



ROLE OF DOPAMINE D2-LIKE RECEPTORS IN THE MICROSTRUCTURE OF LICKING FOR WATER AND SODIUM CHLORIDE SOLUTIONS IN WATER DEPRIVED RATS

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Licking behaviour in rats is characterised by a microstructure whose different experimental measures have been suggested to represent relevant dimensions of reward-related behaviour, such as incentive salience and hedonic impact. Rats emit licks in bouts, with a bout being a series of successive licks less than 400 milliseconds apart. While initial lick rate and bout size, which are sensitive to the concentration of tastants have been suggested to represent hedonic impact, the number of bouts is thought to be a measure of incentive salience. In spite of the large body of literature on the role of dopamine in reward-related behaviour and in the control of the intake of tasty solutions, not many studies have dealt with the role of dopamine transmission on licking microstructure. In summary, it has been reported that dopamine D2-like antagonists, such as raclopride, and dopamine D2-like agonists, such as quinpirole and 7-OH-DPAT, affect the microstructure of licking for sucrose solutions decreasing the measures suggested to represent hedonic impact, with raclopride and 7-OH-DPAT also increasing bout number as a compensatory effect. In the present study, we have measured the effect of different doses of quinpirole and raclopride on the microstructure of licking for water and sodium chloride solutions at different concentrations, hypotonic (0.075M), isotonic (0.15M) and hypertonic (0.3M), in water deprived rats. In order to minimise the contribution of post-ingestive effects rats were exposed to each of the different solutions for only 60 seconds after the first lick. The results show an effect of sodium chloride with lick number and bout size decreasing along with the increase in concentration. Raclopride (0.25, 0.5 and 1 mg/kg) decreased lick number and bout size while an increase in bout number was observed only at the dose of 0.5 mg/kg. These effects were observed regardless of salt concentration. Quinpirole (0.01, 0.1 and 0.3 mg/kg) dose-dependently decreased lick number only for water and the hypotonic solution, while not affecting the isotonic and hypertonic solutions, with the result that the two highest doses abolished the discrimination between the different concentrations of salt. Moreover, an increase in bout number and a decrease in bout size with the two highest doses were observed, regardless of salt concentration. These results suggest that the role of dopamine D2 receptors in the microstructure of licking for sodium chloride solution is very similar to that observed for sweet solutions, being involved in the licking response to palatability. However, we question the interpretation of this measure as hedonic impact, due to the quite compelling experimental evidence showing that hedonic reactions survive the destruction of dopamine transmission systems and persist without dopamine.