Human Development Psychology III

4.1 Life stages of psychological development

Developmental psychology is the scientific study of changes that occur in human beings over the course of their life. Originally concerned with infants and children, the field has expanded to include adolescence, adult development, aging, and the entire lifespan. This field examines change across a broad range of topics including motor skills and other psycho-physiological processes; cognitive development involving areas such as problem solving, moral understanding, and conceptual understanding; language acquisition; social, personality, and emotional development; and self-concept and identity formation.

Developmental psychology examines issues such as the extent of development through gradual accumulation of knowledge versus stage-like development—and the extent to which children are born with innate mental structures, versus learning through experience. Many researchers are interested in the interaction between personal characteristics, the individual's behavior, and environmental factors including social context, and their impact on development; others take a more narrowly-focused approach.

Developmental psychology informs several applied fields, including: educational psychology, child psychopathology, and forensic developmental psychology. Developmental psychology complements several other basic research fields in psychology including social psychology, cognitive psychology, ecological psychology, and comparative psychology

Pre-natal development

Pre-natal development is of interest to psychologists investigating the context of early psychological development. The whole prenatal development involves three main stages: germinal stage, embryonic stage and fetal stage. Germinal stage begins at conception until 2 weeks; embryonic stage means the development from 2 weeks to 8 weeks; fetal stage represents 9 weeks until birth of the baby. The senses develop in the womb itself: a fetus can both see and hear by the second trimester (13 to 24 weeks of age). Sense of touch develops in the embryonic stage (5 to 8 weeks). Most of the brain's billions of neurons also are developed by the

second trimester. Babies are hence born with some odor, taste and sound preferences, largely related to the mother's environment.

Some primitive reflexes too arise before birth and are still present in newborns. One hypothesis is that these reflexes are vestigial and have limited use in early human life. Piaget's theory of cognitive development suggested that some early reflexes are building blocks for infant sensorimotor development. For example the tonic neck reflex may help development by bringing objects into the infant's field of view.

Other reflexes, such as the walking reflex appear to be replaced by more sophisticated voluntary control later in infancy. This may be because the infant gains too much weight after birth to be strong enough to use the reflex, or because the reflex and subsequent development are functionally different. It has also been suggested that some reflexes (for example the moro and walking reflexes) are predominantly adaptations to life in the womb with little connection to early infant development. Primitive reflexes reappear in adults under certain conditions, such as neurological conditions like dementia or traumatic lesions.

Ultrasound has shown that infants are capable of a range of movements in the womb, many of which appear to be more than simple reflexes. By the time they are born, infants can recognize and have a preference for their mother's voice suggesting some pre-natal development of auditory perception. Pre-natal development and birth complications may also be connected to neuro-developmental disorders, for example in schizophrenia. With the advent of cognitive neuroscience, embryology and the neuroscience of pre-natal development is of increasing interest to developmental psychology research.

Several environmental agents—teratogens—can cause damage during the prenatal period. These include prescription and nonprescription drugs, illegal drugs, tobacco, alcohol, environmental pollutants, infectious disease agents such as the rubella virus and the toxoplasmosis bacterium, maternal malnutrition, maternal emotional stress, and Rh factor blood incompatibility between mother and child.

Infancy

From birth until the first year, the child is referred to as an infant.[26] Developmental psychologists vary widely in their assessment of infant psychology, and the influence the outside world has upon it, but certain aspects are relatively clear.

The majority of a newborn infant's time is spent in sleep. At first this sleep is evenly spread throughout the day and night, but after a couple of months, infants generally become diurnal.

Infants can be seen to have six states, grouped into pairs:

- quiet sleep and active sleep (dreaming, when REM sleep occurs)
- quiet waking, and active waking
- fussing and crying

Infant Perception: Infant perception is what a newborn can see, hear, smell, taste, and touch. These five features are better known as one's "five senses". Infants respond to stimuli differently in these different states.

- Vision is significantly worse in infants than in older children. Infant sight tends to be blurry in early stages but improves over time. Color perception similar to that seen in adults has been demonstrated in infants as young as four months, using habituation methods. Infants get to adult-like vision in about six months.

- Hearing is well-developed prior to birth, unlike vision. Newborns prefer complex sounds to pure tones, human speech to other sounds, mother's voice to other voices, and the native language to other languages. Scientist believe these features are probably learned in the womb. Infants are fairly good at detecting the direction a sound comes from, and by 18 months their hearing ability is approximately equal an adult's.

- Smell and taste are present, with infants showing different expressions of disgust or pleasure when presented with pleasant odors (honey, milk, etc.) or unpleasant odors (rotten egg) and tastes (e.g. sour taste). Newborns are born with odor and taste preferences acquired in the womb from the smell and taste of amniotic fluid, in turn influenced by what the mother eats. Both breast- and bottle-fed babies around 3 days old prefer the smell of human milk to that of formula, indicating an innate preference. There is good evidence for older infants preferring the smell of their mother to that of others.

- Touch and feel is one of the better-developed senses at birth considering it's one of the first senses to develop inside the womb. This is evidenced by the primitive reflexes described above, and the relatively advanced development of the somatosensory cortex.

- Pain: Infants feel pain similarly, if not more strongly than older children but pain-relief in infants has not received so much attention as an area of research.

Language: Babies are born with the ability to discriminate virtually all sounds of all human languages. Infants of around six months can differentiate between phonemes in their own language, but not between similar phonemes in another language. At this stage infants also start to babble, producing phonemes.

Infant Cognition: The Piagetian Era An early theory of infant development was the Sensorimotor stage of Piaget's Theory of cognitive development. Piaget suggested that an infant's perception and understanding of the world depended on their motor development, which was required for the infant to link visual, tactile and motor representations of objects. According to this view, it is through touching and handling objects that infants develop object permanence, the understanding that objects are solid, permanent, and continue to exist when out of sight.

Piaget's Sensorimotor Stage comprised six sub-stages (see sensorimotor stages for more detail). In the early stages, development arises out of movements caused by primitive reflexes. Discovery of new behaviors results from classical and operant conditioning, and the formation of habits.[39] From eight months the infant is able to uncover a hidden object but will persevere when the object is moved.

Piaget came to his conclusion that infants lacked a complete understanding of object permanence before 18 months after observing infants' failure before this age to look for an object where it was last seen. Instead infants continue to look for an object where it was first seen, committing the "A-not-B error." Some researchers have suggested that before the age of eight to nine months, infants' inability to understand object permanence extends to people, which explains why infants at this age do not cry when their mothers are gone ("Out of sight, out of mind").

Recent Finding in Infant Cognition In the 1980s and 1990s, researchers have developed many new methods of assessing infants' understanding of the world with far more precision and subtlety than Piaget was able to do in his time. Since then, many studies based on these methods suggest that young infants understand far more about the world than first thought.

Based on recent findings, some researchers (such as Elizabeth Spelke and Renee Baillargeon) have proposed that an understanding of object permanence is not learned at all, but rather comprises part of the innate cognitive capacities of our species.

Other research has suggested that young infants in their first six months of life may possess an understanding of numerous aspects of the world around them, including:

- an early numerical cognition, that is, an ability to represent number and even compute the outcomes of addition and subtraction operations;

- an ability to infer the goals of people in their environment;

- an ability to engage in simple causal reasoning.

Toddlerhood

Infants shift between ages of one and two to a developmental stage known as toddlerhood. In this stage, an infant's transition into toddlerhood is highlighted through self-awareness, developing maturity in language use, and presence of memory and imagination.

During toddlerhood, babies begin learning how to walk, talk, and make decisions for themselves. An important characteristic of this age period is the development of language, where children are learning how to communicate and express their emotions and desires through the use of vocal sounds, babbling, and eventually words. Self-control also begins to develop. At this age, children take initiative to explore, experiment, and learn from making mistakes. Caretakers who encourage toddlers to try new things and test their limits, help the child become autonomous, self-reliant, and confident. If the caretaker is overprotective or disapproving of independent actions, the toddler may begin to doubt their abilities and feel ashamed of the desire for independence. The child's autonomic development is inhibited, leaving them less prepared to deal with the world in the future. Toddlers also begin to identify themselves in gender roles, acting according to their perception of what a man or woman should do.

Socially, the period of toddlerhood is commonly called the "terrible twos".Toddlers often use their new-found language abilities to voice their desires, but are often misunderstood by parents due to their language skills just beginning to develop. A person at this stage testing their independence is another reason behind the stage's infamous label. Tantrums in a fit of frustration are also common.

Continuity and discontinuity in development

Although the identification of developmental milestones is of interest to researchers and to children's caregivers, many aspects of developmental change are continuous and do not display noticeable milestones of change. Continuous developmental changes, like growth in stature, involve fairly gradual and predictable progress toward adult characteristics. When developmental change is discontinuous, however, researchers may identify not only milestones of development, but related age periods often called stages. A stage is a period of time, often associated with a known chronological age range, during which a behavior or physical characteristic is qualitatively different from what it is at other ages. When an age period is referred to as a stage, the term implies not only this qualitative difference, but also a predictable sequence of developmental events, such that each stage is both preceded and followed by specific other periods associated with characteristic behavioral or physical qualities.

Stages of development may overlap or be associated with specific other aspects of development, such as speech or movement. Even within a particular developmental area, transition into a stage may not mean that the previous stage is completely finished. For example, in Erikson's discussion of stages of personality, this theorist suggests that a lifetime is spent in reworking issues that were originally characteristic of a childhood stage. Similarly, the theorist of cognitive development, Piaget, described situations in which children could solve one type of problem using mature thinking skills, but could not accomplish this for less familiar problems, a phenomenon he called horizontal decalage.

Mechanisms of development

Although developmental change runs parallel with chronological age, age itself cannot cause development. The basic mechanisms or causes of developmental change are genetic factors and environmental factors. Genetic factors are responsible for cellular changes like overall growth, changes in proportion of body and brain parts, and the maturation of aspects of function such as vision and dietary needs. Because genes can be "turned off" and "turned on", the individual's initial genotype may change in function over time, giving rise to further developmental change. Environmental factors affecting development may include both diet and disease exposure, as well as social, emotional, and cognitive experiences. However, examination of environmental factors also shows that young human beings can survive within a fairly broad range of environmental experiences.

Rather than acting as independent mechanisms, genetic and environmental factors often interact to cause developmental change. Some aspects of child development are notable for their plasticity, or the extent to which the direction of development is guided by environmental factors as well as initiated by genetic factors. When an aspect of development is strongly affected by early experience, it is said to show a high degree of plasticity; when the genetic make-up is the primary cause of development, plasticity is said to be low. Plasticity may involve guidance by endogenous factors like hormones as well as by exogenous factors like infection.

One kind of environmental guidance of development has been described as experience-dependent plasticity, in which behavior is altered as a result of learning from the environment. Plasticity of this type can occur throughout the lifespan and may involve many kinds of behavior, including some emotional reactions. A second type of plasticity, experience-expectant plasticity, involves the strong effect of specific experiences during limited sensitive periods of development. For example, the coordinated use of the two eyes, and the experience of a single three-dimensional image rather than the two-dimensional images created by light in each eye, depend on experiences with vision during the second half of the first year of life. Experience-expectant plasticity works to fine-tune aspects of development that cannot proceed to optimum outcomes as a result of genetic factors working alone.

In addition to the existence of plasticity in some aspects of development, genetic-environmental correlations may function in several ways to determine the mature characteristics of the individual. Genetic-environmental correlations are circumstances in which genetic factors make certain experiences more likely to occur.

For example, in passive genetic-environmental correlation, a child is likely to experience a particular environment because his or her parents' genetic make-up makes them likely to choose or create such an environment. In evocative genetic-environmental correlation, the child's genetically-caused characteristics cause other people to respond in certain ways, providing a different environment than might occur for a genetically-different child; for instance, a child with Down syndrome may be treated more protectively and less challengingly than a non-Down child. Finally, an active genetic-environmental correlation is one in which the child chooses experiences that in turn have their effect; for instance, a muscular, active child may choose after-school sports experiences that create increased athletic skills, but perhaps preclude music lessons. In all of these cases, it becomes difficult to know whether child characteristics were shaped by genetic factors, by experiences, or by a combination of the two.