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**eSports: profile of participants,
complementarity with sports and its
perception as sport. Evidence from sports
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Abstract

Research question:

This study investigates three issues associated to the growing industry of *eSports*: the picture of participants in *eSports* and the correlates of the intensity of this participation; the complementary/substitutability relationship between *eSports* and traditional sports; and the perception of *eSports* as sport by the population.

Research methods:

Discrete choice, two-part and regression models are estimated using a sample of 11,018 individuals from the Survey on Sports Habits in Spain 2015.

Results and Findings:

The association of the correlates follows different patterns depending on whether considering participation or the intensity of this participation in *eSports* and also in terms of gender. Using different approaches, a significant degree of complementarity between participation and interest in *eSports* and traditional sports is estimated. For young people interested in *eSports* seems to an element influencing the overall interest in sports.

Implications:

Taking into account the different association of the correlates with the participation and the intensity of participation in *eSports*, this information could be used by firms in order to define marketing and brand investment strategies. The estimated complementarity between *eSports* and traditional sports should influence how the actual stakeholders in traditional sports define future strategies to favour the growth of both industries. The fact that *eSports* is increasingly perceived as a sport should have an influence, among others, in the collection of data on sports habits, in the way these activities are regulated and in the organization of multi-sport events, like the Olympic Games.

Keywords: *eSports*, Discrete choice models, Two-part model, Complementarity, Perception as sport.

JEL code: C25, L83

Introduction

On 21st 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 of a dialogue between the institutions which are conducting traditional sports and the *eSports* community in order to explore areas of collaboration, starting by to what extent *eSports* can be recognised as sports, as a first step, previous to consider the representation of this community in the Olympic Movement. In that sense, it was established an Esports Liaison Group to continue the dialogue between the Olympic Movement and the *eSports* and gaming stakeholders. That was a clear signal of a potential future official recognition of *eSports* as sports, jointly with what IOC Director Kit McConnell said in the forum: "... 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*". More recently, at the 2018 Asian Games, held in Jakarta and Palembang (Indonesia) from 18th August to 2nd September 2018, *eSports* were included in the program as a demonstration sport.

Although the official recognition of *eSports* as a sport is still pending, at an academic level it seems that there is an overall agreement about this issue. Some of the most referred definitions of *eSports* consider this activity explicitly as a sport activity (Wagner, 2006) and some contributions have concluded that *eSports* satisfy the components that characterise traditional sport (Jenny, Manning, Keiper & Olrich, 2017 and Rosell, 2017).¹ In fact, the council of SportAccord, the previous brand of GAISF between 2009 and 2017, established a definition of sport based on some aspects any sport of an international federation candidate to become a member of SportAccord should satisfy. In that sense, *eSports* could be a candidate to be included in more than one of the categories of sports considered by SportAccord.²

On the other hand, *eSports* have become a topic of analysis in the sports economics and marketing literature. In particular, data from *eSports* have some specific features which can be useful either to test the implications of some economic theories (Coates & Parshakov, 2016) or to provide evidence of the effect of some factors in firm performance (Parshakov, Coates & Zavertiaeva, 2018). In fact, *eSports* are also considered a specific sport in the sports economics literature and some research has started to pay special attention to it as a sport (Parshakov & Zavertiaeva, 2018). From the *eSports* consumer behaviour perspective, there are different approaches which take into account specific aspects of this new sports discipline: the experiential perspective of *eSports*, but departing from the traditional point of view based on the firm being in the centre of creating the experience by taking into account the co-creation by different stakeholders of the

¹ It is worth mentioning the words by Thomas Bach, International Olympic Committee President, in an interview at the 2018 Asian Games, about the incorporation of *eSports* in the Olympic Games: "We cannot have in the Olympic program a game which is promoting violence or discrimination".

² <https://web.archive.org/web/20121205004927/http://www.sportaccord.com:80/en/members/definition-of-sport/>

industry (Seo, 2013); *eSports* as a leisure activity but including participation in professionalized pursuits (Seo, 2016); or the development of competences (social, educational, communication, decision-making, problem solution, among others). From the marketing perspective, there is an increasing empirical literature whose objective is providing evidence to design adequate marketing strategies in this sports field with multiple stakeholders and specific features as co-creation. This literature concentrates on the analysis of the motivations behind participating in *eSports* activities in general (Lee, 2011) and not only just playing (Jansz & Martens, 2005; Martoncik, 2015) but also in the comparison between *eSports* and traditional sports motivations (Lee, 2011; Pizzo et al, 2018). In fact, those empirical studies provide most of the available evidence about the profile of those who participate in *eSports*.³

This paper contributes to the empirical literature of *eSports* in three ways. First, it extends the previous descriptive analyses of the profile of *eSports* participants by using econometric models which allow controlling for the correlation among the potential covariates to be used to characterise this profile and distinguishing between participation and the intensity of participation. Second, it makes a first approximation to the issue of the degree of complementarity or substitutability between *eSports* and traditional sports. Finally, it provides new evidence about *eSports* as sport, not in terms of an official or a definitional recognition, but in terms of whether people recognise *eSports* as a sport activity, necessary for the previous two recognitions to be relevant.

To perform these empirical analyses, the Survey on Sports Habits in Spain (*Encuesta de Hábitos Deportivos en España*) 2015, produced by the National Sports Council (*Consejo Superior de Deportes*) and the Spanish Ministry of Education, Culture and Sport, is used. Among the novelties in this last survey, for the first time, there was a question referred to the interest in playing videogames related to sports. This question was in a block of the questionnaire related to the interest in sports, in general, and some specific activities: practice, live attendance, watching or listening using audiovisual media and access to information about sports.

The interest in playing sports videogames is not exactly participating in *eSports*, but it is a good proxy and the coverage and the contents of the survey allow us to deal with the three different contributions mentioned above. Surveys referring more precisely to *eSports* are less complete in terms of the type of individual characteristics, the interest in the different traditional sports activities and the coverage (only *eSports* participants). This makes the data set used in this paper very attractive, even with its limitations, to fulfil the objectives of the paper.

The *eSports* industry

Any economic and/or statistical analysis of a specific industry requires a precise and accepted definition of the products and activities which belong to it. In the case of sport, and at European level, the EU Working Group, established in 2006 by initiative of the Austrian presidency, reached a consensus in its meeting in October

³ Evidence of this type can also be found in some reports on the *eSports* industry (Nielsen, 2017)

2007 about the economic definition of sport, what is known as the “Vilnius definition of sport”, distinguishing three alternative definitions, depending on whether only the NACE (European Classification of Economic Activities) sectors whose activity is related to sports are included (statistical definition); or also sectors producing goods and services necessary for practising sport (narrow definition); or also any sector producing goods or services related to the sport practice but not necessary (broad definition).⁴

The recognition of *eSports* as sport will affect these definitions. But, previously, it is necessary to establish a definition of what *eSports* are, in order to identify the products and activities associated to this industry and to find the corresponding NACE sectors.

This (initial) definition is still an open question, although there is an almost complete consensus about *eSports* being sport. Probably, the first and specific definition of *eSports* was that proposed by Wagner (2006), as a result of adapting the definition of sport given by Tiedemann (2004) 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 society. 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”.

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 games outcomes are produced by human and non human actions and things. Witkowski (2012) emphasizes the physical side of *eSports*, since this is one of the four characteristics identified as relevant in the definition of sports from her word cloud analysis of a set of definitions of sports by sociologists and philosophers.⁵ Hamari & Sjoblom (2017) point out a limitation of Wagner’s definition in the sense that it does not define clearly the limits between what has to be considered *eSports* or traditional sport, since the latter also makes use of technology, and the limits between *eSports* and non sport activities where technologies are also used. They’re referred as the main difference between *eSports* and traditional sports in terms of where the players’ activities in relation to the outcome of the game take place, either in the real world (traditional sports) or in the virtual world (*eSports*). Finally, some emphasis has been made in terms of how the “e” of *eSports* has to be interpreted. Usually, it is done as “electronic”, but some authors (Karhulahti, 2017) interpret the “e” as “economic”, since the organized competition in *eSports* relies on a commercial product (game) which is governed by an executive owner. At this stage, the simple definition by Jenny et al. (2017) exemplifies with four words the basic features of *eSports*: “organized video games competitions”.

⁴ See Vilnius definition of sport 2.0. Retrieved from:
http://ec.europa.eu/eurostat/documents/6921402/0/Vilnius+Definition+Sport+CPA2008+official+2013_09_19.pdf/30838d11-01ea-431f-8112-50786e187c1c

⁵ The fourth characteristic identified in the definition of sport is being officially governed, which is probably one of the most contested in terms of *eSports* being recognized as sport.

In the meantime, and before having a fully accepted definition, the available economic figures of the *eSports* industry produced by Newzoo are based on a specific definition (Newzoo, 2018):

“Competitive gaming at a professional level and in an organized format (a tournament or a league) with a specific goal (i.e. winning a champion title or prize money) and a clear distinction between players and teams that are competing against each other.”

Newzoo (2018) estimates that total *eSports* revenues will reach \$906 million in 2018. This figure includes brand investment revenues (media rights, advertising and sponsorship) plus merchandising and tickets and game publisher fees. This represents an 83.8% increase with respect to the total revenue in 2016. Most of this increase is due to brand investment revenues, in particular, sponsorship, which represents 40% of the total revenue in 2018.

This aggregate evidence from Newzoo (2018) is in line with that provided in the reports by Nielsen, based on online surveys carried out in the United States, the United Kingdom, Germany and France (Nielsen, 2017) plus China, Japan and Korea (Nielsen, 2018).⁶ According to Nielsen (2017) evidence, only less than 10% of *eSports* fans have a negative attitude towards brand involvement in this industry and 50%-60% have a positive attitude. Both studies highlight a clear preference for endemic sponsors (70%-80%), in particular, gaming media and console manufacturers. Among the non-endemic brands technological companies, internet service providers and energy drinks are those better perceived for *eSports*.

The forecasts by Newzoo (2018) for 2021 estimate \$1650 million total revenue, which represents an annual growth rate of 22.1% in the period 2018-2021. Most of this increase corresponds to brand investment revenues which are expected to represent 81.6% of total revenue in 2021. But, according to Newzoo (2018), the main contribution is from media rights, the fastest-growing revenue component, which will become the second-largest generator of *eSports* revenues. Its share in 2018 is 18% just below advertising (19%). This is reflecting the positive trend observed in the United States in both the number of broadcasts of *eSports* and their duration between 2016 and the first half of 2017 (Nielsen, 2017). At contrast, the investment from game publishers in *eSports* is expected to be the slowest-growing component.

Newzoo (2018) also provides information about the size of the demand side of the industry. This is done in terms of *eSports* audience, distinguishing between *eSports* enthusiasts (people watching professional *eSports* contents more than once a month) and occasional viewers (less than once a month). Total audience in 2018 is estimated in 380 million people, 43% of them *eSports* enthusiasts,⁷ and the forecast for 2021 reaches 557 million people, with an average growth rate of

⁶ The sample per country is 1,000 *eSports* fans aged 13-40.

⁷ According to AEVI (2018), based on figures of the full report of Newzoo for 2018, the total number of *eSports* fans in Spain is 5.5 million people and 47% of them are *eSports* enthusiasts.

13.6% in the period 2018-2021. The number of people aware of *eSports* is estimated in 1.6 billion in 2018.

Additionally, according to Nielsen (2017, 2018) evidence, 71% of *eSports* fans in European countries and the United States are males, whereas in Asia this percentage is about 10 points below. The average age is higher in Asia, where about 60% of the fans are older than 25, than in the Western countries (26 years). In any case, as mentioned in Nielsen (2017), it is not possible to identify a global *eSports* fan profile. There are some differences across countries that must be taken into account in order to define marketing and brand investment strategies for this industry.

Data and variables

The Survey on Sports Habits in Spain (*Encuesta de Hábitos Deportivos en España, EHD*) 2015, produced by the National Sports Council (*Consejo Superior de Deportes*) and the Spanish Ministry of Education, Culture and Sport, has the objective of producing indicators of sports habits and practice of Spanish people, their interest in this sector, the practice of different types of sports and the attendance to sporting events either live or by using audio-visual media. The survey covers people aged 15 years and older.

As mentioned above, the survey includes for the first time a question related to playing sports videogames. In particular, question III.1 of the EHD asks: “How do you rate your interest in the following sports activities?”, and point f) refers to “playing videogames related to sports”. The answer to this question is given in a 0-10 scale (0 = No interest; 10 = Maximum interest). In order to define a variable indicating whether the individual is interested or not in playing sport videogames, those who answered between 1 and 10 to the previous question are considered as interested.

In Table 1 the descriptive statistics corresponding to the participation (%) and level of interest (mean value) in playing sports videogames by gender and age are reported. The results correspond to the population level, since weights are used.

<< INSERT TABLE 1 >>

The first evidence from Table 1 is that approximately one third of the Spanish population aged 15 and older showed some interest in playing sports videogames, proportion which is higher among males (more than 40%) than among females (below 25%). This gender pattern also applies to the level of interest, not only when including those who do not show any interest but also when calculating the averages among those who report some interest in this type of activity. In this last case, the average for males is above 5 whereas it is just above 4 for females. This gender pattern replicates what happens when considering different types of activities related to sport.

As expected, there is a clear decreasing pattern with age for both participation and level of interest and for both males and females. The differences in the

participation rates between males and females are also decreasing with age, around 40 percentage points for those younger than 30 and less than 10 points for those older than 45. A similar profile is found when looking at the differences in the level of interest including or not those who do not show any interest.

The EHD also contains quite complete information about the socio-demographic characteristics of the individuals in the sample, apart from the age and gender variables used above. The following variables have been used in the analyses performed in the next sections:

- Education: Five educational levels (Illiterate or less than 5 years at school; Primary school; Secondary school; Advanced professional degrees; University degree).
- Labour status: Seven categories (Occupied; Unemployed; Retired; Permanent disability; Student (not working); Housework; Other).
- 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 children 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).
- Nationality: Three categories (Spanish; Dual nationality; Foreigner).
- Size of municipality: Three categories (Capital of the province; Municipality with more than 50,000 inhabitants; Municipality with less than 50,000 inhabitants).
- Region: Seventeen autonomous communities plus two autonomous cities.

In Table 2 the descriptive statistics for the previous variables distinguishing between individuals who are interested and not interested in playing sports videogames are reported. The evidence with respect to age and gender reproduces the facts pointed out in Table 1: males and young people are more interested in playing videogames. With respect to the other variables education shows a significant pattern in the sense that people with a higher educational level are more interested in this type of activity. Some other evidence from Table 2 is either associated to the effect of age or gender (higher participation of students and single people living their parents; and lower participation for housewives, retired people and married people with children older than 18) or is capturing some additional effects, as it is the case of nationality or the size of the municipality. In any case this descriptive evidence is just capturing bivariate relationships and this is why a multivariate approach is necessary to identify the association of the different variables with the interest in sports videogames, as it will be developed in the next section.

<< INSERT TABLE 2 >>

Profile of participants in sports videogames (*eSports*)

In order to characterize the profile of the interest (participation) in playing sports videogames and the intensity of this interest (0-10 scale), a two-part model is estimated where both variables (participation and intensity) are modelled separately. This is done to avoid that the same model applies to both variables. This specification which is supported by the empirical evidence provided later. The participation equation is estimated by using a Probit model and the intensity equation is estimated by an ordered Probit model using the subsample of participants.⁸ A sample selection model is not considered because the interest is not in the profile associated to intensity, it does not matter whether the individual participates or not, but the profile associated to those who are participants⁹. The ordered model is preferred instead of either a count data model or a linear regression model because it is more flexible in terms of how the answers to the degree of intensity are treated, not as quantitative measures where a specific pattern for the probabilities of taking a particular value is imposed, as in the count data models, or imposing that the effect of the explanatory variables in the intensity is constant, as in the linear regression model.

In Table 3 the estimates of these equations are reported separately for both males and females. Two main initial conclusions can be drawn from the evidence from this table: different specifications for both the participation and the intensity equations seem to matter and there are significant differences in the profile for males and females. The first conclusion is supported, for example, by the fact 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 the personal situation are clear examples of such differences.

<< INSERT TABLE 3 >>

A more detailed analysis of the results reported in Table 3, allows the identification of a clear 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 estimated¹⁰, but it is also true for males. The minimum for the estimated U effect is located at approximately 90 years of age in both equations. With respect to education, as mentioned above, the effect in the probability of being interested in playing sport videogames is negative for both genders, but in the case of males a significant difference between those with a primary or a lower school degree and those with a higher educational level is identified. In the case of females the difference is between those illiterate or with less than five years of schooling and

⁸ In both cases the Probit specification was preferred to the Logit one in terms of the value of the likelihood function.

⁹ See Madden (2008) for a discussion about the characteristics and differences of the two-part model and the sample selection model.

¹⁰ When estimating a second order polynomial for the age variable, the coefficient of the quadratic term was not significantly different from zero.

the others. On the other hand, 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 educational levels, and it has a kind of inverted U profile for females. Those with either the lowest or the highest educational levels have a smaller intensity compared to the remaining educational groups.

The personal status dummy variables are capturing the effect of two variables: the marital status of the individual and the composition of the household (number of children and their age). For males and females, those who are single with dependent children have a higher probability of participation compared to the other categories¹¹. In the case of females having dependent children seems to matter in terms of a higher probability of playing sports videogames, but in terms of intensity those with children have a lower intensity compared to those without children. In any case, education seems to have a more significant effect in both participation and intensity than the personal status. The increase in the value of the likelihood function for both equations is higher when excluding education than when excluding personal status with the exception of the intensity equation for females.

With respect to the other variables, the labour status seems to have a quite heterogeneous effect depending on the equation and the profiles are not clear, probably as a consequence of the degree of association of the labour status and some other variables, for instance age, and the small sample size for some categories¹². On the other hand, nationality does not seem to have a significant effect in both variables 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 videogames. 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 municipalities, mostly rural. This is reflecting a worse access to the information and communication technologies in rural areas, and this access is, to some extent, necessary for the type of activity considered.

Complementarity between *eSports* and traditional sports activities

A first approximation of as to what extent *eSports* can be considered as a complementary or substitutive activity in relation to the traditional sports activities is to analyse the relationship between the interests in both types of activities. As mentioned above, question II.1 of EHD asks for the level of interest in sports in general, practising sport, attending live sports events, watching or listening to sports events by audiovisual media and being informed about sports.

¹¹ Notice that in the case of males there is only one coefficient significantly different from zero but when taking as the reference group those who are single with dependent children then there five out of the seven coefficients for these personal status variables which are significantly different from zero.

¹² This simple size aspect could explain, for instance, the large and not significant coefficient of the housework dummy for males.

In Table 4 some descriptive statistics of these levels of interest for different subsamples are presented.

<< INSERT TABLE 4 >>

In the first two columns of Table 4 the proportion of people who are interested in playing sports videogames among those who are interested in a particular activity related to traditional sport is reported. For instance, 45.7% of males who are interested in sports in general are also interested in playing sports videogames. For all the activities those percentages are below 50% and are higher for males. It is also evident that for both males and females these percentages associated to the different traditional sports activities are higher than the proportion of individuals in the whole population who are interested in *eSports*, 41.1% of males and 24.1% of females, as reported in the last column of Table 4. This is the first evidence of a positive association (complementarity) between traditional sports activities and playing sports videogames.¹³

On the other hand, when comparing the figures in the third and fourth columns of Table 4 (the average of the level of interest in each particular activity among those who are interested in it, i.e. level not equal to zero) with the next two columns (the average of the level of interest in each particular activity among those are interested in it and also in playing sports videogames), it is observed that in all cases, for both males and females, the averages are higher among those who are also interested in videogames, which gives evidence in favour of a positive association between the level of interest in the different traditional sports activities and playing sports videogames. Finally, in the last two columns the average of the level of interest in videogames among those who have interest in both activities (that corresponding to each specific row and *eSports*) is reported. The averages are quite similar in all cases which points out a uniform degree of association between interest in each traditional activity and *eSports*.

A second approach to analyse the degree of association between traditional sports activities and playing sports videogames is to calculate the correlation coefficients between the intensity variables. The first four columns of Table 5 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 videogames (videogamers). All of them are positive and significant, not much different for both males and females, but the highest correlations seem to be associated to the interest of attending live sports events. In any case, those correlation coefficients are smaller than those between the interests in traditional sports activities, which take values between 0.6 and 0.7 in most of the cases.

<< INSERT TABLE 5 >>

An alternative way of measuring this potential association between the interest in *eSports* and the interest in traditional sports activities, controlling for the effects

¹³ Similar evidence is provided in Nielsen (2017) in the sense that approximately 60% of *eSports* fans are interested in the most important traditional sport in the corresponding country.

which are shared through the 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 sport activity and the other one explaining the probability of playing sports videogames. This amounts to the estimation of bivariate Probits for each pair of activities. The last column of Table 4 reports the estimated correlation coefficients, which are positive and significant in all cases, and they have a similar size (between 0.5 and 0.6), bringing additional evidence of a certain degree of positive association (complementarity) between playing sports videogames and the activities associated to traditional sports.¹⁴

Finally, following a similar econometric strategy of controlling the effect of socio-demographic characteristics as the one used when characterising the profile of participants in *eSports*, two part models with the same specification as those presented in Table 3 are estimated, but adding the variables which are referred to the level of interest in each particular traditional activity, with the same definition (binary discrete variable or a quantitative variable) as the dependent variable, i.e. discrete (0-1) variables in the Probit models and as the level of interest (0 to 10) in the ordered Probit models. It could be argued the potential endogeneity of those variables added in both equations, but this problem is not taken into account because there is no interest in estimating causal effects, but to identify some patterns of correlation between the interest in the traditional sport activities and in playing sports videogames.

In Table 6 the effects of those variables are reported. Two versions of these two-part models for both males and females are estimated: one which only includes the interest in sports in general (first row) and another one which includes all the variables associated to the interest in specific activities associated to sport (remaining rows). In the case of the Probit model, the average marginal effects are reported and, in the case of the ordered Probit models, the estimated coefficient for the corresponding variable is reported, which measures the effect of a unit change in the level of interest in a particular activity in the expected value of the latent variable associated to the level of interest in playing sports videogames conditional on being positive. This means that, in the case of males, being interested in sports in general represents on average an increase in the probability of playing videogames 0.254 compared to those who are not interested in sports in general¹⁵. On the other hand, a unit increase in the level of interest of sports in general translates into an increase of 0.109 in the expected value of the latent variable associated to interest in playing sports videogames, i.e. a higher level of interest.

From the evidence presented in Table 6, the conclusion is that, even controlling for the socio-demographic characteristics, the interest in traditional sports activities is positively (and significantly) associated to playing sports videogame, with just one exception in terms of significance: watching and listening to sports events for

¹⁴ The estimates for the five bivariate Probit models are available on request.

¹⁵ This is the average of the marginal effects for each male in the sample, which are different for each individual because they depend on his/her characteristics.

females. These effects are more important for males than for females, but not very much different, and higher when sports in general are considered.

Perception of *eSports* as a sport

As mentioned above, one of the questions associated to the future of *eSports* is whether this activity is considered as a sport or not by the population in general, it does not matter whether they practice this kind of activity or not.¹⁶ Although *eSports* are usually defined in terms of videogames played in professional competitions and, as mentioned above, they are not exclusively related to sports, the fact that among those most popular some sports videogames are found, justifies the use the information of EHD survey related to the interest in playing sports videogames as a first approximation of the interest of *eSports* participants.

In particular, it is assumed that the answer to point a) in the question III.1 of the EHD mentioned above (“interest in sports in general”), can be considered as an overall evaluation of the interest in sports which summarises the interest in all the activities through which individuals can feel identified with sport. Those activities are those in points b) to e) of the question III.1, which, as mentioned above, refer to practising sport, attending live sports events, watching or listening to sports events using audiovisual media and being informed about sports. But the addition a new activity is considered, that one in point f), which refers to playing sports videogames, which can be considered as a close proxy of interest in *eSports*, at least at the practice level.

The approach by Costa, García & Raymond (2014), when they estimate the importance of the different dimensions of the quality of official statistics in their overall quality, is used. Accepting that interest in sports in general is measuring the overall interest in sports and that the abovementioned sport activities are the most important with respect to the interest in sport, then the overall interest could be interpreted as a weighted average of the interests in the different activities. The weights will measure the importance of this activity in valuing the interest in sports or, alternatively, as to what extent each activity can be considered as a “sporting” activity.

Following Costa et al. (2014), a regression model is estimated by OLS, without a constant term and imposing the constraint that the weights add one, 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 to sport. In Table 7 the results of the estimation of different models for males and females are reported, distinguishing two different specifications: one which does not include playing sports videogames a sport activity and another one which it does.

<< INSERT TABLE 7 >>

By looking at the first three columns, where traditional sports activities are considered, the highest weight corresponds to practising sport for both males and

¹⁶ According to the evidence in Nielsen (2017), 53% of *eSports* fans consider it to be an actual sport and 28% think *eSports* should be an Olympic sport.

females (with a weight higher than 50%), in particular, the latter. The other main activity is associated to watching and listening to sports events by using audiovisual media (TV, internet, radio,..), but the weight of this activity is more relevant for males than for females. In any case, these two activities account for almost all the weight in sport in general. Being informed seems to be relevant for males (weight between 10-15%) 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, it does not matter whether considering the whole sample or only those who are interested in playing sports videogames. If any, interest in practising sports seem to matter more for videogamers.

When including as a sport activity the interest in playing sports videogames, 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 sport activity. But it is known from the results in previous sections that young people have a higher probability of being interested in playing sports videogames and also a higher intensity of interest. This is why the model has been reestimated for different subsamples, according to the age of the individuals. One important finding is that the weight of the *eSport* activity is increasing for young people, in particular, for males.

In the last column of Table 7 the estimates for the subsample of males whose age is 18 or less are reported. The interest in practising sport has the highest weight, much higher than the weights obtained in the previous estimations. The interest in watching and listening to sports events has the second highest weight but much smaller than the weights obtained before and the other two traditional activities have negative and/or not significant weights. But the most important feature of this set of estimates is that the interest in playing sports videogames have a positive and significant weight, higher when considering the subsample of videogamers.

This last piece of evidence is very relevant for assessing to what extent *eSports* can be considered in the future either as a sport or not. From the previous evidence it can be concluded that young people take into account 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.

Conclusions

eSports is a growing industry both in terms of the amount of revenues which are generated and also in terms of capturing the attention of people (audience), in particular, young people. In this paper using the information of the Survey on Sports Habits in Spain (*Encuesta de Hábitos Deportivos en España*) 2015, produced by the National Sports Council (*Consejo Superior de Deportes*) and the Spanish Ministry of Education, Culture and Sport, three issues associated to sports video games, as a proxy of *eSports*, have been analyzed: the profile of the participants in this kind of games and their interest, the relationship between *eSports* and traditional sports and the perception by people of *eSports* as sport.

The empirical results show that the way socio-demographic characteristics are affecting participation in *eSports* and its interest (intensity) is not homogeneous. The effect of gender, age and education, among other variables, is substantially different for both variables and, in particular, the effect of gender is providing evidence of the phenomenon of hypermasculinity (Salter & Blodgett, 2012) to the extent that on average females have a lower probability of participating in *eSports* and a lower level of interest. This evidence should illustrate that in order to define branding and marketing strategies in this industry, it is necessary to take into account both elements separately: participation and intensity, and to differentiate between males and females behaviour.

Different approaches have been used in order to provide evidence of the complementarity between *eSports* and traditional sports. All of them go in the same direction. This could influence the strategy of actual professional sports clubs in order to get involved in *eSports* as a way of reaching more people, in particular young people, to widen the fans bases. This could explain why some football clubs like FC Barcelona, Schalke 04 or Paris Saint-Germain, are entering competitions of *eSports* related to football, and why Ruud Gullitt, former international Dutch player, in his keynote speech at the Esports Insider Super Forum held in the 2018 Betting Football conference in London, stated that: "This is a new era, you have to adapt to it". In fact, this is not exclusive of football clubs. McLaren Formula One Team launched its search for the "World's Fastest Gamer", i.e. finding the best virtual racer. Zak Brown, the executive director of the team, mentioned in his 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". *eSports* are visualized as what Jonasson & Thilborg (2010) refer as the second of their scenarios about the future of sport: *eSport* accepted as part of the hegemony of sport. Not as an alternative or counterculture to sport and not as the future hegemonic sport, at least in the medium term, the other two scenarios in Jonasson & Thilborg (2010).

Finally, evidence is provided about the importance 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 to the interest in sports. The interest in sports video games has not a significant effect when considering the overall population, but it has a positive and significant weight when considering males younger than 18 years old. This could be interpreted as a signal of the growing consideration of interest in sports video games as an activity associated to sport, indicating the future growing perception by people of *eSports* as sports. This consideration of *eSports* as sport will require adapting the actual surveys in sports participation to the new scenario, jointly with the relevance of making this kind of statistics official at European level, which is not actually the case. As pointed out but Hollist (2015) and Rosell (2017), among others, there will be also the necessity of regulating these new activities not only in terms of labour relations but also at an administrative and institutional level.

Disclosure statement

The authors declare that they have no potential conflicts of interest.

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Table 1.
Descriptive analysis of the interest in playing videogames by gender and age

| | Males | Females | TOTAL |
|----------------------------------------------------------------------------|--------------|----------------|--------------|
| Interest in playing videogames > 0 (%) | 41.38 | 24.10 | 32.52 |
| <i>15 - 19</i> | <i>91.08</i> | <i>50.25</i> | <i>71.25</i> |
| <i>20 - 29</i> | <i>78.21</i> | <i>39.45</i> | <i>58.66</i> |
| <i>30 - 44</i> | <i>53.17</i> | <i>31.90</i> | <i>42.73</i> |
| <i>45 - 54</i> | <i>32.92</i> | <i>23.26</i> | <i>28.10</i> |
| <i>55 or more</i> | <i>12.81</i> | <i>10.21</i> | <i>11.40</i> |
| Interest in videogames (mean) Whole sample | 2.18 | 0.97 | 1.56 |
| <i>15 - 19</i> | <i>6.26</i> | <i>2.41</i> | <i>4.39</i> |
| <i>20 - 29</i> | <i>4.76</i> | <i>1.79</i> | <i>3.26</i> |
| <i>30 - 44</i> | <i>2.70</i> | <i>1.30</i> | <i>2.01</i> |
| <i>45 - 54</i> | <i>1.35</i> | <i>0.86</i> | <i>1.11</i> |
| <i>55 or more</i> | <i>0.48</i> | <i>0.32</i> | <i>0.39</i> |
| Interest in videogames (mean) Subsample (interest > 0) | 5.27 | 4.03 | 4.80 |
| <i>15 - 19</i> | <i>6.87</i> | <i>4.80</i> | <i>6.16</i> |
| <i>20 - 29</i> | <i>6.08</i> | <i>4.53</i> | <i>5.56</i> |
| <i>30 - 44</i> | <i>5.09</i> | <i>4.08</i> | <i>4.72</i> |
| <i>45 - 54</i> | <i>4.10</i> | <i>3.71</i> | <i>3.94</i> |
| <i>55 or more</i> | <i>3.73</i> | <i>3.09</i> | <i>3.42</i> |
| Sample size | 5386 | 5632 | 11018 |

Source: Own calculations using the microdata from EHD (2015).

Table 2.
Descriptive statistics of the variables [%, except for age (mean)]

| | Non-participant videogames | Participant videogames | Total |
|------------------------------------------------------|-----------------------------------|-------------------------------|--------------|
| Age | 53.33 | 37.23 | 48.09 |
| Gender | | | |
| <i>Male</i> | 42.35 | 67.02 | 48.75 |
| <i>Female</i> | 57.65 | 37.98 | 51.25 |
| Education | | | |
| <i>Illiterate or < 5 years of school</i> | 7.91 | 1.55 | 5.84 |
| <i>Primary school</i> | 20.97 | 8.56 | 16.93 |
| <i>Secondary school</i> | 44.30 | 59.16 | 49.13 |
| <i>Advanced professional studies</i> | 8.14 | 11.45 | 9.22 |
| <i>University degree</i> | 18.69 | 19.28 | 18.88 |
| Labour status | | | |
| <i>Occupied</i> | 42.74 | 51.35 | 45.54 |
| <i>Unemployed</i> | 13.02 | 17.17 | 14.37 |
| <i>Retired</i> | 26.83 | 6.25 | 20.14 |
| <i>Permanent disability</i> | 1.28 | 0.72 | 1.10 |
| <i>Student not working</i> | 4.64 | 19.31 | 9.41 |
| <i>Housework</i> | 10.70 | 4.55 | 8.70 |
| <i>Other</i> | 0.80 | 0.65 | 0.75 |
| Nationality | | | |
| <i>Spanish</i> | 91.64 | 88.71 | 90.69 |
| <i>Double nationality</i> | 2.32 | 2.86 | 2.50 |
| <i>Foreigner</i> | 6.04 | 8.42 | 6.82 |
| Personal status | | | |
| <i>Single living with parents</i> | 11.59 | 35.67 | 19.42 |
| <i>Single without dependent children</i> | 14.06 | 9.45 | 12.56 |
| <i>Single with dependent children</i> | 4.52 | 4.89 | 4.64 |
| <i>Married without dependent children</i> | 9.55 | 8.28 | 9.14 |
| <i>Married with a dependent child (<18)</i> | 23.39 | 27.95 | 24.87 |
| <i>Married with dependent children (>=18)</i> | 15.69 | 7.31 | 12.97 |
| <i>Married with non-dependent children (>=18)</i> | 17.03 | 4.55 | 12.97 |
| <i>Other</i> | 4.18 | 1.92 | 3.44 |
| Size of municipality | | | |
| <i>Capital of province</i> | 31.60 | 32.85 | 32.01 |
| <i>More than 50,000 inhabitants</i> | 20.25 | 21.57 | 20.68 |
| <i>Less than 50,000 inhabitants</i> | 48.15 | 45.58 | 47.32 |
| Sample size | 7548 | 3470 | 11018 |

Source: Own calculations using the microdata from EHD (2015).

Table 3.
Estimation results of the two-part model

| Variables | Probit | | Ordered Probit | |
|-----------------------------------------------------------|---------|----------|----------------|---------|
| | Males | Females | Males | Females |
| Age (/10) | | | | |
| <i>Linear</i> | -0,88** | -0,21** | -0,46** | -0,19** |
| <i>Quadratic</i> | 0,05** | | 0,03** | |
| Education (ref.: Illiterate or <5 years of school) | | | | |
| <i>Primary school</i> | 0,06 | 0,33** | -0,04 | 0,91** |
| <i>Secondary school</i> | 0,24** | 0,52** | -0,04 | 0,79** |
| <i>Advanced professional studies</i> | 0,35** | 0,45** | -0,20 | 0,85** |
| <i>University degree</i> | 0,30** | 0,44** | -0,28** | 0,50** |
| Labour status (ref.: Occupied) | | | | |
| <i>Unemployed</i> | 0,11** | -0,01 | 0,04 | -0,06 |
| <i>Retired</i> | -0,11* | 0,19** | 0,05 | 0,21* |
| <i>Permanent disability</i> | -0,20* | 0,15 | -0,26 | 0,07 |
| <i>Student not working</i> | 0,02 | 0,12* | -0,05 | -0,16** |
| <i>Housework</i> | 0,26 | 0,06 | 0,70 | 0,09 |
| <i>Other</i> | -0,18 | -0,09 | 0,04 | 0,03 |
| Nationality (ref.: Spanish) | | | | |
| <i>Double nationality</i> | -0,08 | 0,00 | -0,20** | 0,12 |
| <i>Foreigner</i> | 0,02 | 0,08* | -0,19** | 0,09 |
| Personal status (ref.: single living with parents) | | | | |
| <i>Single without dependent children</i> | -0,04 | -0,07 | -0,21** | 0,09 |
| <i>Single with dependent children</i> | 0,15* | 0,27** | 0,13 | -0,16* |
| <i>Married without dependent children</i> | 0,02 | -0,21** | -0,21** | -0,08 |
| <i>Married with a dependent child (<18)</i> | 0,03 | 0,09* | -0,03 | 0,00 |
| <i>Married with dependent children (>=18)</i> | 0,06 | -0,11* | -0,18** | -0,02 |
| <i>Married with non-dependent children (>=18)</i> | -0,09 | -0,08 | -0,30** | -0,12 |
| <i>Other</i> | 0,05 | -0,11 | -0,00 | 0,15 |
| Size of municipality (ref.: Capital of province) | | | | |
| <i>More than 50,000 inhabitants</i> | 0,04 | -0,01 | 0,03 | -0,10* |
| <i>Less than 50,000 inhabitants</i> | -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 | 5386 | 2162 | 3470 | 1308 |

Notes: Regional dummies are included in all the models.

* p<0.05; ** p<0.01

(1) Nine cut-off points have been estimated.

Table 4.

Descriptive analysis of the relationship between the interest in playing sports videogames and the interest in other activities related to sports by gender [males (M) and females (F)]

| Activity | (1) | | (2) | | (3) | | (4) | |
|--------------------------|------|------|------|------|------|------|------|------|
| | 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 |
| Audio visual | 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 |

Notes: (1) Percentage of participants in sports videogames 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 videogames.

(4) Average intensity in playing sports videogames among those interested in a particular activity and in playing sports videogames.

Table 5

Analysis of correlation between the different activities related to sports and playing sports videogames by gender [males (M) and females (F)]

| Activity | Corr. Coef. (whole sample) | | Corr. Coef. (videogamers) | | 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 |
| Audio visual | 0.277 | 0.270 | 0.339 | 0.357 | 0.598 |
| Information | 0.300 | 0.298 | 0.341 | 0.358 | 0.624 |

Table 6

Average marginal effects of the variables related to the different sports activities in the participation (Probit) and the intensity of playing sports videogames (Ordered Probit) by gender [males (M) and females (F)]

| Activity | Probit | | Ordered Probit | |
|--------------------------|---------------|----------|-----------------------|----------|
| | 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 |
| Audio visual | 0.146 | 0.081 | 0.039 | 0.007* |
| Information | 0.140 | 0.163 | 0.043 | 0.058 |

Note: * p-value>0.05

Table 7

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)]

| | Not including videogames | | | Including videogames | | | |
|------------------------|--------------------------|-------|--------|----------------------|--------|--------|--------|
| | M | F | Total | M | F | Total | M<=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 |
| Audio visual | 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* |
| Videogames | | | | -10.38 | -14.11 | -12.89 | 2.59 |
| Videogamers | | | | | | | |
| | M | F | Total | M | F | Total | M<=18 |
| 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* |
| Audio visual | 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* |
| Videogames | | | | -1.95 | -3.90 | -3.27 | 5.62 |

Note: * p-value>0.05, otherwise p-value<0.05