



RESEARCH SYNOPSIS

Peters, H., Hunt, M., & Harper, D. (2010). An animal model of slot machine gambling: The effect of structural characteristics on response latency and persistence. *Journal of Gambling Studies*, 26, 521-531.

RESEARCH QUESTIONS

Do rats respond in a similar way to humans in a “slot machine gambling” simulation? Do rats’ response latencies increase after wins and near wins compared to losses? Do near wins influence persistence in rats?

PURPOSE

There are ethical issues associated with studying problem gambling in humans, including potentially creating more problem gamblers. Therefore, testing an animal model of gambling behaviour would be helpful. Research shows that human participants wait longer before placing another bet (i.e., “response latency”) after a win than they do after a loss, and this effect is increased for larger wins. People also tend to wait longer before placing another bet after a near win (e.g., two winning reels out of three) than they do after a clear loss. The first step in developing an animal model of slot machine gambling would involve testing whether animals respond in a similar way as humans do. This study tested whether (i) rats showed increased response latencies after wins and near wins compared to losses, and (ii) near wins influenced behavioural persistence in the rats.

HYPOTHESIS

None stated.

PARTICIPANTS

Subjects were six female Norway hooded rats. During the study, rats were maintained at approximately 85% of their normal weight.

PROCEDURE

Rats were tested individually in test chambers equipped with two levels (a spin lever and a collect lever), and a liquid dipper that dispensed sweetened condensed milk for wins. The test chamber also contained a single row of five lights. Rats were trained to use the levers. During the study, rats pressed the spin lever and one to five of the lights were illuminated. Five lights signaled a big win, four lights signaled a small win, and one, two or three lights signaled a loss. The illumination of three lights was

considered a near win. After the lights were illuminated, the rats pressed the collect lever to collect the food, with the most food dispensed for big wins, less for small wins, and no food dispensed for near wins or losses. After collecting food, rats pressed the spin lever again to commence the next trial.

MAIN OUTCOME MEASURES

Response latency (i.e., the time between winning or losing and the next time the rat pressed the spin lever) was assessed by measuring the time between the presentation of the spin lever to the first response on that lever. Accuracy was defined as making a collect response following win trials or not making a collect response following loss trials. Persistence was assessed by counting the number of trials completed by the rats during the five day study period.

KEY RESULTS

Consistent with human gambling research, response latencies were shortest after losses, and largest after big wins. In other words, rats waited longer before pressing the spin lever after wins than they did after losses. Also consistent with human research, response latencies after near wins were longer than response latencies after losses, indicating that rats treat near wins as similar to wins. Regarding accuracy, rats pressed the collect lever more often after wins than after losses or near wins. There was no evidence that rats tended to persist more on the gambling task after near wins compared to losses or wins.

LIMITATIONS

The small sample size (i.e., six animals) may limit the generalizability of the results.

CONCLUSIONS

The results indicate that some aspects of rats’ behaviour are similar to gambling behaviour seen in human studies. Specifically, rats (like humans) wait longer before “placing the next bet” after winning than they do after losing. In addition, rats appeared to

respond to near wins in a similar way as they did to wins. These results indicate that near wins may be reinforcing because of generalization – humans and animals may become conditioned to associate near wins with wins. Overall, these results suggest that animal models can be used effectively to study gambling behaviour in humans.

KEYWORDS: problem gambling, family violence, domestic violence, prevalence, alcohol, comorbidity, treatment seeking

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