ABSTRACT

ALCOHOL VS. SACCHARIN: A STUDY ON REWARD CHOICE IN ALCOHOL DEPENDENT AND NON-DEPENDENT ANIMALS

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Maladaptive decision-making characterized by drug use despite the availability of many alternative rewards is a key component of substance use disorders. However, the role of changes in decision-making in the enhanced susceptibility to drug use associated with drug dependence has been little studied. The present thesis examined the choice between ethanol and a non-drug reward, saccharin, using the discrete-choice model in ethanol dependent and non-dependent animals. In Experiment 1, male rats were trained to self-administer ethanol (12% w/v; 0.19 ml/delivery) and saccharin (0.05, 0.1%; 0.19 ml/delivery). When given the opportunity to choose between both rewards, animals showed close to equivalent reward preference. In Experiment 2, rats were trained to self-administer intravenous (i.v.) nicotine (0.03 mg/kg/infusion) and oral saccharin (0.1%). The results from this experiment replicate previous research using this model with i.v. drugs by showing that animals have a robust preference for saccharin, the nondrug reward, over i.v. nicotine. In Experiment 3, we determined the effects of ethanol dependence, induced by repeated intermittent exposure to ethanol vapour, on the choice of ethanol versus saccharin (0.1%) in discrete-choice trials and we determined the effect of adulteration of ethanol with bitter-tasting quinine on choice. Ethanol dependence led to profound increases in the choice of ethanol over saccharin suggesting that the value of ethanol was increased in dependent animals. The two main findings of this thesis are: (1) rats choose oral ethanol and saccharin to a similar degree, in contrast to near-exclusive choice of oral saccharin over i.v. drugs, and (2) ethanol dependence shifts reward preference to exclusive ethanol choice. The increased choice of ethanol over saccharin produced by dependence may be explained by a dependence-induced increase in the positive reinforcing effects of ethanol and a decrease in its negative reinforcing effects.