Investigating the Human Factors in eSports Performance

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Abstract. Although its history dates to the beginning of the videogame era, in the recent years eSports has rapidly been maturing into a professional scene that has captured a large and growing audience: the 2017 world finals of one of the most successful pro gaming platforms reached a peak of 75.5 million unique viewers, compared to the NBA finals, which averaged 20 million spectators. Several studies already supported eSports as a legitimate form of sports.
In this paper, we focus on identifying the human aspects of eSports and we discuss their relevance in competitive games. To this end, we discuss interviews with sports and eSports professionals, and we analyze the results of a survey distributed to athletes who are pursuing their career in traditional sports and in pro gaming.

Keywords: Human Factors · eSports · Pro gaming

1 Introduction

Electronic sports (eSports) is a novel type of competition and spectator entertainment that pits individuals or teams playing video games in front of a large crowd attending the show in presence or remotely. The birth of eSports can date back to many competitions but the one that stands out is the First National Space Invaders competition in 1980. Taking place in New York city with 10,000 participants, the concept of eSports spectatorship was born by being broadcasted on live television [1].

In the recent years, eSports has continued to gain popularity and grow into an unprecedented case in the history of computer and entertainment. Specifically, 2017 has been a successful year for eSports. League of Legends, the title of one of the fastest-growing pro gaming scenes, held the knockout stage for the world finals, from October 19th to November 4th. Statistics from this 20-day event include over 4 billion hours of total time watched, a peak of over 106 million viewers during the semi-finals, over 75 million unique viewers during the finals, and over 33 million concurrent viewers throughout the tournament. To put these numbers into perspective, the 2017 NBA finals averaged 20 million viewers, only [2]. Indeed, the large numbers reported by statistics help understand the magnitude of eSports in terms of popularity. Nevertheless, their growth is even more significant if compared to numbers from 2015. Riot Games, the publisher of League of Legends, reported 36 million unique viewers for the world finals [3]. These statistics indicate two-fold increase in popularity of spectating live and online for eSports, in just two years.

As other traditional sports, eSports has turned into an extremely popular spectator sport. Many fans from all around the world flock to live eSports events to watch their favorite players compete in person. In October 2013, one of the competitions sold out the 10,000 available tickets in less than one hour [4]. Fans and live events are a driver for the industry, and this is no different than traditional sports, such as, soccer or basketball. As other competitions, eSports tournaments are broadcasted with play-by-play commentary, slick graphics, player and team statistics, human interest pieces, post-game interviews, and even instant replay analysis [5]. Over the history of eSports, the popularity of team eSports has taken the spotlight leaving most single player competitions behind [1]. With the rise of eSports players are turning competitive video games into a career. Moreover, popular eSports, such as, Starcraft and League of Legends, started to create a culture where best players become super stars.

Not only are eSports events drawing the focus of fans and spectators, but it is also attracting a large amount of revenue. As the history of eSports has evolved, so has its prize pools. In 1999 its average was under $100,000, while it increased to over $600,000 per eSports event, in 2015 [1]. Moreover, eSports are converging towards a structured and lucrative business model in which players are organized into professional leagues and tournaments. Starting in the spring of 2018 the North American League of Legends Challenger Series (NALCS) will be moving to a traditional format for their league: franchises will cost a flat $10 million for existing NALCS organizations [6].

Consequently, it becomes clear that it is not a question of whether eSports will change the way we view and look at sports but how it will change the sporting entertainment industry altogether.

2 Related work

eSports has been maturing into a very professional scene that has captured a huge audience that continues to grow at a rapid pace. The popularity and growth of the industry plays a very important role in defining what exactly an eSports is for those unfamiliar with the industry. Because the eSports industry is relatively new, it is hard to create a definition for it, though achieving a common understanding for eSports is very important for its recognition as a sport. However, one of the official definitions of eSports (i.e., “Competitive tournaments of video games, especially among professional gamers”) does not incorporate several crucial aspects of pro gaming. To this end, authors created a check list on defining a sport [7]. Moreover, in the last years, several studies addressed the debate about whether professional computer gaming can legitimately be defined sports and compared to traditional athletic challenges. Indeed, the evolution of eSports itself is contributing to the discussion [8]. Following some of the major trends of the industry, eSports will probably continue to grow at a healthy rate, and the line between eSports and traditional sports will continue to fade [7,9,10].

Indeed, eSports and traditional sports share several differences and similarities. Nevertheless, only a limited number of studies focused on understanding the characteristics that distinguish the two disciplines and the ones which make them similar. In [11] the authors analyzed the importance of physical abilities and concluded that motor skills are a defining element of eSports.

Therefore, in this paper, we focus on the human aspects of eSports, and we use both qualitative and quantitative methods to investigate the nature of the similarities of electronic and traditional sports. Also, we detail the key psychological and physical factors for agonistic success in pro gaming, and how they relate to other sports.

3 Study

In our study, we investigate the human factors that are relevant for athletes' success in pro gaming and in traditional sports, presented as similar categories. Our analysis does not focus on contributing to the debate about whether eSports is a legitimate type of sport. Conversely, we try to identify the common psychological and physical traits and challenges of athletes in the two types of disciplines.

3.1 Materials and methods

To this end, we realized interviews with four professionals working as managers or coaches in sports and eSports. We selected respondents from Kansas Wesleyan University which, in addition to traditional athletics, developed competence in pro-gaming, in the last years. Specifically, two individuals from conventional sports and two from the eSports scene were selected for the interviews: C1 is the head coach for the football team, they have extensive experience in coaching student athletes, and they have a history of competing as a NCAA division 1 athlete; C2 is the head coach of the woman volleyball team, and thanks to their track record in terms of team victories, they took the position of the most successful volleyball coach in the history of the University, in late 2017; C3 is a former member of a high ranking eSports League of Legends team, and they currently hold the position of head eSports coach at the University; C4 holds the position of eSports manager for the National Association of Collegiate eSports (NACE), and they are the core founder of the eSports program at the University, and during their undergraduate studies supported the hiring of a coach for their program, which resulted to be C3.

Although the interviews were unstructured, we asked the similar questions to both groups and we encouraged respondents to lead the conversation. Conversations with coaches and industry professionals provided us with the opportunity of analyzing common patterns emerging from individual experiences and perspectives. This, in turn, helped us acquire a unique level of understanding of the key human factors for comparing eSports and traditional sports. Moreover, it supported identifying the fundamental aspects for developing a questionnaire, which was utilized to investigate the key factors among athletes in traditional sports and in pro gaming.

Specifically, given their involvement with a very physical sport, C1 provided great insight regarding the physical requirements for a top-level sport athlete. During the interview, C2 focused on coaching success and demonstrated how sports operate and the crucial aspects of how to build successful athlete and program. The conversation with C3 resulted in a deep understanding of what it takes to build an eSports culture, given their experience in creating a new program completely dedicated to pro gaming. Also, by discussing about aspects which are relevant for coaching, C3 highlighted the individual human factors in becoming an eSports athlete, with a bottom-up approach.

Finally, the managerial experience of C4 integrated the study with a top-down perspective on what defines an eSports and how eSports organizations function across the United States and worldwide.

Subsequently, results from qualitative interviews were utilized to design a questionnaire specifically aimed at exploring the human factors eSports by comparing traditional sports athletes and pro gaming participants, with the hypothesis that both groups share similar motivations, attributes, and traits in approaching their activity and, thus, human aspects play the most crucial role in significantly characterizing both types of sports as a single group. Specifically, the survey contained a total of five attributes that were utilized to describe the key human factors of sports and eSports, and items that aimed at getting more insights into the dynamics of players. The survey included questions focused on the topics that emerged in conversations with coaches and managers, and answers were collected using a Likert scale to achieve quantitative results and to standardize the methodology across the two types of sports. Also, subjects were asked to rank factors in terms of importance and impact on performance. The questionnaire was submitted to participants selected among students. They were divided in two groups: G1 included 48 individuals between the age of 18 and 25 who are involved in traditional sports, whereas G2 featured 48 eSports participants within the age range of 18-30.

4 The human factors of eSports

Interestingly, both C1 and C2 were aware of the growth and popularity of eSports. Specifically, when asked about the difference between traditional sports and pro gaming in terms of human factors, C1 commented “I cannot wait for the day that two people sit down to play a competitive game of football through eSports; one of these people has played football their entire life, been on a team through college and maybe even in the professional leagues, whereas the other person has never physically played football but competes in football via eSports and beats the player that competed in the traditional sport; that is one of the reason that I think eSports is so interesting”.

When asked about a definition of eSports, C3 defined them as “a popular video game that is competitive in the fact that there is a clear winner”. Therefore, the main points that C3 bases this definition on is the concept of a winner and a loser. In this regard, our respondents’ perception of pro gaming with the common definition of traditional sports, which is an “athletic activity requiring skill or physical prowess and often of a competitive nature”. Although this sentence supports the hypothesis that both types of sports being are in the same group, more accurate analysis is required to expand on the meaning of sports beyond the moment of the competition and identify whether other factors are relevant in approaching sports. For instance, C2 commented that “the first thing that pops into my head when I think of the word is technology; this type of competition seems to evolve around visual equities, fast reflexes along with a high level of hand eye coordination”.

However, as several other aspects are involved in eSports, our investigation of the physical and psychological components might provide insightful information to re-

shape the definition of pro gaming to take into consideration additional features that specifically characterize eSports. Also, our analysis includes results from interviews and surveys to highlight the similarities and differences between traditional sports and pro gaming, and to identify the most important human factors that play a role in considering eSports as a legitimate sport.

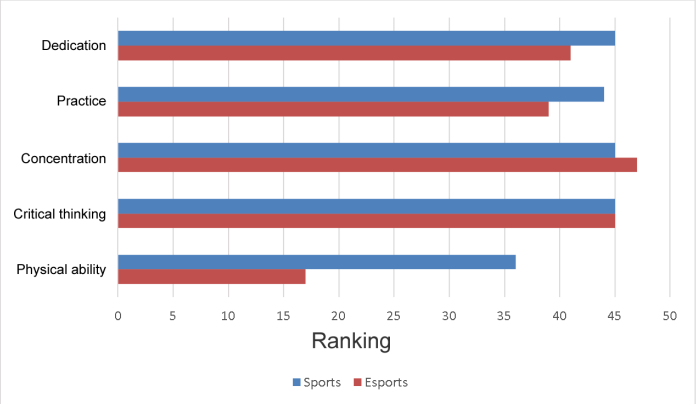

Fig. 1. Ranking of important factors for eSports and sports.

4.1 Competition

As mentioned in the previous section, competition is considered at the very core of the definition of any sport activity. The presence of a goal that players have to achieve by identifying strategies and the fact that the game will ultimately result in a winner and a loser, seems to be the main motivation for playing. Sport, both in its traditional format and in the eSports version, creates a scenario in which players deeply experience the dynamics of competition, which are among the most important psychological drivers for any animal species. In this regard, League of Legends is a very clear example of an environment where teams contend for resources. Moreover, C2 considered competition as the most important, must-have feature of sports as they revealed: "throughout my entire life I have been playing sports; if I had to pick one word to describe sports, it would have to be competitiveness; I believe that competitiveness alone drives many people into the world of sports". In this regard, C1 agreed with C3, as both stated: "when deciding whether something is a sport or not, we need to look at how it ends; if the outcome is strictly through competition resulting in a winner and a loser, then it is a sport, while if the outcome is decided by opinion, then it is art; I believe that eSports are more of a sport than gymnastics because the outcome results in decisions made by facts". Moreover, C1 reported that the most important trait determining sport is competitive integrity: "a winner and loser will be determined by only internal sources following the rules of facts".

4.2 Inclusivity

During the interviews, respondents referred several times to items, which can be associated with inclusivity, a very unique and distal factor of eSports. Surprisingly, inclusivity was not taken into consideration by other studies, and it receives less attention. However, its ability to be unbiased helped eSports grow to the level of popularity that it has today. Surprisingly, the topic was introduced by a traditional sports professional: C1 revealed that "eSports is one of the most inclusive sports that exists. It is completely unbiased toward gender, size, weight, race, or even religion: anyone can sit down and be included". As eSports players start their career autonomously and games develop in a collaborative environment that augments a single-person physical setting, almost anyone can start playing eSports. Then, when they reach competitive or professional levels, their skills and ranking are the only factors that matter. This feature, which eSports inherently has, is increasingly being introduced in traditional sports, to make them diverse and inclusive in terms of levels of physicality, ethnicity, origin, gender, and status. C1 continued supporting the analogy between the two types of sports by mentioning their efforts in improving the inclusivity of their football program: "this is one of the things that I love most about sports; in my football program, I have almost every type of demographic other than females. I have players that line up together, go to meetings together, even laugh and bond together. I get the privilege to bring all these people together in harmony to accomplish one thing; eSports is very similar to this but on a much larger scale". However, our findings contrast with other studies about diversity in eSports [12], as our participants might not be aware of statistics about gender and ethnicity, and therefore, their beliefs might be biased.

4.3 Concentration

Concentration was another factor evaluated during the survey, following suggestions given by the four respondents. Concentration resulted in the highest-ranking factors in terms of importance and impact on performance for both traditional sports and pro gaming. The results of the survey showed that concentration is more critical in eSports than in traditional sports. However, this is not a statistically significant difference. Moreover, the differences in duration and dynamics of eSports matches might explain this difference: traditional sports have breaks and time-outs that help players rest and relax to a certain extent, whereas pro gaming tournaments consist of uninterrupted sets. This is supported by C4, who discussed an example in League of Legends: "a match can last anywhere from 20 to 60 minutes; in this time there are no time outs, no breaks or rest, and all the players are experiencing very intense situations; a lack of focus or concentration for a single moment can lose the whole match for them; concentration is something that a professional eSports player cannot lack".

4.4 Critical thinking

Critical thinking ranked second as a key success factor for both traditional sports and eSports. Both groups were aligned in attributing the same value to this item. Indeed, as sport implements a type of game, teams' strategies significantly contribute to victory or loss, and individuals' tactics are important in improving the outcome of a

coalition. Therefore, both sports and eSports have an intellectual component which is more important than physical aspects, as confirmed from our results (see Physical preparation). Among respondents, C2 had a great perspective on the contribution of critical thinking to a competition: "when you look at the best college players in the nation and at elite level players, those individuals have exceptional critical thinking attributes". Moreover, this factor is directly associated with competition, as C2 referred "what drives most players is more passion and heart, but when a player has great critical thinking abilities that is what brings them to be a whole new level as a competitor". This is in line with findings from previous studies, which addressed the dynamics of specific games, such as, League of Legends [12, 13, 14].

4.5 Dedication

Participants ranked dedication as the third factor in terms of importance and impact on performance, with a slight difference between traditional sports and eSports, with the latter scoring lower. During the interview, C4 commented that "almost all of the most successful teams pour their soul into eSports; if there is anything that these players do have it is dedication". However, other participants had the same perception in regard to sports. As shown by our findings, the difference in dedication between eSports and traditional sports is extremely limited. As a result, we can conclude that high level of dedication is extremely important for both categories.

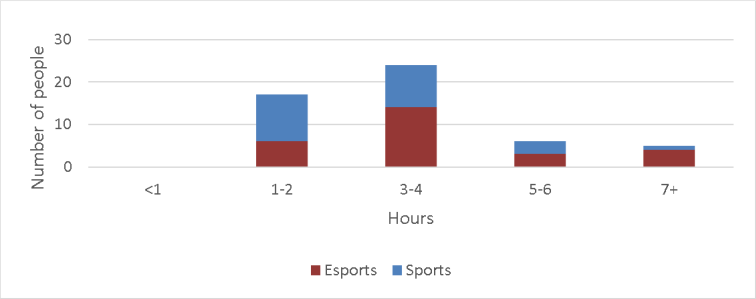

Fig. 2. Hours dedicated to training.

4.6 Practice

The survey explored practice, as during the interviews this emerged several times in respondents' sentences. Specifically, C3 commented: "we practice at least five times a week inside and out of the game; a lot of the time that we put into practice consist of game plan, strategy, and improving overall individual performances within the game; often, when people think of competitive video games, they see it to be nothing but fun, unfortunately this is not the case; the main focus for our team is to get better and produce good results in competition; once this is accomplished, we do try and have a little fun". However, similar comments were made by professionals from traditional sports. Data from the survey (see Figure 2) show that pro gaming players perceived training as less important than subjects in the other group.

4.7 Physical ability

Physical ability was discussed extensively during the interviews, and it was included in the survey. C1 supported the hypothesis of a great similarity of the two types of disciplines by stating that "eSports competitors are athletes; they are using their brains and their body to compete". This is an especially interesting perspective on the need for physical ability in eSports and sports, as C1 is a professional in the traditional sports space". The importance of physical ability in eSports was reiterated by C4, who made several comments on the physical factors that play a role in competitions. They stated that "many people underestimate the physical requirements of eSports; without fast reaction time, and hand eye coordination an athlete won't find much success in eSports". Although this category had the largest disparity between the two groups of responders (with eSports players attributing less than half the score of traditional athletes), both ranked physical ability as the least important factor.

4.8 Audience engagement

During the interviews, respondents reported several elements related to players' engagement in the game, such as, competition, strategic thinking, and technical preparation. Moreover, they spontaneously introduced distal items that expand outside the individuals involved in the game, which, in turn, can be associated with the concept of audience. Although very marginal in some conversations, this factor can be considered one of the defining aspects of sports, and it deserves some consideration in the definition of the word. Furthermore, it is one of the fundamental components of the success of a specific type of sport, or game. Although this factor was not included in the questionnaire, the interviews revealed that when investigated further, the presence of an audience sets the boundary between what can be considered sport (e.g., basketball or League of Legends) and what is just an activity, such as, playing with cards. Specifically, C2 stated: "it is not a sport if there is not any level of entertainment for spectators; the first thing that comes to my mind when thinking about sport, is the word spectator: will anyone want to sit down and watch this? What type of value does this bring outside of the competition". Also, the presence of an audience of viewers creates a generative loop which is beneficial to the development of a sport: higher levels of engagement drive commercial interests which, by injecting resources, promote dissemination to a larger audience.

4.9 Continuous training

The survey asked athletes from pro gaming and traditional sports about their training habits and practices in the off-season, to investigate how they prepare to get ready for competition. We offered four different options, and we gave respondents the opportunity of adding their own opinion. Results are shown in Figure 3, and they demonstrate a common perception of the level of training required by their discipline.

Also, we focused on time spent on training. Figure 2 illustrates how many hours the two types of competitors spend training each day, and it highlights the level of dedication and commitment both groups of players must have.

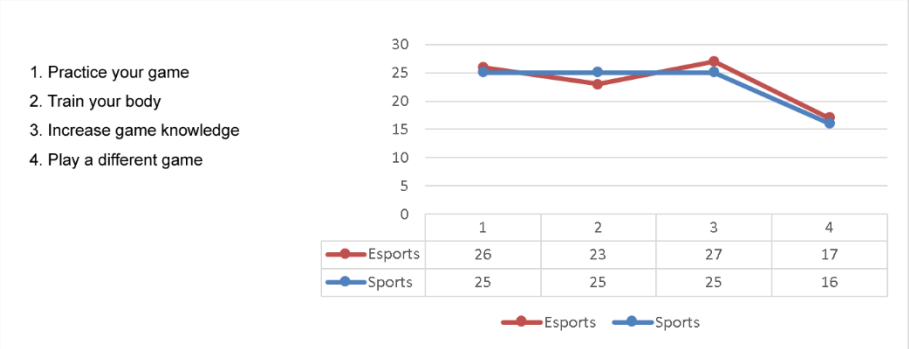

Fig. 2. Type of training and strategy implemented in the off-season period.

5 Conclusion

eSports is a form of competitive sports that heavily relies on the use of technology and video games. In the recent years, its level of popularity has started to spread outside of the eSports culture and into more traditional sports settings. As a result, several studies identified the similarities between sports and eSports, and made a legitimate case for the latter being considered as a sport.

Our study investigated the human factors involved in eSports, and we addressed the topic from the perspectives of coaches and athletes of traditional and electronic sports. To this end, we conducted interviews with professional coaches and players of student teams and eSports leagues. Also, we realized a questionnaire in which we addressed 5 aspects related to individuals' agonistic preparation to tournaments, that is, dedication, practice, concentration, critical thinking, and physical ability.

From our findings, we can conclude that professional coaches share a similar perspective on the challenges and dynamics which traditional and electronic sports have in common, though the intensity of physical activity might be perceived as different. Moreover, specific advantages of eSports, such as inclusivity and the ability of being unbiased, were praised by both groups of coaches. Furthermore, data from our survey shows that 73% of sport players (both groups) recognize pro gamers as athletes, whereas 27% of respondents do not consider eSports as an agonistic activity. In contrast, results from our quantitative analysis reveal that there is no statistical difference between traditional and electronic sports in 4 out of the 5 dimensions of agonistic preparation considered by our study.

As a conclusion, achieving a better understanding of the common human factors, dynamics, and challenges of sports and professional gaming might help define the

interpretation eSports and leverage the opportunities that arise from the similarities between traditional and electronic sports.

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