Sports video games participation: what can we learn for esports?

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Abstract

Purpose – This study investigates three issues associated with playing sports video games: the correlates of participation (and its intensity) in this type of activity, their complementarity with traditional sports and their perception as sport. Given the scarcity of data on esports participation, these results can be seen as an initial approach to these issues with regard to esports.

Design/methodology/approach – Sequential, two-part and regression models are estimated using a sample of 11,018 individuals from the Survey of Sporting Habits in Spain 2015.

Findings – First, the association of the correlates follows different patterns for participation in sports video games and its intensity. Second, complementarity with traditional sports is found using different approaches. Third, young people consider this activity as a dimension of their overall interest in sports.

Practical implications – The different association of the correlates with participation in esports and its intensity can be used to define marketing and brand investment strategies. The complementarity between esports and traditional sports should influence how the actual stakeholders in sport define future strategies to favour the growth of both industries. Finally, the increasing perception of esports as a sport should influence the future organisation of multi-sport events like the Olympic Games.

Originality/value – Using sports video games participation as a proxy of esports participation, this study is the first to provide empirical evidence of the relevance of distinguishing between participation in esports and its intensity, their complementarity with traditional sports and their perception as sport.

Keywords Complementarity, Discrete choice models, Two-part model, Esports, Perception as sport

Paper type Research paper

Introduction

On 21 July 2018, the first Esports Forum was held in Lausanne, hosted by the International Olympic Committee (IOC) and the Global Association of International Sports Federations (GAISF). A large number of stakeholders of the esports and gaming industry participated in the forum. It was the starting point for a dialogue between the traditional sports institutions and the esports community, in order to explore potential areas of collaboration, including to what extent esports can be recognised as sport, as a first step, previous to considering the representation of this community in the Olympic Movement. In this regard, an Esports Liaison Group was established to continue the dialogue between the Olympic Movement and esports and gaming stakeholders. That was a clear sign of a potential future official

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recognition of esports as sport, together with what IOC Director Kit McConnell said in the Forum (IOC, 2018): '. . . we have a strong plan for ongoing dialogue and engagement, and are in a strong position to coordinate and support the wider engagement of the Olympic Movement and esports'. In the last Asian Games, held in Jakarta and Palembang (Indonesia) from 18 August to 2 September 2018, esports were included in the programme as a demonstration sport.

Although the official recognition of esports as sport is still pending, at an academic level it seems that there is an overall agreement regarding this issue. Some of the most commonly used definitions of esports consider this activity explicitly as sport (Wagner, 2006). Some contributions have concluded that esports satisfy the components that characterise traditional sport (Jenny *et al.*, 2017; Rosell, 2017) and there are 'tests' to determine whether a particular activity can be considered as sport (Holden *et al.*, 2017). In fact, the SportAccord Council, the previous name of GAISF between 2009 and 2017, established a definition of sport based on aspects that any sport from an international federation would need to satisfy should it wish to become a member of SportAccord. In this respect, esports could be included in more than one of the sports categories considered by SportAccord (physical, mind, motorised, coordination, and animal-supported).

Regardless of this issue of the recognition of esports as sport, there is no doubt that this is a fast-growing industry. The available economic figures on the esports industry, produced by Newzoo (2019), estimate that total esports revenues will reach $1.1 billion in 2019. This figure includes brand investment revenues (media rights, advertising and sponsorship) plus merchandising, tickets and game publisher fees. This represents a 67.3 per cent increase with respect to the total revenue in 2017. Most of this increase is due to brand investment revenues, in particular, sponsorship, which accounts for 41.7 per cent of the total revenue in 2019. The forecasts by Newzoo (2019) for 2022 estimate $1.79 billion total revenue, which represents an annual growth rate of 17.8 per cent in the period 2019–2022.

Newzoo (2019) also provides information concerning the level of demand in relation to the industry. This is done in terms of esports audience, distinguishing between esports enthusiasts (people watching professional esports content more than once a month) and occasional viewers (less than once a month). Total audience in 2019 is estimated at 454 million people, 44.3 per cent of them esports enthusiasts, a figure that is forecasted to rise to 645 million people in 2022, with an average growth rate of 12.4 per cent in the period 2019–2022. It is estimated that 1.8 billion people were aware of esports in 2019.

The aim of this paper is to contribute to the empirical literature on sports video games and esports in three ways. First, it extends the previous descriptive analyses of the participant profile by using econometric models which allow us to control for the correlation between the potential covariates in order to characterise this profile, distinguishing between participation and participation intensity. Second, it offers evidence, using different approaches, on the issue of the degree of complementarity or substitutability between this type of activity and traditional sports. Finally, it provides new evidence regarding the consideration of esports as sport, not in terms of an official or a definitional recognition, but in terms of whether people recognise sports video games (and esports) as a sporting activity, a condition which would be necessary for the previous two recognitions to be relevant.

These empirical analyses are performed using the Survey of Sporting Habits in Spain 2015, produced by the Spanish Higher Sports Council (Ministry of Education, Culture and Sport, 2016). Among the new elements of this survey, for the first time, there was a question referring to respondents' interest in playing video games related to sports. This new variable is not an exact substitute for being interested in esports either as a player or as a fan (not only as a professional player), but it is a good proxy, since there are different processes in the consumption of esports, and video gaming (including competitions) is the basis for this. In fact, all esports are video games, and the relevance of the analysis of esports in terms of their

effect on the traditional sports industry goes beyond a question of definition. Additionally, the most popular sports video games (FIFA 19, FIFA 18) are among the top-25 most watched games in 2018 (Newzoo, 2019) in both categories: esports content (live professional gaming matches and pre- and post-game analysis) and non-esports content (streamers, influencers and talk shows). These sports video games have the basic features which are assumed to characterise esports: video gaming and organised competitions.

On the other hand, as mentioned above, in such a fast-growing industry as esports, things have changed substantially since 2015 (Newzoo, 2019), but this survey is conducted every five years, and the next one will not be available until 2021. In any event, the issues which are considered in this paper do not refer to the dynamic evolution of the industry (participation and interest growth), but the emphasis is on cross-sectional aspects, in spite of this time gap. In this respect, the coverage and the content of the survey allow us to deal with the three different contributions mentioned above. Surveys referring more precisely to esports participation are scarce, with smaller sample sizes and less complete in terms of the type of individual characteristics, interest in different traditional sports activities and coverage (only esports consumers). This makes the data set used in this paper very attractive, despite its limitations, for fulfilling the paper's aims.

Literature review

As mentioned above, the definition of esports is still an open question, although there is almost complete academic consensus on esports being sport. Probably, the first specific definition of esports was that proposed by Wagner (2006), as a result of adapting Tiedemann's (2004) definition of sport by eliminating the explicit reference to skilled motion and incorporating his understanding of esports as a consequence of a transition from an industrial society to an information and communication-based one. Wagner's definition is: 'esports is an area of sports activities in which people develop and train mental or physical abilities in the use of information and communication technologies' (p. 3).

This definition has been criticised and contested from several points of view. Witkowski (2012) argues that Wagner's definition is based on the centrality of computers when, in fact, the 'complexifications' of bodies and technologies together should be the central element in the definition of esports, given that game outcomes are produced by human and non-human actions and things. She also emphasises the physical side of esports, since this is one of the four characteristics identified as relevant in the definition of sport (physical, rules, competition, officially governed), in her word cloud analysis on a set of definitions of sport by sociologists and philosophers. Hamari and Sjöblom (2017) point out a limitation in Wagner's definition as it does not clearly define the limits between what should be considered as esports or traditional sports, since the latter also makes use of technology, and the limits between esports and non-sporting activities where technologies are also used. They refer to the main difference between esports and traditional sports in terms of where the players' activities take place in relation to the outcome of the game, either in the real world (traditional sports) or in the virtual world (esports). Finally, there has been some emphasis on how the '*e*' from esports should be interpreted. Usually, it is understood as 'electronic', but some authors (Karhulahti, 2017) interpret the '*e*' as 'economic', since the organised competition in esports relies on a commercial product (game) governed by an executive owner. The simple definition by Jenny *et al.* (2017) illustrates with four words the basic features of esports: 'organised video game competitions' (p. 4).

The question of whether esports should be recognised as sport is relevant from many perspectives. Holden *et al.* (2017) comment on different 'tests', based on various items, to analyse this issue. One of them is based on considering the feature of 'public perception', as proposed by Michelman (2000). This kind of test is closely related to the approach followed in this paper in relation to its third aim, mentioned in the Introduction.

Additionally, regardless of whether or not esports is recognised as sport, esports have become a topic of analysis in the sports economics and management/marketing literature (Cunningham *et al.*, 2018). In particular, in the case of sports economics, data from esports have some specific features which can be useful to test the implications of certain economic theories. For instance, the detailed composition of the teams can be used to test the tournament theory of optimal labour contracts by Lazear and Rosen (1981) (Coates and Parshakov, 2016), and to provide evidence of the effect of diversity in firm performance (Parshakov *et al.*, 2018). These practices are in accordance with the view that sports (esports) can be understood as a laboratory generating data for economic analysis. They coincide with what some authors refer to as *sportometrics* (Tollison, 2008), 'sports as economics' (Goff and Tollison, 1990; Palacios-Huerta, 2019) or 'economics through sports' (Shmanske and Kahane, 2012). On the other hand, esports are also considered a specific sport in the sports economics literature, and there is research specifically addressed to that industry (Parshakov and Zavertiaeva, 2018).

From the perspective of behaviour patterns of esports consumers, there are various approaches which consider specific aspects of this new sporting discipline: the experiential perspective of esports, not from the traditional viewpoint, which places the firm at the centre of creating the experience, but rather considering co-creation with different stakeholders in the industry (Seo, 2013); esports as a leisure activity but including participation in professionalised pursuits (Seo, 2016); or the development of competences (social, educational, communication, decision-making, problem-solving, among others).

From a marketing perspective, there is mounting empirical literature aimed at providing evidence to design adequate marketing strategies in this sports field with multiple stakeholders and specific features (Hallmann and Giel, 2018), such as co-creation. This literature focuses on analysing the motivation behind participating in esports activities in general and not just playing them, as well as comparing the motivations for participating in esports and traditional sports (Pizzo *et al.*, 2018; Chikish *et al.*, 2019). This corresponds to one of the three categories of studies investigating factors associated with participation in playing video games identified by Hamari and Sjöblom (2017) in terms of player types (Hamari and Tuunanen, 2014), motivations (Martoncik, 2015) and socio-demographic characteristics (Koivisto and Hamari, 2014).

The type of analysis corresponding to the first objective of this paper, defining the profile of sports video games participants, will fit into the third category. Most of the empirical evidence corresponds to studies based on information about players without making comparisons with the socio-demographic profile of those who are non-participants. To some extent, Williams *et al.* (2008) would be an exception since comparisons are made against data at the population level. Additionally, most of the studies refer to a particular game (*The Sim2*, Jansz *et al.*, 2010) or to a particular group of gamers (people attending the meeting *Campzone2*, Jansz and Martens, 2005), or rely on a self-selected group of respondents (Yee, 2006). In most cases the individual characteristics are reduced to age and gender, with few exceptions, where other variables like race, household income, education, religion, occupation or marital status are also considered, as in Yee (2006) and Williams *et al.* (2008). On the other hand, the dependent variable to characterise is different depending on the study: perceived benefits (Koivisto and Hamari, 2014), use of time (Jansz *et al.*, 2010), motivations (Yee, 2006) or participation as spectators (Hamari and Sjöblom, 2017).

Finally, in relation to the second objective of the paper, there are not many studies which analyse the potential relationship between esports, or video gaming, and traditional sports. Some papers analyse the relationship between esports consumption and the involvement in traditional sports consumption activities. Lee and Schoenstedt (2011) measure the correlation

between indicators of those variables based on scales, whereas Chikish *et al.* (2019) describe the association between being a sports video gamer or not, and some traditional sports activities. A different approach is followed by Pizzo *et al.* (2018) when they compare the spectator motivations associated with esports and traditional sports, concluding that there are no substantial differences between those motivations.

Data and variables

The information used to perform the empirical analyses of this paper comes from the Survey of Sporting Habits in Spain 2015 (SSH), produced by the Spanish Higher Sports Council (Ministry of Education, Culture and Sport, 2016). This survey aims to produce indicators for Spaniards' sporting habits and practice, their interest in this sector, the practice of different types of sports and their attendance at sporting events, whether live or through audiovisual media, covering people aged 15 years and older. The survey was included in the Spanish Multiannual Statistical Programme 2013–2016 and approved by the Spanish Government, taking into consideration the opinion of the Spanish High Council on Statistics. The council guarantees the quality of the statistics to be considered as official, in terms of the European Statistics Code of Practice (last version, European Statistical System, 2018). Principle 5 of the Code refers to the absolute guarantee of the privacy of data providers, the confidentiality of the information and the security of the data.

As mentioned above, for the first time the survey includes a question related to playing sports video games: 'How do you rate your interest in the following sports activities?', and point *f* in the survey refers to 'playing video games related to sports'. Respondents are required to use a 0–10 scale for their answers (0 = No interest; 10 = Maximum interest). In order to define a variable indicating whether the individual is interested or not in playing sports video games, those who give a response of between 1 and 10 to the above question are considered as interested. Respondents are also asked about their interest in sports, in general, and with regard to specific activities: practice, live attendance, watching or listening using audiovisual media and access to information about sports.

As mentioned in the methodological section of the document describing the survey (Ministry of Education, Culture and Sport, 2016), the interviews were carried out using a mixed system including online questionnaire, phone interview, postal interview with telephone support and in-person interviews. It is a two-phase sample with stratification of first-phase units (census areas), each region being treated as an independent population. The theoretical sample was set at approximately 12,000 individuals, with a response rate around 91 per cent.

Table I provides the descriptive statistics corresponding to showing interest or not (per cent) and the level of interest (mean value) in playing sports video games by gender and age. The results correspond to the population level, since weights are used.

The first evidence from Table I is that approximately one-third of the Spanish population aged 15 and older showed some interest in playing sports video games, a proportion which is higher among males (more than 40 per cent) than among females (below 25 per cent). This gender pattern also applies to the level of interest of those who report some interest in this type of activity. The average for males is above five, whereas it is just over four for females.

As expected, there is a clearly decreasing pattern as regards age for both participation (positive interest) and level of interest, and for both males and females. The differences in the participation rates between males and females also decrease with age, around 40 percentage points for those younger than 30, and less than 10 points for those older than 45. A similar profile can be found when looking at the differences in the level of interest.

	Males	Females	Total
Interest in playing video games > 0 (%)	41.38	24.10	32.52
15–19	91.08	50.25	71.25
20–29	78.21	39.45	58.66
30–44	53.17	31.90	42.73
45–54	32.92	23.26	28.10
55 or more	12.81	10.21	11.40
Interest in video games (mean)			
Whole sample	2.18	0.97	1.56
15–19	6.26	2.41	4.39
20–29	4.76	1.79	3.26
30–44	2.70	1.30	2.01
45–54	1.35	0.86	1.11
55 or more	0.48	0.32	0.39
Interest in video games (mean)			
Subsample (interest > 0)	5.27	4.03	4.80
15–19	6.87	4.80	6.16
20–29	6.08	4.53	5.56
30–44	5.09	4.08	4.72
45–54	4.10	3.71	3.94
55 or more	3.73	3.09	3.42
Sample size	5,386	5,632	11,018

Source(s): Own calculations using microdata from the SSH

Table I. Descriptive analysis of interest in playing video games by gender and age

The SSH also contains reasonably complete information on the socio-demographic characteristics of the individuals in the sample, apart from age and gender. The following variables have been used in the analyses performed in the sections below:

(1) Education: Five education levels (Illiterate or less than 5 years at school; Primary school; Secondary school; Advanced professional degrees; University degree).

(2) Employment status: Seven categories (Employed; Unemployed; Retired; Permanent disability; Student (not working); Housewife/husband; Other).

(3) Personal status (marital status plus family composition): Eight categories (Single without children living in his/her parents' home; Single, divorced or widowed without dependent children; Single, divorced or widowed with dependent children; Married without children; Married with at least one child younger than 18; Married with all children older than 18 and living at home; Married with all children older than 18 and not living at home; Other).

(4) Nationality: Three categories (Spanish; Dual nationality; Foreigner).

(5) Size of municipality: Three categories (Capital of the province; Municipality with more than 50,000 inhabitants; Municipality with less than 50,000 inhabitants).

(6) Region: Seventeen autonomous communities plus two autonomous cities.

Table II contains the descriptive statistics for the above variables, distinguishing between individuals who are interested and those not interested in playing sports video games. The evidence with respect to age and gender replicates what was highlighted in Table I: males and young people are more interested in playing video games. With respect to the other variables, education shows a significant pattern insofar as people with a higher education level are more

	Non-participant video games	Participant video games	Total
Age	53.33	37.23	48.09
Gender			
Male	42.35	67.02	48.75
Female	57.65	37.98	51.25
Education			
Illiterate or <5 years of school	7.91	1.55	5.84
Primary school	20.97	8.56	16.93
Secondary school	44.30	59.16	49.13
Advanced professional studies	8.14	11.45	9.22
University degree	18.69	19.28	18.88
Employment status			
Employed	42.74	51.35	45.54
Unemployed	13.02	17.17	14.37
Retired	26.83	6.25	20.14
Permanent disability	1.28	0.72	1.10
Student, not working	4.64	19.31	9.41
Housewife/husband	10.70	4.55	8.70
Other	0.80	0.65	0.75
Nationality			
Spanish	91.64	88.71	90.69
Dual nationality	2.32	2.86	2.50
Foreign	6.04	8.42	6.82
Personal status			
Single living with parents	11.59	35.67	19.42
Single without dependent children	14.06	9.45	12.56
Single with dependent children	4.52	4.89	4.64
Married without dependent children	9.55	8.28	9.14
Married with a dependent child (<18)	23.39	27.95	24.87
Married with dependent children (>=18)	15.69	7.31	12.97
Married with non-dependent children (>=18)	17.03	4.55	12.97
Other	4.18	1.92	3.44
Size of municipality			
Capital of province	31.60	32.85	32.01
More than 50,000 inhabitants	20.25	21.57	20.68
Less than 50,000 inhabitants	48.15	45.58	47.32
Sample size	7,548	3,470	11,018

Source(s): Own calculations using microdata from the SSH

Table II.
Descriptive statistics of the variables [%, except for age (mean)]

interested in this type of activity. There is other evidence in Table II, either associated with the effect of age or gender (higher participation of students and single people living with their parents; and lower participation for housewives, retired people and married people with children older than 18) or which includes additional effects, as is the case of nationality or municipality size. In any event, this descriptive evidence captures only bivariate relationships, and this is why a multivariate approach is necessary to identify the association of the different variables with regard to interest in sports video games, as will be developed in the next section.

Since each of the three empirical issues of this paper use specific econometric and statistical tools, the methodological approaches followed are discussed within each of the subsections of the following section.

Results and discussion

Profile of people interested in sports video games

In order to characterise the profile of interest (participation) in playing sports video games and the intensity of this interest (0–10 scale), a two-part model is estimated where the two variables (participation and intensity) are modelled separately. This separate specification is supported by the empirical evidence provided later. The participation equation (interest > 0 versus interest = 0) is estimated using a probit model, and the intensity equation is estimated

Variables	Probit		Ordered probit	
	Males	Females	Males	Females
Age (/10)				
Linear	−0.88**	−0.21**	−0.46**	−0.19**
Quadratic	0.05**		0.03**	
Education (ref.: Illiterate or <5 years of school)				
Primary school	0.06	0.33**	−0.04	0.91**
Secondary school	0.24**	0.52**	−0.04	0.79**
Advanced professional studies	0.35**	0.45**	−0.20	0.85**
University degree	0.30**	0.44**	−0.28**	0.50**
Labour status (ref.: Employed)				
Unemployed	0.11**	−0.01	0.04	−0.06
Retired	−0.11*	0.19**	0.05	0.21*
Permanent disability	−0.20*	0.15	−0.26	0.07
Student, not working	0.02	0.12*	−0.05	−0.16**
Housewife/husband	0.26	0.06	0.70	0.09
Other	−0.18	−0.09	0.04	0.03
Nationality (ref.: Spanish)				
Double nationality	−0.08	0.00	−0.20**	0.12
Foreigner	0.02	0.08*	−0.19**	0.09
Personal status (ref.: single living with parents)				
Single without dependent children	−0.04	−0.07	−0.21**	0.09
Single with dependent children	0.15*	0.27**	0.13	−0.16*
Married without dependent children	0.02	−0.21**	−0.21**	−0.08
Married with a dependent child (<18)	0.03	0.09*	−0.03	0.00
Married with dependent children (>=18)	0.06	−0.11*	−0.18**	−0.02
Married with non-dependent children (>=18)	−0.09	−0.08	−0.30**	−0.12
Other	0.05	−0.11	−0.00	0.15
Size of municipality (ref.: Capital of province)				
More than 50,000 inhabitants	0.04	−0.01	0.03	−0.10*
Less than 50,000 inhabitants	−0.13**	0.05*	−0.08**	−0.22**
Constant	2.49**	(1)	−0.16	(1)
Log likelihood	−9746.6	−17051.6	−9809.2	−9908.5
Sample size	5,386	2,162	3,470	1,308

Table III.
Estimation results of the two-part model

Note(s): Regional dummies are included in all the models; *$p < 0.05$; **$p < 0.01$; (1) Nine cut-off points have been estimated

by an ordered probit model, given the characteristics of this variable, using the subsample of participants.

In Table III, the estimates of these equations are reported separately for both males and females. Two main initial conclusions can be drawn from this table: it seems clear that the specifications for both the participation and the intensity equations are different, and there are significant differences in the profiles for males and females. The first conclusion is supported, for example, by the fact that the effect of education for males is substantially different in both equations. With respect to the differences in profile for males and females, education and personal status are clear examples of such differences.

A more detailed analysis of the results reported in Table III allows the identification of a clearly negative effect of age in both the participation and the intensity models. This is immediate for females given that a linear effect with a negative coefficient is estimated (the coefficient of the quadratic term was not significantly different from zero). But it is also true for males, since the minimum for the estimated U effect is located at approximately 90 years of age in both equations. With respect to education, the effect on the probability of being interested in playing sports video games is negative for both genders, but in the case of males, a significant difference can be found between those with a primary or lower school education level and those with a higher education level. In the case of females, the difference is between those who are illiterate or have less than five years of schooling and the others. The pattern of the education effect changes quite substantially when the intensity equation is considered. It is negative for males, in particular when comparing the lowest and the highest education levels, and it has a kind of inverted U profile for females. Those with either the lowest or highest education levels have a lower intensity than the remaining education groups.

The personal status dummies capture the effect of two variables: the marital status of the individual and the composition of the household (number of children and age). For males and females, those who are single with dependent children have a higher probability of participation than the other categories. Notice that in the case of males, there is only one coefficient significantly different from zero, but when testing the joint (non)significance of the coefficients of these dummies, the null hypothesis is rejected. The case of females with dependent children is significant in terms of a higher probability of playing sports video games, but in terms of intensity those with children have a lower intensity than those without children. In any event, education seems to have a more significant effect on both participation and intensity than personal status. The decrease in the value of the likelihood function for both equations is always higher when excluding education than when excluding personal status.

With respect to the other variables, employment status seems to have a fairly heterogeneous effect depending on the equation, and the profiles are not clear, probably as a consequence of the degree of association of employment status and other variables, for instance age, and the small sample size for some categories, which could explain, for instance, the large and non-significant coefficient of the housewife/husband dummy for males. On the other hand, nationality does not seem to have a significant effect on either variable except for the case of the intensity equation for males, where Spanish people seem to have, *ceteris paribus*, a higher level of interest in playing sports video games. Finally, the estimates of the coefficients of the dummies corresponding to the size of the municipality seem to indicate, with one exception, that both the probability of participation and the intensity are lower in small, and mostly rural, municipalities. This reflects the fact that access to information and communication technologies, necessary for this type of activity, is more limited in rural areas.

In general, these results differ from those obtained in previous studies (Jansz and Martens, 2005; Yee, 2006; Williams *et al.*, 2008; and Jansz *et al.*, 2010), in which different profiles were found depending on the particular game analysed in each paper. This explains why it is so

important to conduct surveys in which playing video games (or esports), but not a particular game, is the variable of interest.

As mentioned by Hallmann and Giel (2018), this kind of knowledge about the profile of esports consumers is necessary in order to define branding and marketing strategies in the industry. This is particularly relevant given that brand investment revenues are estimated to account for more than 41 per cent of the total revenues in the esports industry. In particular, these results should be merged with the information about product and brand preferences by individuals in terms of their socio-demographic characteristics both at the population level, to design incentives for participation in esports, and for those who are already participants (Chikish *et al.*, 2019), to increase the intensity of participation. In any event, as mentioned in Nielsen (2017), it is not possible to identify a global esports fan profile. Differences across countries must be taken into account in order to define marketing and brand investment strategies for this industry.

Complementarity between sports video games and traditional sports

A first approach to the extent to which esports can be considered as a complementary or substitutive activity with respect to traditional sports activities is to analyse the relationship between the interests in both types of activities. As mentioned above, the EHD also asks for the level of interest in sports in general, practising sport, attending live sports events, watching or listening to sports events through audiovisual media and being informed about sports.

Table IV presents some descriptive statistics of these levels of interest for different subsamples. The first two columns show the proportion of people who are interested in playing sports video games among those who are interested in a particular activity related to traditional sports. For instance, 45.7 per cent of males who are interested in sports in general are also interested in playing sports video games. For all activities, those percentages are below 50 per cent and are higher for males. It is also evident that for both males and females, the percentages associated with the different traditional sports activities are higher than the proportion of individuals in the whole population who are interested in esports: 41.1 per cent of males and 24.1 per cent of females, as reported in the last column of Table IV. This is the first evidence of a positive association (complementarity) between traditional sports activities and playing sports video games. Similar evidence is provided in Nielsen (2017): approximately 60 per cent of esports fans are interested in the most popular traditional sport in the corresponding country.

	(1)		(2)		(3)		(4)	
Activity	*M*	*F*	*M*	*F*	*M*	*F*	*M*	*F*
Sports in general	43.0	27.0	7.41	6.50	7.85	7.05	5.27	4.02
Practice	45.7	28.8	6.83	6.20	7.38	6.68	5.29	4.02
Live attendance	48.1	33.1	6.01	5.12	6.49	5.56	5.27	4.00
Audiovisual	44.0	30.1	6.99	5.54	7.28	5.79	5.28	4.02
Information	44.9	32.1	6.74	5.18	7.06	5.40	5.27	4.01
TOTAL	41.4	24.1					5.27	4.03

Note(s): (1) Percentage of participants in sports video games among those interested in a particular activity; (2) Average intensity in each activity among those interested in that particular activity; (3) Average intensity in each activity among those interested in that particular activity and in playing sports video games; (4) Average intensity in playing sports video games among those interested in a particular activity and in playing sports video games

Table IV.
Descriptive analysis of the relationship between interest in playing sports video games and interest in other activities related to sports by gender [males (*M*) and females (*F*)]

On the other hand, when comparing the figures in the third and fourth columns of Table IV (the average level of interest in each particular activity among those who are interested in it) with the next two columns (the average level of interest in each particular activity among those are interested in it and also in playing sports video games), it can be observed that in all cases, for both males and females, the averages are higher among those who are also interested in video games, which gives evidence to support a positive association between the level of interest in the different traditional sports activities and in playing sports video games. Finally, the last two columns report the average level of interest in video games among those who have an interest in both activities. The averages are quite similar in all cases, which suggests a uniform degree of association between interest in each traditional activity and in playing sports video games.

A second approach to analysing the degree of association between traditional sports activities and playing sports video games is to calculate the correlation coefficients between the intensity variables. The first four columns of Table V report those coefficients, for both males and females, considering the whole sample (the first two columns) or just the subsample of those who have some interest in playing sports video games. All of them are positive and significant, with little difference for both males and females, but the highest correlations seem to be associated with interest in attending live sports events. In any event, those correlation coefficients are smaller than those associated with interest in traditional sports activities, which take values between 0.6 and 0.7 in most cases.

An alternative way of measuring this potential association between interest in sports video games and interest in traditional sports activities, controlling for the effects which are shared across socio-demographic characteristics, is to estimate the correlation between the error terms of two equations: one explaining the probability of being interested in a particular traditional sports activity and the other explaining the probability of playing sports video games. This amounts to the estimation of bivariate probit models for each pair of activities. The last column of Table V reports the estimated correlation coefficients, which are positive and significant in all cases, and have a similar size (between 0.5 and 0.6), providing additional evidence of a certain degree of positive association (complementarity) between playing sports video games and the activities associated with traditional sports.

Finally, following an econometric strategy similar to the one used for characterising the profiles of participants in sports video games, two-part models with the same specification as those presented in Table III are estimated, only adding the variables referring to the level of interest in each particular traditional activity. The same definition (binary discrete variable or a quantitative variable) is used as for the dependent variable, that is, discrete (0–1) variables in the probit models and the level of interest (1–10) in the ordered probit models. It could be argued that potential endogeneity of those variables is added in both equations, but this problem is not taken into account because there is no interest in estimating causal effects, but rather in identifying correlation patterns between interest in traditional sports activities and in playing sports video games.

Activity	Corr. Coef. (whole sample)		Corr. Coef. (video gamers)		Bivariate probit (corr. Coef.)
	M	*F*	*M*	*F*	
Sports in general	0.296	0.255	0.306	0.315	0.501
Practice	0.348	0.272	0.258	0.291	0.510
Live attendance	0.385	0.326	0.335	0.332	0.597
Audiovisual	0.277	0.270	0.339	0.357	0.598
Information	0.300	0.298	0.341	0.358	0.624

Table V. Analysis of correlation between the different activities related to sports and playing sports video games by gender [males (*M*) and females (*F*)]

Table VI shows the effects of those variables. Two versions of these two-part models for both males and females are estimated: one which only includes interest in sports in general (first row) and another which includes all the variables associated with interest in specific activities associated with sport (remaining rows). The average marginal effects are provided for the probit model, and the estimated coefficient for the corresponding variable in the case of the ordered probit models. The latter measures the effect of a unit change in the level of interest in a particular activity on the expected value of the latent variable associated with the level of interest in playing sports video games, conditional on this being positive. This means that, in the case of males, being interested in sports in general represents, on average, a 0.254 increase in the probability of playing sports video games as compared to those who are not interested in sports in general. On the other hand, a unit increase in the level of interest in sports in general translates into a 0.109 increase in the expected value of the latent variable associated with interest in playing sports video games, that is, a higher level of interest. The conclusion is that, even controlling for the socio-demographic characteristics, interest in traditional sports activities is positively (and significantly) associated with playing sports video games.

The above results are in line with those reported in Lee and Schoenstedt (2011) when analysing the correlations between esports consumption and seven different types of sports involvement. Five of these correlations were significant, the authors not finding an association between esports consumption and game attendance and using print media about sports. More recently, Chikish *et al.* (2019), also using the SSH survey, carried out an exploratory analysis of the relationship between playing sports video games and participation in different activities related to sports, finding a positive association, in particular, with respect to live attendance and accessing information about sports through the Internet, social media or mobile phones.

This complementarity supports the possibility of generating interest in physical activity by practising virtual sporting activities (Hallmann and Giel, 2018). Additionally, it could also influence the strategy of professional sports clubs in getting involved in esports as a way of reaching more people, in particular young people, to broaden their fan bases. This could explain why some football clubs, like FC Barcelona, Schalke 04 or Paris Saint-Germain, are entering esports competitions as official teams, and why Ruud Gullit, the former Dutch international, in his keynote speech at the Esports Insider Super Forum held at the 2018 Betting on Football conference in London, stated that: 'This is a new era, you have to adapt to it' (Sport360, 2018). In fact, this is not exclusive to football clubs. The McLaren Formula 1 Team launched its search for the 'World's Fastest Gamer', that is, the best virtual racer. Zak Brown, the executive director of the team, mentioned in an interview published in Nielsen (2017): 'We've long witnessed the growth of online sports gaming, and, right now, the parallels between the real and the virtual worlds have never been closer' (p. 30). Esports are viewed as what Jonasson and Thiborg (2010) refer to as the second of their scenarios about the future of sport: esports accepted as part of the hegemony of sport, and not as an alternative or counterculture to sport or the future hegemonic sport, at least in the mid-term.

Table VI.
Average marginal effects of the variables related to the different sports activities in the participation (probit) and the intensity of playing sports video games (ordered probit) by gender [males (*M*) and females (*F*)]

	Probit		Ordered probit	
Activity	*M*	*F*	*M*	*F*
Sports in general	0.254	0.230	0.109	0.114
Practice	0.128	0.123	0.018	0.031
Live attendance	0.219	0.143	0.077	0.079
Audiovisual	0.146	0.081	0.039	0.007*
Information	0.140	0.163	0.043	0.058

Note(s): *p-value > 0.05

Perception of sports video games as sport

As mentioned above, one of the questions associated with the future of esports is whether this activity is considered as a sport or not by the population in general, regardless of whether or not they practise this activity. In particular, it is assumed that the answer to the question of the SSH survey about 'interest in sports in general' can be considered as an overall evaluation of interest in sports which summarises interest in all activities through which individuals can feel identified with sport. Those activities refer to practising sport, attending live sports events, watching or listening to sports events using audiovisual media and being informed about sports. But a new activity is considered in the survey, which refers to playing sports video games, which can be seen as a close proxy of interest in esports, at least in terms of practice.

The approach used in this paper is that of Costa *et al.* (2014), when estimating the importance of the different dimensions of the quality of official statistics in the overall quality. The overall interest in sports could be interpreted as a weighted average of the interests in the different activities associated with sports. The weights will measure the importance of this activity in valuing interest in sports or, alternatively, to what extent each activity can be considered as a 'sporting' activity.

A regression model is estimated by OLS, where the dependent variable is the overall interest in sport, and the explanatory variables are the interests in the different activities which can be associated with sport, without a constant term and imposing the constraint that the weights add one. Table VII provides the results of the estimation of different models for males and females, distinguishing two different specifications: one which does not include playing sports video games as a sports activity, and another which does.

By looking at the first three columns, which consider traditional sports activities, the highest weight corresponds to practising sport for both males and, especially, females (with a weight higher than 50 per cent). The other main activity is associated with watching and listening to sports events through audiovisual media (TV, Internet, radio, etc.), but the weight of this activity is more relevant for males than for females. In any event, these two activities account for almost all the weight in sport in general. Being informed seems to be relevant for males (weight between 10 and 15 per cent), and live attendance is an activity whose estimated weight is negative, which means that it is not relevant. The pattern of the results is very similar, regardless of whether the whole sample is considered or only those who are interested in playing sports video games. If anything, interest in practising sports seems to be more important for video gamers.

	Not including video games			Including video games			
	M	*F*	Total	*M*	*F*	Total	$M \leq 18$
Whole sample							
Practice	52.03	71.41	62.75	53.65	69.83	62.84	85.90
Live attendance	−10.95	−7.81	−10.64	−1.54	2.44	0.18*	−5.00
Audiovisual	44.79	38.22	42.34	41.73	35.20	38.79	15.44
Information	14.14	−1.82	5.57	16.55	6.64	11.07	1.07*
Video games				−10.38	−14.11	−12.89	2.59
Video gamers							
Practice	59.84	73.18	65.56	60.15	73.27	65.89	82.85
Live attendance	−6.25	−0.02	−4.02	−5.28	1.52*	−2.51	−2.92*
Audiovisual	33.97	32.85	33.97	34.13	33.19	34.23	18.84
Information	12.44	−6.01	4.49	12.93	−4.07	5.66	−4.37*
Video games				−1.95	−3.90	−3.27	5.62

Note(s): *p-value > 0.05, otherwise p-value < 0.05

Table VII. Estimates of the weight (%) of the interest in the different activities related to sport in the interest of sports in general by gender [males (*M*) and females (*F*)]

When interest in playing sports video games as a sports activity is included, the pattern of the results discussed in the previous paragraph is maintained and the weight corresponding to this activity is negative, which can be interpreted as this activity not being considered as a sports activity. But it is known from the results in previous sections that young people have a higher probability of being interested in playing sports video games and are also more likely to have a higher intensity of interest. This is why the model has been re-estimated for different subsamples, according to the age of the individuals, with the result that for young people (last column of Table VII), interest in practising sport has the highest weight, much higher than the weights obtained in the previous estimations. Interest in watching and listening to sports events has the second highest weight, but much smaller than the weights previously obtained, and the other two traditional activities have negative and/or insignificant weights. But the most important feature of this set of estimates is that interest in playing sports video games has a positive and significant weight, which is higher when considering the subsample of video gamers.

This last piece of evidence is very relevant for assessing to what extent esports can be considered as a sport, or not, in the future. From the above results, it can be concluded that young people consider this activity when showing interest in sports in general (positive weight), and this is expected to consolidate in the coming years for the whole population. Consequently, there will also be a need to regulate these new activities not only in terms of labour relations but also on administrative and institutional levels (Hollist, 2015; Rosell, 2017).

Conclusions, limitations and future research

Esports is a growing industry both in terms of the revenues generated and in terms of capturing people's attention (audience), in particular, young people. In this paper, using the information from the Survey of Sporting Habits in Spain 2015, three issues associated with sports video games, as a proxy of esports, have been analysed: the profile of the participants in these kinds of games and their interest, the relationship between playing sports video games and traditional sports and the perception by people of this type of activity as sport.

First, the empirical results show that the way socio-demographic characteristics affect the dependent variables participation in playing sports video games and interest in them (intensity) is not homogeneous. The effect of gender, age and education, among other variables, is substantially different for both dependent variables and, in particular, the effect of gender provides evidence of the phenomenon of hypermasculinity (Salter and Blodgett, 2012) to the extent that females have a lower probability of participating and a lower level of interest. This reported evidence illustrates that the two variables, participation and intensity, must be considered separately, and that there must be differentiation between male and female behaviour.

Second, different approaches have been used in order to provide evidence of complementarity between playing sports video games and traditional sports, a relevant focus for esports researchers, as mentioned by Cunningham *et al.* (2018). This could be just a consequence of what Heere (2018) calls 'sportification' applied to esports, in either of the two meanings of this concept: resembling sport for practitioners or adding a sports component to attract audiences. All the results point in the same direction: the complementarity between these two activities.

Third, there is evidence of the significance of the different activities through which individuals can feel identified with sports in the overall interest in sports. The estimates indicate that practising sports and watching or listening to sports events using audiovisual media are the two main activities associated with interest in sports. Interest in sports video games does not have a significant effect when considering the overall population, but it has a positive and significant weight when considering under-18 males. This could be interpreted as a sign of the growing consideration of interest in sports video games as an activity associated with sport, indicating the future growth in the perception of esports as sports.

The data set used in this study has some limitations: the use of a proxy for esports participation and the absence of information about motivations associated with this participation. The latter could play a relevant role in explaining the intensity of this activity and can be useful in order to design marketing and branding activities, jointly with the socio-demographic profile. These limitations, the type of contributions which can be produced when esports and traditional sports activities are analysed in the same survey and the consideration of esports as sport will require adapting current sports participation surveys to the new scenario by incorporating detailed questions about both types of activities, and facilitating comparisons across countries.

Future research should be associated with the availability of new surveys in which different definitions of esports and sports participation can be considered (participation, intensity, frequency, different types of activities), similarly to what is common in the physical activity literature, often characterised using the FITT principles: frequency, intensity, time and type (Rhodes *et al.*, 2017). Additionally, the esports betting market is rapidly growing and has its own peculiarities in comparison with traditional sports betting. Players can bet, not only in cash, but also in game items. These features plus the potentially addictive characteristics of this type of activity show the relevance of analysing the relationship between esports participation, gambling and addiction. A recent paper by Macey and Hamari (2018) represents a good example of this kind of future research. Finally, not only betting but also other topics, such as cheating in esports, are important for future research and can yield relevant research for the esports industry and/or for economic/management analysis (Chikish *et al.*, 2019).

As mentioned by Funk *et al.* (2018): 'Ultimately, it may not matter whether eSport is sport' (p. 9); what matters is that the sports industry is going to be affected by the growing trend of esports, and this justifies the increased attention to esports by researchers in sports and their relationship with traditional sport and economics/management.

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