



Patterns of wins and losses in video poker games are influenced by level of volatility

What this research is about

Electronic gambling machines (EGMs) include slot machines and video poker games. EGMs are linked to high levels of gambling harm across the world. EGMs are designed to keep people gambling through elements such as pleasantly rewarding sounds, losses disguised as wins, and near-misses. EGMs can have different reinforcement or reward schedules in terms of volatility and return-to-player (RTP) rates. Volatility is the fluctuation in wins and losses across multiple bets. RTP is what people are expected to lose in the long term by gambling on a game. Both concepts are hard for people to understand. It is also hard for game providers to communicate them to the public.

Previous research is mixed on what type of reward schedules are generally preferred. Some people prefer EGMs that provide options for less volatile experiences, while others prefer EGMs that provide more volatile experiences. The purpose of this study was to demonstrate how changes in game volatility affect patterns of wins and losses, including winning streaks.

What the researchers did

The researchers ran simulations of a simplified video poker game. The simulated game involved simulated people who were assumed to gamble 5 rounds per minute with a constant bet size of 1 euro. The RTP was set at about 90%. So, for every 1 euro bet made, each person was expected to lose 10 cents on average when they gambled with an optimal strategy.

Across the simulations, the probabilities of each win were the same, as were the overall RTP rates (set at around 90%). But the individual win sizes differed across three levels of volatility (low, medium, and

What you need to know

Electronic gambling machines (EGMs) can have different reward schedules. These reward schedules vary in terms of volatility and return-to-player (RTP) rates. Volatility is the fluctuation in wins and losses across multiple bets. RTP is what people are expected to lose in the long term by gambling on a game. The researchers ran simulations of a simplified video poker game. The purpose of these simulations was to demonstrate how changes in game volatility affect patterns of wins and losses. Across the simulations, the probabilities of each win were the same, as were the overall RTP rates. But the individual win sizes differed across three levels of volatility (low, medium, and high). The level of volatility was defined mostly by the size of the main prize.

The researchers found that winnings over the short term were relatively frequent. But the percentage of people still winning decreased over more sessions. The simulated people were on a winning streak about 26% of the time in the low- and medium-volatility versions of the game. They were on a winning streak about 18% of the time in the high-volatility version. The average number of people who were winning after various lengths of time gambling depended on the game's volatility level. In the game versions with low and medium levels of volatility, the proportion of winning people dropped to almost 0 by 30 hours of gambling. But in the high-volatility version, about 5% of people were still winning after 100 hours of gambling.

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The researchers then simulated winnings across 100 simulated people, with the following number of rounds: 150, 300, 3,000, 9,000, 15,000, 22,500, and 30,000. These rounds equaled 0.5, 1, 10, 30, 50, 75, and 100 hours of gambling, respectively. The researchers also evaluated the proportion of winning streaks for each simulated person.

What the researchers found

The researchers found that winnings over the short term were relatively frequent. About 22.7–28.7% of the people were winning after gambling for 30 minutes. But the percentage of people still winning decreased over more sessions. Winning streaks were more common in the game versions with lower volatility. The simulated people were on a winning streak about 26.3% and 25.7% of the time in the low- and medium-volatility version of the game. They were on a winning streak about 18.1% of the time in the high-volatility version of the game.

The average number of people who were winning after various gambling times (i.e., 0.5, 1, 10, 30, 50, 75, and 100 hours of play) depended on the game's volatility level. When gambling on the low-volatility version of the game, most people (98%) were losing after having played for 10 hours. For medium- and high-volatility versions, there were still several people who were winning after 10 hours. The number of people still winning decreased to almost 0 after 30 hours of gambling in the medium-volatility version. But in the high-volatility version, about 5% of people were still winning after 100 hours of gambling.

How you can use this research

This study can inform gambling interventions and public health messages. For example, policy makers and practitioners can use the graphical output of this work to communicate information about the random chance of winning when gambling on EGMs.

About the researchers

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Institute for Health and Welfare in Helsinki, Finland. Sari Castrén is also affiliated with the Department of Psychology and Speech-Language Pathology at the University of Turku in Turku, Finland, and with the Faculty of Medicine at the University of Helsinki in Helsinki, Finland. **Nigel Turner** is affiliated with the Institute for Mental Health Policy Research and the Campbell Family Mental Health Research Institute at the Centre for Addiction and Mental Health in Toronto, ON, Canada. Nigel Turner is also affiliated with the Dalla Lana School of Public Health at the University of Toronto in Toronto, ON, Canada. **Joseph Macey** is affiliated with the Centre of Excellence in Game Culture Studies at the University of Turku in Turku, Finland, as well as the Gamification Group in the Faculty of Information Technology and Communication Sciences at Tampere University in Tampere, Finland. For more information about this study, please contact Jussi Palomäki at jussi.palomaki@thl.fi.

Citation

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