What this research is about

Slot machines have many features that encourage gamblers to play them. For example, slot machines have lights and sounds that go off when gamblers win. Some people develop problem gambling from playing slot machines or other gambling games. Problem gambling is repetitive gambling behaviour that leads to negative consequences.

Some people enter “the zone” or “flow” state of mind when they play slot machines. This means that they become so focused on their game that they are not aware of their surroundings or how much time has passed. It has been termed “dark flow” by researchers since players may suffer severe negative consequences from being in this zone. Research suggests that players who are at risk of problem gambling are more likely to go into a dark flow state while gambling.

Players with gambling problems may gamble to find relief from depression. By entering a dark flow state, they can escape their negative thoughts and feelings. Further, players with gambling problems are not as mindful as players without gambling problems. Mindfulness is when a person is aware of their thoughts and emotions and can focus their attention.

In this study, the researchers investigated the relationship between depression, being in a dark flow state when gambling, and problem gambling. They also explored if players who enter a dark flow state while gambling have mindfulness problems in everyday life.

What the researchers did

The researchers recruited participants from a casino in Brantford, Ontario, Canada. Participants were 129 regular slot machine players. They played a simulated slot machine game. During the game, the researchers periodically asked participants if they were thinking about the game or other things. They also asked participants if they were enjoying the game or not. Participants who were less mindful in daily life were more likely to have depression, problem gambling, and experience dark flow while gambling. Thus, playing slot machine might capture their attention and stop their minds from wandering to negative thoughts. These participants experienced dark flow and positive mood when playing. However, entering a dark flow state while gambling could increase the risk of problem gambling.

What you need to know

This study investigated if gamblers who have problems with mindfulness in everyday life become more mindful when playing slot machine, leading to a dark flow state. Participants were 129 regular slot machine players. They played a simulated slot machine game. During the game, the researchers periodically asked participants if they were thinking about the game or other things. They also asked participants if they were enjoying the game or not. Participants who were less mindful in daily life were more likely to have depression, problem gambling, and experience dark flow while gambling. Thus, playing slot machine might capture their attention and stop their minds from wandering to negative thoughts. These participants experienced dark flow and positive mood when playing. However, entering a dark flow state while gambling could increase the risk of problem gambling.
them if they were thinking about the game or something else to assess their in-game mindfulness. Participants also indicated how positive or negative they felt just before they were interrupted. This measured participants’ positive affect.

After completing the slot machine game, participants completed two more questionnaires. The Game Experience Questionnaire (GEQ) assessed whether participants were in a dark flow state during the game. The Depression, Anxiety, and Stress Scale (DASS 21) assessed participants for symptoms of depression.

**What the researchers found**

Participants who entered the dark flow state while playing the slot machine were more likely to have problem gambling and symptoms of depression.

Participants who had greater symptoms of depression experienced more dark flow when playing the slot machine. Participants without depression symptoms were less likely to experience dark flow. Overall, participants enjoyed playing the slot machine more (that is, they had greater positive affect) if they entered a dark flow state. This finding was true regardless of whether participants had symptoms of depression or not. Participants who did not experience dark flow did not enjoy playing the slot machine as much.

Participants whose minds often wandered in their daily lives (that is, were less mindful) were more likely to have problem gambling and depression symptoms. However, they became more focused and mindful when playing the slot machine. This finding suggests that slot machine might capture depressed players’ attention and stop their minds from wandering to negative thoughts. Participants who became more mindful while playing the slot machine were more likely to experience dark flow and positive affect. It is possible that these players enjoyed playing because they got a break from thinking about the problems in their life.

**How you can use this research**

Treatment service providers could use this research to understand why slot machines are attractive to people who suffer from depression. More research is needed to confirm if playing slot machines relieves players from thinking about problems in their lives.

**About the researchers**

Mike J. Dixon, Madison Stange, Chanel J. Larche, and Tyler B. Kruger are affiliated with the Department of Psychology at the University of Waterloo in Canada. Jeffrey Gutierrez is now with the Leslie Dan Faculty of Pharmacy at the University of Toronto in Canada. Candice Graydon is now with the Department of Psychiatry and Behavioural Neurosciences at McMaster University in Canada. Sonia Vintan is now with the Department of Psychology at the University of Toronto. For more information about this study, please contact Mike J. Dixon at mjdixon@uwaterloo.ca.

**Citation**


**Study funding**

This study was funded by the Manitoba Gambling Research Program of Manitoba Liquor & Lotteries.

**Gambling Research Exchange Ontario (GREO)**

Gambling Research Exchange Ontario (GREO) has partnered with the Knowledge Mobilization Unit at York University to produce Research Snapshots. GREO is an independent knowledge translation and exchange organization that aims to eliminate harm from gambling. Our goal is to support evidence-informed decision making in responsible gambling policies, standards and practices. The work we do is intended for researchers, policy makers, gambling regulators and operators, and treatment and prevention service providers. Learn more about GREO by visiting [greo.ca](http://greo.ca) or emailing [info@greo.ca](mailto:info@greo.ca).