

knowledge snapshot



The use of data science in gambling research

What this article is about

Online gambling has become more popular in recent years. There are concerns that online gambling can lead to problem gambling, since it is easy and convenient for people to gamble on the Internet via mobile devices. Problem gambling is repetitive gambling behaviour that results in harm. When people gamble online, their gambling behaviours can be tracked and monitored over time. Such 'behavioural tracking' or 'player tracking' offers large amounts of data on people's gambling behaviours.

Data science involves extracting and analyzing large amounts of data from multiple sources. It may apply machine learning, the practice of using computer algorithms to examine large datasets and make predictions. Applying data science, particularly machine learning, can help identify people who are at risk of problem gambling from their online gambling play. In this article, the authors discuss the use of data science and machine learning in the field of gambling research. They provide a review of research that has examined behavioural markers of problem gambling.

What was done?

The authors provide a review of research that has looked at behavioural tracking data to identify high-risk gamblers. They discuss the challenges in applying machine learning to test a set of behavioural markers and predict the risk of problem gambling.

What you need to know

The first research project on behavioural tracking examined a dataset from *bwin*, a European gambling provider specialized in sports betting. This project has resulted in over 20 publications. Other research has

Why is this article important?

This article is a review of research examining behavioural markers that may signal problem gambling. The authors discuss the use of data science and machine learning to analyze behavioural tracking data. Studies have reported a range of behavioural markers of problem gambling. These include both monetary markers (e.g., bet size) and non-monetary markers (e.g., number of days gambled). These behavioural markers may be combined with other factors, such as payment information, to identify high-risk gamblers and predict problem gambling. Recent research has also done more detailed analyses of gambling behaviour within a session to capture loss chasing. The authors provide insights into current research and challenges that need to be overcome to move the field forward.

examined data on voluntary self-exclusion. This is a common responsible gambling tool in which people apply to be banned from a gambling venue and/or website for a period of time.

Studies using *bwin* and other datasets have found behavioural markers that may signal problem gambling. These include both monetary markers, such as bet size and amount of money lost, and non-monetary markers, such as number of days gambled. These behavioural markers may be combined with other factors, such as payment information, to predict problem gambling. Some studies have also looked at gambling trajectory to see how people's gambling behaviour may change over time.

Recent research has begun to apply machine learning to distinguish high-risk gamblers from healthy gamblers. In these studies, models are set up with a number of behavioural markers as 'input variables' to predict if people belong to the high-risk group or not. These predictions are then tested with additional data. While some studies report models with high accuracy, other studies have much lower accuracy.

A few studies have done more detailed analyses of people's gambling behaviour within a session to understand loss chasing. This happens when people keep on gambling in an effort to recoup their losses. It is one of the few defining features of problem gambling that may be detected behaviourally. In these studies, researchers have focused on average or typical responses to losing streaks. This may overlook atypical patterns of gambling behaviour that could signal high-risk gambling.

Current research is limited by the small number of datasets that are available. Most of the datasets are from online gambling operators in Europe. Furthermore, behavioural tracking data are typically from one gambling operator. However, people may gamble both online and offline, and have multiple accounts with different operators. It is also hard to know to what extent the choice of input variables and the use of different datasets have affected research findings.

Another challenge is how to link new insights about gambling behaviour from data science to psychological knowledge. For example, how do personality traits and mental processes, such as gambling beliefs, link to behavioural markers of problem gambling? There is also a lack of understanding with regard to how machine learning processes work, a problem that has been referred to as the 'black box' in machine learning.

Who is it intended for?

This article is intended for researchers, data scientists, and other experts working on understanding people's gambling behaviours. It provides insights into current research about behavioural tracking, as well as the limitations and challenges to be overcome. It speaks

to the need for collaboration from experts in different fields to advance current knowledge.

About the researchers

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Gambling Research Exchange (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.

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