

Win-cued lights and tones drive risky decision-making in a rodent Gambling Task

Insight into the neurobiology of gambling is lacking because of technical, practical and ethical limitations of research on human subjects. Animal models of gambling behavior allow researchers a route to overcome some of these limitations and more fully explore the neural underpinnings of gambling. Our laboratory has developed a model of human gambling behavior for use with rodents called the rodent Gambling Task (rGT). The rGT allows animals to choose between four options that are associated with varying levels of risk and reward; the optimal strategy on the task is to choose an option with a relatively small reward but also infrequent punishment, allowing the animal to collect the maximum amount of reward over the course of the 30 minute trial. Animals quickly learn the task, and their behavior has been well characterized; most animals adopt an optimal strategy and perform well on the task, while some behave in a riskier manner, preferring a high-risk, high-reward strategy, much like a high-stakes human gambler.

A new version of the rGT incorporates flashing lights and tones to signal wins. These win cues are not proportional to the win size; like a human gambling paradigm, they are much larger for large wins, making these options more attractive despite the fact that they result in larger losses. It appears that the addition of these cues is enough to drive a risk-seeking, disadvantageous pattern of behavior, as rats trained on this task select risky options more frequently than rats trained on the uncued version of the task. Conversely, these rats trained on the cued task select the advantageous options less frequently than rats trained on the uncued task.

The use of the rGT provides greater insight into the neurobiology of gambling, especially risky decision-making in the face of uncertain or probabilistic outcomes. The research in progress on the cued task should leave us with an understanding of how and why cues, especially cues associated with wins and reward, are more motivating than the win or the reward by itself. By using this task and exploring the effects of different drug treatments, we should gain a better understanding of how and why cues shape our decision-making process.

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