exploring the possibilities for adult living and developing a stable life structure. The twenties represent the novice phase of adult development. Gradually, a transition from dependence to independence should occur. This could be marked by an image of the kind of life the young person wants, especially in terms of marriage and a career. Career and Work: Earning a living, choosing an occupation, and developing a career are important themes for people in their twenties and thirties. Entering work life is a challenging event in anyone's life. There are apprehensions regarding different adjustments, proving one's competence, performance, dealing with competition, and coping with expectations both of the employers and oneself. It is also the beginning of new roles and responsibilities. Developing and evaluating a career becomes an important task of adulthood. Marriage, Parenthood, and Family: The adjustments that young adults have to make when entering a marriage relate to knowing the other person if not known earlier, coping with each other's likes, dislikes, tastes, and choices. If 107 both the partners are working, adjustments are required regarding sharing and performing roles and responsibilities at home. In addition to getting married, becoming a parent can be a difficult and stressful transition in young adults, even though it is usually accompanied by the feeling of love for the baby. How adults experience parenting is affected by different situations such as the number of children in the family, the availability of social support, and the happiness or unhappiness of the married couple. Death of a spouse or divorce creates a family structure in which a single parent either the mother or the father has to take up the responsibility of the children. In recent times, women are increasingly seeking employment outside the home thus creating another type of family in which both parents

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work. The stressors when both parents are working are quite the same as of a single working parent, namely, taking care of children, their schoolwork, illness, and coping with workload at home and in the office, etc. Despite the stresses associated with parenting, it provides a unique opportunity for growth and satisfaction and is perceived as a way of establishing concern and guiding the next generation. Physical changes during middle ages are caused by maturational changes in the body. Though individuals may vary in the rate at which these changes occur, almost all middle aged people notice gradual deterioration in some aspects of their physical functioning such as decline in vision, sensitivity to glare, hearing loss and changes in physical appearance (e.g., wrinkles, grey hair or thinning of hair, weight gain). Do cognitive abilities change during adulthood? It is believed that some cognitive abilities decline with age while others do not. Decline in memory is more in tasks involving long-term memory than short-term memory. For example, a middle-aged person can remember the telephone number immediately after s/he has heard it but may not remember it so efficiently after a few days. Memory tends to show greater decline, while wisdom may improve with age. Remember that individual differences exist in intelligence at every age and as not all children are exceptional, neither do all adults show wisdom. Old Age Just when "old age" begins, is not easy to determine. Traditionally, the age of retirement was linked to old age. Now that people are living longer, age of retiring from work is changing, and the cut-off point for the definition of "old age" is moving upward. Some of the challenges, which the aged have to cope with include retirement, widowhood, illness, or death in the family. The image of old age is changing in certain ways. Now there are people who have crossed seventy years of age or so and are quite active, energetic, and creative. They are competent and are therefore, valued by society in many walks of life. In particular, we have aged people in politics, literature, business, art and science. The myth of old age as an incapacitating and therefore, frightening phase of life is changing. Of course, the experience of old age also depends on the socio-economic conditions, availability of health care, attitude of people, expectations of society and the available support system. Work is most importantduring early adult years, then family becomes most important and beyond that health becomes the most important issue in the person's life. Clearly, successful ageing for much of our adult life focuses on how effective we are at work, how loving our 108 relationships are in our family, how good our friendships are, how healthy we are, and how cognitively fit we are. Retirement from active vocational life is quite significant. Some people perceive retirement as a negative change. They consider it as a separation from an important source of satisfaction and self-esteem. Others view it as a shift in life with more time to pursue their own interests. It is

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to insecurity and dependency. The elderly tends to look towards others to lean on and to care for them. Indian culture favours dependency of elderly on their children, for old age needs caring. In fact, parents in most oriental cultures rear their children with the fond hope that they will care for them during old age. It is important to give the elderly a sense of security and belonging, a feeling that people care for them (especially in the time of crisis), and to remember that we all have to grow old one day.

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Although death is more likely to occur in late adulthood, death can come at any point in development. The deaths, especially of children and younger adults, are often perceived to be more tragic than those of others. In children and younger adults, death is more likely to occur because of accidents but in older adults it is more likely to occur because of chronic disease. The death of a

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spouse is usually seen as the most difficult loss. Those left behind after the death of their partner suffer deep grief, cope with loneliness, depression, financial loss and are also at risk of many health related problems. Widows by far outnumber widowers, because studies show that women live longer than men and tend to marry men older than themselves. During such times, support from children, grandchildren, and friends can help the individual cope with the loss of spouse. People in different cultures view death differently. In the Gond culture in our country, it is believed that death is caused by magic and demon. In the Tanala culture of Madagascar, natural forces are thought to cause death. Human development as you have read in this chapter thus, helps you to understand the influence of various factors in an individual's lifetime. 109 110

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