

QUINPIROLE-INDUCED COMPULSIVE DRINKING IN RATS IS INFLUENCED BY MANIPULATION OF BEHAVIORAL COST

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Introduction: Repeated administrations of the D2/D3 agonist quinpirole (QNP) to water-restricted rats trained to perform on a fixed ratio 3 (FR3) schedule of reinforcement in order to obtain water, have been shown to maintain operant responding even when water was made available to the rats at no behavioral cost (1). This perseverative and antieconomical pattern of drinking may be interpreted as an exaggerated form of the antieconomical behavior previously described in the literature as “contrafreeloading” (CFL) (2). The goal of this study was to further characterize this phenomenon by investigating the effects of QNP in rats trained under different schedules of reinforcement. **Methods:** In this experiment, which consisted of 15 daily 60-min sessions, three groups of Sprague-Dawley rats were trained on three schedules (FR1, FR3 and FR10) of water-reinforced operant behavior. On test days, immediately before the start of the session, the rats received an intraperitoneal (i.p.) injection of either vehicle or 0.5 mg/kg of QNP. On days 1-6, water was available only through lever pressing. On days 7-15, the animals were given the possibility to obtain water both through operant behavior and from a bottle at no behavioral cost. **Results:** On days 7-15, QNP did not significantly alter responding and water consumption in the FR1 group relative to the vehicle group. In contrast, both parameters were influenced by QNP in the FR3 and FR10 groups. Under the effect of the drug operant water consumption progressively increased throughout the sessions although the rats consumed only part of the water earned through instrumental behavior. Conversely, free water consumption from the bottle declined progressively in QNP-injected rats. However, there were no significant differences in response rate, in water intake from the bottle, and in CFL between group FR3 and group FR10. **Conclusions:** As expected, repeated administrations of QNP produced a dissociation between appetitive and consumatory components of water-reinforced behavior. Here we found that the appetitive component of drinking depends on the cost of responding. Therefore, QNP-induced perseverative responding does not unconditionally raise according to an augmented response cost, as we could have expected in a rigid antieconomical behavior. These results outline the importance of introducing variables of operant cost in the study of compulsive behavior.

(1) Amato D., Milella M.S., Badiani A., Nencini P. (2006) *Behav. Brain Res.* 172(1):1-13

(2) Cioli I., Caricati A., Nencini P. (2000) *Behav. Brain Res.* 109(1):9-18