

Gamers Who Gamble:

Examining the Relationship Between Esports Spectatorship and Event Wagering

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During recent years, while electronic sports (esports) has increasingly become a positive mainstream cultural phenomenon, it also may have several socio-economic implications, such as the growth of esports betting. Much like betting in sport, betting on esports has become a prominent form of gambling. However, there is still a paucity of knowledge on the demographic characteristics of this gambling cohort, particularly in regard to its relationship to video game play and spectatorship. In the present study, past-year video gamers ($N = 1368$) completed an online survey. Survey questions inquired about their esports event spectating, video game play, and esports betting behaviours, as well as general demographic questions. Video gamers who bet on esports were a distinct cohort from their counterparts: younger, more likely to be male, lower frequency of video game play, higher frequency of esports spectatorship, and more likely to watch esports in a social setting (e.g., with others). By providing a background on gamers' behaviours this work contributes to the growing body of research into the dynamic profile of esports play, spectatorship, and gambling. Findings are reflective of the growing interrelation of gambling and gaming behaviours, a subject garnering increasing attention from governments, regulatory agencies, public health specialists and clinicians, and the related industries themselves.

Keywords: esports, spectatorship, betting, gaming, video games, gamblification

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Introduction

According to popular estimates produced by consultancies and market survey companies, the global esports market has grown rapidly, from estimated market revenues of \$124M in 2014 and \$325M in 2015, to over \$900M in 2018 (NewZoo, 2018). This rapid growth in esports and related video games has been fuelled by snowballing social media presence and mainstream media exposure (Hallmann & Giel, 2018; Jenny et al., 2018). As esports has grown, a parallel gambling industry has emerged. Current estimates value the esports gambling market at several times the size of the esports market itself (Eilers & Krejciak, 2018). Esport, sport, and gambling stakeholders have expressed interest in this new market potential, inspiring extensive market research (see, e.g., Eilers & Krejciak, 2018; NewZoo, 2018; SuperData Research, 2015). Academic research on esports consumers' gambling behaviours, however, is limited in scope. Such research is primarily focused on the convergence of video gaming and gambling and the potential harms that may result from this trend (King, Delfabbro, Kaptsis, & Zwaans, 2014; Peter, Li, Pfund, Whelan, & Meyers, 2018).

These works are important to gambling discourse and make valuable contributions to the field of study. However, if the goal is to provide a holistic perspective of esports fandom and esports betting, researchers should conduct more focused investigations of the specific activities found in and around esports. This enables these practices to be located within the wider conceptual framework while revealing distinct characteristics of both the consumption practices and their participants. Furthermore, esports has only recently emerged as major means of entertainment. In North America, for example, the League of Legends Championship Series began in 2011 (Riot Games, 2019), while the global Overwatch League is only in its second season (Overwatch League, 2018) and Fortnite, one of the most popular recent video game releases, held its inaugural World Cup in 2019 (Epic Games, 2019).

Many bets on esports events have formats similar to those on bets on traditional sporting events (e.g., bets on single games or matches, such as those in the Overwatch League or the English Premier League; in-play wagers such as the next competitor to get a kill in Overwatch or the next footballer to score a goal). The discussion on similarities and differences with sport consumption and sports betting is still ongoing (see, e.g., Editorial Board, 2018). Developing baseline profiles of those who participate in this emerging field are key to understanding if, and in what ways, participants differ from other cohorts. As such, this paper examines the esports media consumption habits of participants, including video games and esports spectating and play, and esports betting behaviours.

Video Gamers and Esports Consumers

The study of video game and esports consumers is somewhat under-represented in academic literature, largely due to the relatively recent emergence of esports. In esports, consumers occupy a space that can incorporate elements from a range of discrete activities: they can be both consumers of content and producers of content, they can be both spectators and players, and they can be both athletes and fans. The professionalisation of streaming video game play (whether it be competitive esports or competitive play in a casual setting) has also grown in popularity (Johnson & Woodcock, 2019). There is great scope for

movement between amateur and professional status in this type of setting, wherein a player can join the ranks of “professional” by monetizing their game play, even if it is not via participation in competitive events, such as the Fortnite World Cup (Johnson & Woodcock, 2019; Seo & Jung, 2014). As such, the majority of esports spectators and bettors are likely to play the games themselves.

Early research into esports has often addressed the nature of spectating, with a particular focus on the role of the player/consumer (Taylor, 2012; Taylor & Witkowski, 2010; Witkowski, 2012). Despite the fact that esports is increasingly addressed in academic journals, the profile of those who consume modern esports is still being developed. Attention has thus far been paid to issues such as gender (Ruvalcaba, Shulze, Kim, Berzenski, & Otten, 2018), regionality (Gibbs, Carter, & Witkowski, 2017), and participation in gambling (Gainsbury, Abarbanel, & Blaszczynski, 2017a, 2017b; Macey & Hamari, 2018; Sanders & Williams, 2018).

Esports spectators match mainstream sports in terms of engagement. Their importance as content consumers is apparent from the amount of attention they have received from businesses and market research companies (Eilers & Krejcik, 2018; NewZoo, 2018; Trefis, 2018). This accumulation of data, primarily in the form of market reports, promotes the narrative that esports consumers fit the young, millennial mould that is both marketable and easily marketed towards. This picture of esports consumers (inclusive of players, spectators, bettors, etc.), is largely supported by academic research in the area. Current data appears to suggest an even heavier skew towards young, male consumers than that presented in market research reports (Gainsbury et al., 2017a, 2017b; Macey & Hamari, 2018, 2019).

Betting and Spectatorship in Sport and Esports

Esports spectators provide the baseline for perceived value in the esports product. When spectators can view popular live streams of esports matches for free, revenues are derived primarily from advertising and sponsorship rather than broadcast rights (Burk, 2013). And these live streams have global reach. The peak of concurrent viewership for the League of Legends 2018 World Championships, for example, reached over 200 million individual spectators from across the Americas, Europe and Asia (Esports Charts, 2018). Such a widespread distribution means that non-endemic organizations, such as betting operators, can market their product on a large scale.

In addition, marketing opportunities exist in individual live streaming through platforms like Twitch.tv. Professional players are often active online streamers, allowing followers a direct line of communication with the pros and other like-minded fans (Hamari & Sjöblom, 2017). People who watch others play online are an attractive audience to marketing professionals. They tend to be younger and intellectually motivated, demonstrating an excitement for learning through their fandom (Hamari & Sjöblom, 2017). They are also active on social media platforms (Sjöblom, Hassan, Macey, Törhönen, & Hamari, 2018). Esports game replays, highlight reels, and commentary and analysis videos are readily available on many social media platforms, such as YouTube (Takahashi, 2018).

The entertainment value, social media marketing, and brand influencer power also contribute to the growth of competitive gaming into new play platforms (Jenny et al., 2018; Sjöblom et al., 2018). Gaming

play and spectatorship in Asia has now significantly expanded into mobile esports, in which games are played on mobile devices. Mobile esports is organized similarly to the mainstream PC-based esports brands, with the competitive titles having their own invitational leagues, live arena events, and a rapidly growing fan base (NewZoo, 2018).

The popularization of esports has been likened to that of traditional sports due to the way in which technological advances have facilitated mass consumption (Carter & Gibbs, 2013). Indeed, the act of spectating is a key characteristic in the conceptualization of modern sports (Carter & Gibbs, 2013; Sutton-Smith, 2001). Gambling is also an activity intrinsically linked to the consumption of sports (Wann, Melnick, Russell, & Pease, 2001). Records show that gambling has accompanied sporting events for thousands of years (Forrest & Simmons, 2003; Hill & Clark, 2001; McClelland, 2013). As such, active participation in gambling can be interpreted as an extension of sporting competition, that it is itself a form of play (Abt, McGurrin, & Smith, 1984) and a means for acquiring wider social status (Geertz, 1972; Hill & Clark, 2001). Short term effects of gambling advertising in sport and esports have been observed too. Prominent display of gambling-operator branding at esports events, for example, can have an immediate, positive impact on betting handle (Eilers & Krejcek, 2018).

This relationship between gambling and sporting competition is a complex one. Gambling has led to formalized structures of conduct on and off the field of play, as well as providing a source of revenue for sports. Such benefits are countered, however, by the potential for corruption and associated illegal activities (Forrest & Simmons, 2003; McNamee, 2013). At the individual level, in particular, there is the potential for problematic behaviours to develop. The interaction of gambling and esports displays a similar developmental trajectory, with increased availability and participation in gambling leading to concerns regarding legitimacy, illegality and the possibility for problematic behaviours to arise (Holden, Rodenberg, & Kaburakis, 2017; Martinelli, 2017; Peter et al., 2018; Sylvester & Rennie, 2017).

The majority of gambling is recreational. Researchers have identified a few ways that gambling has added potential motivations to the experience of consuming sports. The most obvious motivation is winning money (Neighbors, Lotstutter, Crounce, & Larimer, 2002; Wann et al., 2001). Another strong motivation is a high level of identification with a given team. Fans interested in a particular team or individual are more likely to place wagers on them (Mahan III, Drayer, & Sparvero, 2012; Paul & Weinbach, 2010). Conversely, it has also been shown that increased opportunities and participation in gambling also lead to higher levels of sport consumption (Funk, Nakazawa, Mahony, & Thrasher, 2006; Nelson et al., 2007; Nesbit & King, 2010). While directionality may not always be clear, it is apparent that gambling and sports spectatorship maintain a closely intertwined relationship. This relationship in the esports setting is likely to be most evident in the practice of sportsbook-style betting (e.g., single event, in-play, etc.), in the same way as with spectatorship of traditional sports.

Esports and Video Game-Related Gambling

Links between gambling and video games have existed for almost as long as the games themselves, from potential comorbidity of problematic behaviours to business opportunities afforded by

emergent forms of gambling (Huff & Collinson, 1987; Pips, 2013). It is only recently that gambling activities directly related to video games have become formalized and, as a result, widely available. The true scale of gambling related to video games and esports is difficult to gauge effectively. Market estimates for esports- and video-games-related gambling vary greatly, ranging from approximately \$2.3 billion (Eilers & Krejciak, 2018) up to \$50 billion (Juniper Research, 2018). Those who conduct this analysis agree that a large part of the market is based on gambling with skins on unregulated gambling sites. The use of skins for gambling, however, fluctuates in value significantly. Game developers like Valve Corporation, for example, have taken action to reduce the ease of use of skins for gambling purposes through trade restrictions (Mallow, 2018). As the underlying methodology for market research is often opaque in nature, we cannot say with certainty that these estimates adequately account for game developers' actions regarding skins.

The rapid growth of online and mobile technologies has facilitated the emergence of a range of gambling activities associated with esports, which encompass several distinct forms. These forms include 1) the direct translation of traditional forms, such as betting, 2) activities specific to the context of video games, such as head-to-head betting or the use of in-game items (*skins*) as wagers, and 3) completely new forms of gambling, such as crash betting, in which the player must choose when to cash out of a wager before the game “crashes” to zero (Macey & Hamari, 2019). The current situation, however, is in a state of flux. Growing media attention and financial investment in esports and betting has resulted in both heightened demands for professionalization at all levels (see, e.g., Abarbanel & Johnson, 2018; Smith, 2016) and increased attention from legislators and regulators (Gambling Commission, 2018).

Legal Context

The convergence of video gaming and gambling (Gainsbury et al., 2015; King, Delfabbro, & Griffiths, 2010; Macey & Hamari, 2019) has resulted in increased attention from media, politicians and national regulators, with legislation already being enacted in several European territories and bills on the floor of the United States' Congress. Despite the multi-faceted nature of video game-related gambling (Macey & Hamari, 2019), current legislative efforts are directed exclusively at the in-game item known as “loot boxes,” a catch-all term referring to a mechanism for distributing in-game rewards via a random number generator. Esports gambling is a term that is often used to refer to such forms of gambling and gambling-like behaviour. This may be somewhat misleading, however, as the majority of such activities are not directly connected to esports. Instead, the majority are associated with games that also happen to be popular esports titles, (e.g., *CounterStrike: Global Offensive* (CS:GO)). The only true form of esports gambling is betting on the outcome of esports events, such as individual matches, tournaments, etc. The majority of esports betting requires no new interpretation of gambling legislation as it simply replicates established gambling practices in a new context. There is one aspect, however, which is deserving of further attention: the use of virtual items, such as *skins*, as stakes in betting events. Given that established definitions of gambling frame the practice in terms of monetary loss or gain, the use of virtual items is a practice that somewhat muddies the waters. This is particularly the case in situations where these virtual items cannot be exchanged for real world currencies. In 2016, the publisher of CS:GO was the subject of a series of legal actions related to the use of virtual items in third-party gambling sites (Holden and Ehrlich, 2017; Martinelli,

2017). The primary outcome of these cases was to establish the fact that virtual items do not constitute items of value in US law, unlike some other territories, such as the United Kingdom (Holden and Ehrlich, 2017). The situation has become even more complex with the creation of items such as “VGO skins,” which are visually indistinguishable from other skins, but were created solely to be traded and were not, originally, used in any games. In essence, they are a fiat currency masquerading as in-game items (Abarbanel and Macey, 2019). Consequently, as these new contexts of gambling are being exploited, and as new forms of gambling continue to emerge, it is likely that underlying concepts of *value* and *risk* will require ongoing renegotiation.

The Current Study

In light of the literature review, this study asks the following research question: Is there a relationship between video gaming behaviour, esports spectatorship behaviours, and esports event wagering behaviours? Recent works have begun to examine gambling behaviours associated with esports, with consumption of esports having been found to be positively associated with a range of gambling behaviours (Macey & Hamari, 2018). The work presented here expands on this view to assess the gambling behaviour of video gamers more broadly and incorporate their esports spectating behaviours.

Using a data set collected from a sample of participants who had played video games or watched esports at least once in the prior 12 months, this study analyses the interrelationship between video gaming behaviours, esports spectatorship, and propensity to bet on esports.

This work addresses the specific practice of sportsbook-style betting on esports events, rather than encompassing all gambling activities associated with esports. The reason for this approach is twofold: first, that existing research has found evidence of associations between spectating traditional sports and betting; second, that many activities are included under the umbrella term of “esports gambling,” however, there is no commonly accepted definition of this term. Indeed, research has shown that engagement (e.g., time and money spent) with esports is shown to positively correlate with some activities, such as betting, but negatively correlate with others, such as paying to open loot boxes (Macey & Hamari, 2019).

Given the extant research indicating the relationship between sport and competition spectatorship and betting behaviour, we hypothesize that a similar relationship will be present in this analysis of esports spectatorship and betting behaviour. Results presented here will contribute to the growing body of literature that looks at the convergence of gambling and (video) gaming, incorporating both play and spectatorship behaviours. This work will investigate if the relationship between esports and betting replicates that in sports and betting, or if the relationship is a novel one. These results can also inform fields beyond the academic sphere. Governments, regulatory agencies, public health specialists and clinicians, and industry can all make more informed decisions in their practice when equipped with clearer knowledge of the relationship between esports consumption and betting behaviours.

Materials & Methods

Setting

Data was collected via an online survey, which was distributed to participants recruited from an online panel maintained by Qualtrics, a market research company. The data collection occurred in April 2018. Inclusion criteria stipulated that participants were aged 18 years or older, and that they had played or watched video games during the prior 12 months. Potential participants received an informed consent form indicating participation was completely voluntary and that participants could withdraw at any time. Participants had to acknowledge the consent form before accessing the survey. Ethics approval for this research was received from the Institutional Review Board at University of Nevada, Las Vegas.

Participants

The sample consisted of 1368 participants who indicated that they had played video games during the prior 12 months. Respondents were predominantly: male (62.2%); had income levels under \$50,000 (56.9%); had education levels at high school or some college/university (57.4%); and were fairly evenly split across marital status. Age ranged from 18 to 80, with a mean age of 37.83 ($SD = 13.85$).

Measures

Esports Event Betting Behaviour. A fixed-choice question asked if respondents had placed a wager on an esports/video gaming event, which was then used to create the two groups for comparison. This question specifically asked about wagering on competitive esports events, and not in-game gambling nor simulated-gambling behaviours (e.g., peer-to-peer wagering or loot box opening). For purposes of this inquiry, the focus is solely on the esports event betting behaviour (or lack thereof) of the respondent sample.

Video Gaming Behaviour. Respondents were asked to indicate if they had played video games during the prior 12 months, how frequently they played, the game genres that they play (including first person shooter, multiplayer online battle arena, real time strategy, collectible card games, fighting games, sports games, casual games, and massively multiplayer online role-playing games), and with whom they play.

Spectating Behaviour. Respondents were asked to indicate if they had watched an esports event during the prior 12 months, how frequently they watch esports, the game genres that they watch (same categories as above), and with whom they watch esports.

Demographics. Measures included age, gender, education level, household income, and marital status.

Data Analysis Procedure

Data was entered and analysed using SPSS 25. Assumptions testing was conducted on the measured variables for esports bettors and non-esports bettors, including skewness and kurtosis, univariate outliers, multivariate outliers (Mahalanobis distance), linearity, and multicollinearity. Two multivariate

outliers and 11 univariate outliers were found and removed from the dataset. Missing values (N=208 for multivariate analysis) were excluded on a listwise basis.

Chi-square tests (used for all categorical dependent variables) and t-tests (used for the continuous *age* dependent variable) were used to investigate if group differences existed between gamers who bet on esports and those who did not, for single-response demographics, video game play, and esports spectating behaviours. For group comparisons where the assumption of homogeneity of variance was violated, a Satterthwaite approximation for the degrees of freedom was used. Following these comparisons, a logistic regression was conducted to investigate whether a statistically significant relationship exists between esports spectatorship behaviours and esports event wagering behaviours.

For comparison testing in chi-square and t-tests, we used a significance level of 0.05. For each t-test we calculated Cohen's *d*, considering absolute values of 0.2, 0.5, and 0.8, to correspond to small, medium, and large effects, respectively. For each chi-square test, we calculated the phi coefficient, considering absolute values of 0.1, 0.3, and 0.5 to correspond to small, medium, and large effects, respectively. Some variables were not conducive to these analytical procedures (i.e., questions offered multiple response options and thus percentage responses sum to more than 100%). For these variables, frequency percentages are provided without statistical comparisons. Following the omnibus tests, standardized residuals (± 2) were examined to determine where cell differences lie.

Results

Demographics

Those who bet on esports were, on average, younger than those who did not (did bet: $M = 32.11$, $SD = 9.51$, did not bet: $M = 38.60$, $SD = 14.10$), with the former statistically younger than the latter ($t(216.68) = -7.131$, $p < .001$, $d = 0.54$). Respondents were also more likely to be male ($\chi^2(1, N = 1245) = 15.84$, $p < 0.001$, Φ

$= 0.11$), and single ($\chi^2(5, N = 1248) = 12.82$, $p = 0.025$, $\Phi = 0.10$). There was no significant difference between the groups with regard to education level (see Table 1).

Chi-square tests also indicated a significant difference in income categories between the 2 groups ($\chi^2(6, N = 1221) = 17.122$, $p < 0.001$, $\Phi = 0.12$), with the number of esports bettors significantly higher in the \$50,000-\$69,999 and \$70,000-\$89,999 income groups.

Table 1 – Demographic profiles, $N = 1292$ respondents

	Esports bettors ($N = 140$) (%)	Non-esports bettors ($N = 1188$) (%)
Gender		
Male	77.8*	60.2
Female	22.2*	39.8
$p < 0.001$ ($\chi^2 = 15.84$, $df = 1$)		
Education		
Less than High School/Equivalent	3.0	5.4
High School/Equivalent diploma	34.1	29.9
Some College or University	24.2	27.2
2-year University or College degree	5.3	10.5
4-year University or College degree	22.7	18.6
Graduate Degree	10.6	8.3
$p > 0.05$		
Family Household Annual Income		
Less than \$30,000	27.1	34.6
\$30,000-\$49,999	15.5	23.9
\$50,000-\$69,999	21.7*	14.0
\$70,000-\$89,999	15.5*	8.6
\$90,000-\$124,999	8.5	9.8
\$125,000-\$199,999	4.7	4.1
\$200,000 or more	7.0	4.9
$p < 0.01$ ($\chi^2 = 17.12$, $df = 6$)		
Marital Status		
Single	45.5	35.7

Married	43.3	40.4
Unmarried, living with significant other	5.2	10.1
Separated	0.0	2.0
Divorced	5.2	9.3
Widowed	0.7	2.5
$p < 0.05$ ($\chi^2 = 12.82$, $df = 5$)		

Note. Asterisks indicate where standardized residuals exceeded ± 2 for cell differences within each variable.

Video Gaming Behaviours

Table 2 displays the univariate comparisons for video gaming behaviours. Respondents who bet on esports were more likely to play video games once per week ($\chi^2(5, N = 1282) = 11.13, p < 0.05, \Phi = 0.09$), and to play games with others ($\chi^2(2, N = 1274) = 37.231, p < 0.001, \Phi = 0.17$). There was no significant difference between groups with regard to past 12-month video game play, an expected result given the qualification requirement for the survey. The most popular video game genre for esports bettors was first person shooter games (42.0%), followed by fighting games (41.4%), sport simulation games (40.7%), and casual games (40.7%). The most popular video game for other respondents, meanwhile, was casual games (52.9%), followed by first person shooter games (37.6%).

Table 2 – Video Gaming Behaviour, $N = 1292$ respondents

	Esports bettors ($N = 140$) (%)	Non-esports bettors ($N = 1188$) (%)
Past 12 Months Video Game Play		
Yes	98.6	97.2
No	1.4	2.8
$p > 0.05$		
Video Gaming Frequency		
Less than once per month	3.6	4.8
Once per month	6.6	4.4
1-3 times per month	9.5	9.9
Once per week	17.5*	9.3

2 times or more per week	21.9	23.6
Daily	40.9	48.0
$p < 0.05$ ($\chi^2=11.13$, $df = 5$)		
Video Game Genres Played		
First Person Shooter	57.9	37.6
Multiplayer Online Battle Arena (MOBA)	27.1	7.3
Real Time Strategy	26.4	15.8
Collectible Card Games	33.6	24.3
Fighting Games	41.4	25.7
Sports Simulation Games	40.7	27.6
Casual Games	40.7	52.9
Massively Multiplayer Online Role-Playing Games (MMORPG)	20.7	17.5
Video Game Play With Others		
Plays alone	37.7*	64.4
Plays with others	37.7*	21.3
Plays alone and with others	24.6*	14.3
$p < 0.001$ ($\chi^2=37.23$, $df = 2$)		

Note. Video game genres played was offered as a multiple response question. Asterisks indicate where standardized residuals exceeded ± 2 for cell differences within each variable.

A statistically significant difference existed in the number of video game genres played for those who bet on esports ($M = 2.89$, $SD = 2.13$) and those who do not ($M = 2.09$, $SD = 1.62$), with the former more likely to play more game genres than the latter ($t(158.63) = 4.29$, $p < .001$, $d = 0.42$).

Esports Spectatorship Behaviour

As can be seen in Table 3, those who bet on esports were significantly more likely to have ever watched an esports event (90.0%) than non-esports bettors (42.3%; $\chi^2(1, N = 1328) = 114.11$, $p < 0.001$, $\Phi = 0.29$). Those who watched esports in a mixed social capacity (i.e., alone and with others vs. only alone), were more likely to bet on esports events ($\chi^2(2, N = 615) = 15.26$, $p < 0.001$, $\Phi = 0.16$), as were those who watched daily compared to less than once per month ($\chi^2(5, N = 609) = 30.84$, $p < 0.001$, $\Phi = 0.23$).

The most popular watched game genre for all respondents was first person shooter games (bettors 52.1%/ non-bettors 21.0%), followed by sport simulation games (bettors 42.9%/ non-bettors 17.4%) and fighting games (bettors 35.7%/ non-bettors 13.5%).

Table 3 – Esports Spectating Behaviour, $N = 1292$ respondents

	Esports bettors ($N = 140$) (%)	Non-esports bettors ($N = 1188$) (%)
Past 12 Months Esports Spectatorship		
Yes	90.0*	42.3*
No	10.0*	57.7*
$p < 0.001$ ($\chi^2 = 114.11$, $df = 1$)		
Esports Spectatorship Frequency^a		
Less than once per month	1.6*	15.1
Once per month	11.1	11.6
1-3 times per month	13.5	19.5
Once per week	15.1	14.3
2 times or more per week	22.2	20.7
Daily	36.5*	18.8
$p < 0.001$ ($\chi^2 = 30.84$, $df = 5$)		
Esports Game Genres Watched^a		
First Person Shooter	52.1	21.0
Multiplayer Online Battle Arena (MOBA)	25.7	6.1
Real Time Strategy	26.4	8.4
Collectible Card Games	29.3	8.2
Fighting Games	35.7	13.5
Sports Simulation Games	42.9	17.4
Casual Games	25.0	8.4

Massively Multiplayer Online Role-Playing Games (MMORPG)	15.0	7.6
Esports Spectatorship with Others^b		
Watches alone	24.4*	42.5
Watches with others	51.2	42.7
Watches alone and with others	24.4*	14.8
$p < 0.001$ ($\chi^2=15.26$, $df = 2$)		

Note. Asterisks indicate where standardized residuals exceeded ± 2 for cell differences within each variable. ^aEsports game genres watched was offered as a multiple response question. ^b Respondents who indicated that they do not watch esports were not included in cross tabs for frequency and social measures so as to avoid artificial significance due to significant difference between those who watch and those who do not.

There was a significant difference in the number of game genres watched for those who bet on esports ($M = 2.52$, $SD = 1.98$) and those who do not ($M = 0.91$, $SD = 1.46$), with the former more likely to play more game genres than the latter ($t(157.42) = 9.35$, $p < .001$, $d = 0.92$).

Multivariate Analysis

A logistic regression was applied to determine which demographic, video gaming behaviour, and spectating behaviour characteristics statistically differentiated gamers who bet on esports from those who do not bet on esports. A total of 11 predictor variables were used: gender, age, education level, income, marital status, history of video game play (frequency of video game play, with whom respondent plays games, number of video game genres played), and history of spectating esports (frequency of watching esports, with whom respondent watches esports, number of video game genres watched).

Categorical variables were dummy coded using the following reference groups: gender (female), education level (graduate degree), marital status (single), gaming and spectating frequency (daily), gaming and spectating social activity (only watch/play with others).

The test of the overall model was statistically significant, $\chi^2(30, N = 1157) = 205.12$, $p < 0.001$, indicating that, altogether, these predictors reliably distinguish between the two groups. The Hosmer and Lemeshow Test was not significant ($p > 0.05$), indicating a good model fit, and Nagelkerke $R^2 = 0.34$. The Gamma statistic for the regression model was 0.856, meaning 85.6% fewer errors are made in predicting which respondents bet on esports by using the estimated probabilities than by chance alone. The regression

variables were assessed for multicollinearity using Variance Inflation Factors (VIF). VIF values for all variables were under 3.5, indicating multicollinearity was not problematic in the analysis (Allison, 2001).

Table 4 provides regression coefficients, Wald statistics, significance level, and odds ratio for each of the predictor variables, including subcategories for all categorical variables. Controlling for all other variables in the model, the significant predictors that differentiate those who bet on esports from those who do not ($\alpha = 0.05$) include: gender, age, video gaming frequency (particularly, those who play less frequently compared to those who play daily), esports spectatorship frequency (particularly, those who watch daily compared to those who play less frequently), and spectatorship socialization (particularly, those who watch esports with others compared to watching alone).

Table 4 – Logistic regression of characteristics differentiating participants who bet/do not bet on esports
N= 1157

Predictor Variable	B	Wald	Significance Level	Odds Ratio
Gender	0.672	6.148	0.013	1.959
Age	-0.026	4.551	0.033	0.974
Education Level		6.224	0.285	
Less than High School/Equivalent	-1.444	3.601	0.058	0.236
High School/Equivalent diploma	-0.231	0.275	0.600	0.793
Some College or University	-0.319	0.512	0.474	0.727
2-year University or College degree				
	-1.001	2.846	0.092	0.367
4-year University or College degree				
	-0.381	0.756	0.385	0.683
Income	0.017	0.325	0.569	1.017
Marital Status		2.599	0.761	
Married	0.122	0.220	0.639	1.130
Unmarried, living with significant other				
	-0.581	1.541	0.214	0.559
Separated	-18.906	0.000	0.998	0.000
Divorced	0.383	0.452	0.502	1.466
Widowed	-0.100	0.007	0.931	0.905
Video Gaming Frequency		14.966	0.011	
Less than once per month	0.913	1.903	0.168	2.491

Once per month	1.279	5.140	0.023	3.594
1-3 times per month	0.611	1.608	0.205	1.842
Once per week	1.331	12.197	0.000	3.786
2 times or more per week	0.819	7.119	0.008	2.268
Video Game Play With Others		0.411	0.814	
Plays alone	-0.118	0.177	0.674	0.889
Plays alone and with others	0.090	0.059	0.808	1.094
Number of Video Game Genres Played				
	-0.015	0.039	0.844	0.985
Esports Spectatorship Frequency		21.107	0.001	
Less than once per month	-2.819	12.366	0.000	0.060
Once per month	-1.164	5.570	0.018	0.312
1-3 times per month	-1.541	12.385	0.000	0.214
Once per week	-1.223	8.240	0.004	0.294
2 times or more per week	-0.888	6.392	0.011	0.412
Esports Spectatorship with Others		49.810	0.000	
Plays alone	-3.464	46.572	0.000	0.031
Plays alone and with others	-0.895	8.725	0.003	0.409
Number of Esports Game Genres Watched				
	0.098	1.182	0.277	1.103

Note. Significant variables are identified in bold.

Discussion

Consistent with prior research on gambler characteristic profiles, esports bettors display some defining characteristics that differentiate them from non-esports bettors in a gaming population. Gamers who bet on esports are more likely to be: younger, male, single, and to report higher incomes. Esports bettors were more likely to: play games once a week, play more genres of games, play games with others, watch esports events, watch esports with others, and to watch esports more often than those who do not bet on esports.

The finding that esports bettors are characterized as young males echoes results of previous studies on sports and online betting behaviours (Fang & Mowen, 2009). We note that other research has found that women comprise a higher proportion of esports bettors than sports bettors, even when results also find a younger male demographic to be most likely (Gainsbury et al., 2017a; Macey & Hamari, 2018; Wood

& Williams, 2012). This work did not compare gamblers' game preferences, so it can neither support nor refute that specific finding. In the profile representation of younger age groups, male gender, higher income levels, and more frequent gambling behaviour, esports bettors in this gamer population are similar to early adopters of Internet gambling (Wood & Williams, 2012). These parallels suggest that esports betting may similarly grow in popularity. Indeed, this trend can already be seen in growth patterns reported by sports books (Souza, 2015).

That esports bettors are more likely to play more genres of games than non-bettors appears to be couched in the context of engagement. That is, the idea that those who are more interested in games play more often and, consequently, identify more strongly as "gamers". The finding also replicates previous prevalence study findings that video game players were more likely to gamble (generally, as measured across all gambling games) than non-gamers (McBride & Derevensky, 2016). One way in which this sense of identification manifests itself is through participation in esports event betting. This parallels the way traditional sports fans demonstrate their allegiance to a given team, or knowledge of the sport in general, by wagering money on events such as individual matches or tournaments (Wann et al., 2001).

This interpretation is further reinforced when we consider the rates of play by individual game genre for both bettors and non-bettors. Esports bettors reported playing the most popular esports games (i.e., MOBA, FPS, RTS, Fighting Games; (NewZoo, 2019)) at higher rates than non-esports bettors. This pattern was also seen in reported rates for spectating these game genres. Finally, the interpretation that betting on esports is a way of both demonstrating, and gaining, social capital (Hamari & Sjöblom, 2017) is supported by the finding that those who watch esports with others are statistically more likely to both play games and watch esports in a social context, rather than alone.

When considering the logistic regression results, a finding of particular note was that frequency of video game play, frequency of esports spectating, and social esports spectating were all found to be statistically significant predictors of participation in esports betting. These results fall in line with prior findings that gambling and sport spectatorship behaviours are related (Mahan III et al., 2012; Neighbors et al., 2002; Paul & Weinbach, 2010; Wann et al., 2001; Wann, Schrader, & Wilson, 1999). These findings suggest that interest in esports spectatorship makes gamers more likely to place wagers on esports events. While directionality of this relationship is not necessarily provided by the analysis here, we can state that esports spectating behaviours have a significant relationship with esports wagering activity. This phenomenon may be related to the level of gambling advertising and sponsorship in esports and its observed, immediately-positive effects on the betting handle at sites that advertise during and/or sponsor major esports events (Eilers & Krejčík, 2018).

While this study did not conduct a causal analysis, it does open up discussion on the directionality of the esports and betting relationship. Are those who bet on esports a new group of gamblers? Or are they a group who already gambles, and esports wagering is a new opportunity for them to place wagers? The finding that esports bettors are younger and more likely to be esports spectators suggests that the group is likely a new cohort of gamblers, making them a new potential target audience for wagering operators. We additionally note that younger populations have been identified as more vulnerable to problematic gambling

behaviours, particularly in online settings (Gainsbury, Russell, Wood, Hing, & Blaszczynski, 2014; King et al., 2014; McBride & Derevensky, 2016). Given this cohort's higher gambling involvement, it is important that these wagering operators maintain consumer protection standards and responsible gambling tools for managing the potential risks related to betting.

Limitations

Conclusions and implications from this study should be interpreted with certain limitations in mind. The sample for this study was self-selected from a survey panel recruitment process, and may not be representative of the broader population of video gamers who bet on esports events. The survey used in this study was pilot tested and replicated some questions used in previous research, but it has not been validated. In addition, the cross-sectional nature of this study precludes extrapolation of causal relationships between video game playing, esports spectating, and esports betting.

Betting on specific esports games and game genres was not assessed as part of this study. Differentiation between game genres could contribute valuable insights to how wagering patterns develop, particularly with regard to in-play betting. In addition, more detailed examination of the relationship between specific video games and gambling game types can provide a more nuanced understanding of the relationship between spectating esports and gambling. For example, it would be interesting to note if genre specialists are more likely to bet on esports than those without a specific game preference. Genre specialists may believe that their specialized knowledge gives them an advantage in the betting market, perhaps in the same manner of the illusion of control phenomenon (see, e.g., Leonard, Williams, & Vokey, 2015). This could be further complemented with the inclusion of more information on specific spectator behaviours, such as time spent spectating, percentage of match watched, or engagement with broadcast graphics.

The motivations underpinning gambling by cross-platform gamers is also an area deserving of future study. This would help to understand if personal investment manifests itself in ways that truly differ from those of single-platform gamers. This investment in gambling and games should also be investigated at a more granular level. While this study collected information on average session frequencies, it did not inquire as to how that time was distributed. The microtransactional nature of video gaming and some forms of esports betting may make esports bettors display a pattern of higher frequency play, while their average time and monetary spend may be lower.

During the prior research, Valve had not yet placed a time delay hold on traded items, so use of these items for immediate placement in wagering accounts was possible. In addition, gambling regulatory agencies had not yet started restricting these sites (see, e.g., Gambling Commission, 2018), and responsible gambling safeguards were limited (Gainsbury et al., 2017a). When we collected this data, the trade time-delay was in place, restricting the use of skins for immediate gambling purposes. In addition, gambling regulators and the general public had placed significant media attention on skins wagering (e.g., Grayson, 2018; Mallow, 2018; Wolf, 2016), granting a stigma to the practice. While use of skins and other virtual items for gambling purposes is still possible, it is less prevalent than in the past (Abarbanel & Macey, 2019). It is possible that participants in this study were gambling via licensed, real-money sites, which have stronger

financial controls (due to bank involvement), and compliance requirements with regard to responsible gambling tools.

Finally, this study did not investigate migration between different games – future research should consider the potential for esports bettors to migrate to or from other forms of gambling, gaming, or spectating. This study can also serve as a baseline profile of video gamers who bet on esports events, helping to define comparisons in future studies of esports gambling.

Conclusions

Esports betting has grown into a meaningful vertical that crosses over the sports betting, gaming, gambling, and esports industries. The current study describes the differentiating characteristics of video gamers who bet on esports, compared to those who choose not to. The results here contribute to the growing body of research into the dynamic profile of esports gamblers by providing a background on the esports betting behaviours of a video gaming population. In particular, this study found that frequency of video game play, frequency of esports spectating, and social esports spectating were all statistically significant predictors of participation in esports betting. While our analysis does not make claims of causality, we note similarities between esports and sport in the relationship between game play, spectatorship, and betting. We also note that these findings are reflective of the growing interrelation of gambling and gaming behaviours, a subject garnering increasing attention from governments, regulatory agencies, public health specialists and clinicians, and the related industries themselves. Finally, this work provides evidence that many betting behaviours associated with esports replicate those found to exist in the context of traditional sports. Although, it is unclear whether this situation has arisen due to socio-cultural norms surrounding the consumption of sporting activities, or whether it is the nature of competitive activity itself that promotes betting.

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