Sex-dependent modulation of decision-making in the rat gambling task: involvement of brain dopaminergic and stress systems Polymnia Georgiou¹, Panos Zanos¹, Shambhu Bhat¹, Margaret M. McCarthy^{1,3,5}, Istvan J. Merchenthaler^{2,4}, J. Kathleen Tracy^{2,6}, Todd D. Gould^{1,3,4}

BACKGROUND

- > Problem or pathological gambling is characterized by impaired decision-making, higher impulsivity and risk-taking behaviors (Brand et al., 2005)
- > In humans, the prevalence of problem gambling among men is higher than that for women suggesting possible sex-related differences in several aspects of pathological gambling, which may include risk-taking and impulsivity (Wong et al., 2013).
- > Sex differences have been observed in the human lowa Gambling Task, which involves learning to differentiate between advantageous and disadvantageous decks of cards (Cavedini et al., 2002)
- > Men show greater preference for the long-term advantageous options compared to women in the human lowa Gambling Task (van den Bos, et al., 2013)

Aim:

> Assess whether there are sex differences in decision-making and choice impulsivity associated with the addictive gambling behavior in a rat model of the Iowa gambling task.



- female rats.

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METHODS

> Food-deprived rats were trained to nose-poke for sucrose pellet rewards.

> As in the human lowa Gambling Task, four different options associated with different amounts of reward and with different probability and duration of punishing time-out periods were presented to male and

 \succ The four different schedules consisted of the following rewarding/punishment probabilities: (i) 90% reward (1 pellet)/ 10% punishment (5 sec time-out); (ii) 80% reward (2 pellet)/ 20% punishment (10 sec time-out); (iii) 50% reward (3 pellet)/ 50% punishment (30 sec time-out); (iv) 40% reward (4 pellet)/ 60% punishment (40 sec time-out); Fig. 1.

> The schedules were designed such that the options linked with larger rewards result in fewer pellets earned per unit time and the most optimal option was the 2-pellet schedule.

> To test the effects of the dopaminergic system and stress on decision-making, rats were injected with dopamine D2 agonist and antagonist and with α_2 receptor and CRF₁ antagonists.

2013); Wong et al., Journal of Gambling Studies, 29, 171-189 (2013).	Acknowledg
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