

Stages and Theories of Developmental Psychology

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Introduction

Developmental psychology is a subfield of science that is particularly concerned with the explanation and understanding of how and why human beings change over time. The discipline looks at various biological processes that cause such changes to occur, and it seeks to understand the effects of these processes on the brain. It particularly focuses on the influence of nature and culture on human development and the effects they have on people's mindsets and mentalities. Development psychology is concerned not only with the physical changes that occur in the human brain over time but also with a person's thinking, feelings, emotions, behavior, understanding, and perception.

Initially, developmental psychology was only concerned with children. This is primarily because the rate of biological changes that occur in the brain is very fast during the early stages of a person's life. Thus, changes are easier to monitor and measure, which means that they can be studied easily. However, fairly recently, it has been discovered that such changes keep occurring in the brain of a person even in the later stages of his/her life. Thus, the discipline has seen a lot of expansion over the past few years.

There are a number of areas of development that are studied under Developmental Psychology, some of which are biological, social, emotional, and cognitive procedures of the brain. It is for this reason that the discipline is considered to be so vast. In this paper, the development of the brain of a person through four different stages of his/her life will be studied at length. These stages include prenatal, infancy, early childhood, and later childhood. The biological and chemical processes of the brain during each of these stages would be elaborated upon, and their effects on the human brain would be unpacked.

The Prenatal Stage

The prenatal stage begins about forty days before the birth of a human baby, and it is at this point that the first steps of development of the human brain begin. The development of the prenatal stage can be divided further into three sub-categories, namely germinal, embryonic, and fetal. Another way to look at these divisions is to consider the concept of trimesters. Each trimester consists of three months which basically means that the entire nine months of pregnancy can equally be divided into three trimesters.

The germinal, embryonic, and fetal stages of development follow one another. During the germinal stage, which occurs about two weeks after the conception of the baby, the cells that have combined together to form a zygote begin to divide rapidly. During this stage, the size of the zygote increases, and it develops many new parts. The most important process that occurs during this stage is the passing on of the genetic information from the parents onto the zygote. The DNA of the father and the mother is passed onto the zygote, and its genetic makeup is set in place. The sex of the unborn baby is also determined at this point of development. During this stage, the zygote, which initially consists of a single cell, divides and forms another cell, collectively becoming a pair of cells. The divisions take place in multiple steps, and the cells go from being two to four, from four to eight, from eight to sixteen, and so on. This process of cell division in pairs is called mitosis. This process continues up until the ninth month of pregnancy, when the entire body of the human baby is completely formed. As the cells keep on dividing, they develop certain special organelles which enable them to perform certain functions. This process is called specialization.

The cells are developed to perform certain functions, and different cells are assigned different body parts, which are then taken. The cells of the eye, for example, will go into the body's eye, not the brain. Similarly, the skin cells would only form the skin and not go into any other part of the body. ('Prenatal Development) During the germinal stage, the cells become specialized to formulate the umbilical cord and the placenta, and the embryo is formed. The attachment of the embryo to the lining of the uterus marks the last step of the germinal stage, shortly after which the next stage begins.

This next stage is called the Embryonic stage. This stage is fairly long and lasts from about the second week of pregnancy up until the eighth month. Once the embryo is attached to the uterine lining, blood vessels are formulated, and the placenta grows from the cells that were formulated in the germinal stage. The placenta is very important because it attaches to the umbilical cord and provides the embryo with oxygen as well as all the nutrients that it requires from the body of the mother. ('Nutrition and Brain Development in Infants, 1972')

During this stage, the embryo becomes divided into three structures called the ectoderm, mesoderm, and endoderm. Each of these structures forms a layer, and each layer develops in particular ways to form different parts of the body. The ectoderm, for example, forms the nervous system and the skin; the mesoderm forms the bones, muscles, and respiratory systems; and the endoderm forms part of the respiratory and digestive systems along with the urinary system. When the development of the nervous system develops, the heart begins to beat on its own and starts functioning. Towards the end of this period, separate body parts such as the eyes, ears, and nose begin to appear and become prominent in the tiny body of the baby.

The rest of the prenatal development occurs during the fetal stage, which begins in about the ninth month of pregnancy. During this stage, the fetus develops all of its senses, which is why it seems to respond to the sounds around it. During this stage, all the other body organs, such as the kidneys, stomach, lungs, heart, and intestines, are almost completely formulated. It is due to this reason that

even if a baby is born before it is supposed to or expected to, it manages to survive in most cases. Throughout this stage, the brain of the unborn baby also keeps on developing. It not only becomes bigger in size but also develops extensive structures that help it to function properly. ('Prenatal Development') It is during this stage that the nervous system of the baby seems to take over as more coordination of the baby's movements with that of the mother is observed. Some scientists are of the view that even the baby's personality partially begins to develop by the end of this stage.

The Infancy Stage

The brain of a young child develops at an unimaginably fast rate. The period from the birth of a person to three years of age is usually described as the age of infancy. During this stage, not a single second goes by in which the brain of the child does not work towards developing itself. Perhaps the factor that has the most profound effect on the brain development of an infant is the environment that he/she is exposed to. The relationships that he/she has with those around him/her, the activities that he/she engages in, and the mood he/she has are all of these factors that directly impact the development of the child's brain. According to the Child Welfare Information Getaway, a child has a fully developed nervous system when he/she is born.

At the time of its birth, the child has a brain that is developed enough to be able to carry out all the necessary functions. However, those sections of the brain that are responsible for controlling abstract thought, emotions, feelings, and understanding of language and signs grow and develop after birth. These features of the brain keep developing until the age of three when the child gains full control over these aspects of his/her personality. ('Brain Development in Infants & Early Childhood, 2017') One of the most important developmental steps that occur during the age of infancy is the establishment of connections between the neurons. These are called synapses and help one neuron to catch signals sent by another neuron. Synapses basically help in the transmission of signals or any other information from one part of the body to another. The transfer of information could either be between two neurons, between a neuron and a brain, or between a targeted body part and a neuron. Synapses basically carry the information transmitted towards and away from the brain so that the brain can work and make the different body parts perform their respective functions. If it weren't for the synapses or the nervous system altogether, a human being would never be able to feel anything.

For example, if a person were to touch the fire, the brain would immediately detect that what the person's hand is feeling is extremely hot and, therefore, dangerous. Thus, it would transmit a signal via the nerves to that part of the body that is in contact with the fire and inform the hand to be immediately retrieved. The synapses are present throughout the nervous system and make the process of transmission of such information much more quickly. In the body of an average child, about two million synapses are created within a single second. ('Brain Development in Infants and Early Childhood, 2017') Thus, we can say that it is during this phase of life a person develops the ability to react to what he/she feels through his/her senses.

Another important feature that the brain develops during infancy is the formation of myelin tissue. Myelin tissue can be thought of as a thin sheet of cells that cover the brain. The function of this layer is that it ensures clear transmission of information from the brain to the rest of the body via the nervous system. One of the reasons why young children are slow to process information or respond to, for example, sounds is that their myelin tissue has not been completely developed. Their sense of understanding things and reacting to them is enhanced as this layer forms around their brain. According to the Child Welfare Information Gateway, the experiences that a child has and the environment in which he/she grows up directly impact the rate of myelin development.

The Early Childhood

As has been discussed, millions of neural connections are formed within the brain of a human being during his/her infancy. However, as the child grows up, most of these connections are not needed. Thus, during the person's early childhood, which usually characterizes the period from three years of age until about ten or eleven years, a biological process called pruning takes place in the brain. This is done to reduce some of the neural connections formed in the brain to enhance intelligence. ('InBrief: The Science of Early Childhood Development, 2017) If there are extra, unnecessary neural networks in the body, the person runs the risk of becoming confused as the brain is diverted in multiple directions from all the neurons that exist. When some of these neurons are removed, the brain becomes more efficient and only focuses on the more important tasks of the body. The process of pruning highlights the importance of the physical environment and the surroundings of the child. It emphasizes the extent to which the environment affects brain development because it is the experiences and relationships that children have that constantly develop their brains and form neural connections. Once these are formed, the basic structure of the remaining developmental processes that occur up until adulthood and perhaps even after that is formulated.

At such an early stage of development, the brain is not very specialized. It is more plastic and flexible in the sense that it can adapt more easily to the changing environment since it has still not been completely developed. This is exactly why it is said that young children are quick learners. This also explains why they are quick to learn languages as compared to adults. With age, the brain becomes more specialized and takes up very complicated functions. ('InBrief: The Science of Early Childhood Development, 2017) Language, eyesight, emotions, and fine motor coordination all keep developing and become more complex, advanced, and specialized during this particular stage of brain development. During this time period, the brain's neural network is more receptive than it would ever be during any other time of the person's lifetime. This explains why children are quick to learn certain skills such as dancing, painting, singing, and the like during the first ten years of their lives.

A very important part of brain development during this stage of life is the coping mechanism. At this stage, the child begins to experience minor stress, which in some cases might last for longer periods of time. This is especially seen among those children who live under conditions of extreme poverty or those who do not have parents. Even those children who do not live under such miserable conditions

may experience minor stress on and off. This causes the levels of hormones in the child's body to increase or decrease, which sometimes also causes the heart rate to increase slightly. This is an important part of development because it prepares the child to deal with greater levels of stress that are to be faced in the later stages of life. Higher levels of stress can, however, be dangerous and can impede normal brain development in multiple ways. ('Brain Development in Children') This is why parents or guardians of a child must be careful to make sure that they are well taken care of and do not face any problems.

Brain Development in Later Childhood

By the time a person turns ten, his/her brain needs remodeling. This process occurs at different stages in life for different people, but in most cases, the approximate age around which it occurs is ten. Some of these brain changes occur during puberty, whereas other change processes keep taking place even long after that, up until the twenties. During this point, the brain is still in the process of developing. The major and the most important change that occurs during this time is the pruning away of that part of the brain that is unused. This is called grey matter. When this happens, the brain becomes more efficient as it loses that part that had only been a burden on it and had absolutely no function whatsoever. ('Brain Development: Teenagers') However, at the same time, since the brain has fewer parts to focus on now, new neural connections are developed and strengthened.

This change begins from the back side of the brain and then moves towards the front part of the brain, called the prefrontal cortex. This part of the brain is crucial because it is responsible for thinking and decision making activities of the brain. ('Brain Development: Teenagers') Thus, when this part is remodeled, the person gains maturity and a better understanding of the world. It helps the person to make decisions, solve complicated problems, weigh the consequences of each potential action against one another, and so on. Because the prefrontal cortex is still in its developing stage, people at this stage of their lives might rely on another part of the brain for such functions of decision-making, called the amygdala. The amygdala is mainly associated with emotions, feelings, and sentiments. This explains why teenagers find it harder to deal with the problems they face than adults. It also explains why they happen to be a lot more emotional and are much quicker to get angry and frustrated at the slightest inconvenience they face than adults.

Conclusion

The process of brain development is a much more complicated process than one might think. The extent of its complexity can be realized from the fact that it takes place over a very vast time span. If it were as simple as we tend to think it is, it would have just happened in about a day. Learning about the development of the human brain is extremely important because information about it can solve many of our everyday problems. It also makes things a lot easier for new parents who are unable to understand the difficulties that their young children are facing. Thus, brain development lets them

know the proper way of dealing with their children and helping them cope with their problems.

It is important to realize that the development of the brain has profound impacts on all the other parts of the human body as well. Impediments in the development of the brain might also affect, for example, the person's physical growth of the body. The brain is perhaps the most important part of the human body because all the other body parts function according to the instructions provided by it. If the brain fails to function, the entire body collapses. If any other part of the body, for example, the heart stops functioning, the person can still be kept alive through unnatural means. However, if the brain stops working, there is no way of keeping the body alive. Thus, it is crucial, which is why its development needs to be perfect. If there are even slight problems in the development of the brain, huge, long-lasting, and irreversible problems can be caused in the later stages of life.

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