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RELATIONSHIPS BETWEEN NEGATIVE SYMPTOMS AND ABNORMALITIES IN THE ANTICIPATORY COMPONENT OF REWARD

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A dysfunction of the dopaminergic reward system has been postulated in the pathophysiology of schizophrenia. A subcortical hyperdopaminergic state in unmedicated schizophrenia patients has been associated with the pathogenesis of positive symptoms and a prefrontal hypodopaminergic state with cognitive and negative symptoms. But negative symptoms like anhedonia have also been hypothesized to be associated with a dysfunction of the mesolimbic dopaminergic system. However, preclinical studies indicate that the mesolimbic dopaminergic system mediates motivation and incentive salience of reward-indicating stimuli rather than the ability to experience pleasure.

Recent neuroimaging findings in schizophrenia patients confirmed dysfunctional activation during reinforcement learning. We used functional magnetic resonance imaging (fMRI) to assess the BOLD response in the ventral striatum of unmedicated schizophrenia patients during presentation of reward-indicating stimuli and during reversal learning. Compared with healthy controls, unmedicated schizophrenics showed reduced ventral striatal activation during presentation of reward-indicating cues, which was negatively correlated with the severity of negative symptoms. During reversal learning unmedicated schizophrenia patients displayed behavioral impairments and reduced activation in the ventral striatum and the ventrolateral PFC. In unmedicated schizophrenic patients, a high striatal dopamine turnover may interfere with neuronal processing of reward-indicating stimuli by phasic dopamine release, thus contributing to negative symptoms as such as loss of drive and motivation.