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Immersion in slot machine gambling influences how long people pause before starting the next spin

What this research is about

The post-reinforcement pause (PRP) refers to a break that animals take between receiving some uncertain reward and beginning to seek the next reward.

Electronic gaming machines (EGMs) are fast-paced games with a continuous format. When a bet is placed on a slot machine and the outcome is learned, the time to initiate the next spin (or *spin initiation latency*, SIL) is usually longer after positively reinforcing “winning” outcomes in comparison to “losing” outcomes. Previous research has found the duration of SILs in gambling tasks is linked to the size of wins.

Slot machines have introduced new forms of positive reinforcement. For example, bonus features including free spins and losses disguised as wins (LDWs) are stimulating and may reinforce gambling behaviour.

Immersion in gambling is a state of high focus and absorption in gambling. People who are immersed in gambling may not pay as much attention to external stimuli and goals. Immersion in gambling has been linked with a higher risk of experiencing gambling-related harms and gambling disorder. The aim of this study was to examine whether immersion in slot machine gambling influenced PRPs. The study also examined whether this effect varied due to the nature of reinforcement (wins, losses, free spins, and LDWs).

What the researchers did

The researchers used data from a previous eye tracking study. Participants lived in or near Vancouver, Canada, and had experience gambling on slot machines. A total of 53 participants were recruited through the community message board Craigslist.ca, including 32 men and 21 women. On average, participants were 34 years old. The inclusion

What you need to know

The post-reinforcement pause (PRP) refers to a break that animals take between receiving some uncertain reward and beginning to seek the next reward. Spin Initiation Latency (SIL) is the time to initiate the next spin after a bet is placed on a slot machine and the outcome is known. The aim of this study was to examine whether immersion in slot machine gambling influenced PRP duration. This study also examined whether this effect varied due to the nature of reinforcement. A total of 53 Canadian adults (19+ years old) were recruited. Participants were given \$40 CAD to gamble on a popular slot machine. Eighteen participants were asked to bet until all funds were used, while the other participants bet until 20 minutes had passed.

The SIL duration was longer for trials that involved forms of positive reinforcement; that is, participants paused for longer before starting the next spin after wins, free-spin bonus features, and losses disguised as wins (LDWs) than after losses. Free-spin bonus features resulted in the largest PRP. Wins had the next highest effect on PRP, followed by LDWs. The researchers also found support for the influences of immersion in gambling. Specifically, longer pauses following wins and LDWs occurred among participants who were more immersed in gambling.

criteria required that all participants were at least 19 years old. They could not have any neuropsychiatric diseases, ophthalmic diseases, neurological problems resulting from a traumatic brain injury, or

psychotropic medication use. Participants were excluded if they reported high-risk gambling on the Problem Gambling Severity Index (PGSI). They were also excluded if they had visual acuity that required correction beyond ± 4 diopters.

Participants first completed the PGSI. A score of 8+ was considered high-risk problem gambling. Then, they gambled on a popular slot machine that was widely available in local gambling venues. Participants were given \$40 CAD to gamble. Eighteen participants were asked to bet until all funds were used, while the other participants gambled until 20 minutes had passed. The gambling session was video recorded.

Participants then completed a questionnaire that measured immersion during gambling. Immersion during gambling was measured using the average of scores on the Dissociation Questionnaire and the Flow subscale of the Game Experience Questionnaire.

The researchers processed the video of each slot machine play to create a trial-by-trial time series for each participant. This included the outcome types (e.g., loss, win, loss disguised as a win, and free-spin bonus feature), the SIL duration for each type, and the participants' responses.

What the researchers found

The SIL duration was longer in trials that involved forms of positive reinforcement. These included real wins, free-spin bonus features, and LDWs. In other words, participants paused for longer before they started the next spin after receiving these outcomes compared to losses. The researchers noted that although participants did not receive many free-spin bonus features, free-spin bonus features resulted in the largest post-reinforcement pause (PRP). Wins had the next highest effect on PRP, followed by LDWs.

The researchers also found support for the influences of immersion on the PRP effect. Longer pauses following wins and LDWs occurred among participants who were more immersed in gambling. Participants with greater gambling immersion also paused after free-spin bonus features. But this difference was not statistically significant, perhaps because of the low frequency of free-spin bonus features.

How you can use this research

This research can inform policy makers regarding policies around permitted audiovisual feedback of wins, losses, and LDWs on slot machines.

About the researchers

W. Spencer Murch is affiliated with the Department of Sociology & Anthropology at Concordia University in Montreal, QC, Canada, and with the Department of Psychology at the University of British Columbia in Vancouver, BC, Canada. **Mario A. Ferrari** and **Luke Clark** are affiliated with the Department of Psychology at the University of British Columbia in Vancouver, BC, Canada. Luke Clark is also affiliated with the Djavad Mowafaghian Centre for Brain Health at the University of British Columbia in Vancouver, BC, Canada. For more information about this study, please contact W. Spencer Murch at williamspencer.murch@mail.concordia.ca.

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