

# Brain functions



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Brain provides wider function in terms of biological changes that take place in one person; it is the central nervous system thus, it is responsible to overall functional development of the body. Moreover, the brain serves as the indicator of all the responses made by man, and so, any behavioral and/or psychological development coincides with his mental development. Scientists have made a very significant study on brain functioning of adolescents. A teen's brain develops more rapidly according to them than what most people thought.

Through the use of Magnetic Resonance Imaging (MRI), they have found out that the human brain “ undergoes changes after sensitive period and develop throughout adolescent. Brain continues to develop until the age of twenty, and this development is remarkable and must be given enough attention by concerned individual, for in this period lies the future of these teens. Many mentalhealthexperts believe that these changes that occur in one's brain to prepare them to adulthood.

It is a crucial stage in the development of brain because, along the physiological changes that take place in the brain, the psychological and emotional functioning of an adolescent carries with it also. These health professional had commented that, “ adolescence and young adulthood is a time of great potential for change and development – then policymakers need increasingly to focus in the opportunities for helping and influencing young adults that this crucial stage presents. ” Biological Changes that Occur in an Adolescent Brain

The brain controls the overall function of the body: the basic instinct, immune system, sexuality, language capacity, and even abstract thinking.

Not only has that, even a person's behavior or responses depended largely on how his brain functions, specifically, his capacity to adapt to changes brought about by external forces. Adolescent period is the turning point in the life of any person to adulthood; many could observe how differently a person when he turns to this period. Not all can understand these changes, even the person himself.

In the biological development of the brain, renowned Biologist and Psychologist Jean Piaget observed that “ the developing child builds cognitive structure. ” He meant the child develops mental ‘ maps’ scheme, or network concept for “ understanding and responding to physical experiences with in his or her environment. ” Piaget confirmed that cognitive structure increases with development moving from instinctive baby responses to highly complex mental activities of adolescence. In his theory, he identifies four development stages and processes by which children progress through them.

These are:

1. The sensorimotor stage (birth – 2years old) is where the child first learns through physical interaction with his or her environment and forms a set of ideas about ‘ reality and how it works.
2. The preoperational stage (2-7 years old) is the stage that the child needs ‘ concrete physical situation because he can not yet conceptualize abstractly.
3. The concrete operation (7-11 years old), at this ages, the child is able to conceptualize creating ‘ logical structures’ that gives him idea of his or her physical experiences.

4. The formal operations (11-12 years old), the child already develops cognitive structures like those of an adult which include conceptual reasoning. Piaget further explains that during all development stages, the child experiences his or her environment using whatever mental maps he or she has constructed.

By this, he said that repeated experience easily fits or assimilated into child's cognitive structure that maintains his or her mental equilibrium. But if it is a new experience, the child loses equilibrium and alters cognitive structure to "accommodate the new conditions. Through this, the child develops more and more concrete cognitive structures." Men and women differ in many aspects not only in physical attributes and sexes. They also differ even in the way of solving intellectual problems. The differences accordingly are minimal and were merely consequence of "variations in experiences during development before and after adolescence.

"They pointed out that recently, evidence suggests that the effect of sex hormones on brain organization occur so early in life that from the start, the environment is acting on differently wired brains in boys and girls." These then, make evaluating the role of experience independent of physiological disposition which is a difficult task. The basis of biological sex differences in brain and behavior "have become much better known through increasing numbers of behavioral neurological endocrinological studies. These studies also emphasized that observations show that males are more aggressive than females.

Males engage in more rough play while females are more 'nurturing.' It was also noted that males are better at a variety of spatial tasks. It concludes

that male and female are better differentiated in the “ level of exposure to various sex hormones early in life. ” According to the studies conducted by Dr. Elizabeth Sowell, Assistant Professor of Neurology Laboratory of New Imaging, UCLA, “ the discoveries particularly of post adolescent frontal lobemotivationprovides new insight for interpreting occasionally trouble some behavior.

She noted that “ teens in typical western society are notorious for being poor planners, having difficulty interpreting potential consequences of their actions. 12 That these teens have difficulty controlling their emotions and having trouble inhibiting inappropriate behaviors. Dr. Sowell pointed out that “ frontal lobes are responsible for planning, organization, and impulse control all functions typically underdeveloped during adolescence. ” 13 The result of the studies suggested that on-going changes in brain structure play a role.

She said that “ patterns of cortical maturation and degeneration betweenchildhoodand old age likely to reflect changing behavioral functions and cognitive abilities across the human life p. ” 14 The study used computerized brain image analyses to create three dimensional maps of gray matter change in the human cerebral cortex across a decades (7-87 years) involving 176 normal individuals and studies with MRI. Findings showed gray matter increase until about age 30. Whereas gray matter is also observed because of synaptic pruning, and continued myelination occurs during adolescent period.

Both synaptic pruning and increased myelination are “ cellular changes that result in a more fine tuned efficient brain. ” 15 It was also observed that pattern of gray matter loss were more rapid between 7 and 60 years old.

Results of this study show that the “ trajectory of maturation aging effects vary considerably over the cortex with primary visual, auditory and limbic cortices known to myelinate relatively early in development showing a more linear pattern of aging.

A group of health professionals explained some remarkable changes that take place in the behavior of a youth<sup>17</sup> such as: sense of independence and exploration; formation of social bonds (they would choose to be with friends than with family members); they have powerful urges for sexual behavior; they have powerful emotional responses; they have greater tendency to acquire high-risk behavior because they cannot sustain with reason their impulsive behavior; youth are also vulnerable to addiction such as drugs and alcohol, their brain is sensitive with these elements; they also have inclination to materialism or consumerism; and in rare instances, some may experience mental illness or psychological disorder especially if the thinning of grey matter is greater, such as in the case of schizophrenia and bipolar.

Conclusion Environment should not be blamed for what the behavior manifests in youth. Young people should not also be blamed for they themselves cannot comprehend what is going on inside them.

At this crucial stage in their lives, they can experience different impulses and changes in their behavior. Sad to say, many of these youth have gone astray choosing a different path for them, which in turn, did not benefit them at all. Youth is the future of the nation, a country must invest on them, their energy and potential must be realized for greater benefit of all. But this could become possible if the government and the society must work hand in hand to meet the basic needs of the youth. Commissioners need to consider the

specific needs of this age group when planning and commissioning services; failure to do so may contribute to the development of mental health service users being stuck in a cycle of hopelessness, unable to realize their full potential.