

# knowledge snapshot



## How do reward mechanisms affect behavioural addictions?

### What this article is about

A historical view of addictions assumed that addictions resulted from chemicals from various substances. The recent emergence of behavioural addictions challenges this assumption. Behavioural addictions refer to excessive use of *products* (rather than substances). An example is gambling addiction. If the use of such products can become addictive, it is likely that the addictive nature of drugs is not due to chemical properties only.

Researchers have looked at potential factors that may affect the development of behavioural addictions. One learning-based account of addictions is called the Incentive Sensitization Theory. This theory proposes that the brain's dopamine system becomes reactive to a particular stimulus (e.g., a win while playing on a slot machine) via repeated exposure to that stimulus (e.g., repeated plays on a slot machine). This is called "sensitization" and is considered a main process in the development of an addiction.

In gambling, researchers have noted how the irregular schedule of monetary rewards may allow for this type of learning process. A slot machine is a classic example of a variable schedule: on any spin, people who gamble know that they may be rewarded, but they do not know which spin will yield the payout. This form of intermittent reward ("which one?") is present across all forms of gambling. However, it is not the only source of variability in gambling.

The aim of this article was to consider how sources of reward variability operate within gambling products. The researchers also reviewed how similar sources of variability can apply to other behaviours that may be

### Why is this article important?

Reward uncertainty has long been recognized to exert motivational effects, which may lead to the development of addiction. There are multiple sources of reward uncertainty in modern gambling products. This article provides insights into how sources of reward uncertainty may be a precursor of behavioural addictions. It uses gambling disorder as a prototype behavioural addiction, and suggests that similar and novel sources of reward uncertainty also apply to other digital activities, such as social media use and shopping.

classified as behavioural addictions (e.g., gaming, shopping, social media use, and pornography). The internet allows for easy access to these activities, but it also introduces new forms of reward variability.

### What was done?

The researchers reviewed sources of reward variability in modern gambling products. They considered how these sources of variability may be present in other potential behavioural addictions (e.g., video gaming, shopping, and pornography). The authors argued that online access to these products may elicit further sources of variability. In turn, this may amplify the addictive potential of such products. The researchers also posited that digital features, like "infinite scroll" on social media applications, introduce new forms of reward variability.

### What you need to know

The researchers suggested that reward variability is present across various forms of behavioural addictions. There are many forms of reward

variability. For example, which spin will pay out and how much are paid out are unknown in slot gambling. Some gambling products also have concurrent schedules, such as bonus features and game features that allow people to make multiple bets on outcomes revealed at different timescales. The authors posited that these sources of variability are directly influenced and enhanced by the internet. The overlapping sources of variability can amplify the addictive potential of these products via incentive sensitization.

Reward variability also occurs in video gaming and other potential addictive behaviours. For example, modern video games increase the difficulty level as a person's skill improves. This ensures that rewarding outcomes continue to be given out at a variable rate. It also keeps the person engaged in the game. Social media apps allow "infinite scroll" by continuously providing new feed based on prior selections. Personalized recommendations happen in online shopping as well. These features introduce new experiences of reward uncertainty.

The authors proposed "uncertainty" as the "subjective experience" of reward variability. They suggested that reward variability by itself is likely not enough for the development of behavioural addictions. The authors proposed that two psychological factors likely influence the effects of uncertainty:

1. The length of time of uncertainty and its resolution: The authors argued that uncertainty needs to be resolved for it to be attractive. That is, people need to move from not knowing to a state of knowing, even if they do not get the desired outcome. The resolution of uncertainty depends on whether people are distracted by other activities when waiting for the outcome. If people are less distracted by other activities, the effect of uncertainty is more acute. This can lead to a state of immersion in gambling, which is known to be associated with problem gambling.
2. The frequency of exposure: People need to be exposed to the stimulus or activity often enough to become sensitized.

## Who is it intended for?

This research is intended for scholars in the field of gambling research. It can inform novel theories and models of behavioural addictions. It also has the potential to inform interventions.

## About the researchers

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