

Is Eports Spectating Associated with Gambling Behaviour?

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ABSTRACT

Esports exemplifies the evolution of digital games into a socio-economic and cultural force of global impact and can serve as context for investigating pressing issues of contemporary digital culture. The reframing of digital play as a form of sport has both highlighted and supercharged the ongoing convergence of gaming and gambling, pioneering techniques that are increasingly appearing in other digital contexts. There is increasing evidence of individuals first exposed to gambling within games subsequently developing problematic gambling behaviours, lending weight to concerns about normalisation of gambling through digital games. This research uses crosstabulation of a dataset gathered from digital games players to investigate whether esports spectating is associated with participation in a range of gambling, and gambling-like behaviours. By understanding the potential interactions, it is possible to identify those practices and forms of gamblification which impact players and whether links exist between game-related gambling and traditional gambling.

Keywords

esports, spectating, gambling, gamblification, loot boxes, betting, fan culture

INTRODUCTION

Esports has grown from the LAN parties and PC bangs of the late 20th century into a global phenomenon, with many regional esports scenes emerging around the globe, whose communities and practices are shaped by local conditions (Cote, Besombes, and Jenny 2024). While it is defined, to varying degrees and with varied caveats, as the competitive play of digital games (Nothelfer, Jenny, and Besombes 2024), the study of esports extends into multiple domains and attracts scholars from a range of disciplines. Indeed, esports can, arguably, be considered one of the most illustrative

Proceedings of DiGRA 2025

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examples of digital games' place in the contemporary world, and of the potential future for games and game play.

Esports touches upon some of the most significant issues of digital behaviours and experiences, and their relationship to questions of social, economic, and environmental sustainability (Nyström et al. 2022). These range, for example, from issues of toxicity (Donner 2024; Adinolf and Turkay 2018), equality, and identity politics (Xue, Newman, and Du 2019; Jungstedt et al. 2023), to the nature of online labour and the creative industry at large (Tokbaeva, Horst, and de la Hera 2022; Törhönen 2021; Johnson and Woodcock 2021), and the tensions between fan communities and the holders of intellectual property rights (Nyström et al. 2022). The study of esports also highlights concerns around the environmental consequences of the production and consumption of digital games, both in respect to play and spectating (Hiltscher and Möglich 2024.; Flegr and Schmidt 2022; Johnson and Woodcock 2021).

Among these many issues, the reconfiguration of digital gaming as a sport has served to highlight the growing convergence of gaming and gambling (Macey and Hamari 2019). Although not a new phenomenon, the use of gambling and gambling-like activities to drive player engagement and monetisation is most obvious in and around esports due to the inescapable presence of gambling companies as sponsors and advertisers. This process has been dubbed *gamblification* (Macey et al., 2025) and while it was first conceptualised in response to the colonisation of traditional sports by gambling, it is in digital games and gaming that the techniques of *gamblification* have been most exploited by companies (Brock and Johnson 2021). The incorporation of gambling mechanics in esports titles has also been evident in examples such as *Dota2's* "compendium"; a type of battle-pass containing, among other forms of additional content, activities distributing chance-based rewards. Previously, a percentage of the profits generated from sales of the compendium have been put towards the prize pool for *Dota2's* annual championship event *The International* (Ghazali et al. 2023). Other popular esports titles also link esports events to chance-based rewards, for example, another Valve game, *Counter-Strike 2* (formerly *Counter-Strike: Global Offensive*) provides time-limited loot boxes containing "souvenir skins" during specific tournaments which require payment to access and to open (Aallo 2022; Glaser 2022). Additionally, the game client for *PlayerUnknown's Battlegrounds* has offered an "esports tab" where players can take part in a "pick'em challenge" to earn in-game experience points and cosmetic items. As with the *International*, a percentage of venue raised by selling pick'em vouchers is put toward the prize pool for teams competing in the *PUBG Global Championship*¹.

These examples are in addition to the *gamblified* monetisation elements common across all digital games, including those which are not played as esports, including loot boxes, in-game mechanics replicating traditional gambling imagery, such as lucky spin wheels, or in-game casinos² (Macey and Hamari 2024a). Neither do these examples reflect the unregulated gambling activities provided by third parties, such as game-themed gambling and betting websites, the gambling-themed streams and videos available through platforms such as Twitch and YouTube, or the tools Twitch offers streamers (Wu et al. 2023; Abarbanel and Johnson 2020).

The intersection of digital games and gambling, therefore, takes many forms and it can be hard to escape the growing spread of gamblification. Indeed, the addition of gambling, and gambling-like mechanics, to digital games is seen by some as providing additional value to players, for example to increase excitement or the opportunity to access in-game rewards that they might not otherwise be able to afford. Indeed, some players express support for such monetisation mechanics, particularly in F2P games, stating that publishers should be able to generate revenue in whatever way they wish and that responsibility for any negative consequences lies solely on the shoulders of game players, or their parents (Macey and Bujić 2022). This perspective clearly highlights one of the central concerns raised, both by researchers and practitioners in the field of mental health and addiction; that the increasing presence of gambling in and around digital games is exploiting game players and normalising potential problematic behaviours at an increasingly younger age (King and Delfabbro 2020; Wardle 2019). Indeed, there is increasing evidence that exposure to gambling, and gambling-like activities, in digital gaming is directly associated with both increased participation in traditional forms of gambling in later life, and with the development of disordered gambling behaviours (Kim et al. 2015; Brooks and Clark 2023).

The area of digital games most penetrated by gambling is esports, not only in respect to the gamblified elements present in most popular esports titles and events, nor the presence of gambling companies as advertisers and sponsors, but also since many operators provide betting markets on esports events. As such, if the growing gamblification of digital games is associated with increased participation in gambling, any such relationships would be more strongly present among those who are more engaged with esports. This research, therefore, addresses the following research question:

RQ: Is increased spectating of esports associated with increased consumption of gambling, and of gambling-like activities, among players of digital games?

The present Study

This research will use data collected from an online survey to investigate if any relationships exist between the frequency of watching esports and a) frequency of spending money, and b) amount of money spent annually on a predefined list of gambling, and gambling-like activities. Understanding if and where any such relationships exist can help address questions relating to the potential regulation of gambling in and around digital games, and whether the increasing presence of gambling in digital games in general, and esports in particular, is potentially harmful for players. By understanding the ways in which gaming and gambling interact, it is possible to identify those practices and forms of gamblification which have most impact on players and whether links exist between game-related gambling and traditional gambling. While there is a growing body of research which investigates issues around esports gambling (i.e., betting on esports), game consumption (both active and passive), and game-related gambling, this is one of the few empirical works to specifically investigate the relationships between spectating esports and participation in a detailed range of gambling activities.

The forms of gambling investigated in this work were separated into three main types: in-game gambling, out-game gambling connected to games, and traditional gambling.

The first of these refers to gambling-like activities which are contained within a game and includes: the purchasing of loot boxes, further distinguished by those loot boxes which provide only cosmetic items as rewards and those which provide items that materially affect game play; and mechanics which replicate gambling activities, e.g., slot machines, lucky wheels, etc. which can be accessed via small in-game payments, or microtransactions. The second category, out-game gambling, refers to gambling activities which are connected to games and gaming, but are not actually contained within a game itself. This category consisted of the following activities: esports betting; skins gambling (i.e., any gambling activities using game skins as to participate), and game-themed gambling (e.g., activities such as roulette, poker, coin-flipping, etc. which used specific game imagery as “branding”). Finally, traditional gambling contained all established forms of gambling, e.g., lottery, slots, etc., and any form of betting not connected to games or game items.

While digital gaming is becoming increasingly common across all sections of society with the average age of players is steadily rising, it remains the case that gaming is more strongly associated with younger age groups. This situation is even more pronounced in respect to esports, and although estimates vary, the average age of an esports fan is often reported as significantly lower than the average age of digital game players. Esports fans are also more likely to be male, to be higher educated, and to earn more than digital game players (Offen 2024). Consequently, we hypothesise that frequency of esports spectating is: negatively associated with age, i.e., that as frequency of spectating increases, age decreases (**H1**); associated with male gender (**H2**); positively associated with income, i.e., that as frequency increases, so does reported income (**H3**); and, positively associated with educational attainment (**H4**).

Many popular esports titles incorporate some form of loot boxes which provide cosmetic items as a monetisation strategy, with many of these titles also releasing “skins” which are tied to particular events and tournaments (Aallo 2022; Zhu, Pyun, and Manoli 2024). Furthermore, it is common for the top players to use rarer skins during their competitions, thereby contributing to the social/gaming capital they afford and increasing their appeal³. As such, we hypothesise that increased frequency of spectating esports is associated with increased frequency of purchasing cosmetic loot boxes and increased spend on cosmetic loot boxes (**H5**). The situation with loot boxes is less clear, although several esports titles contain loot boxes with game-affecting contents (typically in the form of “card packs” such as in *Hearthstone*, *EA Sports FC* (formerly *FIFA*), *eFootball*, etc.), they are not as popular as other esports titles, at least as “esports” (Šimić 2023; Molina 2024). Furthermore, distributing game-affecting items through loot boxes has led to such games being criticised as “pay-to-win”, further restricting their appeal for many digital game players (Mattinen, Macey, and Hamari 2023; Freeman et al. 2022). Accordingly, we hypothesise that frequency of esports spectating is associated with increased frequency of purchasing game affecting loot boxes, and annual spend on game affecting loot boxes, but that the relationships are expected to be weak (**H6**). The use of in-game mechanics which replicate both established gambling activities such as the spinning reels of slot machines, “lucky wheels”, dice rolls, etc., is a widespread practice. Indeed, it is particularly common among mobile F2P games (Johnson and Brock 2020). Given the proliferation of such in-game mechanics, and the limited popularity of mobile esports (although we acknowledge the growing popularity of mobile esports, particularly in

regions such as South America and Asia), we hypothesise that: there is no relationship between increased frequency of spectating esports and either frequency of paying or annual spend on in-game mechanics representing gambling **(H7)**.

The relationship between engagement with a sport and betting on outcomes and events connected to that sport is both clear and obvious and well-established, indeed sports betting is often a significant aspect of many fan cultures and can take many forms (Deans et al. 2017; Tussey 2023). Fans may choose to place wagers on their teams as a form of support, they may bet against their teams to mitigate possible loss with winnings, they may want to demonstrate their expert knowledge and insight, as such the motivations for sports betting are many and varied (Lamont and Hing 2020). Accordingly, we hypothesise that increased frequency of spectating esports is associated with increased frequency of esports betting, and increased annual spend on esports betting, furthermore, this association is expected to be stronger for esports betting than for any other activity **(H8)**. As discussed above, cosmetic items known as skins are a common part of most contemporary games, and esports is no exception. The financial value assigned to some skins through online marketplaces means that they can also be used in place of real-world or digital currencies as stakes in a range of gambling activities provided by third party websites not directly connected to the games themselves. CS: GO is an example of a popular esports title that has historic associations with the skins gambling scene (Greer et al. 2019). While not all esports titles have skins, and not all those that do allow third-party gambling sites to access their API, this work hypothesises that frequency of spectating esports is positively correlated with frequency and annual spend on skins betting **(H9)**. In addition to skins gambling, third-party sites also provide users the opportunity to take part in gambling activities that use the aesthetics and iconography of popular esports titles to brand these gambling games (Macey and Hamari 2019). While these sites are not necessarily connected to any of the games and likely operate without the knowledge or consent of the IP holders, they are designed to appeal to fans of specific digital games popular as esports, and they are often present or visible in many online discussion forums dedicated to esports (Macey et al. 2021). Therefore, we hypothesise that increased frequency of spectating esports is associated with increased frequency of participation in game-themed gambling, and increased annual spend on game-based gambling activities **(H10)**.

Finally, the highly visible presence of the gambling industry in and around esports has been highlighted as having the potential of normalising gambling as an activity, indeed such concerns reflect the original sense of the term gamblification in (McMullan and Miller 2008). There is an increasing amount of evidence supporting this concern, with both clinical and social services reporting growing numbers of individuals seeking treatment for problematic gambling whose first experiences of gambling were through digital games (Von Meduna et al. 2020). It is expected that frequency of spectating esports is positively associated with both frequency of participation in traditional gambling activities, and annual spend on traditional gambling **(H11)**.

METHOD

Participants and procedure

This study uses data collected via an online survey during autumn 2023. The survey was promoted through social media channels, such as *Facebook*, *Instagram* and *Reddit* to recruit participants, with this approach complemented by using the paid recruitment service *Prolific*. Respondents were required to have played digital games at least once in the previous 12 months in order to participate in the survey and an approximately equal split between males and females was requested from *Prolific*.

The survey was available in English only, and it asked respondents about their experiences and attitudes towards digital gaming, gambling and gambling-like activities found in digital games. The survey included three attention checks, with those who failed two of the three checks being excluded from the sample; additionally, those respondents who reported “never” to playing both “free-to-play” games and “pay-to-play” games in the past 12 months were omitted. As such, from the total 831 responses received; after data cleaning, including the removal of incomplete responses, outliers, and those that failed eligibility checks, the final data sample consisted of 774 valid responses.

In addition to basic demographic information, age, gender, nationality, annual income, education level the survey included measures of engagement with: esports spectating, digital game play, traditional gambling, and range of gambling and gambling-like behaviours directly associated with digital games (see above for description of activities included in the survey). Engagement was measured via three separate items: frequency (7-point Likert scale, “never” to “daily”); annual money spent in EUR (free text entry); and average weekly hours spent (banded response options ranging from “up to 1 hour” to “over 30 hours”).

Analysis

To answer the research question presented above, this work used cross-tabulation to explore the relationship between frequency of spectating esports and both demographic items and those measuring engagement with a range of gambling and gambling-like activities (frequency of participation and monetary spend in the previous 12 months). In order to meaningful comparison using cross-tabulation, for the purposes of this study annual spend was converted from a continuous numerical variable into an ordinal variable with 5 bands. All those who reported not spending any money on a given behaviour were assigned category 0, the interquartile ranges for the remaining responses were calculated and respondents assigned to categories 1 to 4 according to their reported spend.

To avoid losing detail related to frequency of participation, these responses were not pooled, however, as a result several cells in the contingency tables had expected counts of less than five, with several exceeding the 20% threshold. As such, Fisher’s exact test is reported in place of the Pearson’s Chi-squared test. Post-hoc analysis was conducted using Somers’ D and Kendall’s Tau tests to reveal predictive power and direction of association; Somers’ D is an asymmetric test, as such all measures of engagement with gambling and gambling-like behaviour are reported as dependent

variables. In cases where the cross-tabulations used square contingency tables (7x7), Kendall's tau-b is reported, for all other tables Kendall's tau-c is reported. Values for Kendall's tau b and c are interpreted using the following standard thresholds: $\tau < .1$ = weak; $.1 < \tau < .2$ = moderate; $.2 < \tau < .3$ = moderately strong; $.3 < \tau < 1$ = strong. The final value reported in the results is Cramer's V, a measure of effect size; in order to aid interpretation according to Cohen's standard effect sizes, Cramer's V was converted to Cohen's ω using the formula: $\omega = \phi' \sqrt{r-1}$, where r equals the smallest dimension of the crosstab table (either rows or columns) (Cohen 2013). After applying this formula, Cohen's ω can be interpreted in the same way as Cohen's χ^2 .

RESULTS

Participants in the finalised dataset ranged in age from 18 to 53, with median age reported being 27 years old (mean = 28.13), while 380 (49.1%) self-reported being of male gender. For 29 participants, no exact age was reported. Most participants reported residing in Europe (59.7%), predominantly Poland (18.6%), Portugal (14%), and the UK (6.2%), however, the single largest country represented was South Africa, with 31% of valid responses provided by participants who reported residing there. See Table 1, below, for full description of sample.

	<i>Category</i>	<i>n</i>	<i>(%)</i>
<i>Age</i>	18-22	175	23.5
	23-26	197	26.4
	27-31	185	24.8
	>31	188	25.2
<i>Gender</i>	Female	383	49.5
	Male	380	49.1
	Other	11	1.4
<i>Income</i>	Under 20.000€	470	60.7
	20.001 - 29.999€	136	17.6
	30.000 - 39.999€	76	9.8
	40.000 - 49.999€	44	5.7
	50.000 - 74.999€	35	4.5
	75.000 - 99.999€	13	1.7
<i>Education</i>	Doctoral degree	9	1.2
	Master's degree	142	18.3
	Bachelor's degree	342	44.2
	Secondary/Vocational school	275	35.5
	Lower than secondary school	6	0.8
<i>Current residence</i>	Europe	462	59.7
	South Africa	240	31
	United Kingdom	48	6.2

Central America	5	0.6
Middle East	5	0.6
Oceania	5	0.6
Asia	4	0.5
North America	3	0.4
South America	2	0.3

Table 1: Participant demographics.

To be eligible to participate in the survey, respondents had to have played video games at least once within the previous 12 months, the most popular activity was playing F2P mobile games (74%), closely followed by PC games (73%), while 55.3% reported having played console games. Most of the sample reported some form of gambling (gambling-like, game-themed or traditional gambling) during the same time period (72.4%). While a total of 59.3% of the participants reported partaking in any gambling connected to games, 21.8% of them reported only gambling in connection to games. Additionally, only 13% of the participants reported participating solely in traditional gambling, while 37.5% reported having participated in both traditional gambling activities and those connected to games. Frequency of participation and annual money spent on each activity are presented in Tables 2 and 3, respectively. Finally, most participants reported spectating esports within the previous 12 months (57.1%), with 34.6% spectating esports once a month or less, 15.6% between once a month and once a week, and 6.8% more than once a week.

Freq	Gambling-like activities						Game-related gambling						Traditional gambling	
	Cosmetic loot boxes		Game affecting loot boxes		Other gambling mechanics		Esports Betting		Game-themed gambling		Skins Gambling			
	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Never	519	67,1	566	73,1	583	75,3	621	80,2	569	73,5	640	82,7	383	49,5
Once a month or less	187	24,2	167	21,6	126	16,3	105	13,6	126	16,3	93	12,0	249	32,2
Multiple times a month to weekly	55	7,1	30	3,9	51	6,6	35	4,5	53	6,8	32	4,1	105	13,6
More than once a week	13	1,7	11	1,4	14	1,8	13	1,7	26	3,4	9	1,2	36	4,7

Table 2. Frequency of participation

Band	Gambling-like activities						Game-related gambling						Traditional gambling	
	Cosmetic loot boxes		Game affecting loot boxes		Other gambling mechanics		Esports Betting		Game-themed gambling		Skins Gambling			
	n	%	n	%	n	%	n	%	n	%	n	%	n	%
No spend	553	71,4	590	76,2	613	79,2	645	83,3	601	77,6	656	84,8	404	52,2
1st Quart.	44	5,7	46	5,9	39	5,0	27	3,5	48	6,2	26	3,4	92	11,9
2nd Quart.	74	9,6	44	5,7	46	5,9	37	4,8	35	4,5	33	4,3	91	11,8
3rd Quart.	41	5,3	48	6,2	37	4,8	32	4,1	44	5,7	29	3,7	86	11,1
4th Quart.	62	8,0	46	5,9	39	5,0	33	4,3	46	5,9	30	3,9	101	13,0

Table 3. Average annual spend

Crosstabulation

Frequency of esports spectating was cross-tabulated with two consumption measures for all types of gambling and gambling-like activities related to digital games and with traditional gambling, the consumption measures were frequency of participation and annual spend in EUR on each activity. Given that performing this number of comparisons increased the likelihood of producing erroneous results the Benjamini-Hochberg correction was applied to control for the false discovery rate. This procedure was deemed to be the most appropriate as it balances parsimony with power (Zaiontz 2019), in contrast the Bonferroni correction has been criticised as overly conservative (Perneger 1998), thereby increasing the likelihood of producing type II errors (rejection of true positives). The Benjamini-Hochberg correction was calculated based on running all 18 crosstabulations concurrently, all statistically-significant p-values marked in table 4 remained significant after applying the correction.

No statistically significant relationship was observed between age and frequency of spectating esports, meaning H1 was not supported. However, esports spectating was associated with male gender ($D = .149$, $\tau = .164$, $p = < .001$), meaning that H2 was supported, although the effect size can be considered small ($\omega = .234$). Neither H3 nor H4 were supported as no associations were observed between frequency of spectating esports and either annual income or educational attainment.

H5 was supported as frequency of esports spectating displayed statistically significant associations with both increased frequency of buying cosmetic loot boxes ($D = .163$, $\tau = .195$, $p = < .001$) and larger annual spend on cosmetic loot boxes ($D = .139$, $\tau = .128$, $p = < .001$); both associations were of moderate strength (frequency: $\omega = .342$; annual spend: ($\omega = .312$). Esports spectating frequency was associated with increased frequency of consuming game-affecting loot boxes ($D = .076$, $\tau = .098$, $p = .002$), but

not with annual spend on game affecting loot boxes, meaning that H6 was only partially supported. Furthermore, the observed effect size of the statistically significant relationship between frequency of spectating esports and frequency of purchasing game affecting loot boxes was small to moderate ($\omega = .283$). In contrast to expectations, frequency of spectating esports was positively associated with both frequency of spending money on gambling-like mechanics in games ($D = .064$, $\tau = .085$, $p = .007$) and annual spend on gambling-like mechanics in games ($D = .068$, $\tau = .062$, $p = .002$), furthermore, the first of these was of moderate ($\omega = .310$), while the latter effect size was small ($\omega = .223$). As such H7 was supported.

Frequency of spectating esports was found to be positively associated with both frequency of esports betting ($D = .237$, $\tau = .346$, $p < .001$) and annual spend on esports ($D = .196$, $\tau = .179$, $p < .001$), meaning H8 was supported. Unsurprisingly, these associations were the most notable observed with moderate to strong effects ($\omega = .497$) and ($\omega = .456$), respectively. H9 was supported as esports spectating frequency was associated with increased frequency of skins betting ($D = .095$, $\tau = .084$, $p < .001$) and annual spend on skins betting ($D = .08$, $\tau = .074$, $p < .001$), these relationships had moderate effect sizes respectively ($\omega = .315$ and $\omega = .303$). Frequency of spectating esports was positively associated with both frequency of spending and annual amount spent on game-themed gambling activities ($D = .129$, $\tau = .167$, $p < .001$; $D = .1$, $\tau = .092$, $p < .001$, respectively), meaning H10 was supported. The observed effect sizes were moderate ($\omega = .321$) and small ($\omega = .256$), respectively.

Finally, frequency of spectating esports was associated with increased frequency of participating in, and amount of money spent annually on traditional gambling ($D = .173$, $\tau = .179$, $p < .001$; $D = .146$, $\tau = .134$, $p < .001$, respectively), meaning H11 was supported. As with other observed relationships, the observed effect sizes for frequency of participation were larger than for annual spend ($\omega = .321$, moderate; and $\omega = .258$, small, respectively). Full results for all crosstabulations are presented below in Table 4 with effect sizes (Cohen's ω) presented in Table 5.

esports spectating frequency crosstabulated with:	Cramer's v		Fisher's exact		Somers' D	Kendall's tau		
					value	b	c	p
	value	p	value	p				
age	.099	.216	21.931	.189	-.093	-	-.093	.003
gender	.165	<.001	41.041	<.001	.149	-	.164	<.001
income	.086	.493	30.305	.418	.018	-	.016	.505
education	.086	.414	24.613	.445	-.018	-	-.016	.537
cosmetic loot box - freq	.140	.015	89.754	<.001	.163	.195	-	<.001
cosmetic loot box - spend	.156	<.001	61.381	<.001	.139	-	.128	<.001
affecting loot box - freq	.116	.055	70.506	<.001	.076	.098	-	.002
affecting loot box - spend	.098	.204	28.854	.199	.044	-	.041	.063

<i>gambling mechanics - freq</i>	.127	.020	59.103	.004	.064	.085	-	.007
<i>gambling mechanics - spend</i>	.112	.210	44.833	.002	.068	-	.062	.002
<i>esports betting - freq</i>	.203	.003	182.881	<.001	.237	.346	-	<.001
<i>esports betting - spend</i>	.228	<.001	141.080	<.001	.196	-	.179	<.001
<i>skins betting - freq</i>	.141	.009	64.915	<.001	.095	-	.084*	<.001
<i>skins betting - spend</i>	.152	.002	62.283	<.001	.080	-	.074	<.001
<i>game-themed gambling freq</i>	.131	.013	77.389	<.001	.129	.167	-	<.001
<i>game-themed gambling spend</i>	.128	.008	50.155	<.001	.100	-	.092	<.001
<i>trad gambling - freq</i>	.131	.014	79.715	<.001	.173	.179	-	<.001
<i>trad gambling - spend</i>	.129	<.001	50.095	<.001	.146	-	.134	<.001

note: * = table not square

Table 4. Results of crosstabulation

<i>crosstab, esports spectating frequency with:</i>	ω	V (f')	r
<i>age</i>	.171	.099	4
<i>gender (male)</i>	.234	.165	3
<i>income</i>	.193	.086	6
<i>education</i>	.173	.086	5
<i>cosmetic loot box - freq</i>	.342	.140	7
<i>cosmetic loot box - spend</i>	.312	.156	5
<i>affecting loot box - freq</i>	.283	.116	7
<i>affecting loot box - spend</i>	.196	.098	5
<i>gambling mechanics - freq</i>	.310	.127	7
<i>gambling mechanics - spend</i>	.223	.112	5
<i>esports betting - freq</i>	.497	.203	7
<i>esports betting - spend</i>	.456	.228	5
<i>skins betting - freq</i>	.315	.141	6
<i>skins betting - spend</i>	.303	.152	5
<i>game-themed gambling freq</i>	.321	.131	7
<i>game-themed gambling spend</i>	.256	.128	5
<i>trad gambling - freq</i>	.321	.131	7
<i>trad gambling - spend</i>	.258	.129	5

Table 5. Effect sizes (Cohen's ω)

DISCUSSION

This work used data collected from a sample of digital game players to investigate the potential associations between demographic characteristics and spectating esports with participation in a range of gambling and gambling-like activities. Several statistically significant associations were observed, indeed almost all measures of participation in gambling and gambling-like activities were found to be related to frequency of spectating esports. However, as the dataset used in this work is cross-sectional, no conclusions can be drawn regarding causality.

Among the demographic measures tested, only gender was found to be associated with frequency of spectating esports, specifically increased frequency was associated with male gender, although the overall effect size was relatively small. However, neither age, educational attainment, nor annual income displayed statistically significant relationships with frequency of esports spectating. Despite the fact that these results run contrary to the stated hypotheses they are not surprising; although there is a wealth of market research describing esports fans as being younger, more well-educated, and earning higher wages than players of digital games, similar findings have not been reproduced in published academic works (Hedlund 2023). This disparity is most likely explained by methodological issues relating to data collection; it is often unclear how these organisations recruit participants and rarely provide easily accessible information about the makeup of their samples. It is possible that the samples recruited by market research companies over-represent those esports fans (or consumers) who are highly engaged or are from a single nation or region. Conversely, the scope and potential of academic research is often restricted because of limited resources, meaning that it can be hard to both identify and recruit representative samples. Indeed, the lack of diverse and/or representative samples has been highlighted as a major challenge in the field (Kim et al. 2023).

Other potential explanations for the lack of statistically significant association with age include the fact that this sample was limited to those 18 years of age or older because of the recruitment strategy and the nature of the topic. Most paid recruitment services, including Prolific, do not allow under 18s to use their service; it was hoped that promoting the online survey via social media would help address this issue, unfortunately, this proved not to be the case. Finally, the bulk of the respondents, 75%, were under the age of 30. Combined with the lack of under-18s, there may not have been sufficient breadth of respondents for any associations between spectating esports and age to be revealed. It is, therefore, possible that the expected relationship would be observable in a larger sample including younger respondents or, indeed, in a sample taken from wider society and not specifically from digital game players.

It may be that expected associations with income were not observed, as esports is readily available online for free, albeit requiring a certain level of access to both hardware (computers, smartphones, etc.) and infrastructure (sufficient internet connection and data transfer capacity) that may exclude those in more challenging circumstances. Therefore, it is possible that relationship to income would be observable for those who also attended physical esports events in addition to watching online or, alternatively, if a different measure of engagement were used

other than simple frequency of spectating, such as asking about donations to streamers.

Most works investigating the purchase of loot boxes, whether they contain cosmetic or game-affecting rewards, do so in relation to digital games in general, rather than esports specifically. As such, there is little evidence as to why spectating esports would be associated with higher levels of purchasing loot boxes. The relationships between spectating play and motivations for purchasing loot boxes with game affecting contents are easy to conceptualise, precisely due the role these loot boxes play in enabling competitive play in games such as Hearthstone, Magic, the former FIFA franchise, etc. (Mattinen, Macey, and Hamari 2023). Yet the relationship to cosmetic loot boxes is less clear. Several studies that ask game players about motivations for purchasing loot boxes report that “excitement/enhancement” is the most endorsed motivational factor (Kim et al. 2023). Other works have conceptualised loot box purchasing in terms of the value it affords to participants beyond purely financial terms, with factors such as individual expression, aesthetic appreciation, and hedonism contributing to the non-monetary value of loot boxes (Evans 2022). Similarly, accruing rare or otherwise desirable cosmetics (skins) is thought to signal a form of social capital, effectively a combination of status and skill which relies on implicit acknowledgement of time spent playing and awareness of what skins are valued by others (Moshirnia 2018). It is this last factor which may offer the link between spectating esports and purchasing cosmetic loot boxes as shows how the accrual of a kind of game capital can integrate individuals into the fan communities around esports titles. This is an important function as spectator sports have been theorised as attracting fans based on the role they play in offering connections with others; these “imagined communities” offer a means to negotiate life in contemporary capitalist social structures (Kalman-Lamb 2021). It is, therefore, conceivable that any sense of alienation experienced by individuals in the modern world is felt more keenly by those whose lives are subject to a higher degree of mediated interaction. Given the popularity and penetration of digital games, it is esports that provides the most viable space in which to seek community membership, and it is skins and other cosmetic items that are the most effective means of displaying both knowledge of, and affinity to a given title.

Frequency of spectating esports was hypothesised as not being related to either the frequency or amount of money spent on gambling-like mechanics in games, yet contrary to expectations a statistically significant relationship was observed for both. This may be the result of the increasing popularity of mobile esports, or the fact that esports fans could be more engaged with games in general, meaning greater exposure to, and use of the gambling-like mechanics that are so heavily present within the contemporary digital games ecosystem. However, an alternative explanation may be found in the large number of participants from South Africa in the data sample. Both digital gaming and esports are experiencing rapid growth across Africa, and it is online mobile gaming that dominates the market with South African consumers spending most per capita (Khisa 2024).

The relationships between esports spectating and betting on esports are the least surprising of the results and reflect the importance of betting within sporting fan culture more generally (Raymen and Smith 2020). Differences in methodologies and samples mean that comparisons cannot be meaningfully drawn between the

results of this study and those from other sports (e.g., football (soccer), baseball, etc.). However, the relatively large effect sizes observed may highlight the potential effect of combining a skill-based activity of digital gaming, with the perceived skill of predicting the outcome of events. Previous work has hypothesised about the potential for esports fans who are digital game players themselves, to develop maladaptive cognitions where their mastery of digital systems (games) translates into a perceived mastery of other digital systems, including online betting and game-related gambling activities (Macey and Hamari 2020). The field would benefit from further work investigating the relationship between these maladaptive cognitions and both esports spectating and betting behaviours.

The significance of betting as part of fan culture may also explain the observed relationships with other forms of out-game gambling related to esports titles, i.e., both skins gambling and game-themed gambling. It is likely that an affiliation with a certain game means that activities connected to that title are more likely to be attractive than those which are not connected. Skins gambling uses in-game cosmetic items as stakes, affording not only the potential to make a financial profit, but also to obtain more in-game items themselves, while those who already have a desire to gamble could be drawn to activities that make use of familiar aesthetics, providing additional affective gratifications over and above the gratifications related specifically to gambling. Finally, gambling is a highly visible presence throughout the esports ecosystem and is not restricted to sponsorship of players, teams, and events; indeed, many online sites related to esports contain a huge amount of gambling advertising. Similarly, online forums for esports fans often contain dedicated gambling threads and links to online gambling websites, both regulated and unregulated, with this colonisation of the esports ecosystem and fan culture by gambling serving to normalise such behaviours (Kolandai-Matchett and Wenden Abbott 2022).

This normalisation of gambling is evident in the relationship between esports spectating and participation in traditional gambling activities, i.e., those not related to digital games in any way. Indeed, there is already a growing body of evidence supporting the theorised link between exposure to gambling through games and participation in traditional gambling (Brooks and Clark 2023). Furthermore, others have theorised that esports has the potential to attract those not interested in digital games, but interested in gambling as it offers new channels to gratify such motivations. Although evidence for this is lacking, it is supported by the fact that during the early period of the covid-19 pandemic a great number individuals were attracted to esports as traditional sports were largely suspended during lockdowns, while there is some evidence that problematic gamblers were also attracted to esports betting (Håkansson 2020).

Limitations and Future Research

This work is subject to several limitations, not least the standard methodological issues related to survey-based research (Macey and Hamari 2024b), furthermore, the lack of under-18s resulting from the use of a paid recruitment service meant that a significant section of digital game players were not represented. However, this is not an unusual situation when considering previous research into gaming and gambling convergence, as such, the field would benefit from more research which looks at the relationships between digital games, esports, and gambling in underage

individuals. A further characteristic of the sample which may have potentially influenced results is the over-representation of individuals from a single country; approximately 30% of the sample reported residing in South Africa, almost double that of the next highest individual nation (Poland). Rather than regarding this as a negative, however, it should be considered a strength of this work that it featured such a substantial number of participants from outside Western nations, as this has been a major criticism of much of existing research in the field.

Further methodological features which limit the potential nuances that could be read into the finding relate to the pooling of activities, specifically the pooling of traditional gambling activities under a single measure. This decision was made as the focus of the planned research was those gambling activities directly associated with digital games, whether occurring within games themselves, or that are conducted outside of games, but which utilise them to facilitate gambling. Similarly, as is common in much research in the field, this work does not consider individual esports titles or genres, instead using the umbrella term of esports. As such, it is unable to determine whether specific gambling activities are associated with specific esports audiences, this would be a valuable area for future research to investigate as it would provide valuable information that would allow potential interventions or campaigns addressing gambling in digital games to be targeted more effectively. The field would also benefit from alternative approaches investigating the relationships between esports spectating and gambling in and around digital games, for example through research designed to compare motivations and behaviours between esports fans and those of traditional sports, thereby identifying particular characteristics and behaviours of these distinct communities. Such work would benefit other fields of research, informing work into the ongoing digitalisation of sports fan cultures that has recently begun to emerge (Lawrence and Crawford 2022).

CONCLUSION

This research adds to the growing body of work investigating the relationships between spectating esports and participation in a range of gambling and gambling-like activities, and demographics. Specifically, it is one of the first to empirically examine this issue through the use of crosstabulation, a method that reveals associations in categorical data to provide a more detailed and granular understanding of the investigated behaviours. Contrary to the stated hypotheses, frequency of spectating esports displayed a statistically significant relationship with gender, but no other demographic items. This may be the result of methodological issue regarding data collection and potentially highlights one of the major concerns in the field relating to the prevalence of market research organisations in generating knowledge about the makeup of esports audiences.

This research used data gathered from a sample of digital game players, with results showing that frequency of esports spectating displayed positive associations with virtually all measures of participation in gambling and gambling-like activities, with 13 of 14 measures showing statistically significant results; as frequency of spectating esports increased, so did both frequency of participation and annual spend. As such, esports spectating distinguishes the gambling behaviours of digital gamers, however,

as this work utilised cross-sectional data no conclusions can be made as to the direction of causality. The data sample was further characterised by a large percentage of respondents reporting their nationality as South African. As such, it is one of the few works to incorporate non-Western participants and, to the best of our knowledge, the only work in this field that includes significant proportion of African game players.

The relationships observed within this data sample may either be the result of a fan culture which favours these kinds of activities, or due to the highly visible penetration of the gambling industry into the esports ecosystem. Further research targeted at understanding the motivations and developmental pathways of esports spectators who gamble is needed which investigates individual populations, thereby providing richer detail and illuminating contextual factors which impact behaviour.

ACKNOWLEDGMENTS

This research was supported by personal grants from both the Finnish Foundation of Alcohol Studies (Alkoholitutkimussäätiö), and the Finnish Cultural Foundation (Grant 00230796), and the Academy of Finland project Centre of Excellence in Game Culture Studies (CoE-GameCult, Grant 353268).

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ENDNOTES

¹ Introduction of PUBG Pick'em items at: <https://pubgesports.com/en/news/7946>

² In-game casinos, such as those found in the video game GTA V: <https://www.ign.com/articles/2019/07/18/grand-theft-auto-online-diamond-casino-and-resort-update-announced>

³ Example of sites showcasing specific skins from tournaments at: <https://cs.money/blog/esports/shanghai-major-skins-best-from-top-players/>