

Gaming-gambling convergence: Research, regulation, and reactions

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The convergence of gaming and gambling has been the subject of research, debate, and regulatory consideration over the past ten years as technological advances and consumer preferences are changing the nature in which both activities are offered. Gambling activities are increasingly incorporating gaming features that focus on skill, social interaction, progress, achievement, and competition. Conversely, games have integrated gambling themes and aspects of gambling including randomly-determined outcomes and rewards, including those that require a payment, and increased monetization of in-game items through legitimate and illegitimate marketplaces. The motives for both are related to recognition of the broad appeal of both gaming and gambling, the commercial potential of the activities, and an effort to appeal to a broad demographic, including young adults given the aging player base of traditional gambling activities. The limited factual understanding of the impact of incorporating gambling themes and mechanics into popular games and vice versa has not stopped sensationalist headlines and alarmist reactions that are not evidence-based.

Gambling activities are heavily regulated and closely scrutinized in most jurisdictions.

Consequentially, cosmetic gaming adaptations, such as slots based on popular online/video games, are more likely to be available in legal markets than fundamental changes to gambling mechanics like integration of genuine skill and competitive elements. Conversely, games have minimal regulatory requirements and few impediments to implementing new mechanics. Several new features and game-types have drawn the focus of regulatory attention. Social casino games and loot boxes are two examples that have been specifically addressed by international gambling regulators, although with inconsistent outcomes. However, as relatively recent additions to the gaming landscape, there is a small body of empirical evidence that can guide policies.

It is important to consider the potential risks of new technological developments, including unintended consequences, inappropriate usage, and deleterious practices. Nonetheless, fears of potential harms should be founded on a reasonable and substantiated basis and evidence-based

policies are an important ideal. This will enable appropriate harm minimization policies and practices to be implemented to protect consumers, enhance well-being, and benefit the broader community. Currently, the small body of literature surrounding use and impact of social casino games and loot boxes is predominately correlational. That is, studies have found that individuals, including adolescents, who play social casino games or purchase loot boxes are more likely to have higher indicators of gambling problems¹. It is important to be mindful of the limitations of such cross-sectional studies, including the lack of evidence for a causal relationship. The relationship between game use and gambling problems is likely explained by a confound – interest in gambling and gambling engagement. That is, individuals who are interested in gambling are more likely to engage with gambling games and features that resemble gambling and engage in gambling, which may have occurred with or without exposure to gambling themes within games. Studies that fail to control for gambling engagement when making claims about the relationship between games and gambling problems are confounded by this issue. Similar claims were made about the relationship between Internet gambling and problems until further research found that this was not apparent when gambling engagement was controlled for².

¹ Livia Veselka et al., “Factors Associated with Social Casino Gaming among Adolescents across Game Types,” *BMC Public Health* 18, no. 1 (December 2018), <https://doi.org/10.1186/s12889-018-6069-2>; D Zendle and Paul Cairns, “Video Game Loot Boxes Are Linked to Problem Gambling: Results of a Large-Scale Survey,” *Plos One* 13, no. 11 (2018): e0206767; Sally Gainsbury et al., “Migration from Social Casino Games to Gambling: Motivations and Characteristics of Gamers Who Gamble,” *Computers in Human Behavior* 63 (October 2016): 59–67, <https://doi.org/10.1016/j.chb.2016.05.021>; Sally Gainsbury, Alex Russell, and Nerilee Hing, “An Investigation of Social Casino Gaming among Land-Based and Internet Gamblers: A Comparison of Socio-Demographic Characteristics, Gambling and Co-Morbidities,” *Computers in Human Behavior* 33 (April 2014): 126–35, <https://doi.org/10.1016/j.chb.2014.01.031>.

² Kahlil S. Philander and Terri-Lynn MacKay, “Online Gambling Participation and Problem Gambling Severity: Is There a Causal Relationship?,” *International Gambling Studies* 14, no. 2 (May 4, 2014): 214–27, <https://doi.org/10.1080/14459795.2014.893585>; Debi A. LaPlante, Sarah E. Nelson, and Heather M. Gray, “Breadth and Depth Involvement: Understanding Internet Gambling Involvement and Its Relationship to Gambling Problems,” *Psychology of Addictive Behaviors* 28, no. 2 (2014): 396–403, <https://doi.org/10.1037/a0033810>; Stéphanie Baggio et al., “Is Gambling Involvement a Confounding Variable for the Relationship between Internet Gambling and Gambling Problem Severity?,” *Computers in Human Behavior* 71 (June 1, 2017): 148–52, <https://doi.org/10.1016/j.chb.2017.02.004>; Sally Gainsbury et al., “The Prevalence and Determinants of Problem Gambling in Australia: Assessing the Impact of Interactive Gambling and New Technologies,” *Psychology of Addictive Behaviors* 28, no. 3 (2014): 769–79, <https://doi.org/10.1037/a0036207>.

Another methodological limitation to be mindful of when appraising research include the generalizability of the sample, that is, the extent to which those who participated in the study resemble the population of interest. Many studies use convenience samples self-recruited online who elected to engage in the study, potentially due to their interest in the topic. Although useful for exploratory investigations of relationships between variables, results from online convenience panels are at high risk of biases given that they are based on non-representative samples³. The time-frames of studies is important. Gambling problems typically develop over several years⁴, however, loot boxes and to a lesser extent social casino games are relatively new developments. Studies that measure engagement in game features over a recent time period fail to account for the time needed for a gambling problem to develop. That is, if an individual appears to have significant gambling problems, it is unlikely to be caused by games played in the past few months. Finally, the use of self-report of activity, particularly gambling expenditure and use of specific online activities, has been demonstrated to be wildly inaccurate⁵.

Gambling problems, including among adolescents, are not a new phenomenon. However, it has been postulated that gambling themes within games will increase the uptake of gambling by normalizing gambling, creating favourable attitudes and encouraging migration to gambling⁶. A few studies support the migration hypothesis, that is social casino games encourage uptake of gambling,

³ Mario Callegaro et al., "A Critical Review of Studies Investigating the Quality of Data Obtained with Online Panels Based on Probability and Nonprobability Samples ¹," in *Online Panel Research*, ed. Mario Callegaro et al. (Chichester, UK: John Wiley & Sons, Ltd, 2014), 23–53, <https://doi.org/10.1002/9781118763520.ch2>; Ron D. Hays, Honghu Liu, and Arie Kapteyn, "Use of Internet Panels to Conduct Surveys," *Behavior Research Methods* 47, no. 3 (September 1, 2015): 685–90, <https://doi.org/10.3758/s13428-015-0617-9>.

⁴ Hermano Tavares et al., "Gamblers Seeking Treatment: Why Haven't They Come Earlier?," *Addictive Disorders & Their Treatment* 1, no. 2 (2002): 65–69; Wendy S. Slutske, Kristina M. Jackson, and Kenneth J. Sher, "The Natural History of Problem Gambling from Age 18 to 29.," *Journal of Abnormal Psychology* 112, no. 2 (2003): 263–74, <https://doi.org/10.1037/0021-843X.112.2.263>.

⁵ D Ellis et al., "Do Smartphone Usage Scales Predict Behaviour?," PsyArXiv Preprints, December 12, 2018, <https://psyarxiv.com/6fjr7>.

⁶ Jeffrey L. Derevensky and Sally Gainsbury, "Social Casino Gaming and Adolescents: Should We Be Concerned and Is Regulation in Sight?," *International Journal of Law and Psychiatry* 44 (January 2016): 1–6, <https://doi.org/10.1016/j.ijlp.2015.08.025>; Daniel L. King et al., "Adolescent Simulated Gambling via Digital and Social Media: An Emerging Problem," *Computers in Human Behavior* 31 (February 2014): 305–13, <https://doi.org/10.1016/j.chb.2013.10.048>.

particularly among those who have made in-game purchases⁷. Nonetheless, prevalence studies indicate that the level of gambling problems in the adult population has remained relatively stable over the past thirty years, despite introduction of new games⁸. These studies indicate that gambling participation is decreasing, and younger generations are less likely to engage in traditional forms of gambling such as slot machines. Although Internet gambling has increased, this increase is from a very low (non-existent) base and online gambling is much less popular than online gaming. For example, the most recent adolescent gambling study from the UK found that gambling participation was lower than in 2011 and most gambling participation involved private betting outside licensed establishments⁹. Only 5% of young people had gambled online in the past year, despite 13% playing online gambling-style games and 31% claiming to have paid money to open loot boxes. Among those who had played online gambling-style games, one-quarter had gambled for money first, with two-fifths playing games first, indicating an overlap in interest in the activities and potentially bi-directional relationship in terms of engagement. This is similar to previous Australian research¹⁰. The findings confirm broader population studies indicating that despite increased engagement with gambling-themes and mechanics within games, gambling participation has remained relatively

⁷ Gainsbury et al., "Migration from Social Casino Games to Gambling"; Daniel L. King et al., "The Cost of Virtual Wins: An Examination of Gambling-Related Risks in Youth Who Spend Money on Social Casino Games," *Journal of Behavioral Addictions* 5, no. 3 (September 1, 2016): 401–9, <https://doi.org/10.1556/2006.5.2016.067>; Hyoun S. Kim et al., "Do Social Casino Gamers Migrate to Online Gambling? An Assessment of Migration Rate and Potential Predictors," *Journal of Gambling Studies* 31, no. 4 (December 2015): 1819–31, <https://doi.org/10.1007/s10899-014-9511-0>; Samantha J. Hollingshead et al., "The Social Casino Gaming-Gambling Link: Motivation for Playing Social Casino Games Determines Whether Self-Reported Gambling Increases or Decreases Among Disordered Gamblers," *Journal of Gambling Issues*, no. 33 (August 1, 2016): 52, <https://doi.org/10.4309/jgi.2016.33.4>; Frédéric Dussault et al., "Transition from Playing with Simulated Gambling Games to Gambling with Real Money: A Longitudinal Study in Adolescence," *International Gambling Studies* 17, no. 3 (September 2, 2017): 386–400, <https://doi.org/10.1080/14459795.2017.1343366>.

⁸ John W. Welte et al., "Gambling and Problem Gambling in the United States: Changes Between 1999 and 2013," *Journal of Gambling Studies* 31, no. 3 (September 1, 2015): 695–715, <https://doi.org/10.1007/s10899-014-9471-4>; Paul Delfabbro, Daniel L. King, and Jeffrey L. Derevensky, "Adolescent Gambling and Problem Gambling: Prevalence, Current Issues, and Concerns," *Current Addiction Reports* 3, no. 3 (September 2016): 268–74, <https://doi.org/10.1007/s40429-016-0105-z>; Gainsbury et al., "The Prevalence and Determinants of Problem Gambling in Australia"; Ola Ekholm et al., "The Prevalence of Problem Gambling in Denmark in 2005 and 2010: A Sociodemographic and Socioeconomic Characterization," *Journal of Gambling Studies* 30, no. 1 (March 2014): 1–10, <https://doi.org/10.1007/s10899-012-9347-4>.

⁹ Gambling Commission, "Young People & Gambling 2018" (London: UK Gambling Commission, 2018).

¹⁰ Sally Gainsbury et al., "The Use of Social Media in Gambling," *Gambling Research Australia*, 2015.

unchanged. There have been no substantial reports of an increase in young people or adults seeking help for gambling problems including related to use of games. This is consistent with longitudinal studies suggesting that gambling participation fluctuates over time and patterns of gambling observed in adolescence rarely translate to adult engagement¹¹.

More research is unquestionably needed to further unpack the relationship between gaming and gambling and related behavioural addictions. Research that includes longitudinal components and assess directionality and causation of engagement and problems will inform on the dynamic interactions between these activities and related harms. Efforts are also needed to address the potential benefits of engagement with gambling themes and mechanics within games. An Australian study found that 9% of adolescents and 17% of adults surveyed reported that playing social casino games decreased how much they gambled¹², which is consistent with qualitative reports that the games reduced urges to gamble¹³. Engagement with gambling within games may be educational to teach people the low chances of winning, the impact of spending money and not receiving the expected benefits, and to allow people to engage in gambling-like scenarios with lower costs than actual gambling.

Caution surrounding the regulation of new gambling technologies is warranted given the unknown impacts of introducing elements that make gaming highly popular into a product already associated with serious harms. Similarly, there is merit in increased regulatory scrutiny where possible of games

¹¹ Paul Delfabbro, Daniel King, and Mark D. Griffiths, "From Adolescent to Adult Gambling: An Analysis of Longitudinal Gambling Patterns in South Australia," *Journal of Gambling Studies* 30, no. 3 (September 2014): 547–63, <https://doi.org/10.1007/s10899-013-9384-7>; René Carbonneau et al., "Variety of Gambling Activities from Adolescence to Age 30 and Association with Gambling Problems: A 15-Year Longitudinal Study of a General Population Sample," *Addiction* 110, no. 12 (December 1, 2015): 1985–93, <https://doi.org/10.1111/add.13083>; René Carbonneau et al., "Trajectories of Gambling Problems from Mid-Adolescence to Age 30 in a General Population Cohort.," *Psychology of Addictive Behaviors* 29, no. 4 (2015): 1012–21, <https://doi.org/10.1037/adb0000102>.

¹² Gainsbury et al., "The Use of Social Media in Gambling."

¹³ Sally Gainsbury et al., "An Exploratory Study of Interrelationships Between Social Casino Gaming, Gambling, and Problem Gambling," *International Journal of Mental Health and Addiction* 13, no. 1 (February 1, 2015): 136–53, <https://doi.org/10.1007/s11469-014-9526-x>; Jonathan Parke et al., "Exploring Social Gambling: Scoping, Classification and Evidence Review" (The Gambling Lab, 2012), <http://eprints.lincoln.ac.uk/16412/1/Social%20Gambling.pdf>.

as consumer products that may be predatory and/or lead to harmful and addictive use. Efforts are needed to protect vulnerable consumer groups with limited ability to make informed choices, including children and adolescents. This may include educational strategies targeting parents, young people, and professionals working with youth, consumer protection measures within games, and revised age ratings for gambling content and in-game purchasing. Predatory practices and marketing targeting youth may lead policy makers to enforce stricter codes of conduct for games, particularly as the understanding of the etiology of gaming addiction progresses. Meanwhile, commentaries and opinion pieces, including those published in academic journals and/or authored by 'experts' should not be cited as evidence. As research develops, efforts are needed to avoid sensationalist reporting of results to claim causality without evidence and balance indicative evidence with policy decisions.

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