Virtual Reality Gambling: Public Policy Implications for Regulation and Challenges for Consumer Protection

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Abstract

Advances in Internet technology have substantially altered the characteristics of products offered by the gambling industry and associated effects on user experiences. Virtual reality gambling involves using an innovative 3D computer-based format with high-resolution graphics that totally immerses an individual into an interactive gambling environment. Regulators and policy makers are faced with the need to comprehend the full ramifications of this sophisticated mode on gambling behaviour and its potential contribution to the development of gambling disorders. This article aims to provide a description of virtual reality gambling, current market offerings and regulations, and discusses the implications for the gambling field. Although not yet widely adopted, commercially affordable virtual reality software and headsets will allow users to engage in ‘live’ gambling from any location in a fully immersive experience. For those vulnerable to experiencing problems, it is likely that the sense of involvement and presence will facilitate cravings, dissociation, behavioural disinhibition, and potential loss of control over expenditure of time and money. Virtual reality technology could enable innovative and effective harm minimisation strategies to be implemented. Although more research is needed, regulators need to consider the implications of this emerging form of gambling in a timely manner to enact safeguards to protect users.

Keywords: Virtual reality, gambling, regulation, technology, Internet, policy
Introduction

Virtual reality refers to computer simulated three-dimensional interactive representation that allows almost total sensory immersion into an artificial environment. Although 19th century stereoscope photographic viewers and 1920's flight simulators can be considered early precursors of the concept, head mounted devices emerged in the 1950's with more sophisticated and commercially available computer-based formats appearing in the following decades ¹. With improved graphics and computer capacities, virtual reality, a term first coined by Jaron Lanier in 1987, is now increasingly applied across a host of disciplines and activities: entertainment, military, architecture, business, and health ².

Commercially, the virtual reality market is expected to reach US$1 billion in 2016 including sales and content, with estimates of continued sharp increases ³. Applications in the entertainment sphere are predicted to be widespread, particularly in relation to entertainment including the gambling market. The interest in immersive entertainment experiences is demonstrated by movies, with 3D films accounting for over 20% of box office revenue in 2010, and expectations that as the industry matures interest will escalate ⁴. Similarly, the augmented reality app Pokémon Go earned $206.5 million in revenues and set a Guinness World Record with 130 million downloads in its first month of release ⁵.

Estimates suggest that in 2016 there were already nearly 18 million virtual reality users playing games, even prior to the availability of affordable headsets ⁶. Although estimates of sales of headsets and controllers were revised downward to account for slower than expected growth, predictions for the long-term growth of the market remain strong ⁷.

The total immersive and artificial nature of virtual reality raises significant concerns related to potential negative outcomes in relation to gambling behaviour and the development of potential

² Ibid.
⁷ Ibid.
gambling disorders (commonly referred to as compulsive, addictive, or pathological gambling). Being totally immersed in an artificial environment fuels the illusion that the behaviour and losses are virtual with no real-world connection and/or consequences from actions conducted in that setting. The potential exists for monetary worth to be devalued and the impact of losses detached from reality. Given the predicted expansion of virtual reality gambling, this article aims to highlight the potential impact of this form of gambling drawing attention to critical areas of inquiry needed to advance our understanding of this nascent form of technological consumption. The article will provide an overview of virtual reality gambling, current market offerings and regulation, and its future implications for the field of gambling.

**Virtual reality: An introduction**

Virtual reality uses hardware that incorporates a headset displaying 3D stereo images. Headsets are typically the size of large diving goggles and fit over the user’s head and enclose the full visual field. Sensors track the user’s movements to offer a corresponding view of the surrounding environment. Headsets can also provide 3D binaural audio with no external environmental sounds or lights penetrating the headset to disturb the virtual reality experience. Binaural recordings put users in the exact sound field as originally intended, that is, they fully immerse users in the intended experience, for example, casino sounds surrounding them, which tricks the brain into experiencing sounds as though they were first hand. Accordingly, the experience is highly immersive. Immersion is the psychological state of perceiving oneself to be included in and interacting with the environment.

High resolution graphics create a powerfully realistic virtual environment that provokes emotional and cognitive responses that are almost indistinguishable from that experienced in real-world casino or gambling environments despite the user’s awareness of the virtual nature of that environment.

Full feature virtual reality devices requiring headsets, controllers and powerful computing devices or gaming consoles remain expensive. However, the more affordable mobile virtual reality

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5. Deloitte, “Predictions 2016.”
incorporates high-end smartphone screens into special cases that are placed over the user’s head and still provide a reasonably high quality experience. With evolving technological advances and mass production, it is anticipated that a widening range of sophisticated commercially affordable systems and hardware will become available. Headsets are becoming lighter and more comfortable, Avatars\textsuperscript{13} more realistic allowing users to choose their own personal image, and facial tracking allowing “real” expressions to be depicted to facilitate social interactions. Users move around the virtual environment using a handheld game controller, although some allow for actual movement, including walking and the use of hands. The incorporation of voice navigation is anticipated, with users being able to chat and interact with real other users and/or hosts and other avatars provided by gambling operators, such as casino dealers and service staff.

**Virtual reality gambling**

Virtual reality gambling expenditure is predicted to rise 800 per cent in the next five years\textsuperscript{14}. In 2016, estimates suggest that $58.5 million internationally has already been bet through virtual reality gambling. Current opportunities are typically concentrated in virtual reality casino gambling following the trend of online and mobile betting. Overall, the interactive gambling industry is expected to account for over 40\% of total gross gambling wagers by 2021\textsuperscript{15}. Given the rapid popularity and uptake of online and mobile gambling, it is likely that users will continue to seek remote online gambling experiences (with virtual reality used to heighten experiences) that allow participation from any location.

Gambling companies have begun using augmented reality and, following the popularity of Pokémon GO, incorporated this into smartphone technology, including cameras and geolocation software. Augmented reality is an interactive visualisation system (e.g., a head-mounted display, smartphone, tablet) allowing the merging of digital contents with the real environment surrounding the user\textsuperscript{16}. This allows the augmentation of a real experience by blending virtual elements into the real world.

\textsuperscript{13} The representation of humans in digital form is referred to as an avatar. An avatar allows a user to interact with their environment, including controlling it where possible and manipulating certain stimuli.


\textsuperscript{15} Ibid.

Examples of augmented reality gambling apps include the capacity to point a phone at the screen and instantly identify all available bets across different markets on that game. Betfair launched a product for Google Glass to provide real-time notifications around race results and odds. Other betting companies have also begun experimenting with augmented reality, including casino and betting options. For example, 888Sports launched ‘free bet hunt’, allowing users to hunt in real-life locations to find and capture free-play bets.

Virtual reality allows users to experience a jockey’s perspective during a race, and watch a live sporting event as though they were present with friends and being exposed to promotions, live odds, receiving personalised messages and commentary, and placing bets. Virtual reality poker rooms allow players to interact with other players in real time, and casino sites can use live dealers and slots to enhance the highly immersive experience. In 2016, SlotsMillion was the first to market a virtual reality casino. On their site, players can enter and walk through a casino setting located in a skyscraper overlooking a futuristic landscape. They can visit the bar, interact with other players, look out the window and experience real vertigo looking down, or use the many immersive 3D slot games situated around the casino. Other virtual reality casinos are currently under development; In Microgaming’s virtual reality gambling environment, players sit in front of a roulette table and can use and see their own hands moving while placing bets. NetENT has developed a virtual reality slot game which uses 3D sound technology as a feature. Gamblit Gaming is launching their Virtual Reality Cube onto casino floors across the USA in 2017 as a way for casino operators to bring people to new gaming areas on the floor. This demonstrates that virtual reality is not only intended to be offered for gamblers at home, but by gambling venues with a gambling license, who could offer gamblers an opportunity to gamble in a new way, for example, while experiencing sitting on a beach, or in outer-space, potentially attracting new customers, including Millennials.

20 Green, “Catch That Bet.”
Despite the potential for virtual reality gambling, several challenges exist. High quality devices are still costly to purchase and require high-end capacity computers, which are likely to inhibit the extent of user adoption. SuperData revised their estimate of the number of virtual reality units to be sold in 2017 downwards as sales of virtual reality headsets have not been as high as originally predicted. However, this will change over time as devices become more mainstream. Those who purchase devices initially are likely to be early adopters, serious gamblers, and high-end users; this may provide a base of virtual reality high-roller casino players. Nonetheless, since the inception of SlotsMillion’s virtual reality casino, business has grown exponentially, but a base of virtual reality users remains absent, with players tending not to use headsets. This suggests that perhaps the market may not have yet achieved its potential, or alternatively, whether it will go the way of 3D television, more of a gimmick where the product is singularly expected to maintain user engagement in the absence of supportive new and innovative content. The long-term potential of virtual reality is still expected to be strong.

**Regulation**

Among the general population, there is currently very little consumer awareness and understanding of virtual reality, with estimates suggesting that more than half of US consumers are not familiar with the concept of virtual reality. However, this is likely to change with multiple companies looking to generate adoption through marketing and promotions. Concomitantly, international gambling regulators have struggled to keep pace with new technologies impacting on gambling. Internet gambling has become increasingly licensed and regulated, as jurisdictions realise the difficulties of prohibition and importance of consumer protection. As it is accessed remotely using the internet through a user’s personal device, it is likely that virtual reality gambling will fall under Internet gambling regulation. However, it virtual reality may also be made available within an existing gambling venue via a peer-to-peer network (direct connection with a gaming server), as

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24 Juniper Research, “Virtual Reality Gambling Set to Deliver Real Spend.”
25 “Is 2017 the Year of Virtual Reality Gaming?”
26 Deloitte, “Predictions 2016.”
31 Ibid.
such, it may be regulated as an additional form of land-based gambling. As the technology is developed and utilised by gambling companies, it will be important for regulators across the sector to carefully consider their stances, and the implications of this new mode of gambling.

As virtual reality gambling is still in its developmental phase, few regulators have specifically addressed this new technology. No regulators have addressed augmented reality gambling specifically, to the author’s knowledge, despite companies offering gambling options through this channel. Malta currently regulates the VR casino site Slotsmillion, with a license that includes some specific purported responsible gambling requirements, for example, clocks remaining visible at all times in the visual field. However, there is little evidence that having clocks in venues or on screens exert any impact on gambling behaviour. Within SlotsMillion, customers can seek help and support from ‘agents’ in the casino, including having the option to exclude themselves.

Currently, most jurisdictions do not differentiate between various modes of online gambling, despite their many differences. Research has shown that those who gamble via mobile and supplementary devices are more likely to exhibit gambling problems than gamblers using computers. There is little research that has specifically examined different modes of online gambling suggesting a need to further consider modes of access carefully if the potential impact and social harm are to be fully understood. Identifying the risks associated with new technologies is important to anticipate future issues and minimise gambling-related harm by developing effective responsible gambling strategies and interventions for those with gambling-related problems.

**Impact of virtual reality on gambling**

There is very limited empirical evidence regarding the impact of virtual reality gambling on consumers, including gambling problems. As such, there is little research to inform responsible gambling policies and practices.

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Structural features of the online gambling environment are likely to contribute to gambling problems, features that are inherently similar to or amplified in a virtual environment. Both online and virtual reality gambling allow instantaneous access to uninterrupted and extended sessions of play, in private settings, with no constraints on alcohol consumption. Comparable to the effects to online gambling cues, desires, urges and cravings are elicited by exposure to virtual reality gambling. This is similar to findings that exposure to smoking and substance use cues in virtual reality increase subjective cravings and physiological responses. Similarly, in one experimental study, participants with gambling problems exposed to virtual reality gambling experienced increased urges to gamble that did not diminish after session cessation. This suggests that virtual reality could increase gambling, not only in the virtual but also in subsequent, real gambling environments.

In contrast to Internet gambling, where users can still see, feel, and hear the world around them, virtual reality removes all external stimulation and connection to reality provoking a greater sense of involvement and presence. Involvement refers to the psychological state of focusing attention and engaging in activities in the virtual reality environment. Presence is defined as the subjective experience of being in one place despite being physically situated in another. Both involvement and immersion are necessary for presence; and both are achieved through the sophisticated virtual reality technology now appearing in the commercial sector.


39 Giroux et al., “Gambling Exposure in Virtual Reality and Modification of Urge to Gamble.”

40 Witmer and Singer, “Measuring Presence in Virtual Environments.”
describe presence as total immersion, being cut off and detached from reality to such an extent that the game was all that mattered: “You just forget about the things around you and you’re focused on what you’re doing in the game” 41. The level of immersion felt by gamers seems to correlate with the extent of stimuli and attentional resources needed 42, as such, virtual reality, with visual, auditory, and sometimes tactile stimuli would be expected to enhance presence. A relationship has been found between dissociation and presence experienced in virtual reality 43. Consequently, it is important to consider how a sense of involvement and presence may impact gambling, including those vulnerable to experiencing dissociation during gambling sessions.

Virtual reality offers the prospect of ease of interaction, objective realism, and ability to interact and communicate with other virtual humans 44. The ability for users to move around within the environment reinforces their sense or presence, contributing to the sense of realism and intensity of their reactions 45. The level of presence felt within a virtual reality experience is positively related to affect 46, which is consistent with a study where cigarette craving levels were observed to be significantly correlated to the sense of presence within a virtual reality context 47. Similarly, Park and colleagues reported that urges to gamble were strong when playing a casino game in a virtual environment 48. These results suggest that compared to online gambling, there is a significantly greater capacity for virtual reality, through its immersive nature, to narrow the focus of attention (Anderson & Brown, 1984) and produce heightened states of dissociation 49. Under these circumstances, virtual reality gambling represents a particularly effective form of gambling for

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42 Ibid.
48 Park et al., “The Effect of Repeated Exposure to Virtual Gambling Cues on the Urge to Gamble.”
individuals seeking to use gambling as a coping mechanism to deal with affective and emotional stresses 50.

Coupled with this, in both online and virtual reality, the use of credit points and digital currency disrupts the financial value and salience of money, leading players to perceive losses as more tokenistic rather than real 51. Given the capability of virtual reality to disconnect the players from reality to a much greater extent than online play, it is possible that the effect of tokenisation is greatly enhanced under virtual conditions increasing the propensity for poorer decisions and impulse control to be made.

The immersive and artificial environment generated by virtual reality has the propensity to suspend judgment and foster behavioural disinhibition. It is widely accepted that certain characteristics of online gambling act to impose fewer constraints on their behaviour as compared to land-based venues where there are interactions with real others 52. In virtual reality, similar features such as anonymity and minimal face-to-face social interactions occur but these are intensified as the interactions with avatars are perceived to be artificial and divorced from reality. Accordingly, the immersion into an artificial environment where social interactions involve avatars provides a fertile foundation for behaviourally disinhibited decisions 53. Therefore, the facilitation of behavioural disinhibition under conditions where actual gambling takes place is likely to contribute to excessive gambling.

One way in which virtual reality gambling differs from online gambling is the extent to which socialisation is possible. Within virtual gambling settings, gamblers can see, and interact with others, including gamblers, hosts, and avatars of artificial intelligence. The theory of social facilitation holds


that the presence of others raises arousal levels and reduces behavioural inhibitions. This theory is in part explained as a consequence of fear of negative appraisal by others and the need to be perceived in a positive manner by others.

Virtual reality cue exposure studies have demonstrated that social interactions with virtual environments can increase cravings for substances, including tobacco and drugs. In one study, smokers interacting with avatars and offered cigarettes experienced higher cravings than when limiting interactions to other materials. Similarly, the presence of avatars drinking alcohol and offering users the opportunity to drink increased subjective craving levels for alcohol, a finding similar to crack cocaine dependent users where high cravings occurred in conditions where virtual avatars where observed using crack cocaine. With regards to gambling, research has demonstrated that social presence can intensify gambling as people are concerned with making a favourable impression and are motivated by a negative mood state to avoid appearing as a 'loser'. For problem gamblers, the greater degree of social interactions with others has been shown to increase persistence in betting as compared to gambling alone. In virtual reality, a greater degree of social interactions with virtual gambling staff and players is possible with the nature of such interactions breaking down the common constraints limiting normal social protocols. Drawing on such evidence would suggest that interactions with other gamblers in a virtual environment is likely to increase desire to gamble for users. As the creators of virtual reality casinos are able to embed artificially intelligent avatars, it is likely that all users of virtual reality gambling will be influenced by the observed behaviours, gambling cues, and related social interactions of avatars.

However, in contrast to most land-based venues, individuals in virtual reality gambling are depicted as the optimal versions of themselves, often highly glamorised and attractive. 'Dissociative imagination' is the notion that 'one’s online persona along with the online others live in a make-
believe dimension, separate and apart from the demands and responsibilities of the real world.” It is possible that consumers may specifically use virtual reality to depict themselves in a favourable manner and seek social affirmation. Individuals are increasingly turning to the Internet for social affirmation and engaging in impression management practices with young people in particular using online platforms, such as social networking sites, to carefully manage self-presentation. Creating an idealised self-identity online can encourage people to embrace these attributes in their real life, which may result in virtual reality gamers embracing the role of a gambler or ‘big-spender’, particularly if this is reinforced during online social interactions. Therefore, the impact of self-presentation and social presence on virtual reality gambling needs to be specifically considered, as research findings based on land-based gambling venues may not be generalisable and/or applicable.

**Implications**

Virtual reality offers enormous potential and may be in the stage of nascent growth as in the 1990s when academics pondered the potential impact of the “World Wide Web”. Virtual reality has yet to be embraced by mainstream consumers and its impacts are not fully realised at this stage. Virtual reality gambling will likely be a totally new experience and extend well beyond the offerings of a land-based or online casino or gambling experience. However, just as many gambling regulators who have traditionally dealt only with land-based gambling were initially relatively poorly prepared to deal with Internet gambling, the specific policies needed for virtual reality in terms of consumer protection and harm minimisation have not been developed or perhaps even been considered by many jurisdictions. Some lessons in this important context may be gleaned from the increased experience with Internet gambling among regulatory systems and jurisdictions, including many throughout the EU and the United Kingdom, for example, as may be applied to this new emerging technology. Virtual reality gambling appears to bring together some of the most problematic elements of gambling that have the potential to lead to gambling problems; availability, accessibility, and rapid and continuous play. There will be a mixed effect of anonymity and privacy where social interactions occur with avatars, with the potential for gamblers to be influenced by the highly glamorised presentation of others, including one’s own avatar. The virtual reality environment represents an immersive and realistic environment where virtual credits disrupt financial value of

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61 Suler, “The Online Disinhibition Effect.”
bets placed, and provoke greater degrees of dissociation with no external distractions or awareness of the passage of time to cause or prompt breaks in play. These factors combined make it possible that this mode of gambling will contribute to the development of and significant exacerbation of gambling problems in the near future, especially if not addressed with reasonable regulatory measures put in place for this sort of new technology.

As with the emergence of remote gaming over the Internet many years ago, at the starting point of all new technologies, alarmist views can be unproductive. Certainly, not all those who engage in virtual reality gambling are likely to develop problems. It is possible that the experience of virtual reality is so realistic that the emotional and cognitive impact of losing money in a virtual gambling environment may cause negative attitudes. However, as in a real gambling environment, gamblers are likely to focus more on wins than losses, particularly when using virtual credits, which minimise the salience of expenditure.

It is important to consider the advantages of this new technology. As with Internet gambling, virtual reality gambling potentially provides opportunities to make harm minimisation strategies more effective.

- As social interaction can influence gambling, avatars can be used to approach players to discuss their gambling in an anonymous setting. For example, just as some jurisdictions require gambling venues to intervene if a player appears to have gambling problems, virtual reality gambling sites could intervene with avatars and personalised messages seen only by a specific player.
- Rather than requiring clocks to be visible, players should receive prominent time notifications to remind them to the time they have been in the virtual reality gambling environment. These could have default settings, but be modified by players. Similarly, players can be notified when they are approaching a pre-set limit on their gambling expenditure.
- Pop-up notifications can be displayed for users with appropriate messages, for example, encouraging gambling at a reasonable level and for entertainment and warnings about gambling to a problematic level.
- Virtual reality gambling environments should be required to have areas without any gambling stimuli for players to take a break and interact with others. Other virtual players taking breaks may promote imitation through vicarious social learning.

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64 Monaghan, “Responsible Gambling Strategies for Internet Gambling.”
• Players should have to leave the virtual reality environment to add credit to their account, to provide an opportunity to think through this action and break any potential dissociation within a gambling session.

• Many of the consumer protection measures that have been suggested for Internet gambling are also relevant to this mode, for example, self-exclusion for temporary breaks and longer periods, ability to easily access aggregated activity statements on expenditure, detection of indicators of problems and intervention by gambling operators.

There is very little research on the impact of virtual reality on gambling, all of which has been conducted in highly controlled experimental studies, often in a treatment setting. Virtual reality gambling operators should be involved in independent research, including data sharing, to enable a greater understanding of the psychology of virtual reality gambling and impact on harms. Virtual environments can be used for research purposes, which is important in the field as it is difficult to simulate a realistic gambling scenario in a laboratory. Many gambling studies rely on decision-making tasks in a laboratory, which have limited applicability to real world gambling. There are many research questions that need to be addressed; these include understanding what aspects of the virtual reality environment impact gambling urges and behaviour; How the experience of virtual reality gambling compares to online and offline gambling and what implications this has for the development of problems? And what harm minimisation measures are relevant and effective in a virtual reality gambling environment? Virtual reality has been used in treatment programs and has many applications in health care. Further research is needed to understand how this technology is best utilised for preventing and treating gambling-related harms.

Conclusion

It is predicted that virtual reality gambling will progressively capture a portion of the market sector, particularly as technological, software and computing capacity and graphical resolution become more sophisticated and commercially affordable. The inclusion of features that enable a realistic representation of familiar and/or preferred environments coupled with some interactive skill-based

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component that determines payout levels is expected to be of specific appeal to the young technically knowledgeable generation of players. The gambling environment is moving toward more interactive formats with electronic gaming machines containing skills-based elements. Virtual reality gambling is a logical extension of this development. To date, most regulators continue to either neglect or are attempting to gain an understanding of the potential impact of virtual reality gambling and the extent to which responsible gambling and harm minimisation regulations ought to or should be introduced. Similarly, treatment providers need to gain an understanding of the possible presence of unique psychological factors underlying virtual reality that contribute to, or exacerbate, gambling problems, and if present, modify existing interventions to counter those factors. Further research is urgently needed to understand the likely impact of virtual reality gambling on consumers, including the development and exacerbation of compulsive and other problematic gambling.
References


