The role of the orbitofrontal cortex in delayed reinforcement choice in rats

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Previous studies have reported that lesions of the orbitofrontal cortex (OFC) in rats induce impulsive choices in delayed reinforcement tasks. However, some studies have suggested that the OFC is not related to impulsivity but instead to compulsivity. In this study, we investigated the effects of OFC lesions on choice in a T-maze. First, 14 rats were trained to discriminate spatially between a high-reward arm with a delay of 15 seconds and a low-reward arm without a delay. The high-reward arm contained 10 food pellets, whereas the low-reward arm contained only one pellet. In the presurgery test, all rats chose the high-reward arm in most trials. In the postsurgery test, both OFC lesioned (n = 7) and control (sham-lesioned and intact; n = 7) rats continued to choose the high-reward arm in most trials. Following the postsurgery test, the high- and low-reward arms were reversed. In the reversal test, OFC lesioned rats made significantly fewer high-reward choices than did control rats. These results indicate that OFC lesions induced compulsive choices rather than impulsive choices.

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