AMPHETAMINE AND THE "BATH SALT" 3,4-METHYLENEDIOXYPYROVALERONE (MDPV) ALTER ACCURACY OF MEMORY FOR EMOTIONAL AROUSING EXPERIENCES IN RATS

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Drugs of abuse have long been recognized to affect memory function. However, the mechanisms by which these substances affect the accuracy of memory processes are not well investigated. To this aim, we tested the effects of the psychostimulants Amphetamine and the “bath salt” 3,4-methylenedioxypyrovalerone (MDPV) in an inhibitory avoidance discrimination task. Male Sprague Dawley rats (350-370 g) were trained and tested in different inhibitory avoidance apparatuses. During training rats were placed into the light compartment of a first inhibitory avoidance (Non-Shock box) and they were allowed to cross to the dark compartment of the apparatus. Then, after a 1-min delay, they were placed into the light compartment of a second, contextually distinct, inhibitory avoidance apparatus (Shock box), and they received footshock upon entering the dark compartment. Amphetamine (1-3 mg/Kg), MDPV (0.5–1 mg/Kg) or saline were systemically administered immediately after training. On the 48-h retention test, rats were tested, in a randomized order, in the Shock box and Non-Shock box as well as in a Novel box. Saline-treated rats had similar retention latencies in the Shock and Non-Shock boxes, indicating lack of discrimination. However, latencies in the Shock and Non-Shock boxes were both significantly longer than those in the Novel box, indicating that rats recognized the two training contexts. Amphetamine (3 mg/kg) administration increased retention latencies in the Shock box indicating an increase in memory strength. However, retention latencies in both safe environments, i.e., Non-Shock and Novel boxes, were also longer, indicating also an increased generalization. MDPV did not affect retention latencies in the Shock box, indicating a lack of memory enhancement, but it (1 mg/Kg) increased retention latencies in the Novel box. Amphetamine and MDPV had differential effects on memory strength, but both drugs increased generalization of memory for emotional training. It is tentative to hypothesize that the different effects on memory strength versus generalization induced by the two psychostimulant drugs could be due to differences in the modulation of the monoaminergic neurotransmissions, in the recruitment of different brain areas or in the interaction with the stress response systems.