

# What is a gambling habit?

## Behavioural changes with practice in slot machine gambling

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### What is a gambling habit?

Although problematic gambling is commonly referred to as 'a gambling habit,' research has not yet examined the precise behavioural expressions of habits (or their predictors) within gambling games.

### Background

Habits are generally thought of as reflexive or automated responses to commonly encountered situational cues—they are thought to utilize fewer cognitive resources than deliberative, goal-directed behaviours. Habits are learned gradually through repeated cue-response pairings, and a shift from goal-directed to habitual responding can be seen in a shifting of neural processing across parts of the striatum [see 1].

In etiological models of substance addictions, habit formation has been implicated as a development and maintaining factor and is thought to be modulated in part by stress [2, 3]. Similarly, models of problem gambling—such as the Pathways Model [4]—have also adopted habit formation as a partial explanation for problem gambling.

The aim of this study was to develop a procedure to identify changes in candidate slot machine habits using known associates of habit formation.

### How to measure gambling habits?

Smith and Graybiel [5] summarize a list of behavioural "reference points" for identifying habit formation, including increased speed and reduced distractibility. Based on this, we predicted that the spin initiation latency—the time between the reels stopping and the next bet—would be a candidate marker of habit formation in slot machine gambling. We further predicted that immersion and stress—which are known associates of habit expression—would each be associated with changes in spin initiation latency.

### Study Methods

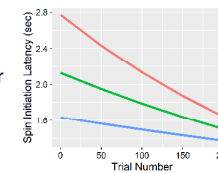
56 participants (37 women, mean age = 21.89 years) with no slots experience played a simulated slot machine game on three separate occasions. The game was housed within an authentic slot machine frame and was programmed to record several characteristics of spins, including spin latency.

For each session, participants were given \$40 in credits to play 200 bets of any amount. Winnings at the end of sessions were paid out up to \$15. Participants completed several pre- and post-gambling questionnaires to provide state measures, including weekly stress (DASS) and immersion during the game.

## Results

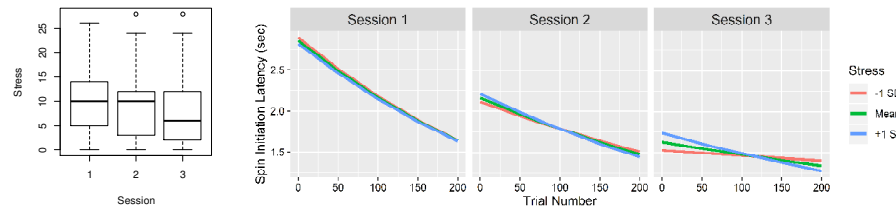
### Preliminary Analysis

We used a multilevel fixed-effects approach to model spin latency, which controlled for profit status, outcome type (wins, losses, losses disguised as wins), and whether the bet was changed. Our results showed significant reductions across spins ( $B = -.002, p < .001$ ) and between sessions ( $B = -.198, p < .001$ ) in the spin initiation latency.



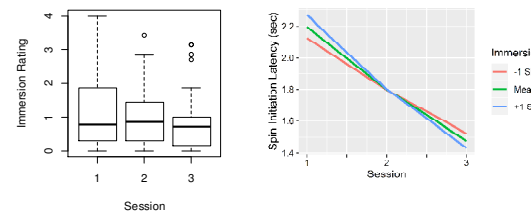
### Weekly Stress

A hierarchical linear regression confirmed that self-reported stress did not change over the three sessions ( $B = -.812, p = .07$ ). Using a fixed effects approach as described above, we found that Stress predicted an changes in speed of play across ( $B = -.00003, p < .001$ ) and between ( $B = .00127, p = .043$ ) sessions. Furthermore, there was a significant Session x Stress interaction ( $B = -.00004, p < .001$ ), which is depicted in the leftmost figure below.



### Immersion in the Game

Contrary to our hypothesis, self-reported immersion *decreased* over the three sessions ( $B = -.171, p = .001$ ). However, fixed effects modeling showed that Immersion predicted decreased spin initiation latencies across spins ( $B = -.03016, p = .016$ ) and between sessions ( $B = -.03680, p < .001$ ). The Session x Immersion interaction was not significant ( $B = -.00010, p = .198$ ).



### Conclusion

As novice slot machine gamblers gain experience with gambling on a slot machine, changes in speed of play occur across and between gambling sessions. These changes in pace appear to be increasingly sensitive to self-reported weekly stress, supporting our hypothesis that speed of play is related to habit formation in novice slot machine gamblers. This hypothesis was further supported by our findings indicating that increased immersion in the game was predictive of faster gambling throughout and between sessions. Contrary to our expectation, self-reported immersion in the game—a proximate measure of distractibility—*decreased* over the three sessions.

Our results lend to a characterization of candidate makers of habit formation in slot machine gambling that may be relevant to the development of problem gambling. Ongoing work is examining the relationship between such markers and a Pavlovian-Instrumental Transfer measure of habit formation and strength. Future work will examine the impact of acute stress on gambling habits.

### References

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### Acknowledgement

The Centre for Gambling Research receives funding from the Province of British Columbia and the British Columbia Lottery Corporation (BCLC). Mario Ferrari and Luke Clark are supported by funding from the Natural Sciences and Engineering Research Council (NSERC; Canada).

For their help with data collection, we thank Rahu Singh and Zoha Janjua.

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