Int. J. Sport Psychol., 2020; 51: 613-625
doi: 10.7352/IJSP.2020.51.613

The psychological aspects of electronic sports: Tips for sports psychologists

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Professional competition in the field of videogames, known as electronic sports (esports), is rapidly growing and sport psychologists are considering providing support to optimize performance. However, psychologists doubt whether esports is an activity of their competence and players (gamers) and coaches know little about how psychologists can help them optimize their performance. The aim of this article is to bring information related to esports and to how sports psychology applies to the context of competitive gaming. The paper begins with an overview of video gaming, tracing the evolution from the first recreational games to the international competitions of today. The article goes on to define esports and to discuss the extent to which they can be considered sports. Next, the article discusses the role of the sport psychologist in esports and offers an overview of the psychological issues worthy of special attention in this field. In addition, the article presents a career model applied to esports. Finally, the authors provide some reflections on the psychological factors involved in esports, highlight the possible roles of sport psychologists, and suggest possible directions for future research and interventions.

KEY WORDS: Careers In Sports, Esports, Motivation, Psychological Skills, Video Games.

Video games have quite a lengthy history as a form of entertainment. Perhaps the first video game, one in which human player competed against a machine, can be traced back as far as 1952 (Stanton, 2015). However, it was with the appearance of *Spacewar* (1962) and *Pong* (1972), collaborative games where gamers could play together, that the popularity the games spread enough for video games to reach the status of an entertainment industry in their own right (Banyai, Griffiths, Kiraly, & Demetrovics, 2018).

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Subsequent technological advances, especially in the quality of microprocessors and memory chips, made it possible to develop home video game consoles like the popular Nintendo system. Other breakthroughs came with the arrival of CD-ROM and 3D technology, which made it possible to develop video games for personal computers (PCs). Thanks to the proliferation of Internet connections and the advent of consumer IT, video games, which had started out as an experimental pursuit on university campuses, came to take a place among the most popular leisure activities worldwide. Recent years have witnessed the appearance of Massively Multiplayer Online Role-Playing Games (MMORPG). This genre allows players to move through virtual online worlds and interact with one another in real time via online representations (avatars) as they complete missions, go from one level to the next, gain experience and create and use objects within the games. The boom in these games represents a qualitative leap forward in the popularity of video games overall (Fuster, Carbonell, Chamarro, & Oberst, 2013).

Table I shows some of the key milestones in the history of video games over the last several decades.

TABLE I
Milestones in the history of video games

Decade	Milestone
1950	First video game: *Noughts and Crosses*. Player vs. machine."*Tennis for Two*", table tennis simulator, created using an oscilloscope.
1960	*Spacewar*!, spaceship simulator, Player vs. player. *Fox and Hound* video game project, start of home video gaming.
1970	First home video game system: Magnavox Odyssey. First recreational arcade game: "*Pong*", used in public places. *Space Invaders*, the cornerstone of the video game industry.
1980	Spread of technological advances: microprocessors and memory chips.Launch of home video game systems: Odyssey 2, Atari 5200, Commodore 64…The growing popularity of arcade games: *Pacman*, *Battle Zone*…Video game crisis, mainly affecting the United States and Canada.Explosion of home game consoles in Japan: Nintento Entertainment System (NES). Microcomputers dominate the European market: Commodore 64 and Spectrum. In North America, the NES becomes the most popular video game system.
1990	16 Bit generation: Mega Drive and Super Nintendo Entertainment System (SNES) Launch of the Neo Geo console, with the same features as arcade games. Spread of CD-ROM technology Start of 3D video games: *Doom* and *Wolfenstein* for PC32 Bit generation: Sony Playstation and Sega Saturn 64 Bit generation: Nintendo 64 and Atari Jaguar3D accelerators allow huge advances in video game graphics. The popularity of arcade machines declines. The appearance of portable consoles: Game Boy, Game Gear and Neo Geo Pocket The appearance of connections between computers, allowing for the first multiplayer games. Popular video game genre: First person shooters (FPS); *Quake …*Popular video game genre: Real time strategy (RTS); *Stracraft …*
2000	Launch of consoles: Playstation 2, Dreamcast, Gamecube …Microsoft enters the video game console sector: XboxLaunch of portable consoles: Nintendo DS and Playstation Portable (PSP) Launch of consoles: Xbox 360, Playstation 3 and WiiSpread of DVD and Blue-Ray (BR) technologyThe beginnings of electronic sports (esports)
2010	Launch of consoles: Playstation 4 and Xbox One Spread of Virtual Reality (VR) technology Professionalization of electronic sports (esports)

From recreational video games to organized competition

Competitive video game play is far from a new development. As far back as 1972, Stanford University hosted an event in which 20 people (playing on teams of five) competed in the game *Spacewar* (Li, 2016). Table II shows the evolution of electronic sports (esports) over the decades.

The growth of esports since then has been constant. Sponsors began to organize a wide range of events, making video games into a highly lucrative activity. Game developers also realized the potential of esports and began to pay more attention to the competitions. In 2013, the Canadian professional *League of Legends* player Danny Le became the first esports participant to be granted a P-1A visa (the visa given to internationally recognized athletes) by the US government (*Los Angeles Times*, 2013). Universities now accept gamers as student athletes, and more than 50 colleges have esports teams (Difrancisco-Donoghue, Balentine, Schmidt, & Zwibel, 2019).

The proliferation of online platforms for streaming video of competitions, most prominently Twitch.tv, has played a key role in the spread and promotion of esports competitions. Currently, the most popular games for tournaments are *League of Legends* and *Counter Strike* (Newzoo, 2019a).

Since 2017, esports have been growing at an annual rate of 40% worldwide, and the industry has surpassed $500 million in sales, a boom that has awakened the interest of a growing number of sponsors of these competitions and of the media, which have devoted more and more coverage to this sport (Newzoo, 2017). In 2019, the industry is expected to generate a total revenue of $152.1 billion (Newzoo, 2019b).

Because of the exponential growth of these competitions around the world, since 2017 the International Olympic Committee (IOC) has been engaged in a debate as to whether esports can be considered sports, and

TABLE II
Milestones in the history of esports

Decade	Milestone
1970	First video game competition: *Spacewar!*
1980	First large-scale competition: *National Space Invaders Championship* First video game team: *United States National Video Game Team* Appearance of video game tournaments on the Internet and in magazines First television broadcasts of video game tournaments
1990	First event defined as esports: *Red Annihilation*, a *Quake* competition Dennis Fong considered first esport player
2000	Rise of esports in Asia with the video game *Starcraft* Esports becomes the national pastime of South KoreaBirth of the World Cyber Games (WCG) and the Electronic Sports League (ESL) Birth of Major League Gaming (MLG)

included as medal events at the upcoming 2022 Asian Games, and as a demonstration sport in the 2024 Olympic Games in Paris (BBC, 2018). The IOC is slated to take a final decision on this matter after the 2020 Games in Tokyo.

Electronic Sports (Esports): What Are Esports?

Esports "are a form of sports where the primary aspects of the sport are facilitated by electronic systems; the input of players and teams as well as the output of the esports system are mediated by human-computer interfaces" (Hamari & Sjoblom, 2017, p. 211). Scholars in the field have come to the consensus that in order for a video game to be considered an esport, there must be an organized, competitive event involved. Esports are now an undeniable competitive, social, economic and entertainment phenomenon, as well as a viable profession for many of their participants, and they are still growing considerably worldwide (Thiel & John, 2018).

Although the video games on the market number in the thousands, only a few of them have ever taken hold among professional competitors and gained the status of esports (Antón, 2019). An esport cannot be solely founded upon the design of a video game itself. Instead, esport emerges thanks to certain game design patterns that favor the creation of both competitive structures (competitions, clubs, professional teams and players) and media structures (a community of fans, media coverage, broadcasts and sponsors). These two structures, along with the principle of competition among equals (all participants play under the same conditions) are important defining factors of esports (Garcia-Naveira, et al., 2018). Chanson (2017) suggest that it should be considered that video games allow marked differences in level between players (skill gap), as well as being spectacular.

Table III shows the various video game genres that are currently considered esports. It sometimes happens that certain games lose prominence due to declining interest on the part of the gaming community or the organizations that hold competitions. However, *League of Legends* and *Counter Strike* have been able to maintain their positions as the leading esports games in their respective genres ever since they appeared (Newzoo, 2019a).

Video of esports competitions is streamed to online audience via platforms such as *Twitch* (Gerber, 2017). Professional gamers seated, depending on the game, in front of computer screens or monitors attached to video game consoles (such as a *PlayStation* or *Xbox)* compete against one another individually or in teams. They also use handheld controllers called gamepads, as well as computer keyboards and mouse to interact with video

TABLE III
Video game genres and games currently considered esports

Genere	Video Game
Multiplayer Online Battle Arena (MOBA)	*League of Legends* (LOL) *Defense of the Ancients 2* (DOTA2) *Heroes of Storm* (HOS)
Real-Time Strategy (RTS)	*Star Craft 2* (SC2) *Age of Empires 2* (AOE2)
First Person Shooter (FPS)	Counter-Strike: *Global Offensive* (CSGO) *Call of Duty* (COD) *Overwatch* (OW)
Battle Royale (BR)	*Player Unknown's Battlegrounds* (PUBG) *Fortnite*
Collectible Card Games (CCG)	*Hearthstone* (HS) *Clash Royale* (CR) *Magic the Gathering* (MTG)
Sport Games	*FIFA 20 NBA 2 K20*
Fighting Games	*Street Fighter V Dragon Ball Fighter Z*
Racing Games	*Sim Racing Moto GP 2020*

games. They communicate with teammates using headphones, which allow them to immerse themselves in the world of the game and block out any distracting noise. It is also worth underlining here that many gamers live in so-called gaming houses, residence that also function as high-performance training centers where they can work with a range of different professionals (coaches, personal trainers, nutritionists, physiotherapists and psychologists) (Pereira, Wilwert, & Takase, 2016).

Are Esports Really Sports?

There has been a great deal of controversy about the extent to which esports can be considered sports. Scholars who have argued in favor of defining them as such have often underlined that esports do meet the general definition of sports in that they are organized, competitive games that require physical ability and have a significant number of followers (Jenny, Manning, Keiper, & Olrich, 2016). Meanwhile, Thiel and John (2019) have argued that it is not that easy to distinguish esports from established sports. These researchers point out that esports, as sports in general, take place in competitive settings in which competing teams or players fight for victory, are structured according to rules valid for all participants, and are characterized by training regimens that lead to improvements in the skills that are characteristic of the game. In addition, game-specific tactical knowledge plays a decisive role with regard to success. For Pedraza-Ramirez, Musculus, Raab and Laborde (2020) the existence of ranking systems and competition regulated by official leagues are key aspects for considering a video game as an esport.

However, Parry (2018, p.1) has maintained that "e-sports are not sports because they are inadequately 'human': they lack direct physicality, they fail

to employ decisive whole-body control and whole-body skills, and cannot contribute to the development of the whole human; and because their patterns of creation, production, ownership and promotion place serious constraints on the emergence of the kind of stable and persisting institutions characteristic of sports governance."

There is little doubt, though, that esports are part of our contemporary culture, and they have cemented themselves as a specific kind of sporting competition, one whose popularity is likely to continue to grow (e.g., Pereira, Brito, Figueiredo, & Verhagen, 2019). Despite the boom in esports, there is still a debate as to what technical criteria should be applied to determine whether these activities are indeed sports, and there are questions about the legal framework that should regulate them (for example, whether esports are in need of an official federation). A fundamental problem in this regard is that companies design the game settings and produce the games. This, in turn, means that sports federations have no freedom of choice when setting rules of the game (Thiel & John, 2019). According to Huk (2019), however, this criticism is based on an idealized notion of sports bound up with the ideals of the Olympic Games, not on an objective analysis of present reality.

Some might argue that the debate as to whether esports can be strictly defined as sports is of little interest to psychologists, but the issue is not as trivial as it might seem. Psychologists involved in esports will doubtless have to justify their professional activities. For now, in the absence of a scholarly consensus on the matter, we would rely on the account of esports provided by García-Naveira et al. (2018). These researchers argued that esports are activities that test human performance and that they are integrated with technology and the media, have a large mental component and are socially accepted. Pedraza-Ramirez et al. (2020) also suggest that the esports player has to show cognitive abilities to meet the demands of competitive gaming. Regardless of whether esports can be defined as sports, Heere (2018) maintains that their emergence has been marked by "sportification", as the activities are organized along similar lines to sporting events (for instance, by cre-

TABLE IV
Skills to be developed by sports psychologists

Skill	Tool	Use
Online communication	Team Speak3 (TS3) Discord	Contacting gamers
General knowledge	Scrims Replays	Forming relationships with gamers Understanding of gamers' language
Knowledge of platforms	You Tube Twitch	Watching training and competition Making corrections
Knowledge of competitions	Rule book (ESL)	Learning how leagues function

ating a safe and gratifying atmosphere for cooperation, competition and comparison of performance), and organizers add aspects typical of sports to increase the competitions' appeal to the audience.

The Sports Psychologist in Esports

Himmelstein, Liu, and Shapiro (2017) have detailed the similarities between the psychological demands of esports and those of traditional sports. The existence of these psychological pressures represents a professional opportunity for sports psychologists. Professionals in this field face the challenge of how to study and adapt to the phenomenon of esports, as well as to the use of online psychology, a usual practice among gamers who often are geographically dispersed, as they train and compete online. This means that sports psychologists wishing to get involved in esports need to improve their skills with regard to online work and the use of new technology, with a special focus on tools related to electronic sports (for example, by using Discord rather than Skype) (see Table V).

Despite this emerging need, esports have only recently begun to attract the interest of the sport psychology field, and there are few professionals with experience working with gamers in this context (García-Naveira et al. 2018).

Characteristics of Esports Gamers

One objective of recent psychological research in this field has been to find out what psychological variables tend to characterize esports gamers. Most of these studies have used observational techniques and qualitative interviews to come to an understanding of the cognitive demands placed upon participants in esports (Reitman, Anderson-Coto, Wu, Lee, & Steinkuehler, 2019). Researchers have identified a number of characteristics present in successful gamers, including knowledge of the video game, decision-making skills, motivation, the ability to separate one's personal life from one's sporting activities, concentration, emotional control (Tilt), a positive attitude, and a commitment to constant improvement and to mental and physical warm-ups (for example, by typing very quickly) before training sessions (Himmelstein et al., 2017). Huang, Yan, Cheung, Nagappan, and Zimmermann (2017) add that successful gamers tend to follow pre-competition routines and to be able to adapt to new game situations.

TABLE V
Glossary of words used in esports

Word	Meaning
Adderall	Psychostimulant used to enhance concentration
Aimbot	Third-party program that allows for automatic targeting
Cash Prize	Winnings at the end of a competition
Casual	Occasional amateur player
Cheat	Unauthorized program that allows players to access improvements in the game
Creep	Creature that players must defeat
Diskhack	Third-party program that allows players to disconnect opponents
Fog of War	Fog that prevents players from seeing what the opposing team is doing
Gaming House	Training facility where gamers live
Hype	Enthusiasm about a video game, team or trend
Jungler	Player who moves around the map to help his teammates
Ladder	Ranking system based on points earned while playing
Lane	Road linking the bases of the two teams
Maphack	Third-party program that allows players to see through the fog
Meta	Strategy that makes reference to a video game
Mid	Player at the center of the map
Mod	Software extension that modifies a video game
Patch	Software update or extension of a video game
Pay to Win	Financial system in which the player buys elements of the game
Playmaker	Player who can affect the results thanks to his or her mastery of a game
Replay	Game recorded for analysis, whether featuring one's own team or another team
Scrim	Training session with other professional teams
Skill Gap	Difference in skill levels between players
Skin	Appearance of a character in a game
Soloqueue	Classification system used in League of Legends
Speedrun	Achieving the objective of a video game in the shortest possible time
Streaming	Online broadcast
Sub	Substitute
Support	Player who protects his or her teammate
Tilt	State of frustration in a player
Lore	Universe in which a video game is set
Top	Gamer who plays at the top of the map
Wallhack	Third-party program that allows players to see through walls

Pérez-Rubio, González, and Garcés de los Fayos (2017) pointed to the possible emergence of burnout (emotional exhaustion, depersonalization and reduced fulfillment) because of excessive attention paid to results and hours spent on training. García-Lanzo and Chamarro (2018) have suggested that esports gamers tend to be young, passionate people with a high degree of dedication, whose game playing activity is usually in harmony with the other elements of their everyday lives. These researchers also concluded that passion is a useful variable for understanding the differences in motivational patterns with regard to video game competition. Elsewhere, Bányai, Griffiths, Demetrovics, and Király (2019) highlight esports gamers play video games in a different way those recreational gamers: they play for more time, are more competitive, and are motivated by the social and skill-development aspects of games. Social motivation could help becoming an effective teammember and interact with the esport community. Skill-development motivation may help in persevere in gaming.

Psychological Skills In Esports

There seems to be a great deal of consensus among researchers that competing in esports requires considerable skill and ability, including in psychological terms (e.g., Pereira et al., 2019). Firstly, these psychological requirements come from the fact that video gaming has a social component, as gamers often compete on teams to reach a shared objective. Because of the importance of group cohesion, psychological processes like efficiency, anxiety and stress take on importance in this context. At the same time, it is critical to maintain pleasant atmosphere for gaming despite the pressure of competition (Pérez-Rubio et al., 2017). Himmelstein, Liu, and Shapiro (2017) found that the most important variables included the ability to control *tilt* (a momentary feeling of rage and impotence caused by a player's perception of his or her inability to achieve a given objective, which can cause a loss of concentration and poor performance) and successful *comms* (the team's internal communication). These authors also stressed the importance of learning the specific language used by esports gamers to communicate, as this facilitates an understanding of the context and of the relationships among team members (see Table V).

Examining gamers' performance, a number of researchers (Hilvoorde & Pot, 2016; Kari & Karhulahti, 2016; Railsback & Caporusso, 2019) have observed that, in order to meet the demands of competition, esports participants train to enhance their cognitive capacities (such as mental agility, spatial memory and decision making), psychological skills (such as emotional self-control, concentration and self-efficacy), physical capacities (such as aerobic endurance and reaction time), technical and tactical abilities (such as knowledge of a game and its strategy), coordination (for example, hand-eye coordination) and traditional values (such as individual effort, teamwork and overcoming obstacles). Pedraza-Ramirez, Musculus, Raab, and Laborde, (2020) highlight that expert gamers were characterized by establishing consistent habits and routines. This is especially relevant because esports are in constant evolution and new rules require adaptation.

Some studies have emphasized the stressful nature of esports (e.g., Smith, Birch, & Bright, 2019). The increasing social attention received by the competitions and the pressure to perform can lead to anxiety and other mental problems (Pereira et al., 2019), and gamers need to develop strategies to deal with these consequences. Some of the stress factors identified in the research include the following: team communication, criticism from teammates and team leaders, a lack of shared team objectives, difficulties in living a balanced life and the impact of the gaming lifestyle. In the same vein, Pérez-Rubio, González, and Garcés de los Fayos (2017) found that emotional

burnout and cynicism could emerge among gamers because of the degree of importance attached to results. These researchers recommended that gamers undergo training in social abilities.

Motivation in esports

Kahn et al. (2015) examined the question of motivation among esports gamers and identified six different categories of gamers, according to the factors that most motivated them: socializers (with an interest in building and maintaining social relationships), completionists (with an interest in exploring every aspect of a game to the fullest), competitors (with an interest in winning and in ensuring that their behavior contributes to victory), escapists (with an interest in escaping from reality) story-driven gamers (with an interest in the plot of a game and in the characters' backstories) and smarty-pants gamers (with an interest in enhancing their mental capacities and intelligence).

More recently, García-Lanzo and Chamarro (2018) showed that the biggest motivating factors for esport gamers were competition, social relationships and exploration. Professional gamers stood apart from other more recreational video game players not only in terms of the number of hours a week they spent on games, but in how likely they were to be motivated to enhance their mental abilities through gaming. Both Kahn et al. (2015) and García-Lanzo and Chamarro (2018) have pointed to players motivated by escapism as being at particular risk of engaging in problematic use of esport. Elsewhere, Bányai et al. (2019) identified a number of factors that make esports gamers more likely to want to gaming: competitiveness, social interaction (belonging to a club or team) and skill-development.

The factors that most motivate esports spectators are the players' skills, the team that is playing, the commentary of the announcers (casters) and enjoyment (Lee, An, & Lee, 2014). Beyond the enjoyment of watching a match, esports spectators take the opportunity to analyze the games and learn from watching the best players.

Careers In Esports

Some researchers have also looked at the evolution of esports careers. Kim and Thomas (2016) have identified four phases that esports gamers tend to experience during their careers (see Table VI).

It is clear that the career phases of esports gamers are quite similar to those of traditional athletes (e.g., Hallmann, Breuer, Ilgner, & Rossi, 2019).

TABLE VI
Phases experienced by gamers in their careers

Phase	Description
Enjoyment	The gamer plays mainly for fun, but soon recognizes that his or her skills are better than those of other players are and begins to take competitive video gaming more seriously.
Struggle	The gamer successfully passes the tests required to become a member of a professional club. In this phase, the player's individual skills are no longer sufficient, and he or she has to start to train in basic skills and strategy. At this stage, the gamer also begins to compete.
Achievement	The gamer now has more experience and comes to play an important role on the team (such as captain). He or she begins to communicate more with coaches to develop winning strategies. In this phase, the player attains his or her greatest achievements in competition.
Decline	The player begins to pass up chances to take part in official competitions, and his or her motivation decreases. Some players retrain and resume competition, but eventually they stop competing altogether. When they are no longer active as players, they tend to move on to other professions within the world of esports (becoming coaches, announcers or streamers)

Thus, as Pedraza-Ramirez et al. (2020) suggest, one of the roles of sports psychologists in esports also have should to carry out interventions related to identification of players' career paths and the acquisition of skills that facilitate their evolution along different transition stages.

Conclusion

Esports have been growing exponentially from one year to the next, and gamers require psychological skills very similar to those demanded of traditional athletes. In light of the important psychological factors involved in video gaming, sports psychologists have an important role to play within esports clubs. For example, it would desirable for sports psychologists to train gamers in values, teamwork, communication skills and, most importantly, in how to develop their professional sporting careers. Some researchers (e.g., Difrancisco-Donoghue, 2019; Pereira et al., 2019) have also suggested that gamers undergo preventive treatments to avoid the potential negative health effects (e.g., sleep alterations, repetitive strain injuries, neck and back pain) associated with the intensive use of computers and joysticks. In short, we believe that the figure of the psychologist should be an integral part of any esports team. However, research on esports is still limited, mainly qualitative and exploratory. With a few exceptions (e.g., Pereira et al., 2016) authors present their results in journals on human-computer interactions journals, not in sport psychology journals. Therefore, this field offers great opportunities to sport psychology researchers, but according to Pedraza-Ramirez et al. (2020), both, researchers and practitioners, should consider individual esports (e.g., LoL) better than whole genres.

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