

An overview of physiological Basis of Peace and violence

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Abstract

It is a reference to the fact that humans are biological creatures as other animals. Human are the product of millions of years of evolution, their physical make up changing to make them fitter to survive and reproduce. However, although humans are animals, they also have something that no other animal has: the most complex social structure on Earth. They gather in families, tribes, clans, nations. They have an extremely complicated method of interacting. Humans memories are the longest, their interactions the most complex, and their perception of the world all together the most comprehensive. And human has some significant attributes which other animals do not consist with. Hence peace, compassion, empathy, tolerance etc as well as aggression, cruelty are some of these attributes and because of these attributes human has become advanced animal. The central focus in this article is to examine the human physiological basis of peace and violence. In order to emphasise the relationship it has critically analysed the human brain, emotions and the biological basis, and hormones.

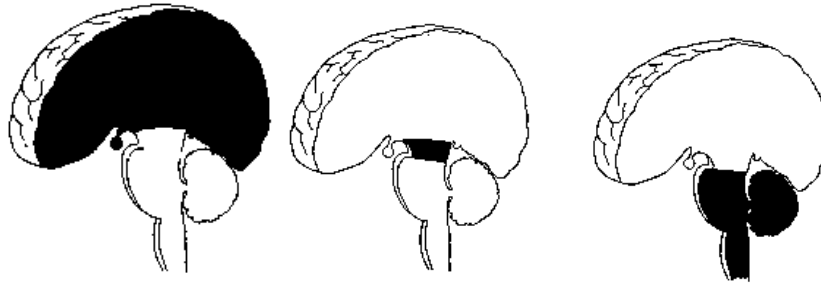
Introduction

For centuries, scientists have been captivated by the brain, but until recently they viewed the brain as nearly incomprehensible. Now, however, the brain is starting to give up its secrets. Scientists have experienced more about the brain in the last ten years than in all earlier centuries because of the accelerating speed of research in behavioral science and the growth of new research techniques.

The brain initially appeared in fish, reptilians, nearly 500 million years ago. The **reptilian** brain, the oldest and controls the body's vital functions such as heart rate, breathing, body temperature and balance. Reptilian brain consists with the main structures found in a reptile's brain: the brainstem and the cerebellum. The reptilian brain is dependable but tends to be somewhat inflexible and compulsive. It continued to expand in amphibians and reached its most complex stage in reptiles, approximately 250 million years ago. The limbic system first appeared in small mammals, about 150 million years ago. Lastly, the neo cortex began its impressive expansion in primates, scarcely 2 or 3 million years ago, as the genus *Homo* emerged. Human brain cells, brain molecules, neurotransmitters and synapses are almost identical in all animals, so the brains of insects, fish, reptiles, birds and mammals are all made from the same building blocks. The human brain is the most complex part of the human body. This three pound organ is the bench of intelligence, predictor of the senses, originator of body movement, and manager of behavior. Lying in its bony case and washed by protective fluid, the brain is the foundation of all the attributes that describe humans' humanity. All the parts of the brain work collectively, but each part has its own special duties. The brain can be divided into three basic units: the forebrain, the midbrain, and the hindbrain.

Illustration 01: Three main parts of the human brain

The Forebrain ----- The Midbrain ----- The Hindbrain



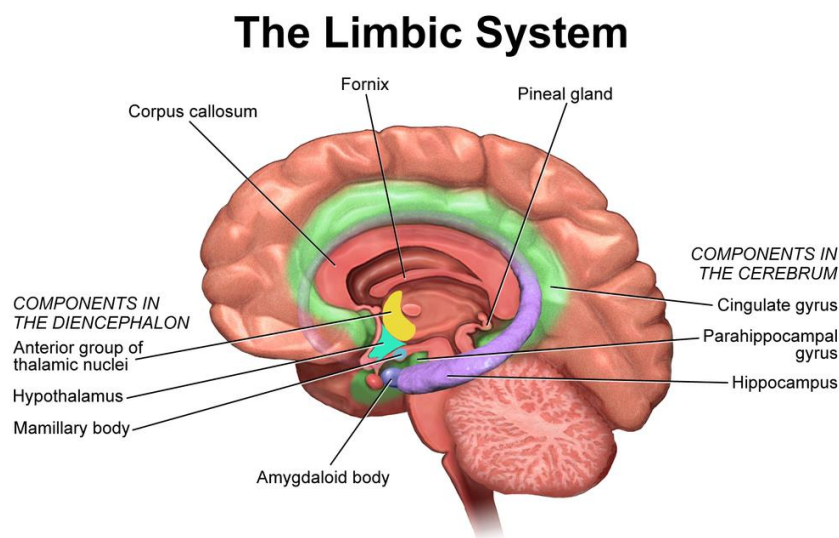
Source: <https://www.google.lk/search?q=human+brain&biw>

Forebrain is the most anterior of the primary brain vesicles and the short part of the brainstem just above the pons known as mid brain. Hindbrain, also called rhombencephalon, region of the developing vertebrate brain that is composed of the medulla oblongata, the pons, and the cerebellum.

Human Brain and Peace

Many researchers as well as academicians attempted on the brain to explain violence and peace. As a result of these attempts they have identified numerous circuits within both neocortical and sub cortical structures play a vital role in controlling violence and peaceful behaviors, depending on the species, and the exact role of pathways may vary depending on the type of trigger or intention. In mammals, the hypothalamus and periaqueductal gray of the midbrain are serious areas, as shown in studies on cats, rats, and monkeys. These brain areas manage the expression of both behavioral and autonomic components of violence and peace in these species, including vocalisation. Electrical motivation of the hypothalamus causes violent behavior and the hypothalamus has receptors that help decide violent levels based on their relations with serotonin and vasopressin. These midbrain areas have straight relations with both the brainstem nuclei controlling these functions, and with structures such as the amygdala and prefrontal cortex.

Illustration 02: An illustration of the Limbic System



Source: <https://www.google.lk/search?q=human+brain>

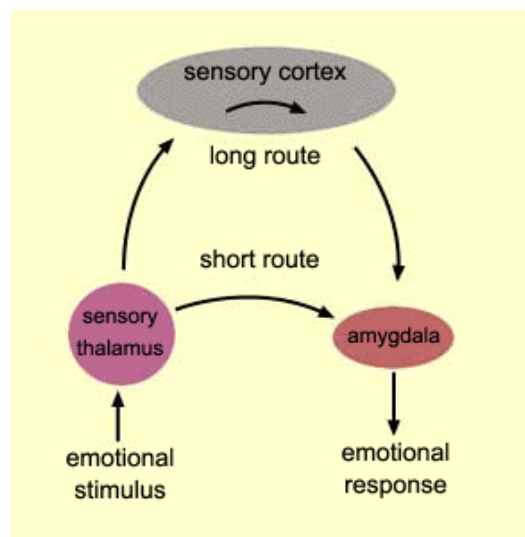
Stimulation of the amygdala results in improved violent behavior in hamsters, while lesions of an evolutionarily homologous area in the lizard greatly reduce competitive drive and aggression (Bauman et al. 2006). In rhesus monkeys, neonatal lesions in the amygdala or hippocampus results in reduced expression of social governance, linked to the regulation of aggression. Experiments in attack primed Syrian Golden hamsters, for example, support the claim of circuitry within the amygdala being involved in control of aggression. The role of the amygdala is not very much clear in primates and appears to depend more on situational context, with lesions important to enhance in either social affiliatory or aggressive responses. The wide area of the cortex recognized as the prefrontal cortex has been implicated in aggression, along with many other functions such as including inhibition of emotions. Reduced activity of the prefrontal cortex, in particular its medial and orbitofrontal portions, has been associated with violent or antisocial aggression. The role of the chemicals in the brain, particularly neurotransmitters, in aggression has also been examined. This varies depending on the pathway, the context and other factors such as gender. A deficit in serotonin has been theorized to have a primary role in causing aggression.

Emotions

As mentioned earlier the limbic brain emerged in the first mammals. It can record memories of behaviours that produced agreeable and disagreeable experiences, so it is accountable for what are called emotions in human beings. The main structures of the limbic brain are the hippocampus, the amygdala, and the hypothalamus. The limbic brain is the chair of the value judgments that human make, often automatically, that apply such a strong pressure on human behaviour. Emotions are something that happens much more than something person decides to make happen. Much of the clarification for this lack of direct control over emotions lies in the way that the human brain is interconnected. Human brains have originated in such a way

that they have far more relations running from their emotional systems to their cortex than the other way around. Emotions, often called feelings, include experiences such as love, hate, anger, trust, joy, panic, fear, and grief. Emotions are specific reactions to a particular event that are usually of fairly short duration. Although everyone experiences emotions, scientists do not all agree on what emotions are or how they should be measured. Emotions are complex and have both physical and psychological components. Generally researchers agree that emotions have the following parts: subjective feelings, physiological responses, and expressive behavior. The component of emotions that scientists call subjective feelings refers to the way each individual person experiences feelings, and this component is the most difficult to describe or measure. Subjective feelings cannot be observed; instead, the person experiencing the emotion must describe it to others, and each person's description and interpretation of a feeling may be slightly different.

Figure 01: Routes of an emotion



Source: <https://www.google.lk/search?q=route+of+an+emotion&biw>

It has to start with a sensory stimulus, such as a strange shape or a threatening sound. Like all information captured by the senses, this message must be routed first to the thalamus. The thalamus then sends this message on to the suitable sensory cortex which evaluates it and assigns it a meaning. If this meaning is threatening, then the amygdala is informed and produces the appropriate emotional responses. But what has been discovered much more recently is that a part of the message received by the thalamus is transferred directly to the amygdala, without even passing through the cortex. It is this second route, much shorter that explains the rapid reaction of human natural alarm system.

Physiological responses are the easiest part of emotion to measure because scientists have developed special tools to measure them. A pounding heart, sweating, blood rushing to the face, or the release of adrenaline in response to a situation that creates intense emotion can all be measured with scientific accuracy. Humans have very similar internal responses to the same emotion. Although the psychological part of emotions may be different for each feeling, several different emotions can produce the same physical reaction.

Hormones

The hormonal neuropeptides vasopressin and oxytocin play a key role in complex social behaviours in many mammals such as regulating attachment, social recognition, and aggression. Vasopressin has been concerned in male typical social behaviors which include aggression. Oxytocin may have a particular role in regulating female bonds with offspring and mates, including the use of protective aggression. Relationship between aggressive behavior and the endocrine system have been studied intensively in recent years. This interest has occurred presumably because hormones are naturally occurring secretions of the body's endocrine or ductless glands, and are perceived as providing possibly reversible therapies for some clinical conditions that include hyper aggressiveness as a symptom. Hormones are transported throughout the body by the blood stream and represent the slow section of the neuroendocrine coordinating system that regulates physiological and behavioral activities.

Conclusion

Darwin's theory of evolution process that animals well suits to their environment survive and pass on their genes. Animals that are not well suites perish before they have offspring. Over the course of millions of years, this has led to astounding array of different creatures and organisms on the planet. Human being is still on the earth because humans have well suited to the environment and no doubt that human being is the advanced animal in the planet. Human being receives this status because, he has an advanced brain anatomy and he acquired significant attributes like peace, compassion, tolerance, empathy, aggression and cruelty etc. Peace and other attributes is influenced by diverse factors that are difficult to sort out. These include; Biological factors; genes, neural system, neurotransmitters and hormones, Situational determinants; the environmental or social content, the accumulated experience of individuals. Among biological factors human brain, hormones and genes are playing vital role.

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