

review

Esports Betting and Skin Gambling: A Brief History

Nancy Greer,¹ Matthew Rockloff,² Matthew Browne,² Nerilee Hing,² & Daniel L. King³

¹ School of Health, Medical and Applied Sciences, CQ University Australia, Melbourne, Victoria, Australia

² School of Health, Medical and Applied Sciences, CQ University Australia, Bundaberg, QLD, Australia

³ College of Education, Psychology, & Social Work, Flinders University, Adelaide, SA, Australia

Abstract

The rising popularity of competitive video gaming (“esports”) has attracted the involvement of the gambling industry, with esports cash betting available from the majority of wagering operators. In addition, an unregulated gambling subculture around esports has arisen, with virtual game items known as “skins” being used as currency to place bets on esports and third-party sites that host games of chance. Little is presently known about these novel forms of gambling, although there are growing concerns that these products may place some vulnerable consumers (e.g., youth) at risk of gambling-related harm. The current paper provides a historical overview of esports betting and skin gambling globally, drawing on the limited research literature available, including academic journals, government publications, conference presentations, and media reports. Topics briefly covered in the review include esports, skins, history of the gambling products, gambling exposure and accessibility, research findings (e.g., prevalence, awareness, demographic characteristics, gambling behaviour, problem gambling), illegal activities, changes to skins and the skin gambling market, and industry and government responses to concerns arising from these new gambling products (e.g., underage gambling). The intention of this paper is to provide the general public, academics, governments, and other key stakeholders with an understanding of the evolving landscape around esports betting and skin gambling, the type of bettors that these forms of gambling attract, and the potential adverse consequences of these activities.

Keywords: Esports betting, skin gambling, loot boxes, video games, virtual items, esports

Résumé

La popularité croissante du jeu vidéo de compétition (« e-sport ») a attiré la participation du secteur du jeu qui y voit une occasion de pari d'argent « e-sport » auprès de la majorité des exploitants de jeux d'argent. De plus, une sous-culture du jeu non réglementée autour des e-sports est apparue, des objets virtuels appelés « skins » étant utilisés comme monnaie pour placer des paris sur des sites sportifs et de tiers hébergeant des jeux de hasard. Cependant, on en sait actuellement peu sur ces nouvelles formes de jeu et on craint de plus en plus que ces produits ne mettent certains consommateurs vulnérables (par exemple, les jeunes) en situation de risque de préjudice lié au jeu. Le présent document fournit un aperçu historique des paris sportifs et des paris d'objets virtuels (skin gambling) à l'échelle mondiale, en s'appuyant sur le peu de littérature de recherche qui existe, notamment des revues spécialisées, des publications gouvernementales, des présentations à des conférences et des reportages dans les médias. Les sujets brièvement abordés dans la revue incluent : les sports, les « objets virtuels », l'historique des produits de jeu, l'exposition et l'accessibilité au jeu, les résultats de recherche (c'est-à-dire, la prévalence, la sensibilisation, les caractéristiques démographiques, le comportement de jeu, le jeu compulsif), les activités illégales, l'évolution du marché du jeu de hasard et des jeux d'objets virtuels et les réponses de l'industrie et du gouvernement aux préoccupations découlant de ces nouveaux produits de jeu (par exemple, le jeu chez les mineurs). L'objectif de ce document est de fournir au grand public, aux universitaires, aux gouvernements et aux autres parties prenantes une compréhension de l'évolution des paris sportifs et des jeux de hasard, du type de parieurs qu'ils attirent et des conséquences néfastes potentielles de ces activités.

Introduction

Esports are organized video game competitions between highly skilled video game players or teams that audiences view either online or in-venue (Jenny, Manning, Keiper, & Olrich, 2016; Seo & Jung, 2014). These sports cover a wide range of games, but generally fall into game types in which players, or teams of players, compete against each other, such as action shooting (usually first-person shooter games; e.g., Counter-Strike: Global Offensive [CSGO], Call of Duty), real-time strategy (e.g., StarCraft), multiplayer online battle arena (e.g., League of Legends, Defense of the Ancients [DOTA]), fighting (e.g., Mortal Kombat, Street Fighter, Super Smash Bros.), sports (e.g., FIFA, Madden NFL, Rocket League), survival (e.g., Player-Unknown's Battlegrounds [PUBG], Fortnite Battle Royale), and other games (e.g., collectible card game Hearthstone; Holden, Edelman, & Baker, 2019; MEC, 2016).

The elements of esports have all the hallmarks of traditional professional sports: competition, skilled players, large audiences and fan bases, institutionalization via

leagues and governing bodies, tournaments at various levels, corporate sponsorships, advertising, media coverage, merchandising, player scholarships, prizes, and celebrity status for its athletes (Grove, 2016a, 2016b; Holden et al., 2019; Jenny et al., 2016; MEC, 2016; Seo & Jung, 2014). Although esports have existed since the 1980s (MEC, 2016), market demand began to grow rapidly only from 2011 with the launch of Twitch, a live-streaming platform for esports (Hilvert-Bruce, Neill, Sjöblom, & Hamari, 2018; SuperData, 2015). Esports competitions are now easily accessible via online streaming television (e.g., Twitch, YouTube, Facebook, Fetch TV) and, increasingly, via in-venue events. The estimated global esports audience and revenue for 2019 is 454 million viewers and \$1.1 billion, respectively, excluding revenue from gambling on esports (Newzoo, 2019). Esports viewership is common among younger and male demographics. An Australian study found that 34.5% of 18- to 24-year-olds and 30.9% of 25- to 34-year-olds have watched esports, but only 13.6% of adults have done so (YouGov, 2018). A separate Australian study with esports fans aged 13–40 years shows that 17% of them are 13–17 years old, 66% are 18–34 years old, and 74% are male (Nielsen, 2018).

The rising popularity of esports has attracted the provision of esports gambling services offered by established sports wagering operators across the globe, as well as newer esports-exclusive betting operators (Esports Insider, 2018; Macey & Hamari, 2018a; Newzoo, 2019). Furthermore, a gambling subculture exists, with unregulated online websites allowing the use of virtual items, known as “skins,” to be used to place bets on esports and simplified games of chance such as roulette (Grove, 2016b). Skins are virtual in-game items that “provide cosmetic alterations to a player’s weapons, avatar or equipment used within the game” (Gambling Commission, 2017, p. 17), but otherwise give no advantage to game play. The attraction of skins is that they are a collectible within a tiered system in which the rarer skins are harder to obtain and the most coveted. The majority of video games have skins that can be purchased directly, rewarded (i.e., for game play), or won in loot box purchases and for the most part have no real-world value outside of the game (Macey & Hamari, 2018b). The exception is the handful of video games whose skins (i.e., CSGO, DOTA2, PUBG) can be transferred to third-party websites for skin gambling, and then traded for money on skin exchanges, some skins being worth thousands of dollars and creating a skin marketplace worth billions (Gambling Commission, 2017). The transfer of skins outside the video game is facilitated via video game developers’ online stores whose application programming interface is open to interact with outside servers. The main concern with these newer forms of gambling, voiced by both academics and governments, is that they blur the lines between gambling and gaming, potentially placing underage consumers at risk of harm (Gambling Commission, 2018a; Johnson & Brock, 2019; King, 2018). Yet very little literature exists about these products to provide a basic understanding in order to enable key stakeholders to take appropriate action.

The current paper aims to provide a historical overview of esports betting and skin gambling. It also includes an informational summary on the products, ongoing

developments, and current knowledge, as well as the key issues being researched and debated surrounding esports betting and skin gambling.

Method and Results

A search of existing published knowledge of “esports betting” and “skin gambling” was undertaken, involving a three-stage approach: (1) a systematic search of journal articles, (2) a targeted search of the grey literature, and (3) manual additions from a targeted search of online media and other sources (e.g., news articles, esports industry reports, esports and video game social media). The initial, and main, searches were conducted in February 2018, which focused on the period from 2000 onwards and attempted to include articles in press. A second literature review search was conducted in March 2019 for new journal articles, grey literature, and other relevant sources published between 2018 and 2019. The aim of this approach was to source all information related to esports betting and skin gambling in order to review and summarize current knowledge of these products. An initial systematic literature review of published journal articles yielded little relevant literature, which is not surprising considering that esports betting and skin gambling are newly emerging gambling products (last 5 years). The search was therefore extended to target government publications and other online sources. Although we consider this approach to be comprehensive, some sources of knowledge may have either not been found or not been accessible.

The systematic literature search targeted journal articles on esports betting and skin gambling. Electronic databases searched included the following: ACM Digital Library, Directory of Open Access Journals, EBSCOhost, Gale Cengage Academic OneFile, PsycINFO, PubMed Central, SAGE Journals Online, ScienceDirect (Elsevier), Springer journals, and Wiley Online Library. Specific journals not catalogued in the electronic databases were manually searched, and included the following: *Game Studies: The International Journal of Computer Game Research* (2001 onwards); *International Gambling Studies* (2001 onwards); *Eludamos. Journal for Computer Game Culture* (2007–2014); *Journal of Gambling Issues* (2008 onwards); *Journal of Gambling Studies* (2000 onwards); *Loading...* (2007 onwards); *The International Journal of Interactive Worlds* (2010 onwards); *Transactions of the Digital Games Research Association* (2013 onwards), *Gaming Law Review* (2010 onwards), and *Social Science Research Network* (1994 onwards). The following search terms and logic were used: (bet* OR wager* OR gambl* OR gaming*) AND (esports* OR e-sports* OR electronic sports* OR cybersport* OR virtual sport* OR competitive computer gam* OR skin* OR skin bet* OR skin gam* OR virtual good* OR virtual item* OR in-game item* OR virtual currenc* OR cryptocurrenc* OR digital currenc* OR video-game* OR video game* OR videogame* OR electronic game* OR computer game* OR internet game* OR online game* OR CSGO* OR Valve* OR Steam* OR social casino game* OR social gam*). Search results were filtered to journal articles and reports, abstract/title/keywords (depending on database and journal), full text availability, English language, publications from 2000 to current (including articles in press), relevant subjects, and

references available. Endnote X8.2 was used to store and manage the search results. The systematic searches yielded 1,390 results. Articles were considered eligible if the content was about esports betting, skin gambling, or relevant content to provide historical context for these gambling activities. A total of 96 duplicates were removed. Of the 1,294 remaining results, 10 journal articles were included in this review.

The targeted literature search was designed to capture government publications and conference presentations that would not necessarily have been found in the systematic literature search, such as government reports and inquiries. We searched the following government, academic, and organizational websites pertaining to gambling, as well as other related topics: Australian Communications and Media Authority, Australian Institute of Family Studies, Alberta Gambling Research Institute, Gambling Research Australia, Gambling Research Exchange Ontario, Victorian Responsible Gambling Foundation, and the United Kingdom Gambling Commission. Each of these sources was searched by using the same search terms as in the systematic literature review with Boolean logic applied (where possible), screened to full-text available articles from 2000 to current year and articles in press, and limited to English language publications. Ten reports were included in the review from this search.

In addition, the primary author sourced relevant articles manually via the reference lists of sourced literature from the systematic and targeted literature searches, online searches (e.g., news articles, esports industry reports), social media posts, and recommendations from other academics. Much of the literature cited herein was sourced via manual additions by the primary author: 16 news articles, 15 journal articles, nine reports, three press releases, and one conference presentation.

The information from the literature covered various topics to provide a rich background to esports betting and skin gambling, including product descriptions, value of the esports market, value of related gambling markets, gambling exposure and accessibility, research data (e.g., prevalence, awareness, demographic characteristics, gambling behaviour, problem gambling), changes to the skin market and the impacts on skin gambling, underage gambling, illegal activity, consumer protection, industry and government responses and actions (e.g., video gaming developers, regulators), and skin gambling in the context of other “gambling-like” video game activities (e.g., loot boxes). The findings of the literature review are organized by the targeted gambling products: esports betting and skin gambling.

Esports Betting

Many regulated sports wagering operators across the globe now offer esports cash betting (Esports Insider, 2018; Macey & Hamari, 2018a; Newzoo, 2019). Esports betting is also increasingly available via online operators who offer esports betting exclusively (e.g., Unikrn, EGB.com, Arcane Bet, LOOT.BET, GG.BET; Macey & Hamari, 2018a). Besides the traditional payment methods for gambling (cash, credit),

some operators allow esports betting with cryptocurrencies, such as Bitcoin or Ethereum, which allow gamblers greater anonymity (Macey & Hamari, 2018a). In addition, esports betting can also occur informally between friends and esports players, or via player-versus-player betting, where players can bet on their own performance when playing a video game (Grove, 2016b). Lastly, there is a large market for esports skin betting, in which unregulated online websites offer virtual in-game items (skins) to be wagered on esports matches. The estimated global combined esports cash and skin betting revenue was \$56 billion in 2016 (Grove, 2016a). However, these estimates appear to have subsequently decreased following game developer actions that affected the unregulated skin marketplace, with 85% of the 2016 estimated revenue (cash and skins) attributable to skin betting (\$4.9 billion) dropping to around 10% for 2019 (\$670 million; Grove, 2016a). Esports viewers are being exposed to esports cash betting, with gambling operators promoting esports betting via esports broadcasts, social media, and websites (King, 2018). For example, esports teams and events are increasingly being sponsored by gambling operators (e.g., Betway, GG.BET, Unikrn), and advertisements appear as product placements on player uniforms and on websites (Gambling Insider, 2017; Holden et al., 2019; Luongo, 2018). Esports revenue is increasingly being driven by advertising and sponsorships, estimated as approximately 58.7% of the total 2019 esports global revenue (Newzoo, 2019). However, the share of gambling operator investors is unknown.

Reliable data on the prevalence, characteristics, and gambling behaviours of esports bettors are hard to obtain, considering that relatively few studies have been conducted (Gainsbury, Abarbanel, & Blaszczynski, 2017a, 2017b; Gambling Commission, 2017) and that a large sector of the esports betting market is either jurisdictionally offshore, illegal, or unregulated. An Australian study (Gainsbury et al., 2017a) sampled regular sports bettors and subsampled two groups: those who also bet on esports (esports bettors) and those who were engaged in sports betting only (sports bettors). Both esports bettors and sports bettors were predominantly male, but esports bettors were more likely to be younger, better educated, in full-time employment, earning a higher income, and more ethnically diverse than other compatriots. They also had a preference for offshore versus domestic gambling operators, which provides access to a larger esports betting market. Esports bettors and sports bettors were also compared for gambling intensity and problem gambling. The findings revealed that compared with sports bettors, esports bettors gambled more often, gambled on more activities, and had higher problem gambling severity scores (Gainsbury, Abarbanel, and Blaszczynski, 2017b). The main limitation of Gainsbury and colleagues' (2017a, 2017b) research was the exclusion of an esports-only bettors sample for comparison to sports-only bettors. As no other research exists on esports bettors, the profile of esports-only bettors remains unknown.

The main gap in these two Australian analyses, based on the same data set (Gainsbury et al., 2017a; 2017b), is the focus on "esports cash betting," excluding the unregulated "esports skin betting" market. The importance of skins in esports betting is evident in UK research, with similar proportions of adults betting on esports with money (7%) versus skins (6%) in the previous 12 months (Gambling Commission, 2018b).

Compared with the overall adult sample, a greater proportion of the youngest demographic of 18- to 24-year-olds had bet on esports with skins (12%) than they had with money (10%; Gambling Commission, 2018b). In this UK sample, rates of esports betting were highest among 18- to 24-year-olds (14%) and 25- to 34-year-olds (16%) and were more common among males (9%) than among females (6%).

Unregulated online websites that offer esports skin betting often also offer skin betting on other games of chance. These two types of gambling have been collectively termed “skin gambling” or “skin betting” (Grove, 2016b).

Skin Gambling

Skins are video game items (e.g., weapon, avatar, equipment) that offer purely cosmetic differences to the base models of these items (Gambling Commission, 2017; Grove, 2016b). Thus, they have no direct influence on game play, but may be valued for their rarity, or their ability to signal status to other players. Skins have monetary value in that they are not only won in-game, but they are also purchased with in-game currency or cash, or they are traded, and they can in some instances be exchanged for cryptocurrency (e.g., Bitcoin) or cash on a skin exchange (Gambling Commission, 2017; Grove, 2016a). Another avenue to obtain skins involves an element of chance whereby a consumable virtual video game item known as a loot box is opened (King & Delfabbro, 2018a, 2018b). As with skins, loot boxes can be purchased with money or in-game currency, or they are rewarded via game play or special events; they are becoming almost ubiquitous with video games as they generate billions of dollars in revenue for the video game industry (King & Delfabbro, 2018a, 2018b).

Some rare skins can be worth thousands of dollars (Gambling Commission, 2017). Hence, skins have a market value, and skin gambling can be a means of making financial returns or accumulating an inventory of skins as financial assets. Once acquired, some skins (but not all) can be used on third-party websites to engage in skin gambling on esports or other games of chance (e.g., roulette, coin flip, slots, cards). The most common skins used for skin gambling on esports or other games of chance include those from the following video games: CSGO, PUBG, Team Fortress 2, DOTA2, and H1Z1. A 2016 survey of over 100 skin gambling websites revealed that approximately 45% offered betting on esports, 45% on games of chance (jackpots, roulette, coin flip), and 10% on “other” products such as cases containing skins (Grove, 2016b).

Skins used as virtual currency for gambling have similarities and differences to social casino games, which are free-to-play gambling-themed games available on social media or mobile apps (Gainsbury, King, Abarbanel, Delfabbro, & Hing, 2015). Similar to skin gambling, social casino games have their own virtual in-game currency (e.g., credits, coins, dice), which can be earned (e.g., via game play, watching advertisements, doing surveys, downloading apps, referring friends) or sometimes purchased with cash (Gainsbury et al., 2015). In-app purchases of virtual items in social casino games in order to continue game play is functionally similar to

purchasing skins for skin gambling. The major difference is that some skins are often financially redeemable, whereas the virtual goods in social casino games have currency only within the game. In this respect, gambling with skins offers a financial incentive that is analogous to traditional online gambling activities.

The skin gambling market has evolved subject to decisions made by gambling developers, skin betting websites, skin exchanges, litigation, market demand, and government responses. Skins first became available in 2013 when video game developer Valve released skins for the video game CSGO via their online Steam marketplace, where skins could be purchased, sold, or traded (Haskell, 2017). The demand for skins led to the emergence of a skin marketplace within Steam (Yamamoto & McArthur, 2015), shortly followed by third-party websites offering a secondary marketplace for Steam skins (e.g., OPSkins, Bitskins) and skin gambling. Although not Valve's probable intention, Steam's application programming interface enabled app developers to insert bots, or automated programs, allowing the transfer of skins between a Steam account and third-party websites offering betting on esports and chance-based games (Assael, 2017). Skin gambling with CSGO skins boomed between 2014 and 2016, with \$2.3 billion in CSGO skins being used for esports betting in 2015, and the esports betting website CSGOLounge dominating the market (Haskell, 2017). Globally in 2016, the skin gambling market was estimated at \$4.8 billion, 7 times higher than cash betting on esports (\$649 million; Grove, 2016a).

A major concern arising from skin gambling is underage gambling, as websites often require a login only via players' Steam accounts with no age or ID verification checks (King, 2018). Steam membership only requires the consumer to be 13 years or over, to register a valid card or gift card for purchases, and to have a valid email address. Online streaming (e.g., YouTube) promoting skin gambling to young audiences is ubiquitous. A potentially problematic phenomenon is the existence of "social influencers" (often in their early twenties, sometimes achieving celebrity status) who show themselves winning large amounts of money, thereby encouraging their audience (i.e., children and adolescent esports viewers, video gamers) to gamble on these websites (Hermant & Doman, 2016; King, 2018; Parent Zone, 2018; Sood, 2016). Unregulated websites offering skin gambling are reported to sponsor online streamers to promote their service, and several websites (e.g., CSGOShuffle, CSGO Lotto, CSGODiamonds, CSGOWild) have been caught manipulating winning outcomes for streamers to give the misperception that consumers have a greater chance of winning than they actually do (Canfield, 2017; Holden & Ehrlich, 2017; King, 2018; Lewis, 2016; Sood, 2016). Valve's complicity in skin gambling has also been criticized as being motivated by financial gain, as they receive up to a 15% commission from skin transactions (Luongo, 2018).

Concerns over protecting underage consumers from skin gambling came to the forefront in late 2016, when CSGO game developer Valve issued cease-and-desist notices to skin gambling websites. News coverage revealed the apparent scale of underage skin gambling, with numerous stories of underage participants developing

gambling problems and suffering large monetary losses (Assael, 2017; Brustein & Novy-Williams, 2016; Campbell, 2016; Kollar, 2016; Toomey, 2019). This was followed by two class-action lawsuits brought against Valve in the United States for being complicit in allowing third-party gambling operators to conduct illegal gambling with their skins, who facilitated “unfair contests, corruption, and received substantial benefit from minors” (Holden, Rodenberg, & Kaburakis, 2016, p. 6). In both legal cases, it was ruled that skin gambling was normalizing esports gambling, but the courts did not recognize skins as items of monetary value (Canfield, 2017). Gambling on esports matches has also led to condemnation, corruption, and scandals in esports from players betting on their own performance, match fixing, and being sponsored by and/or having a financial stake in skin gambling websites (Abarbanel & Johnson, 2019; Holden & Ehrlich, 2017; Holden et al., 2016; Martinelli, 2019; Toomey, 2019). Professionals with a stake in the esports market (e.g., consultants, esports teams/leagues, sports teams/leagues, game developers, sponsors/ad agencies, investors) have expressed concerns that match fixing, illegal gambling, and lack of protections for youth players are the main risks to the legitimacy and growth of esports (Foley & Lardner LLP & The Esports Observer, 2018). These concerns have given rise to the establishment of esports organizations, such as the World Esports Association, which provide rules and regulations for esports teams and players, including banning match fixing and betting on matches that they are participating in (Martinelli, 2019; World Esports Association, 2017). Academics have also voiced concerns that gambling with virtual items could be a pathway to traditional gambling (Gainsbury et al., 2017a; Gambling Commission, 2016, 2017, 2017c; Griffiths, 2017; King, 2018; Macey & Hamari, 2018a, 2018b).

The UK Gambling Commission has been a strong advocate for regulating skin gambling, both domestically and globally. Their policy aims to “disrupt the provision of illegal gambling facilities” (Gambling Commission, 2017, p. 7) to protect consumers, and it prioritizes the disruption of those products made available to children. The Gambling Commission considers in-game items, or virtual currencies, to be money or worth money if they “can be won, traded, or sold [and] can be converted into cash or exchanged for items of value” (2017, p. 1). Operators providing services offering virtual item gambling to consumers in Britain, where the items can be converted to real money, require a gambling license provided by the Gambling Commission (Gambling Commission, 2016). In a move that was viewed as supporting skin gambling, the Isle of Man in 2017 enacted gambling licensing for online gambling operators offering the deposit, betting, or withdrawal of virtual items (skins) gambling (e.g., eSportsPools by ESP.bet; Slotegrator, 2017). In the same year, following a court case, the government of Denmark blocked access to six major skin betting websites that operated by using skins traded with the Steam platform (Danish Gaming Authority, 2018); access to another 15 websites was blocked in 2019 (Danish Gaming Authority, 2019). The strongest stance was taken by Norway’s Gaming Authority in 2017, classifying skin betting as gambling and issuing a statement that skin gambling websites operating in their country are subject to sanctions (Mitchell, 2017). The estimated market for skin gambling on esports dramatically dropped from \$4.8 billion in 2016 to \$830 million in 2017 following Valve’s crackdown on 23 skin

gambling websites, the most prominent website ceasing operations being the esports skin betting website CSGO Lounge (Grove, 2016a). However, hundreds of skin gambling websites continued to operate and were still easily accessible to underage consumers. In March 2018, Valve announced a 7-day trade ban on CSGO skins that aimed to “reduce some negative unintended uses of trading in CSGO (such as fraud or scams)” (Valve Corporation, 2018). The response of many skin gambling websites was to shut down. In a relatively short time frame, some websites re-emerged and still offered skin deposits for betting on esports and/or games of chance, alongside other monetary deposit options. The option to withdraw skins was still made available with the new 7-day waiting period applied. However, alternative withdrawal options (e.g., online cash wallet, Bitcoin, gift cards) to replace the delayed skin trading were made available to facilitate the instant cash-out of winnings.

Capitalizing on the 7-day skin trade ban in June 2018, skin exchange operator OPSkins launched ExpressTrade to allow skins to be traded outside of Steam, with a few major skin gambling websites adding this as a deposit/withdrawal option. Within a week, Valve notified OPSkins that they would disable OPSkins Steam accounts associated with trade on Steam (OPSkins, 2018a). Later in June 2018, OPSkins announced that VGO skins, digital items generated by using blockchain technology designed to be collected and traded (Abarbanel & Macey, 2018), were integrated into their marketplace via WAX ExpressTrade (OPSkins, 2018b). The blockchain technology that VGO skins uses is similar to other crypto non-currency items such as those used in the CryptoKitties game that are known as “non-fungible tokens” (Abarbanel & Macey, 2018). Unlike cryptocurrencies (e.g., Bitcoin) that can be directly exchanged between parties with a set monetary value (fungible), non-fungible tokens are virtual items whose “value is determined by a range of subjective qualities, one of which is scarcity” and are akin to baseball cards that can be exchanged for currency (Abarbanel & Macey, 2018, p. 2). Skin gambling websites appear to have adapted to this development by including VGO skins as a deposit/withdrawal method for betting on esports (e.g., CSGOFast, Thunderpick) and on games of chance (e.g., VGOArena, CSGORoll, SkinBet.gg, Gamdom; Abarbanel & Macey, 2018). This development creates a new marketplace that uses VGO skins as currency distinctly outside of video games and therefore not controlled by game developers (Abarbanel & Macey, 2018). While the loss of OPSkins as a skin exchange had an impact, it was relatively small, with a reported \$2 million worth of skins lost from the total \$245 million worth of CSGO skins (Luongo, 2018). Furthermore, the markets for CSGO and other skins are continuing, with numerous skin exchanges still operational (e.g., Gameflip, SkinCoin Trade, BitSkins, SkinsCash, PvPRO).

The Research on Skin Gambling

The annual Youth Gambling Survey conducted among 11- to 16-year-olds for the Gambling Commission in Great Britain shows a downtrend in skin gambling between 2017 and 2018 (Gambling Commission, 2017c; 2018c). In 2017, 11% of 11- to 16-year-olds reported ever having personally participated in skin gambling in either esports or other games, and this was markedly more common among boys

(20%) than among girls (3%; Gambling Commission, 2017c). In addition, 36% of betting with skins had occurred within the past 7 days, 23% from a week to a month ago, and the remaining 41% more than 1 month ago (Gambling Commission, 2017c). In 2018, skin gambling had dropped among 11- to 16-year-olds, with only 3% having ever bet with skins, even though 15% were aware of skin gambling (Gambling Commission, 2018c). This decrease in skin gambling could be due to two factors. First, the UK Gambling Commission newly required gambling licences for any operators who offered virtual items for betting that could later be converted into money (Gambling Commission, 2016). This licence would establish consumer protection for underage gambling, requiring operators to provide strict age verification for account holders, thereby removing the skin gambling market of gamblers under the age of 18 years, the legal gambling age in the United Kingdom. Second, the March 2018 changes at Valve caused CSGO skins to be harder to trade and therefore less attractive as a currency for gambling. Another study conducted in May to June 2018 (after the CSGO skin 7-day trade ban) in Britain found that 27% of children aged 13–18 years were aware of skin gambling, 10% had engaged in skin gambling, and 29% viewed skin gambling as a problem (Parent Zone, 2018). Skins used for gambling were obtained via loot boxes, purchased in Steam, or bought from other users. Forty-six percent of children claimed to be able to access more than 18 websites for skin gambling if they wanted to and understood that there were few to no age verification barriers (Parent Zone, 2018). Interviews with Greenlandic adolescents on their perceptions and experiences with gambling revealed that several children purchased skins (directly or via loot boxes) for the purpose of selling valuable skins for a profit (Udesen, Lenskjold, & Niclasen, 2019). A recent secondary analysis of the 2017 British Youth Gambling Survey by Wardle (2019) found that 39% of the children aged 11–16 years who engaged in skin betting in the last month had gambled on other activities. These skin bettors were at greater risk for gambling problems (23%) compared with non-skin bettors (8%), and this risk was higher when they engaged in other forms of gambling (Wardle, 2019). A study by Macey and Hamari (2018b) found that over two-thirds (68.4%) of loot box purchasers, comprised of mostly young males, had engaged in skin gambling. Two recent studies by Macey and Hamari (2018a, 2018b) examined online gambling, video game-related gambling (esports betting, skin gambling, loot box purchasing, fantasy esports, and social network gambling games), esports watching, and gambling problems among video gamers. In the last 12 months, 34.4% of video gamers had engaged in online gambling and 47.5% in video game-related gambling (Macey & Hamari, 2018a). Furthermore, this research shows a clear relationship between esports consumption and “video game-related gambling” (as defined above by Macey & Hamari, 2018a, 2018b), with watching esports significantly positively related to a greater gambling intensity in video game-related gambling (average weekly hours, average monthly spend; Macey & Hamari, 2018b).

Discussion

Very little literature and research exists on esports and skins, or on their convergence with gambling. The current review aimed to source and consolidate all relevant

information on esports betting and skin gambling to provide a detailed background of the history these products. In so doing, this review provides readers with a basic understanding of esports betting and skin gambling, and highlights a number of issues that warrant consideration for future inquiry and research. Esports and skins are intrinsically connected to video games, which attract a younger demographic who engage in esports consumption (e.g., watching, playing) and skin purchasing and trading. Early research into esports supports the concerns about youth gambling, with esports bettors likely to be younger than traditional sports bettors. Young people are also more likely than older people to be both aware of skin gambling and to have bet with skins. Video gamers and esports viewers are being encouraged to engage in these types of gambling through exposure to the marketing of esports cash betting in esports events and of skin gambling via online streamers. Over time, increased exposure to esports betting and skin gambling may lead to the normalization of these gambling activities. The concern is that increased exposure to these gambling activities, especially at a younger age, may lead to increased gambling consumption, subsequent experiences of gambling-related harm, and the development of gambling problems.

Skin gambling on esports and games of chance are easily accessible to underage persons. Access to gambling is mainly occurring via unregulated websites that use the video game developer Valve's Steam marketplace for skin trading (and gambling). While Valve intervened by ceasing operations of a handful of skin gambling websites (e.g., CSGO Lounge) and a major skin exchange (OPSkins), these skin markets continue to adapt and globally they remain largely unregulated. For example, skin gambling websites now offer betting with VGO items, which are similar to video-game skins in their cosmetics and which have a monetary marketplace for purchasing, selling, and trading (e.g., via online exchanges). Unlike video-game skins, VGO items cannot be used in any current video games. However, given the adaptability of the market, it might be expected that video games will be developed for VGO items. As with CSGO skins, demand from video gamers to obtain in-game items (e.g., for their collectability, rarity, to show off in game) may drive the marketplace for VGO items upward and, alongside it, gambling websites. Key stakeholders should endeavour to keep themselves informed about the changes to these unregulated gambling products; if otherwise left unchecked by gambling regulators and video-game conglomerates, skin and VGO item gambling websites will remain accessible to underage gamblers. Increasing accessibility to and availability of gambling plays a significant role in the pathway to increased gambling consumption and problematic or harmful gambling (Abbott et al., 2018; Blaszczyński, 2013; Delfabbro, King, & Derevensky, 2016; Gainsbury et al., 2013; Productivity Commission, 2010). This review highlights the fact that despite the concerns of skin gambling expressed by governments worldwide, only a small handful have taken regulatory or legal action against websites offering skin betting on esports and/or games of chance (Danish Gaming Authority, 2018, 2019; Gambling Commission, 2016).

Early evidence has shown that esports bettors may be at risk for greater gambling involvement (i.e., extending to traditional forms of gambling), greater gambling

intensity, and the development of gambling problems. No known research to date has explored the impacts of skin gambling, but it is hypothesized that it may lead to a migration to real money gambling on esports or similar games of chance (e.g., casino table games, electronic gaming machines). Migration to monetary gambling could be precipitated by the gambler becoming of legal gambling age, or the decline in availability of skin gambling websites. Esports cash bettors could also increase their participation in other forms of gambling, since gambling operators providing esports betting often have offerings on traditional sports, casino games, fantasy sports, and other types of activities.

Lastly, more research is needed on esports betting and skin gambling (i.e., prevalence, impacts) to address the concerns surrounding youth exposure, easy access, lack of regulation of virtual items for gambling, migration to traditional gambling, gambling-related harms, and development of gambling problems. Future research should also inform policy and regulation, potential harm minimization interventions (e.g., consumer, parental, and video-game industry education), and support services that treat clients who are using these new forms of gambling.

References

Abarbanel, B., & Johnson, M. R. (2019). Esports consumer perspectives on match-fixing: Implications for gambling awareness and game integrity. *International Gambling Studies*, 19, 296–311. <https://doi.org/10.1080/14459795.2018.1558451>

Abarbanel, B., & Macey, J. (2018). VGO, NFT, OMG!: Commentary on continued developments in skins wagering (October 12, 2018). Retrieved from SSRN website: <https://ssrn.com/abstract=3265587> or <http://dx.doi.org/10.2139/ssrn.3265587>

Abbott, M., Binde, P., Clark, L., Hodgins, D., Johnson, M., Manitowabi, D., . . . Williams, R. (2018). *Conceptual framework of harmful gambling: Third edition*. Retrieved from Gambling Research Exchange Ontario website: <https://doi.org/10.33684/CFHG3.en>

Assael, S. (2017, January 20). *Skin in the game*. Retrieved from http://www.espn.com/espn/feature/story/_/id/18510975/how-counter-strike-turned-teenager-compulsive-gambler

Blaszczynski, A. (2013). A critical examination of the link between gaming machines and gambling-related harm. *The Journal of Gambling Business and Economics*, 7, 55–76. <https://doi.org/10.5750/jgbe.v7i3.818>

Brustein, J., & Novy-Williams, E. (2016, April 20). *Virtual weapons are turning teen gamers into serious gamblers*. Retrieved from <http://www.bloomberg.com/features/2016-virtual-guns-counterstrike-gambling/>

- Campbell, C. (2016, July 18). *The true cost of Counter-Strike skin gambling*. Retrieved from <http://www.polygon.com/features/2016/7/18/12203534/counter-strike-cs-go-skin-gambling>
- Canfield, B. (2017). Case analysis: Gradually, not suddenly: Judge John C. Coughenour's crucial role in the legal standing of esports—G.G. v. Valve and McLeod et. al. v. Valve. *Gaming Law Review*, *21*, 634–636. <https://doi.org/10.1089/blr2.2017.2186>
- Danish Gaming Authority. (2018). *Report on illegal gambling*. Retrieved from <https://www.spillemyndigheden.dk/uploads/2018-12/Report%20on%20illegal%20gambling%202018.pdf>
- Danish Gambling Authority. (2019, April 3). *The Danish Gambling Authority has 25 illegal gambling websites blocked*. Retrieved from <https://www.spillemyndigheden.dk/en/news/danish-gambling-authority-has-25-illegal-gambling-websites-blocked>
- Delfabbro, P., King, D. L., & Derevensky, J. L. (2016). Adolescent gambling and problem gambling: Prevalence, current issues, and concerns. *Current Addiction Reports*, *3*, 268–274. <https://doi.org/10.1007/s40429-016-0105-z>
- Esports Insider. (2018, November 6). *Choosing an esports betting site that pays*. Retrieved from <https://esportsinsider.com/2018/11/choosing-an-esports-betting-site-that-pays/>
- Foley & Lardner LLP & The Esports Observer. (2018). 2018 Esports Survey. *The Esports Observer*. Retrieved from <https://esportsobserver.com/product/2018-esports-survey/>
- Gainsbury, S. M., Abarbanel, B., & Blaszczynski, A. (2017a). Game on: Comparison of demographic profiles, consumption behaviors, and gambling site selection criteria of esports and sports bettors. *Gaming Law Review*, *21*, 575–587. <https://doi.org/10.1089/blr2.2017.21813>
- Gainsbury, S. M., Abarbanel, B., & Blaszczynski, A. (2017b). Intensity and gambling harms: Exploring breadth of gambling involvement among esports bettors. *Gaming Law Review*, *21*, 610–615. <https://doi.org/10.1089/blr2.2017.21812>
- Gainsbury, S. M., King, D. L., Abarbanel, B., Delfabbro, P., & Hing, N. (2015). *Convergence of gambling and gaming in digital media*. Melbourne, Australia: Victorian Responsible Gambling Foundation.
- Gainsbury, S. M., Russell, A., Hing, N., Wood, R., Lubman, D., & Blaszczynski, A. (2013). How the Internet is changing gambling: Findings from an Australian Prevalence Survey. *Journal of Gambling Studies*, *31*, 1–15. <https://doi.org/10.1007/s10899-013-9404-7>

- Gambling Commission. (2016). *Virtual currencies, eSports and social gaming – discussion paper*. Birmingham, United Kingdom: Gambling Commission.
- Gambling Commission. (2017a, November 24). *Loot boxes within video games*. Retrieved from <https://www.gamblingcommission.gov.uk/news-action-and-statistics/news/2017/Loot-boxes-within-video-games.aspx>
- Gambling Commission. (2017). *Virtual currencies, eSports and social casino gaming – position paper*. Birmingham, United Kingdom: Gambling Commission.
- Gambling Commission. (2017c). *Young people and gambling 2017: A research study among 11-16 year olds in Great Britain*. Birmingham, United Kingdom: Gambling Commission.
- Gambling Commission. (2018a). *Declaration of gambling regulators on their concerns related to the blurring of lines between gambling and gaming*. Birmingham, United Kingdom: Gambling Commission.
- Gambling Commission. (2018b). *Gambling participation in 2017: Behaviour, awareness and attitudes*. Birmingham, United Kingdom: Gambling Commission.
- Gambling Commission. (2018c). *Young people & gambling 2018: A research study among 11-16 year olds in Great Britain*. Birmingham, United Kingdom: Gambling Commission.
- Gambling Insider. (2017, January 16). ESports sponsorship on the rise as Unikrn invests in CS:GO team. Retrieved from <https://www.gamblinginsider.com/news/2830/esports-sponsorship-on-the-rise-as-unikrn-invests-in-csgo-team>
- Griffiths, M. (2017). The psychosocial impact of professional gambling, professional video gaming & eSports. *Casino & Gaming International*, 28, 59–63.
- Grove, C. (2016a). *Esports and gambling: Where's the action?* Narus and Eilers & Krejcik Gaming. Retrieved from <https://www.thelines.com/wp-content/uploads/2018/03/Esports-and-Gambling.pdf>.
- Grove, C. (2016b). *Understanding skin gambling*. Narus Advisors. Retrieved from <https://www.thelines.com/wp-content/uploads/2018/03/Skin-Gambling-White-Paper-V2.pdf>
- Haskell, J. V. (2017). More than just skin (s) in the game: How one digital video game item is being used for unregulated gambling purposes online. *J. High Tech. L.*, 18, 125. Retrieved from https://heinonline.org/hol-cgi-bin/get_pdf.cgi?handle=hein.journals/jhtl18§ion=7

Hermant, N., & Doman, M. (2016, May 30). Counter-Strike skins gambling: Australian teens risking thousands through video game. *ABC News*. Retrieved from

Hilvert-Bruce, Z., Neill, J. T., Sjöblom, M., & Hamari, J. (2018). Social motivations of live-streaming viewer engagement on Twitch. *Computers in Human Behavior*, *84*, 58–67. <https://doi.org/10.1016/j.chb.2018.02.013>

Holden, J., Edelman, M., & Baker, T. (2019). A short treatise on esports and the law: How America regulates its next national pastime. *University of Illinois Law Review* (in press); Baruch College Zicklin School of Business Research Paper No. 2019-09-05. Retrieved from SSRN website: <https://ssrn.com/abstract=3441843>

Holden, J. T., & Ehrlich, S. C. (2017). Esports, skins betting, and wire fraud vulnerability. *Gaming Law Review*, *21*, 566–574. <https://doi.org/10.1089/blr.2017.2183>

Holden, J. T., Rodenberg, R. M., & Kaburakis, A. (2016). Esports corruption: Gambling, doping, and global governance. *Maryland Journal of International Law*. Retrieved from https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2831718

Jenny, S. E., Manning, R. D., Keiper, M. C., & Olrich, T. W. (2016). Virtual(ly) athletes: Where esports fit within the definition of “sport.” *Quest*. doi:10.1080/00336297.2016.1144517

Johnson, M. R., & Brock, T. (2019). *How are video games and gambling converging?* Retrieved from Gambling Research Exchange Ontario website: <https://www.greo.ca/Modules/EvidenceCentre/Details/how-are-video-games-and-gambling-converging>

King, D. (2018). *Online gaming and gambling in children and adolescents – Normalising gambling in cyber places*. Melbourne, Australia: Victorian Responsible Gambling Foundation.

King, D. L., & Delfabbro, P. H. (2018a). Predatory monetization schemes in video games (e.g. “loot boxes”) and internet gaming disorder. *Addiction*, *113*, 1967–1969. <https://doi.org/10.1111/add.142856>

King, D. L., & Delfabbro, P. H. (2018b). Video game monetization (eg, “loot boxes”): A blueprint for practical social responsibility measures. *International Journal of Mental Health and Addiction*, 1–14. Retrieved from <https://link.springer.com/article/10.1007/s11469-018-0009-3>

Kollar, P. (2016, July 7). *Valve deserves more of the blame for Counter-Strike’s disgraceful gambling scene*. Retrieved from <http://www.polygon.com/2016/7/7/12103022/counter-strike-gambling-valve>

- Lewis, R. (2016). *Phantomlord and CSGO Shuffle*. The Richard Lewis Show. Retrieved from <https://www.youtube.com/watch?v=dY3ltGjUBUo>
- Luongo, C. (2018, June 22). *ESI gambling report: Is Valve hanging on by the skin of its teeth?* Retrieved from <https://esportsinsider.com/2018/06/esi-gambling-report-is-valve-hanging-on-by-the-skin-of-its-teeth/>
- Macey, J., & Hamari, J. (2018a). Investigating relationships between video gaming, spectating esports, and gambling. *Computers in Human Behavior*, *80*, 344–353. <https://doi.org/10.1016/j.chb.2017.11.027>
- Macey, J., & Hamari, J. (2018b). eSports, skins and loot boxes: Participants, practices and problematic behaviour associated with emergent forms of gambling. *New Media & Society*, *21*, 20–41. <https://doi.org/10.1177/1461444818786216>
- Martinelli, J. (2019). The challenges of implementing a governing body for regulating esports. *University of Miami International and Comparative Law Review*, *26*(2). Retrieved from <https://repository.law.miami.edu/umiclr/vol26/iss2/8>
- MEC. (2016). *Spotlight on esports: An exploration of the growing esports landscape and its implications for marketers*. Retrieved from <http://www.mecglobal.com/assets/publications/2016-08/Spotlight-On-Esports.pdf>
- Mitchell, F. (2017, March 15). Norwegian Gaming Authority to sanction skin betting operators, view skins as virtual currency. *The Esports Observer*. Retrieved from <https://esportsobserver.com/norwegian-gaming-authority-sanction-skin-betting-operators-view-skins-virtual-currency/>
- Nielsen. (2018). The Esports Playbook: Australia. Retrieved from <http://www.nielsen.com/au/en/insights/reports/2018/exploring-esports-fans-in-australia.html>
- Newzoo. (2019). *2019 Global esports market report*. Retrieved from <https://newzoo.com/insights/trend-reports/newzoo-global-esports-market-report-2019-light-version/>
- OPSKins. (2018a, June 9). Official statement regarding Valve & OPSkins Steam accounts. Retrieved from <https://blog.opskins.com/official-statement-regarding-valve-opskins-steam-accounts/>
- OPSKins. (2018b, June 20). VGO items are now on OPSkins Marketplace! Retrieved from <https://blog.opskins.com/vgo-items-are-now-on-opskins-marketplace/>
- Parent Zone. (2018). *Skin gambling: Teenage Britain's secret habit*. Retrieved from https://parentzone.org.uk/system/files/attachments/Skin_Gambling_Report_June_2018.pdf

- Productivity Commission. (2010). *Gambling* (Report No. 50). Canberra, Australia: Author.
- Seo, Y., & Jung, S. U. (2014). Beyond solitary play in computer games: The social practices of eSports. *Journal of Consumer Culture*. <https://doi.org/10.1177/1469540514553711>
- Slotegrator. (2017, September 1). *Isle of Man issued the world's first license for skin betting*. Retrieved from https://slotegrator.com/gambling_news/isle-of-man-issued-the-worlds-first-license-for-skin-betting.html
- Sood, R. (2016, April 19). *Underage gambling on video games is happening*. Retrieved from <https://news.unikrn.com/article/underage-gambling-video-games>
- SuperData. (2015). *eSports market brief*. Retrieved from <https://www.superdataresearch.com/market-data/esports-market-brief/>
- Toomey, R. P. (2019). Upholding the integrity of esports to successfully and safely legitimize esports wagering. *Gaming Law Review*, 23(1). <https://doi.org/10.1089/blr.2019.23112>
- Udesen, S. E. J., Lenskjold, T., & Niclasen, B. (2019). Gambling in Greenlandic adolescents. *International Journal of Circumpolar Health*, 78(1), 1577094. <https://doi.org/10.1080/22423982.2019.1577094>
- Valve Corporation. (2018, March 29). Counter-Strike: Global Offensive: Adjustments to maps and trade. Retrieved from <http://blog.counter-strike.net/index.php/2018/03/20308/>
- Wardle, H. (2019). The same or different? Convergence of skin gambling and other gambling among children. *Journal of Gambling Studies*, 35, 1109–1125. <https://doi.org/10.1007/s10899-019-09840-5>
- World Esports Association. (2017). *Code of conduct and compliance for teams and players*. Retrieved from <http://www.wesa.gg/wp-content/uploads/2019/05/WESA-Code-of-Conduct-Teams-and-Players-Final-03052019-1.pdf>
- Yamamoto, K., & McArthur, V. (2015). Digital economies and trading in counter strike global offensive: How virtual items are valued to real world currencies in an online barter-free market. In *2015 IEEE Games Entertainment Media Conference (GEM)*. <https://doi.org/10.1109/GEM.2015.7377220>
- YouGov. (2018). *Just a game? Understanding the existing and future eSports market in Australia*. Retrieved from <https://au.yougov.com/find-solutions/reports/esports/>

Submitted November 19, 2019; accepted November 21, 2019. This article was peer reviewed. All URLs were available at the time of submission.

For correspondence: Nancy Greer, School of Health, Medical and Applied Sciences, CQ University Australia, Melbourne, Victoria, Australia. E-mail: n.greer@cqu.edu.au

Competing interests: None declared (all authors).

Ethics approval: Not required.

Acknowledgements: This research was supported by an Australian Government Research Training Program Scholarship.