The evolutionary aspects of fear psychology essay

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This paper presents an exclusive discussion of what is known about the biological basis of fear. In presenting this discussion, the paper shall explore the main concepts relating to the biology behind fear in humans with the main ideas being the definition of fear, the evolutionary aspects of fear, as well as the emotional response of the brain in the event of fear or anxiety. The paper shall also present an analysis that seeks to establish fear and anxiety as identical rather than two contrasting concepts as believed by many. In the discussion on the biological basis of fear, the study shall include biological evidence relating to the specific parts of the human brain that respond and react to fear.

Introduction

It is interesting how humans respond to fear, especially the bodily changes that take place in the event of an activity or something that triggers fear. Humans respond to fear in different ways, and their bodies react to unexpected situations of fear almost instantly. In response to fear, human bodies exhibit increased arousal, autonomic and neuroendocrinal activation and immediate expectancy among other spontaneous reactions. It is even surprising that fear triggers some emotional reaction in humans based on recent studies by psychologists. An interesting revelation according to empirical studies on emotions under the field of biology point to the fact that emotions are not just feelings as evolutionary studies would want us to believe. Emotions in human beings are accompanied by physiological and behavioural variations (Davidson, 2000). A widely accepted perception of emotions today touches on the fundamental ideology that humans experience emotions in three different but interrelated levels: the

behavioural level, the neurophysiological level and the psychological or metal level. Based on inference that emotions have a close relation to fear in terms of the mental or psychological state, it is possible to use such information to build upon the biological basis of fear (Walker, 2002). The consequence of predisposing factors that trigger emotions also tend to instil fear in human beings and this paper shall seek to unravel the biological basis of fear in terms of psychological and behavioural responses relating to biology.

What is fear?

Fear is a motivational state triggered by specific stimuli that result in or escape defensive behaviour. Enthologists believe that fear is an unpleasant emotion that comes about as a result of the perception that somebody or something dangerous is likely to happen. This unpleasant emotion triggers a form of defence mechanism that results in escape or counter behaviours. In terms of biology, a couple of neuoroendocrinal activations that are usually automatic mostly typify fear. This is essential in explaining the sudden escape of a person at the sight of a scary animal that triggers immediate activations in the brain (Strongman, 1996). This effective defence mechanism triggered by a stimulus instils fear. In this context, such instantaneous reactions to fear facilitate coping mechanisms used by the body to respond to cases of fear.

The evolutionary aspects of fear

The evolutionary aspects of fear mainly relate to emotional responses. Fear is a factor of de-escalating tactic interceded by the emotional (paleomammalian) part of the fore brain. As man and other animals evolved

millions of years ago, they adapted differently to fear. During the evolutionary period, diverse types of fear characterized the universe and were responded to by animals and humans in dissimilar ways. Scientists conclude that the adaptations developed by humans during this period explain the response and reactions of humans towards fear (Strongman, 1996). However, a couple of fear such as the fear of height is common to all mammals because of the adaptations developed during the Mesozoic era. The fear of snakes and other dangerous reptiles came into existence during the Cenozoic era and is common to all higher primates including humans and apes. However, others such as the fear of insects and mice developed in the Paleolithic and Neolithic periods are unique to humans. During these periods, insects and mice became popular carriers of dangerous infections and diseases, which resulted in different adaptive measures by humans. Such fears are still common today (Iijima, et al., 1996).

The emotional brain

The emotional aspect of the brain occurs at three levels: the behavioural level, the neurophysiological level and the psychological or metal level. Theories of emotion touching on the brain reveal that bodily changes tend to follow directly the perception of existing facts and human feelings of the same changes according to the occurrence of the emotion. In other words, the stimulus that reaches the cerebral cortex part of the brain provokes intuitive changes, which are perceived as emotions. Other studies have advanced that the thalamus is greatly involved in the neuropsychological matter of the brain because such matters are subcortical in nature. A biological explanation on the emotional brain is that a stimulus from the

environment triggers the thalamus, which transmits information from to the viscera and cortex, and back again to the cortex to engender an emotional state (Gray & McNaughton, 2000).

Specific parts of the brain that work together to trigger reactions to fear stimuli

Amygdala

The amygdala is part of the brain structure where a majority of neurobiological events related to fear occurs. It is located just behind the pituitary gland and respond in different ways to fear stimuli. Any fear stimulus activates the Amygdala to secrete a series of hormones that immediately influence aggression and fear (Vianna, 2003). As the process of secreting such hormones into the body begins, the Amygdala prompts the body into a state of awareness and alertness, which trigger instant response from other muscles in the legs and hand to get ready for take-off or a fight. As the essential component of the limbic system, the amygdala is critical in preparing the body to respond or react to fear by secreting hormones at the trigger of a fear stimulus (Borod, 2000). It integrates rapid and direct thalamic inputs that transmit a fear stimulus and imitates a cognitive process that prepares the body to respond or react to the threat.

Hippocampus

The hippocampus is touted as the central structure in the brain that engages in processing contextual information necessary to fear conditioning. Situated just next to the amygdala and connected to it by the subiculum and

entorhinal cortex, the hippocampus′s main functions is to condition fear into contextual information. The hippocampus conditions fear in circumstances that involve complex polymodal events by receiving impulses from the amygdala and integrating such impulses with prior information to ignite meaningful reactions that respond to fear (Davidson, 2000).

Hypothalamus

The hypothalamus plays a crucial role as far as fear response is concerned. It is responsible for controlling stress reactions and other body processes including emotions and moods. Through the hypothalamic-pituitary-adrenal axis (HTPA axis), the hypothalamus controls the limbic, pituitary, adrenal and genadotropic aspects of the body. A fear stimulus sends LC (locus ceruleus) neurons to the hypothalamus, which activates the HTPA axis that triggers the stress response linked to fear (Lewis & Haviland-Jones, 2000). The connection between the hypothalamus, hippocampus and amygdala act to activate the HTPA axis to respond to a fear stimulus. The hypothalamus receives sensory information from the lateral part of the amygdala, processes the information and relays to the central nucleus, which then projects it to various parts of the brain that respond and react to fear. Fear stimulus impulses relayed by various neurons activate the sympathetic nervous system, as well as the modulating system of the HTPA axis. This triggers a run or attack response, better known as a fight or flight response mechanism (Hyman, et al., 1999).

Sensory cortex

The sensory cortex is an essential component of the fear response mechanism. Immediate sensory data from fear stimulus collects in the thalamus part of the brain. After the collection of the sensory data, the sensory cortex obtains the data from the thalamus, interprets it and organizes the sensory data for dissemination to the amygdala, hippocampus and hypothalamus (Hirsh, 2004).

Thalamus

The thalamus also plays a critical role in fear response. The thalamus basically acts as a collection center, which gathers and collects information from essential sensory organs such as the ears, eyes and mouth. After collecting the sensory information from such organs, the thalamus has the capacity to determine where to send such information for processing. A fear stimulus from the eyes, hands or mouth sends sensory information through neurons to the thalamus, which collects and sends the information to the appropriate response organs for processing (Lewis & Haviland-Jones, 2000).

Fear conditioning explains the behavioural archetype displayed by organisms and their capacity to learn to respond to or predict fearful or threatening events. Fear conditioning explains why some people fear dogs to the extent that they become helpless at the sight of this â€Ëœmonsterˊ. It is believed to depend upon the amygdala and the hippocampus in cases of contextual fear conditioning. Fear conditioning also explains the neurobiology of fear because touches on the essential components of the brain including the thalamus, the pituitary gland, the hypothalamus, the amygdala and the sensory cortex (Lewis & Haviland-Jones, 2000). Latest research findings point

to the fact that researchers are beginning to develop interest on the neurological processes that trigger fear response mechanisms.

Conclusion

The biological basis of fear can be explained by the evolutionary concepts of anxiety and emotions and adaptations of human beings to different stimuli. However, empirical research findings have established a basis for explaining the biology of fear through the human mind the structures such as the hypothalamus, amygdala, thalamus, hippocampus and the sensory cortex. The outcome of predisposing factors that trigger emotions tend to instill fear in human beings as discussed in this paper. The biological basis of fear in terms of psychological and behavioural responses relates to emotion and anxiety, which is an advanced form of fear. Further research should be directed to the neurochemical processes that occur in the brain and the chemical components involved in response to fear.