

The Frontal lobe and Criminal behaviour

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Abstract

The frontal lobe comprises a third of the surface of each hemisphere in human brain, and is responsible for movement, speech production, emotional expression, reward, attention, short-term memory tasks, future planning, and motivation. It is also involved in internal, purposeful mental action, and reasoning, and in socially acceptable responses. Many neuropsychological, volumetric and functional imaging studies, and case reports have shown certain changes in the frontal lobes of subjects who exhibited criminal or violent behaviour.

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Frontal lobe anatomy

The frontal lobe is the largest of the four lobes of the brain in the mammalian brain, comprising about a third of the surface of each hemisphere. It is located at the front of the brain and it is separated from the parietal lobe by the central sulcus, and the temporal lobe by the Sylvian fissure. The frontal lobe is functionally related to movement, speech production, emotional expression, reward, attention, short-term memory tasks, future planning, and motivation. The prefrontal cortex, which represents the anterior most portion of the frontal lobe and the largest part of the frontal lobe, is linked to internal, purposeful mental action, and reasoning. The Prefrontal cortex (PFC) is involved in predictions of future consequences that result from current actions, and includes override and suppression of socially unacceptable responses and task differentiation. The prefrontal cortex is one of the last cortical regions to undergo full myelination during adolescence in human [1].

The PFC is connected to distant and broadly dispersed parts of the limbic system and association cortex. It is connected with the amygdala, hypothalamus, midbrain, and pons, connections which are likely to integrate higher-order brain functions mediated by the PFC with more developmentally fundamental brain activities such as emotion and visceral, or autonomic functions [2]. The vast majority of the prefrontal connections is reciprocal, with the exception of the connections with the basal ganglia, to which the PFC sends unreciprocated direct