Esport from a sociological perspective

Reflections on the social dimension of electronic competitive gaming

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1 Introduction

1.1 Research context

Computer and video games have developed from a niche subculture for hardcore fans to a mainstream entertainment activity. Icons like *Pacman*, *Super Mario*, *Tomb Raider*, and many others are part of our popular culture. What is more, *Lara Croft* is only one amongst many video game characters who starred in blockbuster movies. Cross medial representation of video games is commonly found in series, films, literature, art etc. (just to name a few: *Arcane*, *Uncharted*, or *Prey*). *Arcane* is a highly successful series based on the popular esport computer game *League of Legends.* With more than a hundred million players worldwide, it is among the most-played computer games and one of the most prominent examples of competitive gaming, commonly referred to as electronic sport (abbreviated esport). [1] Esport has developed parallel to the growing gaming industry, especially in the 1990s and 2000s. It developed alongside digitalization, improving hardware, software, and broadband technology, which eventually allowed players to connect their homes and play with and against each other (Müller-Lietzkow, 2006; Taylor, 2012; Wagner, 2006). In the beginning, esport was mainly driven by its own community that created or organized platforms, (gameplay) modifications, tournaments, and leagues to play in. Today, it has become one of the biggest phenomena in the sports industry regarding popularity, prize money, spectatorship, or media attention. Esport regularly outperforms many disciplines of traditional sports (cf. Ahn et al., 2020; Ballhaus et al., 2020). In international politics, it is increasingly considered a cultural equivalent to traditional sport and thus seeks acknowledgment (cf. Borggrefe, 2021; Ekdahl, 2021a; Parry, 2019; Thiel & John, 2020; Willimczik, 2019). In countries where esport is already regarded as a sport, professional gamers enjoy the same benefits and status as athletes from traditional sports including funding, visa, and medical support, and they are seen as representatives of their countries (Taylor, 2012). In Germany, the coalition agreement of 2017 and 2021 included the passage to acknowledge the public benefit of esport and therefore open it for the sport system, but

[1] There are different established spellings for the abbreveiation of electronic sport (Formosa et al., 2022). This dissertation uses the spelling ‚esport', unless citing a source.

this is yet to be realized (CDU et al., 2017; SPD et al., 2021). Regardless of the political debate, esport is no longer a niche culture, but now comes with a multi-billion-dollar industry, with spillover effects beyond its economic factors, in areas such as education, teaching, health, legal implications, sport, among others (Bascón-Seda & Rodríguez-Sánchez, 2020; Jonasson & Thiborg, 2010; Ward & Harmon, 2019). Since esport is growing as part of mainstream culture there is more and more scientific literature on the topic, and it becomes imperative to approach esport through scientific scopes from various perspectives (Reitman et al., 2020; Thiel & John, 2018; Thiel & John, 2020).

Early research about esport was conducted mainly by communication and media science, with only a few sports scientists dealing with the subject (e.g. Müller-Lietzkow, 2006; Taylor, 2012; Wagner, 2006). Today the scientific stage has diversified, and various disciplines are exploring esport. For example, legal science investigates implications for gamers under the premise of whether they can be regarded as athletes (e.g. Funk et al., 2018; Holden & Baker III, 2019), economists investigate the business environment (e.g. Breuer, 2011, 2012; Mangeloja, 2019) and sports science deals with the question whether esport can be considered a sport (e.g. Schmidt et al., 2019). On the one hand, esport is often criticized for lack of physicality, sports structures, or the dependency of the game developers and publishers (Borggrefe, 2021; Parry, 2019). On the other hand, proponents argue that sport is always developing and therefore esport is a logical development of sport in an increasingly digitalized society (cf. Thiel & Gropper, 2017; Thiel & John, 2020).

One unique trait of esport compared to traditional sports is that players can immerse themselves in the digital world while competing. This implies that players feel connected to and with a medium, in this case, a computer or video game, in a way that the physical and mental perception of a frontier between digital and physical worlds is disappearing (cf. Brown & Cairns, 2004). The competitions are held simultaneously in real life and in the digital world. Usually, in sports, the domain of execution, where an action takes place, and the domain of application, where the result of the action is happening, occur at the same location. In esport, these two domains stretch from the real into the digital world (Holt, 2016; Thiel & John, 2020). Therefore, it is possible to observe requirements

for the players in real life, such as the physical and mental ability to play, and also require immersing into a digital world both physically and mentally. While for entertainment (games, movies, books), immersion is a sign of an intense experience (Nilsson et al., 2016), in esport it is unclear how exactly this affects playing and competing. Digitalization created the basis for an overlap of analog and digital worlds in sports. Esport can be regarded as a new type of sport and a novel movement practice in between the virtual and real world (Goebeler et al., 2021).

A fundamental question of sport sociology is how sport affects society (Heinemann, 2007; Thiel et al., 2013). This may be extended to the realm of esport with its increasing popularity and unique characteristics. The public, political, and scientific interest in esport is increasing, and especially the origins of the development of esport have been dealt with thoroughly (e.g. Borowy & Jin, 2013; Breuer, 2011, 2012; Edgar, 2019; Jenny et al., 2017; Jonasson & Thiborg, 2010; Taylor, 2012; Wagner, 2006). Currently, the research questions are diversifying and the interest in investigating esport from a (sport) sociological perspective is growing. In particular, the question about the role of esport in society becomes increasingly significant (Bascón-Seda & Rodríguez-Sánchez, 2020; Tjønndal, 2022). Considering that we are looking at a new form of sport, this cumulative dissertation investigates social dimensions to understand the impact of esport on society from a sport sociological standpoint.

The impact of esport on society regarding the different societal branches where it is now rooted will be tried. In this context, it is also of interest to understand how sociality can be produced or generated. In esport, there is a peculiarity compared to traditional sports, whereby the players do not necessarily interact with each other and instead are mediated through digital avatars. Physical interaction, which is a basis for social interaction, is therefore not assured. This is a strong contrast to traditional sports, and it shows that investigation into corporeality is an important topic when considering the social dimensions in esport (cf. Ekdahl, 2021a; Rail & Harvey, 1995; Thiel et al., 2013). Eventually, different facets and peculiarities of esport, like the duality of the real and virtual world and its overall impact on (for example) economics, pedagogics, education, management, and communication may lead the research interest and contribute to the

foundation for future research on the social dimensions and social and societal impact of esport.

1.2 Structure of dissertation

After chapter 1 has presented the initial thoughts and aims of the dissertation, chapter 2 delivers definitions and background regarding esport and illustrates the current state of research that serves as the foundation for the last sub-chapter, which summarizes research gaps and desiderata.

In chapter 3, the peculiarity of the digital nature of esport is explained since this is a major consideration compared to traditional sports. On this basis, firstly the chapter elaborates how digitalization can occur differently within a sportive context, and how esport can be categorized within the trend of the digitalization of sport. Further, this chapter explains the role of immersion in competitive gaming, as a distinctive characteristic of esport compared to traditional sports, and how far the virtual worlds can be perceived as real ones by the players. The chapter ends with an overview of the esport ecosystem considering that the interplay between reality and virtuality stretches beyond the individual experience of the players and can be observed in many facets of esport.

Chapter 4 contains a preliminary conclusion of the theoretical background and summarizes the overarching research questions for this dissertation.

Chapter 5 provides the three scientific articles on which this dissertation is based.

In Chapter 6 the central findings of this dissertation are discussed. It provides overarching theoretical and practical implications, reveals future research avenues, and outlines the limitations of the thesis before concluding it.

2 Revisiting the research on esport and competitive gaming

This chapter explains the terminology esport and gives an overview of different ways of defining esport, before providing a short outline of its origins, and explaining different genres and respective computer games that are commonly played competitively. This creates the foundation for the scientific approach of this dissertation and paves the way to elaborate on the current state of research into esport. On this basis, research gaps and desiderata are explained, which are dealt with in this dissertation.

2.1 What is esport?

2.1.1 Defining esport

Although the terminology esport reveals a connection to sport, not all definitions of esport build on the link to traditional sport. For example, Wagner (2006) does not see the necessity of looking at esport in a sportive context, and rather sees it as a distinctive field of research. This also appears in various definitions of esport that have been published over the years.

Definitions not related to sport resemble one another considerably. Usually, they refer to the competitive nature, the degree of organization, and the type of gaming (digital, virtual, online, computer, or video gaming) (Borowy & Jin, 2013; Maric, 2011; Parshakov & Zavertiaeva, 2015; Weiss, 2008; Weiss & Schiele, 2013; Witkowski, 2012). Hamilton et al. (2012, p. 310) emphasize the entertainment and exhibition value of "playing and spectating digital games". While it is difficult to say whether there are more or fewer definitions referring to sport, it can be stated that the sport-based ones tend to be more differentiated. One of the first definitions comes from Hemphill (2005, p. 199). Instead of esport, he uses the term cybersport and describes it as "alternative sport realities, that is, to electronically extend athletes in digitally represented sporting worlds". Further, he claims that "the prowess involved in certain computer games is sufficiently 'physical' and 'skillful'" (Hemphill, 2005, p. 205). Wagner (2006, p. 439) refers to a sport definition by Tiedemann (2004)[2], describing esport as an "area of sport activities in

[2] "‚Sport' ist ein kulturelles Tätigkeitsfeld, in dem Menschen sich freiwillig in eine wirkliche oder auch nur vorgestellte Beziehung zu anderen Menschen begeben mit der bewussten Absicht, ihre Fähigkeiten und

which people develop and train mental or physical abilities in the use of information and communication technologies". Tiedemann (2004) criticizes that all facets of his definition are required for a practice to qualify as a sport. Witkowski (2012) claims that many aspects of traditional sport are mediated through or influenced by electronic devices or the games themselves. Hamari and Sjöblom (2017, p. 213) further argue that the definitions by Wagner (2006) and Witkowski (2012) are not comprehensive since they only cover information- and communication technology, and fail to address the "complex mixture of both physical and electronic aspects in eSports". Rambusch et al. (2007, p. 157) define esport as "competitive gameplay which borrows forms from traditional sports". Jonasson and Thiborg (2010, p. 288) also refer to traditional sport terminology in their definition of esport as "sport within and through the medium of cyberspace, as the new upcoming sport and as competitive (professional) video or computer gaming". Another approach is raised by Hamari and Sjöblom (2017, p. 211), defining esport as "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". According to Hutchins (2008, p. 857) "e-Sport is born in and of media, which alters the parameters of competition". He takes the view that esport is a new social form of interaction without the material and institutional boundaries between media, sport, and gaming. Müller-Lietzkow (2006, p. 30) chooses a definition from a traditional sports point of view:

> "The term esport (short for electronic sport) describes competitive computer and video gaming in solo- or multiplayer mode. ESport sees itself according to classic sport terminology and requires game skills (hand-eye coordination, responsiveness), as well as strategic and tactical comprehension (overview and understanding of the game). Therefore, it is not uncommon that players or teams are competing for prize money (pro gaming). Players are exercising and there are international leagues, or

Fertigkeiten insbesondere im Gebiet der Bewegungskunst zu entwickeln und sich mit diesen anderen Menschen nach selbstgesetzten oder übernommenen Regeln zu vergleichen, ohne sie oder sich selbst schädigen zu wollen" (Tiedemann, 2004).

national teams. Partially they are supported by coaches teaching tactical and technical finesse via sophisticated training processes."[3]

Although this definition is almost two decades old and there has been a lot of progress in esport, it still covers the relevant facets of esport and distinguishes between casual, amateur, and professional gamers (pro gamers). He is right about the training and coaching staff in professional esport and the fact that there are national teams, but on a commercial scale, these teams play a rather insignificant role.

There is no central definition of esport, but it shows that many existing approaches either refer to traditional sport context or to constitutive characteristics of sports, like competitiveness. It is hence noticeable how much esport and traditional sport have in common when it comes to terms of definition (cf. Heinemann, 2007; Thiel et al., 2013). Eventually, categorizing esport in a sportive context may make sense, but it is still considered debatable, despite many countries classifying esport as a sport (Ekdahl, 2021a). Depending on which approach is chosen toward sport, esport can or cannot be considered as such. The many approaches to defining esport have parallels with the discussion about the unclarity of the term sport in general (cf. Heinemann, 2007; Thiel et al., 2013; Willimczik, 2019). If we draw from the nominal definition of the German Olympic Sports Confederation, esport is only partially considered as such (DOSB, 2018a, 2018b). Heinemann (2007), sees sport as a social construct built on the four constitutive characteristics of physical activity, competition, based on specific rules, and unproductivity, so the sport is being practiced just for the sake of it. On this basis, he derives different models of sport: Traditional competitive sport, exhibition sport, expressive, functional sport, and traditional play- and sports culture. In this example, sport can fall under the model of traditional competitive sport.

[3]"Der Begriff eSport (englisch kurz für electronic sport) bezeichnet das wettbewerbsmäßige Spielen von Computer- oder Videospielen im Einzel- oder Mehrspielermodus. eSport versteht sich entsprechend des klassischen Sportbegriffs und erfordert sowohl Spielkönnen (Hand-Augen-Koordination, Reaktionsschnelligkeit), als auch strategisches und taktisches Verständnis (Spielübersicht, Spielverständnis). So ist es keine Seltenheit mehr, dass Spieler oder Teams für Geld spielen (Progaming). Die Spieler trainieren und es gibt internationale Ligen und Nationalteams. Teilweise werden Teams von Trainern unterstützt, die ihnen taktisches Verständnis und Techniken im ausgereiften Trainingsprozess vermitteln" (Müller-Lietzkow, p. 30, 2006).

These two examples are taken from the German understanding of sport. In other countries or cultural areas, there can be an entirely different understanding of sports and therefore esport (cf. Thiel et al., 2013), and many countries worldwide have adopted esport in their sports system. This conceptual unclarity about what esport is and whether it fits into the concept of sport is an ongoing debate, which Ekdahl (2021a, p. 35) labels the "can-[esport]-be-sport-debate" (CEBS-debate).

2.1.2 History and development of esport

The term esport was mentioned for the first time at the end of the 90s. However, the origins of competitive gaming can be traced back to the 70s or early 80s (Borowy & Jin, 2013; Taylor, 2012). The competitions back then only have a little in common with what is commonly referred to nowadays as esport. Back in the day, players were not competing directly against each other, and instead were individually aiming for a high score in arcade games. At the same time, the organization *TwinGalaxies* was established, which started documenting records and high scores for multiple games. Eventually, the *US National Video Game Team* emerged, where, as part of a show event, attendants could compete against the team. Although arcade games and consoles are an integral part of the development of computer and video games, and their marketing can be seen as a forerunner of esport marketing nowadays (Borowy & Jin, 2013), PC games played the most important role. Growing and improving technological possibilities, like computer performance or connectivity via local networks or the internet was essential for the development of esport (Taylor, 2012)

In the mid and late 90s, competitive computer gaming began to grow independently in various regions of the world including Asia, Europe, and America. For example, in South Korea, government subsidies in the telecommunication infrastructure paved the way for the rising popularity of multiplayer and competitive gaming. Increasing broadband access and so-called "PC Bangs" - internet cafes designed for playing - established an affinity toward new media and gaming. The game *Starcraft* was the first popular esport title in South Korea in the mid-90s and is still relevant today (almost 25 years later which, considering the lifespan of 'esport-disciplines', is a noticeable rarity). Quickly *Starcraft* players became as popular as athletes, matches became attractions, dedicated esport

tv-channels were established, and esport has become a national sport (Taylor, 2012; Wagner, 2006). While *Starcraft* was the flagship of esport for the eastern spheres, first-person shooter was the most important genre in the western development of esport. Stakeholders from the economy used games to promote soft- and hardware products and staged gaming tournaments. In 1995 *Microsoft* organized a *DOOM II* tournament, *Judgement Day*, to promote the launch of their *Windows 95* operating system, and it can be described as one of the first ever esport tournaments (Taylor, 2012; Wagner, 2006). Two years later during the E3 trade event in Los Angeles, several software developers staged a *Quake* tournament where the game's publisher, *ID Software*, awarded the winner a Ferrari. *Quake* went on to become one of the most famous titles in esport. Further, in 1997 the *Cyberathlete Professional League* (CPL) was founded and quickly became "one of the most high profile venues for eSport, covering a range of titles and setting new standards for prize winnings, sponsorships, and corporate partnerships" (Taylor, 2012, p. 7). Until its cessation in 2008, it was one of the most important leagues and drivers in the development of esport, including organizing tournaments all around the globe and collaborating with media outlets to bring esport into television.

Local-Area-Network (LAN) parties were another important aspect of competitive gaming. These events were a possibility to play with and against each other and socialize within the community, especially for players who had no access to a stable internet connection. Besides private gatherings, there were also large, commercial LAN-Parties with thousands of participants. This increased the relevance of competitive gaming for brands to advertise themselves within this particular target group (Hepp & Vogelgesang, 2009). Many of today's famous esport organizations have their roots in private LAN-Parties where friends came together to play, for example, *SK Gaming* or *Mousesports*, and leagues and tournaments also evolved from them, such as the *Electronic Sports League* (ESL, 2023). The latter is the oldest operating provider for esports tournaments and leagues. Throughout its existence, the ESL hosted competitions in many esport titles. They differed in terms of popularity, player numbers, spectatorship, and degree of professionalization, ranging from blockbuster to niche games. Therefore, their scope

included all types of competitions from amateur leagues to the most decorated esport tournaments worldwide.

An important aspect of esport's development has been modifications for games, developed by players or communities, the so-called modding (Weiss & Schiele, 2013). Although multiplayer functions became more and more important for developers with the growing possibilities of connectivity, features supporting organized competitions were often lacking. Players began to modify games by including features such as warmup-phase, timeouts, recording options, improved networking capabilities, and a spectator mode (just to name a few). These mods became canon for organized esport titles and were mainly played in tournaments or leagues.[4] Non-commercially organized communities played an important role in the creation of entirely new games. They based newly designed gameplay on the accessible source code of a previously commercially released game (which was then used as a platform for the newly created modification). The most prominent examples of this are *Counter-Strike* (*CS*) or *Defence of the Ancient* (*DOTA*). Not only are these games still among the most popular and most played esport titles ever, but they created new genres that have been adopted by the computer and video games industry when creating new games as dedicated esport titles.

2.1.3 Taxonomy of esport games

Throughout the years, technological development was both a curse and a blessing for esport. On one hand, it allowed many popular games to be developed and played, on the other hand, progress reduced the half-life of many computer games. Better graphics, new features, and game sequels made older games obsolete or less interesting for the wider audience. Still, many of the most popular games in esport are the successors of old games with better graphics and comfort functions for both players and spectators. In this context, it is important to mention that although all esport titles are computer games, not all computer games can be considered relevant or suitable for esport. Many games do not feature a (competitive) multiplayer option, for example, plot-driven adventure games, role-playing games, or serious and educational games. Eventually, the

[4] This was for example the case for games of the first-person shooter genre like *Quake*, *Unreal Tournament* or *Painkiller*.

motivation to play competitively is different from playing non-competitive games (Bányai et al., 2019a). Further, said games can be played on different systems like computers, consoles, or mobile-devices, with more games becoming cross-platform compatible. This means that players with a console can compete with computer gamers. For esport, there are multiple games for different genres which can be considered canonical. The following listing is exemplary for the most prominent ones, but should not be considered complete (Esport Earnings, 2023).[5]

Shooter: Two types of shooters can be distinguished regarding the point of view, first or third-person shooters. In first-person shooters (FPS) the players look through the eyes of their avatar, with commonly only the hands, arms, and weapon visible, whereas in third-person shooters (TPS) the player controls an avatar from an overview perspective. An essential part, but not always the aim of the game, is eliminating the opponent, called fragging. Depending on the game and game mode, it is usually played one on one or in teams. Here another distinction can be made between a fast-paced arena shooter (mainly one on one), tactical shooter (only in teams), or battle royal. In the former, players start with equivalent equipment on a digital asymmetrical playground, the map, where they can pick up additional equipment to outplay the enemy by gaining more frags against him/her than vice versa, during a certain time. After being fragged, players respawn (the avatar is revived) immediately with the basic equipment. Tactical shooters are round based and do not necessarily require the elimination of the opponents. There are certain objectives on the map which need to be solved by one team (attackers), whereas the other one tries to prevent this from happening (defenders). Each round has a certain time limit and there is a set number of rounds to be played, before switching sides. *Battle royal* is a type of competition where two or more parties play against each other with every competitor for themselves. The aim is to eliminate other competitors and be the last remaining player in the match.

[5] The community website esportearnings.com gathers and summarizes information about all esport competitions, regardless of genre or game. It is often used as a database for scientific research regarding sport economic or econometric topics, but also about the general growth of population of esport (e.g. Parshakov et al., 2018; Parshakov et al., 2020; Parshakov & Zavertiaeva, 2018; Parshakov & Zavertiaeva, 2015).

Real-time strategy (RTS): In RTS games, players usually compete in a one-on-one setting. The competitors start with a small base and a handful of units. The aim of the game is to gather resources that are located on the maps in order to build more units and bases and eventually eliminate the opponent. Depending on the title, various fractions can be played that may feature different economic and military dispositions. In order to have a fair and therefore interesting competition, these fractions will have to be balanced perfectly (Bosc et al., 2013). It is not uncommon for players to focus on mastering one fraction and to perfect their game style with it.

Multiplayer Online Battle Arena (MOBA): The MOBA genre has developed from the *Warcraft 3* modification *DOTA*. Although initially based on the same games as RTS, the competitors commonly control only one avatar instead of an entire army. Depending on the title, there are more than one hundred different playable characters with different features, roles, and abilities. Two teams (usually 5 vs. 5) face each other trying to destroy the enemy's base. The map is symmetrical, with the two bases being connected via three paths. Regularly, non-personal characters (NPC) controlled by the computer are sent from the bases toward the enemies. By eliminating these NPC or the other players one's avatar becomes stronger, develops new skills, and can obtain powerful equipment. Currently, MOBA games are the highest-profile esport games with the highest prize money, the biggest leagues, and the most spectators worldwide (Esport Earnings, 2023).

Sport Video Games (SVG): All games simulating actual sports fall under this category. This includes simulations of football, basketball, motorsport ('sim-racing'), or games mixing elements of different sports like *Rocket League*, a mix of motorsport and football. While this genre is highly popular in gaming in general (*FIFA* being one of the most successful game-series), sport video games only play a minor role in professional esport regarding prize money or spectatorship.

Beat 'em up: In Beat 'em ups or Fighting Games, two competitors face each other in a melee combat scenario. Titles such as *Street Fighter* that feature an arcade-based gameplay are bigger in professional esport than simulation-based gameplays that may be found in the *Ultimate Fighting Championship* series. A typical facet of Beat 'em ups

are thus “combos”, complicated key combinations that require flawless timing to trigger special attacks and maneuvers. Parts of this community prefer the term competitive gaming over esport (Ferrari, 2013).

Collectible Card Games (CCG): In esport, CCG includes all types of digital adaptions of collective card games. The gameplay and rules among the CCG (both digital and analog) are similar whereas each game plays in a different fictional scenario. Although CCGs are card games, it is commonly referred to as esport, despite the aleatory component, so the possibility that chance decides a match is significantly higher than in other esports-genres or sport in general.

Table 1 Taxonomy of exemplary esport titles according to their genres

GENRE	GAME TITLES
Shooter	Counter-Strike, Valorant, Fortnite, Quake, Call of Duty
RTS	Starcraft, Age of Empires
MOBA	DOTA, League of Legends
Sport simulations	FIFA, Rocket League, Madden NFL
Beat ‘em up	Mortal Kombat, Tekken, Street Fighter, Super Smash Bros.
CCG	Hearthstone, Legends of Runterra

Section 2.1 shows that esport has developed into a multifaceted phenomenon with ties toward gaming and sport. Esports are different genres and games, each with its own characteristics, essentially like disciplines in traditional sports. However, they all share the fact that they are played competitively using an electronic device, which is steered by physical input and requires individual motoric and mental skills. Defining and outlining esport now allows a more specific insight into existing research in esport. Therefore, the next subchapter gathers and summarizes literature to identify research gaps and desiderata which are tackled by this dissertation.

2.2 Studies and reviews about esport and competitive gaming

Esport is a rather novel topic for researchers, but the body of literature is growing rapidly. The first publications date back almost two decades, highlighting the importance and relevance of esport research (cf. Bryce & Rutter, 2002; Wagner, 2006).

Research about the body of literature on esport

Currently, there are several overarching reviews covering esport from different perspectives (Bascón-Seda & Rodríguez-Sánchez, 2020; Reitman et al., 2020; Vera et al., 2018). Vera et al. (2018) conducted an analysis of literature on esport and concluded that the body of research is growing and diversifying rapidly. Papers from various disciplines have been published with the majority being computer and sport scientific papers. While qualitative and quantitative papers are almost equal in numbers, most publications are theoretical papers. A similar approach was followed by Reitman et al. (2020). They investigated the existing esport literature corpus until 2018 and identified seven different fields of research in which existing literature can be clustered: Media studies, informatics, business, sport science, sociology, law, and cognitive science. Media studies take up most of the studies, followed by computer science. While the diversification of publications is evident, like in the work from Vera et al. (2018), the distribution regarding disciplines differs between the two papers. This could be traced back to differences regarding the methodology or research question. According to Reitman et al. (2020), sport scientific literature mainly focuses on questions about definitions and how to cluster esport within a sport-context. Literature about sociology treats topics like the interaction of esport enthusiasts at live events or gender roles in esport. Generally, most publications from all categories try to elaborate how many sport traits are observable in esport for their respective fields. They say that esport is predestined for interdisciplinary scientific approaches. Further, the review states that esport research is a field that is still growing rapidly, and stakeholders should keep up to date concerning emerging studies and new fields of research. The research itself is starting to develop in a direction with more precise questions, away from defining esport and trying to fit it solely into a sportive context. Bascón-Seda and Rodríguez-Sánchez (2020) conducted a literature search and identified four main topics to which

current literature can be overarchingly assigned: Physical activity & health, esport as sport, esport as a social phenomenon, and marketing and legal framework. While they also see exponential growth in the number of publications throughout the past few years, the distribution of publications regarding the topics differs from the findings in other literature reviews with similar approaches (Reitman et al., 2020; Vera et al., 2018). This could be due to different lingual restrictions and databases which were used conducting the review.

Research about economics in esport

The above-mentioned consider the overall literature about esport, but more reviews have been published that are dedicated to specific areas of research, questions, or disciplines, for example, considering the economics of esport. In particular, the comparison to traditional sport systems is the foundation for these studies. Scelles et al. (2021) look into how far typical models and concepts of team sports economics fit in with or are visible in esport. While there are certain differences, in general, many aspects of sports economics are recognizable in esport, for example, the way teams are organized, player transfers work, or competitors' dependence on each other to create a sellable product. The authors argue this supports the idea that esport can be regarded as a sport, from a sports economic perspective. Another economic approach includes the analysis of viewership demand by testing the uncertainty of outcome hypothesis (cf. Neale, 1964; Rottenberg, 1956) with mixed results regarding its relevance for esport, whereas the superstar effect (cf. Rosen, 1981) can be observed. Fans are eager to watch esport to see their favorite players compete, are interested in high-skilled performance, and are drawn by large prize pools for the tournament instead of competitive balance (Mangeloja, 2019; Ward & Harmon, 2019). The depiction of the business environment in esport and the role of different stakeholders from players up to sponsors are investigated by Julkunen et al. (2021). The core actors are players and game developers who are essential to creating the product of esport tournaments or leagues. League organizers, sponsors, or fans only exist and function if the core of esport is guaranteed. However, these stakeholders help grow the core actors in form of broadcastings, prize money, or sponsoring. The authors state that the bigger esport becomes, the more

dependent the stakeholders are on each other. Compared to traditional sports, esport sponsoring is still developing and more non-endemic sponsors begin to engage in this field, with fans expecting brands to create added value for the game and themselves (Abreu Freitas et al., 2020; Gawrysiak et al., 2020).

Research about psychology in esport

Several reviews including (sport) psychological approaches regarding esport have been published to date (Bányai et al., 2019b; Bediou et al., 2018; Pedraza-Ramirez et al., 2020; Vaamonde et al., 2018). Two publications argue that playing competitive games has positive effects on several cognitive skills, processes, and abilities. It can be concluded that it is important for keeping up to date with research about this topic, and that esport and gaming have to be investigated separately, because of the different requirements for each title played competitively (Toth et al., 2020; Vaamonde et al., 2018). Bányai et al. (2019b) investigate literature about psychological traits in esport. Although only yielding a few relevant qualitative publications, three overarching areas of research can be identified here: First, the psychology around becoming a professional player, second, the psychological characteristics of players, and third, motivations for spectating and following esport competitions. The findings depict similar traits to traditional sports, although some scholars argue it should not be considered as such. The authors find implications regarding potential connections between gaming popularity and rising problematic gaming behavior. They also raise the question about parallels between excessive professional gaming and addictive behavior. Eventually, the body of research is not as elaborated as in other fields, therefore it is recommended to keep up to date with current research from this field and continue working on psychological traits of esport, especially because of its rising popularity and relevance for society and sport. Pedraza-Ramirez et al. (2020) extend this field of research by focusing only on quantitative studies. They find empirical evidence about the positive effects of competitive gaming on cognitive skills. The authors recommend a differentiation between cognitive performance, such as working memory, inhibitory control, cognitive flexibility, and higher order functions, and in-game performance, including affective- and (bio)social skills, capacity for teamwork, and game-specific requirements. This will

alter methodological rigor regarding further research and improve the quality of training and coaching. However, the results might vary between different genres, games, or player demographics. In their dual-systematic review, Toth et al. (2020) investigate the importance of certain cognitive abilities for FPS and MOBA. Important skills include memory attentional skills, memory, information processing, and task-switching. In the second phase, the authors investigate the connection between physical exercise or activity and cognitive skills. They conclude that physical exercise increases cognitive performance and can therefore be helpful for competitive gaming. Bonilla et al. (2022) observe the relevance of psychological skills for professional gamers: Technical-tactical and psychological skills as well as healthy habits were identified as relevant traits. The study shows similarities in the sport psychological approach to esport compared to traditional sports. Professional gamers eventually need the same attention from (sports) psychologists to attain and maintain high-performance levels and prevent negative influences during their career paths. Negative psychological implications have been investigated by other scholars who predict gaming disorder and hazardous gaming as an evolving side effect of the growing popularity of esport (Chung et al., 2019). The study demands more research to build a medical field for these issues and face the threats accompanying the growing popularity of esport for players and spectators.

Research about health-related topics in esport

A call for more medical research into esport is also mentioned by Schary et al. (2022) in their narrative review about health-related topics surrounding esport players. Key topics are physical health, including musculoskeletal and eye health issues, mental and emotional health, sleep and nutritional habits, and performance-enhancing drug abuse. The authors claim that the above-mentioned are better researched than the latter, and they recommend increasing the quantity and quality of research in this field. Typical health issues evolve around reduced physical activity and sedentary behavior. Wrist and hand injuries are typical symptoms presented by players, as well as problems stemming from poor body posture (Lam et al., 2020; Schary et al., 2022). Further, psychological hazards are depicted resulting from sleep and nutritional deficits, including coping mechanisms involving performance-enhancing drug abuse (Chung et al., 2019; Schary et

al., 2022). Managing player health from amateur, to collegiate and professional levels becomes more important with the growing recognition of esport as part of the sport-systems (Lam et al., 2020). Therefore, providers of games and tournaments have a growing responsibility toward the players. Chan et al. (2022) find similar results in their review of the impact of esport on lifestyle behavior. Problematic tendencies regarding sleep quality and quantity, reduced physical activity resulting in injuries, and increased Body Mass Index (BMI), as well as ocular health constraints and nutritional deficits among esport players, are observable. Several scholars endorse the need for longitudinal studies, better medical support, and interventions for health problems and behavior evolving around esport (Chan et al., 2022; Chung et al., 2019; Lam et al., 2020; Schary et al., 2022). Palanichamy et al. (2020) analyze seven articles about health-related issues occurring from stress through esport. The review identifies various psychological, sociological, and physiological risks related to competitive gaming, like exercise deficit, reduced psychological well-being, stress, or escapism. However, it must be noted that because of the low number of included studies, the gravity of each risk needs to be further investigated to provide professional guidance. Leis and Lautenbach (2020) also investigate stress in competitive gaming regarding psychological and physiological traits. While there are studies that reveal hormonal and sympathetic nervous reactions to competitive gaming, others conclude that there are no such reactions. Further physiological reactions through competitive gaming are observable in the cardiovascular system. However, the overall evidence is still evolving and there is a need for more research on psychophysiological stress in esport (Leis & Lautenbach, 2020; Palanichamy et al., 2020). Sleep behavior has also been investigated for both the connection between performance and sleep behavior and problematic sleep issues through excessive gaming (Bonnar et al., 2019; Kemp et al., 2021; Lam et al., 2020). In their review, Kemp et al. (2021) find evidence that there is a difference between the sleep behavior of professional competitive gamers and non-professionals or non-competitive gamers. Lam et al. (2020) find similar results, however, it needs to be stressed that both reviews use similar sources regarding literature about sleep behavior.

Still, it can be stated that pro gamers are dependent on good physical well-being, for which sleep is essential (Bonnar et al., 2019).

Research about social and societal topics

Rogstad (2021) investigates gender disparity in esport by conducting a literature review. He states that esport is heavily influenced by and also organized for men. Hegemonic masculinity and a hostile environment toward women are characteristic of the scene. Non-males tend to disavow their gender, refuse feminism, or adapt typical male traits to fit in. It is necessary to discard these traits to create a more inclusive and open environment for all players.

Jonasson and Thiborg (2010) depict in their theoretical paper how esport can impact future sports. Considering existing definitions and approaches toward the terminology of sport, they show three possible scenarios where esport can head in the future. Firstly, it can exist as a counterculture, especially based on the debate about the sportiness of esport and its presumably contrary characteristics compared to traditional sports. Secondly, esport might become part of the existing sports hegemony. It would benefit from the image of traditional sport, but also complement it as contemporary sporting practice. This is already happening in many nations worldwide that accept esport as part of their sports culture. Thirdly, esport can become the hegemony of sport: Technological progress has paved the way for modern sports and new movement practices, with esport being the next step in this progression (Jonasson & Thiborg, 2010). However, the impact of esport on various societal areas is a topic that is yet to be treated in-depth (Bascón-Seda & Rodríguez-Sánchez, 2020; Huk, 2019; Jonasson & Thiborg, 2010). While Bascón-Seda and Rodríguez-Sánchez (2020) raise the question about the social implications behind the development of esport, Huk (2019) theorizes about potential positive side effects regarding cognitive, social, and identity spheres of players and consumers, using a uses and gratifications approach.

2.3 Central research question, research gaps, and desiderata

The current state of research shows that there is a lack of literature about sociological topics in esport, particularly observing it through a sport sociological scope. Still, it shows

that some scholars raise the question about the potential (future) impact of esport on society or sport, but they are not investigating this matter more precisely. Therefore, this dissertation focuses on social dimensions of esport to investigate the question of how far esport has an impact on society. This question can be answered considering many different social dimensions on various societal levels (macro-, meso-, micro) (cf. Thiel et al., 2013).

Based on the social and societal impact, it is possible to observe areas where esport creates an environment where social interaction happens, as in traditional sport (macro-level). However, one particular, very important point in traditional sport where sociality is produced, stands out in esport. The body does usually not appear as the first point of reference for social interaction, because the players are represented by digital avatars, whereas in traditional sports the body can be considered one of the key elements. So, corporeality in esport requires a more precise focus to get a more detailed picture of the social relevance of esport (meso/micro-level). In order to investigate these topics, three concise research questions are derived and tackled in this dissertation:

(1) What societal impact does esport have?

Firstly, the literature about esport has been diversifying and growing almost exponentially in the past few years (Reitman et al., 2020; Vera et al., 2018). Prominent topics include psychological traits of esport, economics, and health-related issues like physical activity, exercise, or sleep behavior among competitive gamers. The influence of esport on players, spectators, practitioners, the economy, and other stakeholders and how they deal with esport are also subjects of research. However, scholars have raised the question about the impact esport has on society (e.g. Bascón-Seda & Rodríguez-Sánchez, 2020; Huk, 2019; Jonasson & Thiborg, 2010; Schmidt et al., 2019). Since esport has already outnumbered many traditional sports, regarding for instance players or prize money, and is frequently discussed in a sportive context, the question arises as to whether esport has a societal impact like traditional sport, how this impact can be made visible, and what implications can be derived from this.

(2) What role does the body play in esport and competitive gaming?

Secondly, several physical attributes and aspects have been treated in current esport-research including motoric requirements, physical activity, exercise, health-related issues, or injuries. It can be stated that all these papers use the body or aspects of the body as the origin of research. Most studies focus on the physical traits required for esport, but fail to thoroughly address the role of the body in the virtual worlds as well, for example in terms of intercorporeality or the digital bodies of the avatars. Further, many of the physical phenomena are treated individually, but it is currently not known what overarchingly role the body plays in esport. Especially considering the importance of the body in sport science in general and the ongoing debate about the esport being a disembodied sport (Borggrefe, 2021; Ekdahl, 2021a; Parry, 2019; Thiel & John, 2020; Willimczik, 2019), exploring this research gap can deliver valuable information about esport in the context of sport, and consolidate the debate about the sportiness of esport.

(3) What effect has the shifting focus from the physical to the digital corporeality on the players' behavior and the ecosystem?

Thirdly, compared to traditional sport, the body is only partially present when competing in esport. This is regarded as a typical trait of esport (Ekdahl, 2021b; Jenny et al., 2017; Thiel & John, 2020). The social consequences for players and the surroundings which derive from the body being mediated through digital avatars are yet to be researched. The body is a central aspect of various discussions in and about esport, and gaining a deeper understanding of the body in esport could help practitioners and stakeholders to better understand and benefit from potential positive aspects while diminishing negative ones. There is still a lack of research regarding the duality of the body, considering its presence in the real world and virtual world (Ekdahl, 2021a).

Eventually, it needs to be stressed that these are not meant to be exhaustive and other research gaps can be derived from the current state of research. Still, these three questions are treated in the three articles that are presented in Chapter 5. For a more profound understanding and better interpretation of the findings, the next chapter

provides insights into the peculiarity that esport can be considered a digitalized form of sport.

3 Theoretical Background

Esport is often regarded as an offspring of digitalization and is accepted as a sport in many countries worldwide (Goebeler et al., 2021; Parshakov & Zavertiaeva, 2018; Taylor, 2012). This indicates practically a direct link between technological progress, especially digital technology, and sporting practice. The overlap of sport and digital technology creates interesting new characteristics and perspectives for sporting competitions (Goebeler et al., 2021), which need to be considered when dealing with the topic of esport and competitive gaming. Therefore, this chapter delivers the theoretical background of this dissertation.

It is important to understand how digitalization is observable in the sporting environment in general and how esport is linked to this. It is also observable in the way how players perceive the virtual realms and immerse in them while competing. This is a unique trait compared to traditional sports, and it is critical to consider when putting scientific findings into a broader picture. The following chapter also addresses the role of immersion in esport and to what extent virtuality can be perceived as reality. Eventually, it concludes with how the duality of the virtual and real world can be observed through all levels of the esport ecosystem.

3.1 Digitalization in sport

Digitalization is the process of converting information into digital formats. On this basis, existing procedures can be facilitated or substituted. It has brought and still bears massive changes for society and there are almost no areas where digitalization cannot be observed (Dufva & Dufva, 2019; Tsekeris, 2018). Therefore, many changes in this technological development can be seen in modern sport, ranging from broadcasting to the accessibility of sport, and toward the creation of new movement practices (cf. Miah, 2014; Mitchell, 1996; Ratten, 2019; Thiel & Gropper, 2017; Xiao et al., 2017).

The accessibility of sport media coverage has changed drastically throughout the years. In the early days of spectator sport, the nineteenth and early twentieth century, fans needed to attend the competitions or read newspaper articles about them. With upcoming technology, radio broadcasting, and the invention of sophisticated cameras,

television became the standard (Boyle, 2012). Nowadays, the internet offers many opportunities to follow sports, including different camera angles, slow-motion replays, picture-in-picture, video-on-demand, etc. Supplemental information about competitions, including live statistics can be accessed at any time. Further, technological progress created the possibility for almost anyone to create their proprietary broadcast on streaming platforms like *YouTube* or *Twitch*. This means that not only top-tier sport can be followed, such as the *Olympics*, the *UEFA Champions League*, or World Cups, but also niche and grass-roots sport are accessible via streams (cf. Ballhaus et al., 2020; Hutchins et al., 2019). With growing social-media platforms, sport journalism is also undergoing significant changes (Boyle, 2012). Everyone with access to social media, like fans, players, coaches, managers, etc., can voice their opinion any time they want. This extends the work of sports journalists not only regarding the channels they need to cover, for example, when publishing their articles also on social media, but also the need to observe and/or incorporate said social media opinions into their own coverage (Boyle, 2012; McEnnis, 2013; Reed & Hansen, 2013). Regarding sport management, there is almost no area untouched by social media and therefore digitalization, including sport communication, marketing, and sales (Abeza et al., 2015; Xiao et al., 2017). Digitalization opens new possibilities for sporting clubs and associations. It facilitates administrative tasks like managing memberships, finances, or internal and external communication, while also offering the possibility of new sources of income, broadcasting, performance analysis, membership recruiting, or diversifying their portfolio with online training possibilities (Ehnold et al., 2020; Ehnold et al., 2019).

The benefits of digitalization can also be observed in the healthcare sector, and therefore many areas of sport related to it, such as medicine, training science, or health promotion (cf. Lamplot et al., 2020; Rigamonti et al., 2020; Sætra & Fosch-Villaronga, 2021). This is also related to trends in the sports industry, for example, the evolvement of apps, healthcare tracking devices, and other everyday wearables that can monitor and inform the carrier anytime with vital signs and other health-related data (Rigamonti et al., 2020). Virtual physical examinations for health problems can be done via video calls, which can be an adequate substitute for real-life visits in certain cases (Lamplot et

al., 2020). Also, there are apps specially designed to track one's training success that are connecting entire communities who share their training results and progress. People can train or compete together, either by exchanging their training data, or by using virtual- and augmented-reality training equipment to exercise directly with each other, regardless of geographical locations, weather, or access to sporting grounds (Neumann et al., 2018; Rigamonti et al., 2020; Sawan et al., 2020). Based on big data and the athlete's input, apps and devices can create individual training schedules, and therefore the expertise which was usually shared by experts such as physicians or coaches is, to a certain extent, substituted by electronic devices and made accessible to a wide audience (Fister et al., 2015; Rajšp & Fister, 2020). This development is not only applicable to leisure or professional sporting activity, and can also play an important role in physical education if applied adequately (Cummiskey, 2011; Mears et al., 2012; Mödinger et al., 2022). However, the growing digitalization in sport also affects the required competencies of people working in this sector since the practitioners need to implement new technology in their everyday work and routine. Based on the aforementioned literature this includes teachers, health practitioners, coaches, athletes, managers, marketers, and many more.

Digitalization also changes how sport is practiced physically, both in terms of competitions and forms of movement practices. On this basis, Goebeler et al. (2021) depict how digital technology affects sport. They use the ideas of Robey et al. (2003) to describe that physical and digital components do not just coexist in the same place, in this case, sport, but also intertwine with each other. The interplay between the virtuality and reality of the sport can be reciprocal, as they reinforce and complement each other and eventually create synergies. They show four different hybrid configurations between sport and digitalization:

(1) In 'digitally supported sport' the movement practice itself, so the movement task, regulations, or aim of the game is not altered. Digital technology is used to support the competition or aid the training routine. Hawkeye in tennis, VAR in football, or timekeeping and performance measurements for track and field are all examples where digital technology facilitates the work of referees. Further, technology can be used for

improving training routines, for example by using virtual- and augmented reality tools. For this type of digitalization in sport, technology is not an integral part of the sport per se. So, if all these supportive tools were to be excluded, the sport itself would remain virtually the same. The addition of the VAR in football, for example, is still discussed vividly among fans, press, and experts since the application of this technology is not always transparent and some even argue that since its introduction, it has made the game less fair than before. For some interest groups, especially fans, removing the technical aid would even restore the game and return to the way they think it is supposed to be (Scanlon et al., 2022).

(2) 'Digitally augmented sport' refers to sports and competitions where digital technology is an integral part of the action. In motorsport, the physical performance of the drivers, accelerating, braking, and steering, is converted into the physical movement of the car by sophisticated technology. In the same instance, the teams' engineers are monitoring the status of the car, and on this basis can immediately communicate with the drivers or adjust the racing strategy. Another example would be a regatta like the *Vendée Globe*, where the skippers are dependent on their navigational systems. The spectators of *Formula E*, the e-mobility pendant of the *Formula 1*, can vote for their drivers to give them a so-called *FANBOOST*. The drivers with the most votes acquire additional power during the race for a short period. In all the examples above, digital technology is an essential part of the competition and relevant for the performance of the competitors, unlike in digitally supported sports where the technology is an aid for the overall integrity and smooth operation of competitions.

(3) 'Digitally replicated sport' takes the physical action of movement practices and combines it with virtual realms. This can also be described as motion-based video games (MBVG) or trans-reality games (Jenny et al., 2017; Lindley, 2004). Exergames, where the virtual environment leads and instructs the movement practice of the consumers, mainly for health purposes, fall under this category (Peng et al., 2011). But also, one-to-one replications of sports like golf simulations or cycling can be described as such. The physical input is practically the same as the physical motion sequences from the actual sport, but the movements are mediated into a digital realm where eventually

competitions can also take place. This requires adequate equipment such as a bicycle ergometer connected to the computer, to mimic a cycling race (Dyer, 2022). The action will also be depicted on screen in a digital sports ground. So, the players see on their screens which terrain or city they are currently driving through. The technology, that is the ergometer, screens, and sound, is therefore essential for this type of digital sport. An interesting aspect of this is that players can compete with and against anyone who is also playing, ranging from amateurs to professionals who can also log in to this digitally replicated sport.

(4) 'Digitally translated sport' refers to virtual adaptions of sports in form of computer- or video games. While the 'digitally replicated sport' mimics the physical activity and mediates it into the digital world, this is not the case for digitally translated sports. For example, SVG do not require the same physical input and instead are controlled with a mouse, keyboard, or controller. A professional cyclist would certainly be a good contender in a digitally replicated cycling race, whereas a professional football player would not automatically be a good *FIFA* player, since the skill requirements are completely different. The relevant physical input is happening in front of a screen and is translated into the virtual realm, which differs from game to game. It can be a digital football pitch (*FIFA*) or a fantasy world (*League of Legends*). Additionally, the physical and mental prowess required to master each game is different from the others. Playing an SVG is an entirely different practice from playing an RTS game or a shooter (Vaamonde et al., 2018).

The work of Goebeler et al. (2021) displays how digitalization can be regarded as an aid to existing sports and also as the foundation for new movement practices. For digitally supported and digitally augmented sports, the physical action or motoric requirements are not altered by technological progress. Digitally replicated sports are based on the reproduction of sport-specific movement patterns under the use of advanced technological equipment. This can therefore happen isolated from certain external factors that might affect the execution of movement, for example, the impact of weather while trying to perform a golf shot. The result of the physical input is eventually displayed and (partially) measured in a digital environment. For digitally translated

sport, the players need to understand how their physical input using a mouse, keyboard, or controller are transferred into certain movement patterns of the digital avatar. For example, the recoil of shooting a gun in-game can be countered by understanding the programmed mechanic of the recoil and counter-steering it with the mouse. Controlling the recoil in sport shooting requires a completely different physical reaction. For both (3) and (4) the domain of execution, where an action takes place, and the domain of application, where its action can be observed, stretch from the analog into the digital world (Holt, 2016; Thiel & John, 2020). This happens regardless of the way the physical input is mediated. So, the players need to understand and internalize how the workings of the physics and rules of the digital world they are competing in. The process of accepting and dealing with such a fictional environment is called immersion – a typical characteristic when playing computer games (cf. Nacke & Lindley, 2008; Nilsson et al., 2016; Procci & Bowers, 2011). The following chapter explains immersion in gaming and elaborates on what role immersion plays in esport.

3.2 Competitive gaming as an immersive experience

The exposure to media can trigger an effect that sees the consumers diving into the virtual world. The digital environment is perceived as partially or fully realistic and the frontiers between virtuality and reality are blurring. This phenomenon is commonly described as immersion and is an omnipresent feature in media usage, including movies, games, books, etc. (cf. Dede, 1995; Patrick et al., 2000; Sawan et al., 2020). While this can be used for different areas such as medicine, education, construction, military, and others, to create more realistic scenarios for learning or fulfilling tasks, in the entertainment industry it is used to enhance the experience of leisure activity. Eventually, the gaming industry aims to increase the entertainment factor of games by increasing their immersive potential (Pietschmann et al., 2012).

The literature about immersion in virtual reality has been growing and various definitions can be found that treat different types and facets of immersion. Many scientific approaches to the term show overlaps and similarities (e.g. Agrewal et al., 2020; Nilsson et al., 2016). Immersive experiences lead to a disconnection from the real world. Commonly this is mentioned in the context of being exposed to a virtual

environment like computer games or movies (Nilsson et al., 2016; Patrick et al., 2000), virtual reality – so a comprehensive digital world –, or augmented reality – simulations of virtual elements in a real environment (Sawan et al., 2020). Similar to physical immersion, when an object is immersed and surrounded by a liquid, immersion is sensed when people feel that they are surrounded by the media they are consuming (Murray, 2017). According to Dede (1995, p. 49), immersion is a state that consumers of media can reach if the exposed artificial world appears realistic to trigger willing "suspension of disbelief".[6] It consists of an actional and a symbolic element, both of which induce this state of adopting a non-real world. The actional factor relates to the state of consciousness one attains when concentrating to succeed at a certain task, like a newborn learning to walk. The concentration is extraordinarily high because of the motivation to learn something new and succeed at it. The symbolic factor is triggered by using semantic links. So, reading horror stories in a thematically fitting environment may increase the experience of the book and allows the reader to emotionally connect deeper with the fictional environment. Eventually, Dede (1995) states that the power of imagination triggers immersion and it can be used to facilitate learning processes.

An intense or even the most intensive form of immersion is often described as 'presence'. In this state, people are made to believe they are in a different location than their physical body (Patrick et al., 2000; Witmer & Kline, 1998). The term presence refers to telepresence, which describes the possibility of being present in a different location using technology. However, telepresence focuses only on how technologically sophisticated a medium is when mimicking the digital world. Narration, emotions, or semantics play no role in telepresence (cf. Draper et al., 1998; Held, 1992). When a person experiences presence, it makes him or her believe that the virtual environment is reality. However, for deep immersion and therefore presence, the narration is even more important than the technical devices and an optimal interplay of different immersive forms regarding the subjective requirements to perceive immersion (Zhang et al., 2017). Since immersion and presence relate to each other, commonly, the words

[6] This term originally comes from literarary science and explains the perception of fictive narration for the purpose of entertainment (Coleridge, 1984).

are used synonymously (Brown & Cairns, 2004; Mäyrä & Ermi, 2011), although it can be argued whether this is accurate.

3.3.1 Immersion in esport

As depicted, there are different approaches toward immersion, how it can be defined, and which types of immersion exist. On this basis, it is possible to analyze the different traits while playing games competitively. Nilsson et al. (2016) segment immersion into three overarching types that are not mutually exclusive but can occur at the same time: (1) System Immersion; (2) Narrative Immersion; (3) Challenge-based immersion (Figure 1).

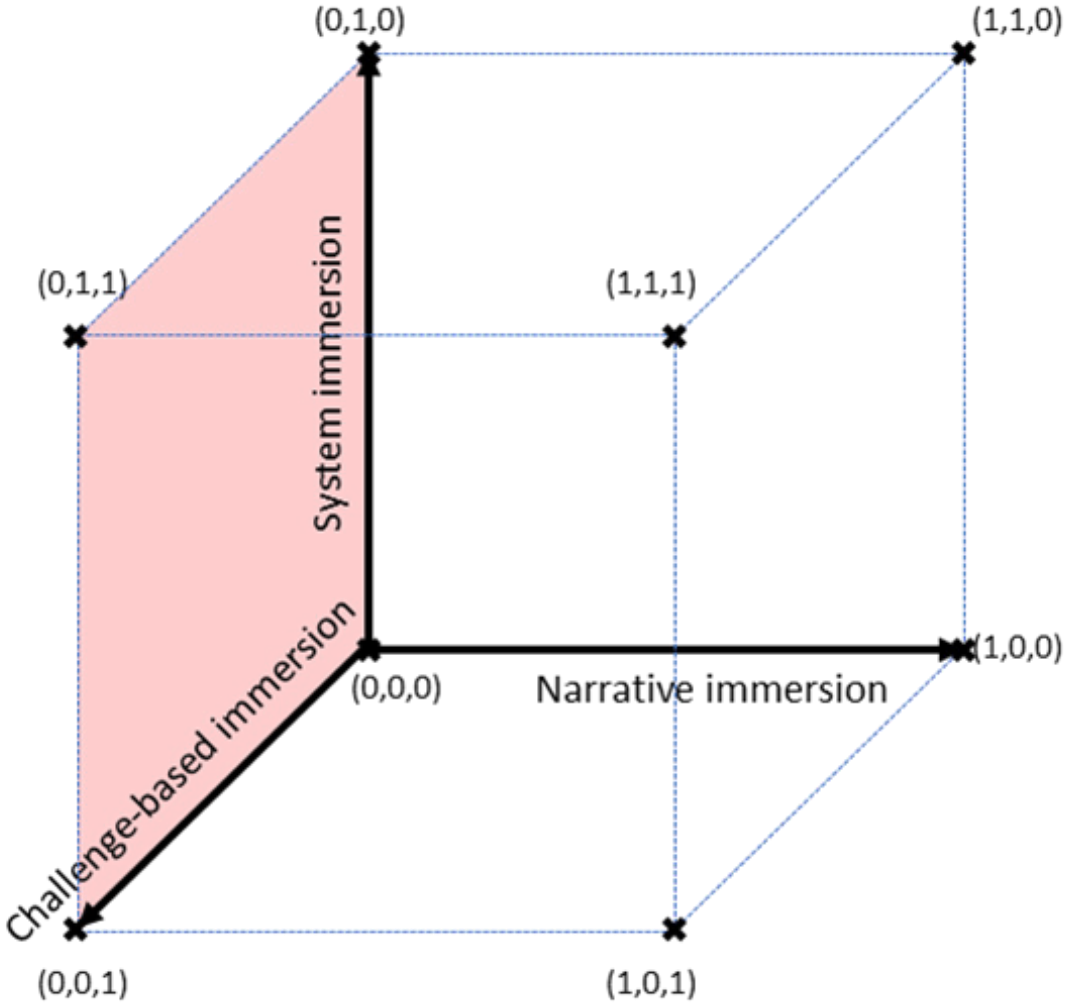

Figure 1 Illustration of different types of immersion in a three-dimensional Cartesian coordinate system, with the red highlighted area referring to the degree of immersion where competitive gaming can be located (modified illustration based on Nilsson et al., 2016).

(1) First, system immersion is a feature of the physical system, so a computer, a display, or any type of device (Nilsson et al., 2016; Slater, 1999). This immersion refers to the quality, arrangement, and technological standard of an electronic device and its relevance for the degree of immersion. The more realistic the depiction of a virtual world is, the more likely it is for consumers to immerse in it. Devices like virtual reality goggles, oculus rift, or 3D technology are essential in creating an immersive experience for consumers . The perception of being included in the virtual world, including cognitive and sensorimotor responses, creates the sensation of being in the virtual environment. The definition of Witmer and Singer (1998) focuses on the sensorimotor perception of immersion, as they describe that the subjective experience is physically located at a different point to the body itself. Other scholars are more distinctive about the terminology: Arsenault (2005) refers to this as sensory immersions and underlines the relevance of the sensorimotor perception of the stimuli omitted by an electronic device. According to McMahan (2013, p. 82), "perceptual immersion" is created by blocking out stimuli that do not stem from the media and amplifying those that do, for example by using technical devices like goggles or headphones. This is similar to system immersion, where the use of sophisticated technology supports the sensorimotor perception of artificial worlds (Mäyrä & Ermi, 2011). These examples show the interplay between audiovisual and haptic stimuli from technology and cognitive responses by the user of said technology.

For esport, it is important to have a computer or console which can run the game as smoothly as possible. This means that the device's performance is decisive for the overall playing experience, not the accuracy of detail in the depiction of a virtual world. While nowadays most PCs can run relevant esport titles, in the early stages of esport it was common for players to reduce the game graphics so that the games ran smoothly. Additionally, in some games, this helped to create a stronger contrast between opponents and the environment and reduced distracting graphic effects. Technological immersion is required for the players to feel engaged with the virtual worlds. The mouse and keyboard need to be adjusted to the player's needs. Ideally, the game runs without any technical disruptions like lags or errors. The graphics are usually adjusted to the

competitive purpose: Some want high-quality graphics and others prefer performing with lower graphic settings. Precise audio settings are required to hear, evaluate, and react to certain audio queues that can be triggered by the opponents, for example, footsteps revealing that an enemy is nearby, or sound effects signalizing an incoming attack. Distracting sound effects (such as ambient sound or in-game music) may be deactivated. The mouse and keyboard are adjusted to the players' needs. The whole setup may be arranged to deliver high quality information and reduce potentially distracting information. The same counts for tactile stimuli like force feedback from a controller. If the physical or tactile response from the controller, for example, a vibration, is equivalent to crucial information happening in the game then it is another helpful feature that might provide a competitive edge. If it is just for ambiance, like a vibrating controller mimicking suspense in a penalty shootout in an SVG, it can distract the player and his/her movement when trying to execute the penalty. Therefore, system immersion in esport is crucial and it is reliant on functionality rather than high fidelity. The player may adjust all available settings to feel as comfortable as possible in the interplay with the virtual world. If the game is too distracting because of ambient sounds, special graphic effects, or tactile stimuli, it reduces the feeling of being 'in the zone', and therefore disturbs the sensory perception of the digital avatar. Players should aim to find their perfect setup for optimal system immersion. In this way, they can immerse themselves in the digital competition and reduce the perception of the border between the analog and virtual worlds, thus allowing them to concentrate on the game.

(2) Second, immersion occurs as a response to the semantics and narratives of the consumed media (Nilsson et al., 2016). So, when an artificial world is accompanied by a diegetic depth, immersion is more likely to occur. The stories told, characters depicted, and worlds described can create an emotional connection between consumer and media. This does not necessarily require high-tech or perceptual immersion, but the narrations are decisive for the degree of immersion. The more intriguing the plot, the characters, or the fictional world overall, the deeper the immersion. Therefore this fictional immersion (Arsenault, 2005), narrative immersion (Adams, 2013; Ryan, 2008), imaginative immersion (Mäyrä & Ermi, 2011) or psychological immersion on a diegetic

level (McMahan, 2013). This is apparent regardless of the type of media (books, movies, games, etc.), since it is the depiction of the fiction that emotionally attracts and binds the consumer (Dede, 1995).

While for plot-driven games (usually single-player campaigns) narrative immersion is crucial since they tell a story, for competitive gaming this plays a subordinate role (cf. Mäyrä & Ermi, 2011). The digital avatars, forces, or characters that players control are more a means to an end than a figure of identification for the player. For example, in *Counter-Strike*, the factions (Terrorist vs. Counter-Terrorists) merely frame the conflict for the competition and do not actually tell a narration-driven story. The teams could be simply labeled red and blue, which would not change anything about the game mechanics (just like a chess board with figures from the *The Lord of the Rings* instead of the classical ones, whereas *Galadriel* is the queen and *Gandalf* the king etc. – the game is the same while the design only gives a 'flavour' for personal, design-related preferences). What counts is the aim of outperforming the opponent. In *League of Legends,* all playable characters – so-called champions – have background stories about their origin and functionalities. However, neither do these play any role in the game: The players usually choose the champions based on their functionality and their strategic and tactical roles. If a certain champion loses its purpose, it is less likely to be picked anymore, for example, because new strategies have been developed to outplay it or an update changed the mechanics of said character. Eventually, the narrative immersion is less relevant for competitions, since the digital avatars are mere tools that, in interplay with the peripherals, need to be mastered to outperform the opponents (Ford, 2017).

(3) Third, immersion is seen as a result of intellectual and sensorimotor challenges (Nilsson et al., 2016). This is referred to as systemic (Arsenault, 2005), challenge-based (Mäyrä & Ermi, 2011) or ludic immersion (Ryan, 2008). McMahan (2013) calls this type of immersion engagement and stresses its non-diegetic level, and forms the counterpart to psychological immersion on a diegetic level. Adams (2013) distinguishes between strategical immersion, the planning and optimization of choices within a game, and tactical immersion, the feeling of being 'in the zone' and being able to adapt adequately

and quickly to changing situations during a match. Both approaches neglect the relevance of narration for this type of immersion (Adams, 2013). All these definitions have in common the fact that they address the mental absorption of a physically and mentally challenging task. While trying to solve said challenge the player is immersed, thus incorporating the task and focusing on the game. In single player-gaming, the degree of challenge can be controlled by the difficulty settings, in competitive gaming this is dependent on the opponent's skill level. Many esport titles have introduced systems to match players at the same skill level with each other in order to create a balanced competition, like an ELO-system (cf. Bisberg & Ferrara, 2022). This is especially important for casual competitive gaming to guarantee a balanced competition and therefore a better gaming experience. When facing an opponent of similar strength, the challenge-based immersion is more likely to be triggered, since in this case, the players are adequately challenged to outperform the opponent, and therefore they are being mentally absorbed by the game. If the opponent is too strong this results in frustration, while a too-weak opponent causes boredom, just like when facing a computer-controlled enemy which is calibrated too strong or too weak (Nacke & Lindley, 2008; Riatti, 2014). This has conceptual overlaps with the flow state that occurs when people experience the optimal balance between a challenging task and their abilities to solve the task (cf. Csikszentmihalyi, 1990; Procci & Bowers, 2011). However, it needs to be stressed that flow and immersion as a response to a challenge have been compared by researchers with mixed results, despite conceptual similarities like reaching a state where the full focus is on the task itself, therefore neglecting time or environment and losing self-consciousness (Nacke & Lindley, 2008; Nah et al., 2014; Procci & Bowers, 2011). Research about flow in gaming is vivid and it reveals that flow is an important part of the gaming experience. Sweetser and Wyeth (2005) and Sweetser et al. (2012) introduce the term 'gameflow', explaining that concentration, challenge, skills, control, clear goals, feedback, immersion, and social interaction are important elements for experiencing flow in gaming. So contrary to Procci and Bowers (2011), they see a relation between immersion and flow. Further, they argue that social interaction through multiplayer experience causes flow, which can be linked directly to competitive gaming.

Flow is a desirable state for competition because it gives the competitors the feeling of being 'in the zone' and therefore they feel more comfortable while performing.

When looking at esport in the context of Figure 1, the degree of immersion will most likely be located along the y-axis (system immersion) and the z-axis (challenge-based immersion). The outset of esport is based on having an adequate system to compete with a challenge – outperforming the opponents – as the meaning of the action. The computer game does not need to mimic reality, require an in-depth narration, or create any form of perfect illusion. This is also described by Salen and Zimmerman (2010) as the immersion fallacy, which explains that also games with minimalistic graphics can create a sense of immersion. It supports the idea that competitive gaming can be an immersive experience even without a narration, pseudorealistic graphics, and high-fidelity equipment. Therefore, challenge-based immersion might play the most important role in immersion in competitive gaming, which can be compared to the flow state (Csikszentmihalyi, 1990; Sweetser et al., 2012; Sweetser & Wyeth, 2005).

3.3.2 Reality and virtuality in competitive gaming

According to the model of Nilsson et al. (2016), it can be argued that players are always immersed whenever they play. However, the degree of immersion is different depending on the game played and the system used. Playing a single-player campaign differs greatly from playing in a competitive match. In a single-player game, narration plays an important role in the game: The player experiences the story of the game, the characters, and the environment, just like the plot of a movie or a book. If the narrative immersion is supported by systemic immersion in the form of a high-performance PC with high-fidelity devices allowing a flawless rendition of audiovisual and tactile feedback, this may strengthen the sense of immersion. Lastly, if the game is designed to adequately challenge the players, the immersion intensifies and so does the degree of entertainment. Here, achieving presence and a loss of consciousness about what is real and what is virtual would be a desired state. In competitive gaming, immersion is perceived differently since the narration plays no role, and system immersion only requires delivering the optimal setup for the players to compete, regardless of the high-

fidelity depiction of a fictional world, and challenge-based immersion is achieved almost automatically based on the interplay with the opponent.

Under the assumption that the immersive experience for esport is only partially leading to the players diving into the virtual world, compared to other types of gaming or media consumption, the player's experience is happening in the virtual and the real world to a certain extent. Following this argument, the reality-virtuality continuum can offer a foundation for looking into this subject (Figure 2). Milgram et al. (1995) describe how technical devices, in their study a computer display, imitate reality and where along the continuum consumers find themselves while interacting with said device. They explain what the device needs to be capable of in order to mimic a virtual environment.

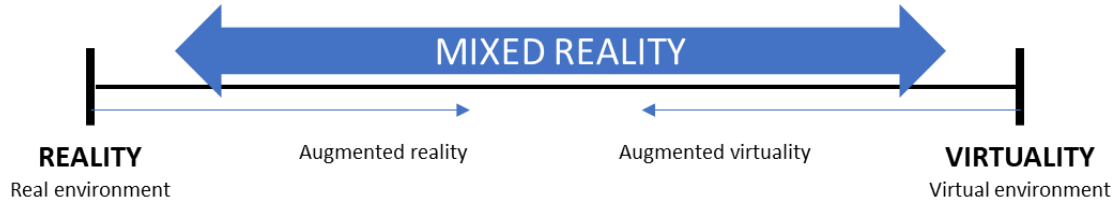

Figure 2 Reality-virtuality continuum (modified illustration based on Milgram et al., 1995)

Skarbez et al. (2021), extend this model and argue that immersion is one of the three dimensions of a system, which describes the mixed-reality experience, and shifts the focus from the technical specs of a system toward what a consumer experiences while interacting with a (semi-)virtual environment (Figure 3).

First, the extent of world knowledge (EWK) continuum describes how precisely the real world is modeled in virtuality. In esport, this dimension is mainly irrelevant. Fantasy games like *League of Legends* are creating a proprietary world and are not trying to mimic reality at all. Even games that are located in a realistic scenario, like *Counter-Strike,* do not need to recreate real environments, since the maps are designed to create an interesting and balanced competition, instead of representing the real world.

Second, the immersion (IM) continuum refers to how deeply the user interacts with the virtual world. As described in the previous chapter, users experience immersion in competitive gaming based on the challenge and the technological devices. The model defines the maximum on the continuum as if the system "supports every possible user

action" (Skarbez et al., 2021, p. 6). However, the mediation of the player's interaction is predetermined by how the physical input is converted into digital actions by the avatar, according to the game's rules and its physics. For example, players in *Counter-Strike* can run, walk, crouch, and jump. Going prone, crawling, climbing, pushing over crates, or other interacting with the virtual environment is not possible. Another aspect limiting the immersion is the time frame of a match. It is only for this specific time that the players are being immersed and they need to be aware of this since it bears tactical and strategic importance. Therefore, not only are the ways of interaction limited by the game's physic, they are also only possible during the duration of the match. The player's experience on this continuum is located somewhere between the two extremes.

Third, coherence refers to the authenticity of the virtual environment. The input always leads to the same result according to the laws of the virtual environment – the game's physics. This is an important part of competitive gaming, as this allows balanced and equal competition. For the competition, coherence assures the consistency of the rules. In this context it is possible to distinguish between constitutive and regulatory rules (d'Agostino, 1981): For competitive gaming, the former describes what is allowed or possible in the virtual world according to the in-game physics – movement possibilities and speed, accuracy settings of weapons, skillset of the digital avatar, etc. The latter describes the outline of the competition, like the game mode, how big the teams are, the aim of the game, how many points must be scored, or what the time limit is. The constitutive role of the virtual world is particularly important for coherence because it is responsible for the overall design of the computer game: If the developers were to change the time limit from 10 to 15 minutes in a match, the overall game would remain the same. If, however, they were to alter the possibilities in the world, players would need to retrain their physical input to adapt to the new settings. Thus, the players should be able to internalize the game physics, like gravity, movement speed, or friction. This means that a certain input always leads to a guaranteed output: Casting a spell in a game creates a colorful firework and a sound cue, visible and audible to everyone. The players know that this is the audiovisual output of their physical input that can, for example, give their positions away and deliver valuable information to the opponent. Therefore,

the game may assure that “every virtual behavior is entirely plausible” (Skarbez et al., 2021, p. 6). This leads to the players accepting the virtual world as the reality of the competition and guarantees reproducible outcomes of singular actions for a fair competition (‘If I do this, that will happen!’).

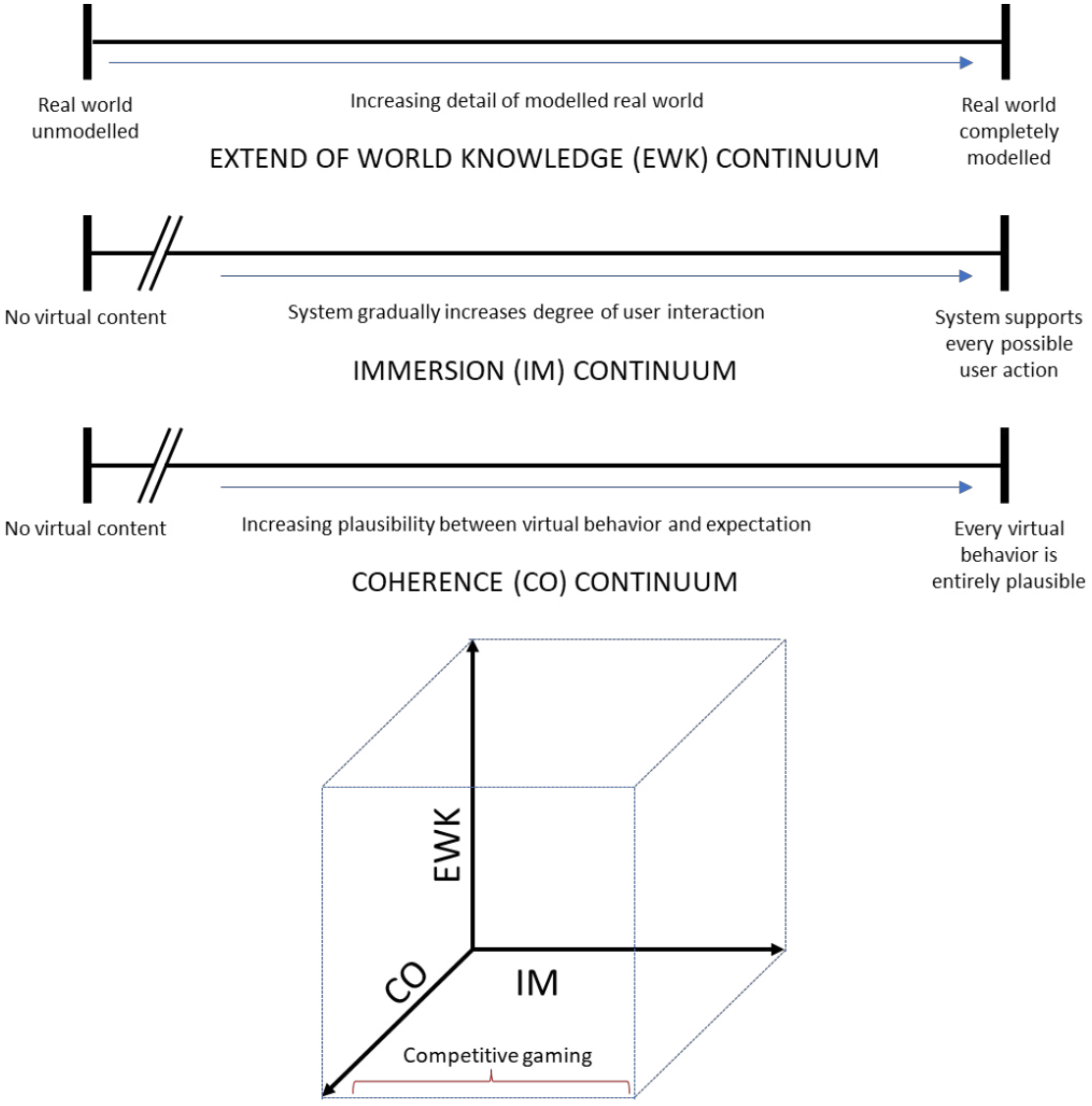

Figure 3 Reality-virtuality continuum, including extent of world knowledge continuum, immersion continuum, coherence continuum, and the combination of all three exemplified in a Cartesian coordinate system (modified illustration based on Skarbez et al., 2021)

On the three axes of the revised reality-virtuality continuum by Skarbez et al. (2021), competitive gaming is located along the IM continuum and at the maximum of the CO continuum. Eventually, this illustrates that esport is partially happening in a virtual environment, but there is always a connection to and awareness of the real world. The

differences are much clearer than for example in trans-reality gaming (cf. Goebeler et al., 2021; Lindley, 2004). That type of gaming aims to completely dissolve the frontiers between the virtual world and the real world, with the players almost being able to move between both seamlessly. In esport, players should be aware that the purpose of playing is competing and not entering a different realm. Esport is based on competition and the idea of outperforming an opponent based on physical and mental prowess is the same as in traditional sports. During the competition, they are aware that their opponents and their teammates are real people who, just like themselves, are embodied through a digital avatar. Also, in games that include computer-controlled units, like *DOTA2* or *League of Legends*, it is clearly distinguishable which characters are controlled by humans and which by the computer. Since the players can communicate with each other, using microphones or chat, social interaction can be observed. This is always a reminder of interacting with real people and not with artificial intelligence. Therefore, it creates meeting places across the digital and real world that are accessible to all participants (cf. Nardi & Harris, 2006; Thiel & John, 2020; Tillmann & Hugger, 2014).

In summary, esport combines actions from the real world, like the physical input, the requirement of technologies, or a communicative environment with the virtual worlds, such as the game itself with its coherent rules, the audiovisual depiction, or the embodiment of a digital avatar. Therefore, the idea of Holt (2016) regarding the distinction of the domain of execution and the domain of application in esport is plausible. However, a shortcoming in his argument is, that both the virtual and the real world require each other in esport. Arguing that the domain of application and execution are detached from each other fails to emphasize the importance of the interweaving between the real and virtual world for the competition (cf. Ekdahl, 2021a).

3.3.3 Fully immersive competitive gaming

Based on the definitions of esport, games that are played in fully immersive virtual worlds where the player's physical input mimics actual sporting movements are also part of the esport canon. Trans-reality gaming and MBVG include bicycle-simulations, played on an ergometer or golf-simulations using (pseudo)realistic golf equipment (cf. Cranmer et al., 2021; Jenny et al., 2017; Lindley, 2004). The main difference to esport

titles like *Counter-Strike* or *League of Legends* is the peripheral devices, including VR goggles and motion-tracking systems, instead of a mouse and keyboard. These game formats are a niche within the esport canon, mainly because they require very sophisticated and expensive technology and are therefore not as easily accessible as conventional gaming with a PC or a console. The system immersion would be more intense because these practices allow the users to dive deeper into the movement practice such as imitating a golf swing, or audio-visually entering the virtual pitch via virtual reality goggles, detaching the players more from the real and leading them more into the virtual world (cf. Nilsson et al., 2016; Slater, 1999, 2003). Currently, some competitions feature esport in the form of virtual reality matches, like the *Virtual Athletics League* (VAL, 2022). The contenders are equipped with VR goggles and controllers, which haptically simulate their in-game equipment and are located within a physical pitch. Their movement is tracked on the field and mediated through the goggles. However, this means that the players need to be onsite to compete in this type of esport or require very sophisticated technology like omnidirectional treadmills to simulate the player's movement from home. Contrary to the current mainstream esport, the player's movements are mimicked, and therefore the movement requirements, regarding condition, cognition, or motoric skills, differ significantly from playing with a mouse and keyboard in a sedentary position. However, referring to the development of esport achieved through the technological progress in the 90s and early 2000s, with computer devices becoming more affordable and (almost) omnipresent internet access, this could imply a similar development for this type of virtual reality-focused esport (cf. Jonasson & Thiborg, 2010). For Jenny et al. (2017) esport based on virtual- or trans-reality gaming is more likely to be accepted as a sport because of the gross motoric activities required. Still, this closes the circle on the debate about what esport is and if gross motoric physical activities are a must for an activity to be accepted as a sport. If esport were only regarded as such (when the input devices are sophisticated enough to mimic actual movement, like in the above-mentioned example) it would exclude games that are played with a mouse, keyboard, or controller. This perspective could be continued considering the simulation of sport in games like *FIFA*, or the attempt of

sports governing bodies to distinguish between esport and egaming (cf. Jenny et al., 2017; Willimczik, 2019), and it would eventually lead back to the overall CEBS-debate (Ekdahl, 2021a).

Still, esport may be seen as an immersive sport simply because of the mediazation through computer games. Some games can be more immersive than others depending on the input devices used. Therefore, the experience of reality through gaming in a virtual environment can differ between the games and/or the devices used to play. For example, the physical experience of playing a shooter in a sedentary position using a keyboard and mouse is different from playing it in a fully immersive virtual reality environment which mediates the actual movements in a virtual world. So, the most popular titles are still being played with a mouse and keyboard or a controller and are less immersive than games that incorporate VR goggles or movement-tracking devices. The players are moving between the digital world and the real world when competing in esport titles and are physically and mentally interwoven with the devices in different ways, like the physical input to steer the avatar based on the audiovisual feedback from the game (Ekdahl, 2021a; Taylor, 2012). It is unclear if virtual- and trans-reality gaming in esport will become as popular as the current esport games, especially since it only addresses a niche target group, requires highly sophisticated technology, and only offers very few games compared to existing esport titles (Cranmer et al., 2021). However, a possible increase in popularity and relevance within the field of esport would certainly be accompanied by many other phenomena regarding physical activity in esport, physical and mental interaction, the esport ecosystem, and its stakeholders.

3.3.4 The esport ecosystem between the real and digital world

A vivid ecosystem has evolved around competitive gaming over the years with the players being the core and professional players, professional teams, game developers, and tournament organizers being the primary stakeholder (Figure 4). These primary stakeholders have social, ecological, and economical aims, obligations, and interests. On a second level, there are sponsors, media, providers, investors, shareholders, and suppliers. Eventually, all stakeholders are bound to and need to act within a legal frameworks, for example created by existing sport entities or the government (Scholz,

2020). To illustrate the scope of competitive gaming's duality regarding the real and digital world, it is possible to break down this interweaving on macro-, meso, - and micro levels:

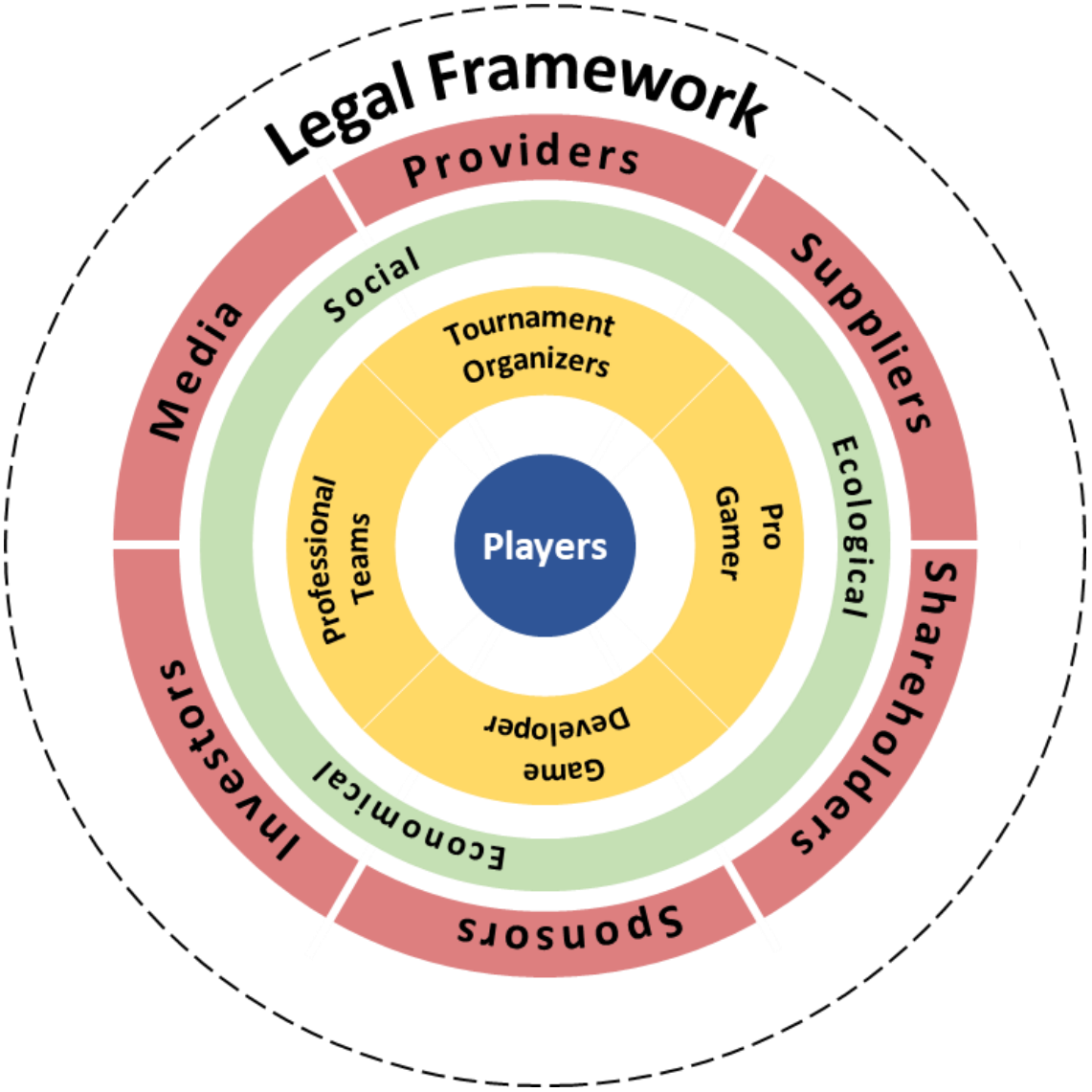

Figure 4 Esport ecosystem categorized with respective stakeholders (modified illustration based on Scholz, 2019; Scholz, 2020)

First, on a macro level, competitive gaming turned into a flourishing and expanding multi-million, if not billion-dollar, ecosystem (cf. Ahn et al., 2020; Ballhaus et al., 2020). Scholars argue about the potential societal impact for all participants in this system not least because of the CEBS-debate (cf. Bascón-Seda & Rodríguez-Sánchez, 2020; Ekdahl, 2021a; Jonasson & Thiborg, 2010). Therefore, although initially regarded as virtual competitions or competitive computer gaming, esport has become an environment

beyond the digital world that can promote values, virtues, or behaviors that are commonly assigned to traditional sports (cf. Seo, 2016).

Second, on a meso level, it is possible to observe how teams and players are organized in esport. For example, while traditional sporting clubs are usually bound to a geographical location, respectively where their sport can be exercised (football pitches, swimming pools, racetracks, etc.), esport organizations are not, because esport can be practiced from almost everywhere around the globe. While the competitions are virtual, the organizations, teams, and players in the ecosystem rely on both online and offline infrastructure to practice their sport, manage their teams, and organize competitions. This adds the feature that players do not have to be in the same place when playing, unlike many other traditional sports.

Third, on a micro level, it is possible to observe how the players are interacting with the virtual world via the input devices on their computer or console. There is reciprocity between the player in reality and virtuality (Ekdahl, 2021b). The players sit in front of a device, controlling the mouse and keyboard while staring at the monitor and receiving auditive signals from a headset. In doing so, they control the digital avatar in the game and receive audiovisual and affective feedback from the game, to control the avatar, based on their physical input. Here, the input devices form a connection to the digital avatar, which eventually turns it into a tool, just like a mouse or a keyboard, to achieve the aim of the game (Ford, 2017; Geraci, 2014). Lastly, the players can perceive the avatar as a portrayal of themselves. So, to a certain extent, the player is experiencing what the character is experiencing in the game, based on the possibilities of the in-game mechanics, ranging from the character's movement up to being taken out of the current game when the avatar is being eliminated. Certainly, the player him- or herself does not need to fear physical consequences for in-game actions, but when the avatar is eliminated, it leaves the 'playfield' for a period in which also the player him- or herself is out of the game.

These remarks show that discussing esport simply as a new movement practice and regarding its physicality fails to address many aspects of esport compared to traditional

sport. While virtuality is the foundation for the competitions, it is possible to observe how it is also the origin of other practices and peculiarities in the esport ecosystem, including the societal impact, the management of teams, the management of tournaments, and legal implications, just to name a few.

4 Preliminary conclusion

This dissertation looks at esport and competitive gaming through a sport sociological scope. It aims to shed further light on the scientific discourse of esport and map out theoretical and practical implications for sport and society in dealing with esport.

As discussed in the preceding chapters, digitalization and the technological progress aligned with it had a major impact on the possibilities of esport evolving over the years, to the extent that it can be discussed whether it is part of the popular media and sports culture. Since sport has always been exposed to technological development and has been constantly changing and adapting to the present zeitgeist, esport is a logical development of sport (cf. Ekdahl, 2021a; Jonasson & Thiborg, 2010; Thiel & John, 2018), although there are arguments against adopting it within the sports canon (cf. Borggrefe, 2018, 2021; Parry, 2019). Still, up to now, esport has developed a flourishing ecosystem and a multi-million-dollar economy around it, which can have a significant impact on sport and society (Bascón-Seda & Rodríguez-Sánchez, 2020; Scholz, 2020).

A significant trait that differs esport from traditional sports is the fact that the domain of application and domain of execution are in the digital and real world, whereas in traditional sports this happens entirely where the respective sport is being practiced (Holt, 2016). Players are immersed in the digital world while gaming, which can occur in different facets regarding the fidelity of the system, the narration, and the perceived challenge. For esport primarily the latter and the former are relevant. On this basis, players are physically and mentally interwoven with the virtual world, which creates an unprecedented requirement for the players, compared to other sporting activities. While immersing in the virtual world, the players are aware of the reality around them on different levels. This includes the fact that they are playing in a real competition, awareness of their physical and mental input, and internalizing the interplay between the digital and real world to outperform their opponents. In traditional sports, the role of the body, both physical and psychosociological has been investigated profoundly (cf. Sabiston et al., 2019; Thiel et al., 2013), whereas for esport this is still an emerging research topic (Ekdahl, 2021a; Reitman et al., 2020). Another aspect regarding

corporeality in esport is that players are not facing each other in the same physical location, for example as in traditional sports. Mainly professional tournaments are held in venues where the contenders are participating accompanied by fans, coaches, and media, and under the supervision of referees. Especially while playing online, which is the most common practice for competitive gaming, the players are physically isolated from one another. This setup is uncommon for sporting competitions, where athletes usually compete at the same physical venue, like on a pitch, in an arena, on a racetrack, etc.

One of the overarching questions in the sport sociological scope about the extent to which sport – in this case esport – has an impact on society, may be approached by investigating different social dimensions of esport (cf. Heinemann, 2007; Thiel et al., 2013; Weis & Gugutzer, 2008). The first article of this cumulative dissertation treats the research question '(1) what societal impact stems from esport'. This builds the foundation for the second paper, since not only is it of interest what the societal impact is, but also where and how sociality is being created. In traditional sport, a major point of reference for this is the body (cf. Thiel et al., 2013). The peculiarity of esport in that the players are not directly competing with each other and are mediated by digital avatars, leads to the second research question '(2) what role does the body play in esport and competitive gaming'. The third article follows up on the topic of corporeality in esport by investigating the research question '(3) what effect does the shifting focus from the physical to the digital corporeality has on the players' behavior and the ecosystem'.

5 Collection of articles

This chapter presents the three articles, which are the foundation for this dissertation. Two studies are scoping reviews, conducted via the PRISMA-ScR guidelines, an extension to the scoping review approach to increase the methodological rigor and quality (Tricco et al., 2018). The first scoping review examines literature about the societal impact of esport. The second one discusses the role of the body in esport based on the current state of research. Both include an introduction, the theoretical foundation, and a description of the methodology, followed by the depiction of the results, and a discussion of the findings before concluding the paper. The third study is a conceptual paper building up on the aforementioned two studies to outline, depict and discuss the relevance of the physical body as a point of social interaction, and how the shifting focus toward its digital pendant affects the way players interact with each other, based on the theory of panopticism by the French sociologist Michel Foucault (2016).

All three papers were written by the same two authors. The respective contribution to each paper is shown in Table 2.

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Table 2 List of the three articles with the respective contribution of the main author and co-author

	Contribution doctoral candidate (Paolo Riatti)	**Contribution co-author (Prof. Dr. Ansgar Thiel)**
Paper 1: The societal impact of electronic sport: a scoping review	• Project management • Idea & development of research question • Literature research and preparation of literature • Compilation & preparation of the dataset • Analysis • Development of paper structure • Writing of first paper draft • Review and revision process	• Idea & development of research question • Co-development of paper structure • Revision of the first paper draft • Support in revising subsequent paper versions
Paper 2: The role of the body in electronic sport: a scoping review	• Project management • Idea & development of research question • Literature research and preparation of literature • Compilation & preparation of the dataset • Analysis • Development of paper structure • Writing of first paper draft • Review and revision process	• Idea & development of research question • Co-development of paper structure • Revision of the first paper draft • Support in revising subsequent paper versions
Paper 3: Using panopticism to theorize the social role of the body in electronic sport	• Project management • Idea & development of research question • Literature research and preparation of literature • Development of paper structure • Writing of first paper draft • Review and revision process	• Idea & development of research question • Co-development of paper structure • Revision of the first paper draft • Support in revising subsequent paper versions

5.1 Article 1: “The societal impact of electronic sport: a scoping review”

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The societal impact of electronic sport: a scoping review

Supplementary Information

The online version of this article (https://doi.org/10.1007/s12662-021-00784-w) contains supplementary material, which is available to authorized users.

Introduction

In modern society sport has become an integral part of everyday life. This rooting ranges far beyond participation as leisure or health care activities, but has differentiated into a vital economic sector, a philosophy of life and affects everyday interaction such as behavior or speech (Stichweh, 2013). It is usually positively connoted and is regarded as an engine for development, thus underlining that sport has an impact on society on many levels (De Bosscher, Shibli, & De Rycke, 2021; Pawlowski, Schüttoff, Downward, & Lechner, 2018; Spaaij, 2009). The depiction of sport has evolved throughout history and differs from culture to culture. It evolves and adapts to trends and changes in society (Heinemann, 2007). Nowadays, digitalization is a major driver of change in society and therefore also in sport (Miah, 2014; Ratten, 2019). As the digital development in sport grows, it also alters the social depiction and role of sport (Thiel & Gropper, 2017). Therefore, sport undergoes a variety of changes, like improved equipment such as the video assistant referee in football, big data usage for health and performance diagnostics, or an alteration of movement practices (Edgar, 2019; Thiel, Seiberth, & Mayer, 2013). Several reviews have shown how digitalization changes common practices in sport (Abeza, O'Reilly, Séguin, & Nzindukiyimana, 2015; Baca, Dabnichki, Heller, & Kornfeind, 2009; Filo, Lock, & Karg, 2015; Gruettner, 2019; Rigamonti et al., 2020; Xiao et al., 2017). But there is still little knowledge about electronic sport (esport), a symbiosis of gaming and sportive competition, which has seen a considerably strong growth since the 1990s, especially due to an evolving digitalization and a growing computer game industry. It is a global phenomenon, particularly popular in the far east, like China or South Korea, Europe, North America or Brazil (Parshakov & Zavertiaeva, 2018; Taylor, 2012). Regarding player base, spectatorship, or prize money, it has outperformed many traditional sports and witnessed an additional boom during the coronavirus disease 2019 (COVID-19) pandemic (Droesch, 2020). While some scholars argue esport is a contemporary sport (Thiel & John, 2018), others reject the idea of competitive gaming as sport (Borggrefe, 2018). Scholars see chances and benefits but also threats and risks for society and the depiction of sport on both sides (Jonasson & Thiborg, 2010; Pfeffel, Horn, Nickolai, & Ratz, 2020; Willimczik, 2019b). This ambiguity can also be seen on a political level since some countries regard esport as a sport, while others have not reacted yet or refuse this acknowledgement (Pack & Hedlund, 2020). Still, the amount of research on esport is growing and topics shift from explanations or translations of esport's nature, towards more precise ones (Reitman, Anderson-Coto, Wu, Lee, & Steinkuehler, 2020), like the link between nonverbal communication (Leavitt, Keegan, & Clark, 2016) or team composition (Goyal, Sapienza, & Ferrara, 2018), and in-game performance. Scholars have been raising the question on what societal impact esport has, e.g., the influence of and effects on various areas of society and how it is taking root (Holmberg, Bowman, Bowman, Didegah, & Kortelainen, 2019), but this is yet to be investigated (Bascón-Seda & Rodríguez-Sánchez, 2020; Jonasson & Thiborg, 2010). The present study examines this issue in form of a scoping review, since it allows handling a broad research question, identifying the extent of research for a specific topic, summarizing and disseminating findings, mapping out key concepts, and analyzing emerging evidence as a foundation for prospective research (Arksey & O'Malley, 2005; Peters et al., 2017). The aim of this study is to examine the societal impact of esport, consolidate discussions about the topic, offer a deeper base for constructive debates and contribute to research evaluating esport's impact on society.

Theoretical background

This section defines the terms esport and societal impact and concludes with the theoretical framework for this study, the Mapping Elite Sport Societal Impact (MESSI) model (De Rycke & De Bosscher, 2019), which is used to investigate societal impact of sport and is considered an adequate approach for studies on the topic (De Bosscher et al., 2021; De Rycke & De Bosscher, 2020; De Rycke, De Bosscher, Funahashi, & Sotiriadou, 2019).

Consent for publication

■

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Table 1 Depiction of the Mapping Elite Sports' potential Societal Impact (MESSI) framework, showing areas in which societal impact of sport can be observed, modified by adding numberings to categories and subcategories (De Rycke & De Bosscher, 2019)

Context	Events/Athletes & Teams/Successes/Stakeholders worldcups, Olympic games, championships/athletes, football players, sports teams/winning medals, games, records/coaches, sport organisations, sponsors									
Category	(1) Social equality & inclusion	(2) Collective identity & pride	(3) Ethics & fair play	(4) Feel good & passion	(5) Fans & media attraction	(6) Prestige & image	(7) Athletes ability & quality of life	(8) Sport participation & health	(9) Sponsors & commercial activity	(10) Local consumption & living conditions
Potential positive impacts	(1) Integration (2) Social Equality (3) Inclusion (4) Social Justice (5) Socioeconomic equality	(1) Community' identity (2) Community' pride (3) Socializing opportunities	(1) Ethics (2) Symbolism & Rituals (3) Fair play (4) Social debate	(1) Pleasure (2) Special experiences (3) Well-being (4) Passion	(1) Beauty' of sport (2) Fandom (3) Celebrities (4) Media Consumption (5) Sport Knowledge	(1) Globalization (2) International Prestige (3) Political Power (4) Peace building (5) Country/city marketing	(1) Fame (2) Role model function (3) Quality of life (4) Life skills	(1) Identification (2) Sport participation (3) Volunteering (4) Adoption qualities (5) Health awareness	(1) Economic boost (2) Sponsorship (3) Media rights (4) Sport industry assets (5) Commercial activity (6) Innovation (7) Fundraising	(1) Consumption (2) Employment (3) Tourism (4) (sport) infrastructure (5) Greening
Potential negative impacts	(6) Sexism (7) Exclusion (8) Exploitation (9) Discrimination	(4) Opposition & rivalry (5) Chauvinism (6) Shame	(5) Corruption & Fraud (6) Hooliganism (7) Deviant examples	(5) Disappointment (6) Failure	(6) Gambling (addiction) (7) Repulsion (8) Drop sports' image	(6) Soft power (7) Bad international image (8) War propaganda	(5) Pressure (6) Injuries (7) Safe guarding issues (8) Post-career depression (9) Doping	(6) Discouragement effect (7) Unhealthy lifestyle (8) Distorted body image	(8) Associations with scandals (9) Financial hangover	(6) Legacy costs (7) Environmental impact (8) Declined living conditions (9) Excessive Investments

What is esport?

There appears to be no grammatical consensus about a common terminology of electronic sport. Common expressions are e-sport, esport, cybersport or pro gaming, an abbreviation for professional gaming and a professional competitor or athlete being called pro gamer. Along with the heterogeneous terminology various definitions have evolved since the first appearance of the term esport in 1999 (Wagner, 2006). There is a characteristic distinction between game-related and sport-related definitions. Game-related definitions highlight a certain degree of organization and competitiveness of digital, online, virtual, computer, or video gaming (Borowy & Jin, 2013; Maric, 2011; Weiss & Schiele, 2013; Witkowski, 2012). Sport-related definitions refer to typical characteristics usually connoted to sportive competitions, like physical and mental prowess being applied in a digital environment or under the use of information and communication technologies (Hemphill, 2005; Wagner, 2006). While none of these definitions are mutually exclusive, they share certain commonalities. Therefore, esport can be described as competitive and organized computer and video gaming, in which two or more parties (individuals or teams) face each other under regulated and balanced conditions. It takes strategical, tactical, physical, and mental skill to outperform the opponent.

Elaborating the societal impact of sport

Although societal and social impact are often used synonymously, there are differences between the terms (Bornmann, 2013). Social impact refers to positive effects being triggered directly or indirectly on a personal level by an intervention or an entity. Societal impact includes all effects on several areas of society, understanding how an entity is rooted in society, with both positive, therefore including social impact, and negative consequences (Holmberg et al., 2019; Vanclay, Esteves, Aucamp, & Franks, 2015). Therefore, this review focuses on the latter.

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The societal impact of electronic sport: a scoping review

Abstract

Competitive computer gaming, known as electronic sport or esport, is growing and professionalizing profoundly during the past years with experts struggling to allocate it in society. This scoping review explores existing evidence and identifies potential societal impact of esport by applying the Mapping Elite Sports Societal Impact Model. Main findings included insights on the motivation of passive and active esport consumption, beneficial socializing, pedagogical or educational aspects, hegemonial clinical pictures in esport, differing popularity regarding demographics and games, and potential interference of the esport economy in traditional sports. The findings implicate a paradigm shift in the world of sport. It can be stated that esport affects society in a positive and a negative way, although the fragmented body of research has only given superficial evidence so far. Future research needs to go into detail regarding the peculiarities and find approaches of isolating the positive aspects, while reducing the negative spin-offs and allow a well-regulated handling of esport on a broad societal level.

Keywords

Gaming · Socializing · Addiction · Electronic sport · Societal impact · Scoping review

The societal impact of sport is a ubiquitous topic in sport science. The positive effects of sport in form of physical activity for mental and physical health are well documented (Eime, Young, Harvey, Charity, & Payne, 2013; Warburton & Bredin, 2016). Beyond physical activity, research on societal impact of sport offers insights into handling decisions about sport interventions, such as funding, hosting events, health care, socialization, economic development, and many more (Lawson, 2005; Pawlowski et al., 2018; Tonts, 2005). This also indicates that the way sport is managed affects society (Chalip, 2006; Taks, Chalip, & Green, 2015): There are strategically desirable impacts on different societal levels when managing sport with positive effects, like increasing of subjective well-being due to hosting sport events, but also negative side effects like financial risk and opportunity costs (Cornelissen & Maennig, 2010; Kavetsos & Szymanski, 2010; Schulenkorf, 2009). To identify sport's societal impact De Rycke and De Bosscher (2019) conducted a mapping review based on 391 empirical studies and developed the MESSI model. They clustered 128 isolated topics in 79 subcategories and assigned them to 10 superordinate categories, each distinguishing positive and negative impacts (**Table 1**). Although the model focuses only on elite sport, considering a demonstration effect, elite sport can also affect sport on grass-roots or amateur levels, in terms of participation, engagement or subjective well-being (Kavetsos & Szymanski, 2010; Weed et al., 2015). Therefore, impact beyond the elite sport level can be observable.

Methodology

The present review follows the preferred reporting items for systematic reviews and meta-analysis extension for scoping reviews (PRISMA-ScR) guidelines (Tricco et al., 2018). It optimizes the methodological precision, rigor, and quality compared to the classic approach of scoping reviews introduced by Arksey and O'Malley (2005). Objectives, inclusion criteria, and method of this review were specified and documented in a protocol in advance (https://osf.io/s98fc). Any divergence from the protocol is noted in the following section.

Search strategy

In this scoping review MESSI serves the purpose of identifying key terms which come to use in the search strategy to match the topic of esport with a model for the evaluation of societal impact (**Table 2**). Conducting the search, set (1) is matched with the categories of societal impact (2) to (11) and their respective subcategories. Thus, it is possible to identify publications which identify traits of esport regarding the corresponding fields and eventually allow insights on the potential societal impact. Some of the concepts or terms used as the (sub-)categories, appear to be somewhat too abstract in the work of De Rycke and De Bosscher (2019) for using them as search terms. Therefore, scholars recommend to adjust said terminology and use search operators to increase methodological rigor (Kugley et al., 2016). Overall, this results in a heterogeneous search strategy which fits the scoping review approach, for it does not call for a deep dive into the topic but examine it on a broad level. For the same reason no publication date limitation is set. The search was conducted on 13 December 2020. Arksey and O'Malley (2005) propose four steps for conducting the search, which are slightly altered for this study: (1) Searching electronic journal databases EBSCOHost, PubMed, Web of Science, and SagePub; (2) searching in reference lists of eligible studies; (3) additional research with GoogleScholar and hand-searching of key journals to ensure no paper is omitted and find further insights into grey literature; (4) searching in existing networks, relevant organizations, and conferences.

Selection process and data extraction

Literature fitting the following criteria are eligible for the study: (1) qualitative, quantitative, and mixed-method research studies (both observational and experimental); (2) conference and workshop proceedings; (3) theses; (4) unpublished work; (5) grey literature; (6) published in English, French, German, Spanish, and Italian; (7) full-text availability. Studies are excluded if they were non-empirical (reviews, editorials, comments, essays, etc.), they do not discuss esport according to the study's definition, or the search terms are not discussed as intended within the framework. Articles are first scanned by title, then by abstract, and lastly by full text **Fig. 1**. If an article does not meet the inclusion criteria it is not further taken note of. It is recommended to sift the articles with at least two reviewers to increase methodical rigor (Tricco et al., 2018; von

Table 2 Search terms for literature search adjusted to fit the EBSCOHost database

Set	Search Terms
#1	Electronic sport* OR ″e-sport*″ OR ″esport*″ OR ″cybersport″ OR ″professional gam*″ OR ″pro gam*″ OR ″competitive gam*″
#2	Integration OR ″social equality″ OR ″equality″ OR ″socio-economic equality″ OR ″justice″ OR ″social justice″ OR ″inclusion″ OR ″sexism″ OR ″exclusion″ OR ″exploitation″ OR ″discrimination″
#3	″community identity″ OR ″collective identity″ OR ″identity″ OR ″community pride″ OR ″pride″ OR ″social* opportunit*″ OR ″opposition″ OR ″rival*″ OR ″chauvin*″ OR ″shame*″
#4	″ethic*″ OR ″symbo*″ OR ″ritual*″ OR ″fair play″ OR ″sportsmanship″ OR ″social debate″ OR ″corrupt*″ OR ″fraud″ OR ″hooligan*″ OR ″deviant example*″ OR ″devian*″
#5	Pleasure OR ″special experience*″ OR ″well-being″ OR ″feel good″ OR ″passion″ OR ″disappoint*″ OR ″fail*″
#6	Beauty N5 ?sport OR ″media attraction″ OR ″fandom″ OR ″fan″ OR ″celebrit*″ OR ″media consum*″ OR ″?sport knowledge″ OR ″gam* addict*″ OR ″addict*″ OR ″repuls*″
#7	Globali?ation OR ″prestige″ OR ″polit* power″ OR ″peace* build*″ OR ″marketing″ OR ″soft* power*″ OR ″image″ OR ″propaganda″
#8	Athletes ability OR ″fame″ OR ″role model″ OR ″quality N5 life″ OR ″life skill*″ OR ″pressure″ OR ″injur*″ OR ″safeguarding″ OR ″depressi*″ OR ″doping″ OR ″cheat*″
#9	Identification OR ″participation″ OR ″volunteering″ OR ″adoption qualit*″ OR ″health awareness″ OR ″health″ OR ″discouragement effect″ OR ″unhealthy lifestyle″ OR ″body image″
#10	Economic boost OR ″sponsor*″ OR ″media right*″ OR ″?sport industry″ OR ″commerc*″ OR ″innovation″ OR ″fundrais*″ OR ″scandal*″ OR ″financial risk″
#11	Consum* OR ″employ*″ OR ″touris*″ OR ″infrastructure″ OR ″greening″ OR ″legacy cost*″ OR ″environment*″ OR ″living condition*″ OR ″invest*″
#12	″(1) AND ((2) OR (3) OR (4) OR (5) OR (6) OR (7) OR (8) OR (9) OR (10) OR (11))″

Elm, Schreiber, & Haupt, 2019). Any disagreement is settled via constructive debating. The data extraction tool described in the protocol has been modified throughout the process. Extracted data included author, year, origin, aim, study design, sample characteristics and assignment to the review's framework.

Findings

The initial search yielded a total of 16,106 articles, with 12,282 remaining after removing duplicates. After screening and cross-referencing 82 articles were eligible.

Although the earliest study included was publicized in 2005, most publications were published in recent years. More than half of all publications are from the years 2019 ($n = 15$, 18.52%) and 2020 ($n = 34$, 41.98%). While there are studies included from 26 nations, more than half are from USA ($n = 28$, 34.57%), Spain ($n = 10$, 12.35%) and Finland ($n = 8$, 9.88%), while 10.98% are of far eastern origin ($n = 9$). A total of 17 different methods are used in the studies, with the majority of 71.95% ($n = 59$) applying one methodology and 28.05% ($n = 23$) studies applied a mixed-method approach including two or three different data assessment tools. Most studies gathered data using quantitative surveys ($n = 51$, 62.96%) or qualitative interviews ($n = 23$, 28.40%). Four studies used quantitative surveys and qualitative interviews, three used observations and quantitative surveys, and two applied observations and qualitative interviews. Furthermore, quantitative surveys were combined once with MRI (magnetic resonance imaging) scans, once with exploratory data analysis and twice with exploratory field research. Qualitative interviews were applied twice with focus groups and once with a netnographic analysis. There are eight studies each using three tools, of which two applied quantitative surveys, qualitative and observations, two used observations, qualitative interviews, and document analysis, two combined MRI scans with qualitative interviews and a quantitative survey and one combined two types of document analysis with qualitative interviews. Sample sizes from studies including quantitative surveys ranged from 23 (Hyun et al., 2013) to 68,539 (Karakus, 2015). Qualitative interview studies included four (Bertschy, Mühlbacher, & Desbordes, 2020; Mühlbacher & Bertschy, 2020) to 35 test persons (Lin & Zhao, 2020; Zhao & Lin, 2020). The age of the sample sizes ranged from eight (Lobel, Engels, Stone, & Granic, 2019) to 80 (Macey, Abarbanel, & Hamari, 2020). Only six studies included more female probands than males. All publications can be assigned to the ten categories of the framework and their respective subcategories. More than half of them ($n = 43$, 52.44%) address one category. The remaining 39 studies can be matched with two to five categories each. Regarding the subcategories nearly a third cover one topic ($n = 27$, 32.93%) and the majority covering two ($n = 30$, 36.59%). In sum, 47 different subcategories of all ten categories are treated. One study can be assigned to four categories treating seven subcategories (Seo, 2016), another treats six subcategories under five categories (Schaeperkoetter et al., 2017). Most studies can be assigned to the categories Sport Participation & Health (29 times), Collective Identity & Pride (20 times) and Fans & Media Attraction, while Prestige & Image (8 times), Sponsors & Commercial Activity (8 times) and Local Consumption & Living Conditions (3 times) are the least covered topics. The most frequent subcategories treated are sport participation in 19 studies, socializing opportunities in 18 studies, media consumption in 12 studies and health awareness in ten. Because of the variety of topics addressed, it is difficult to depict in depth findings across all studies. Therefore, findings for each category are treated in the following subsections. As most studies cover more than one subcategory, they are reported multiple times in the next section. **Table 3** summarizes all studies and which topics are treated across all studies.

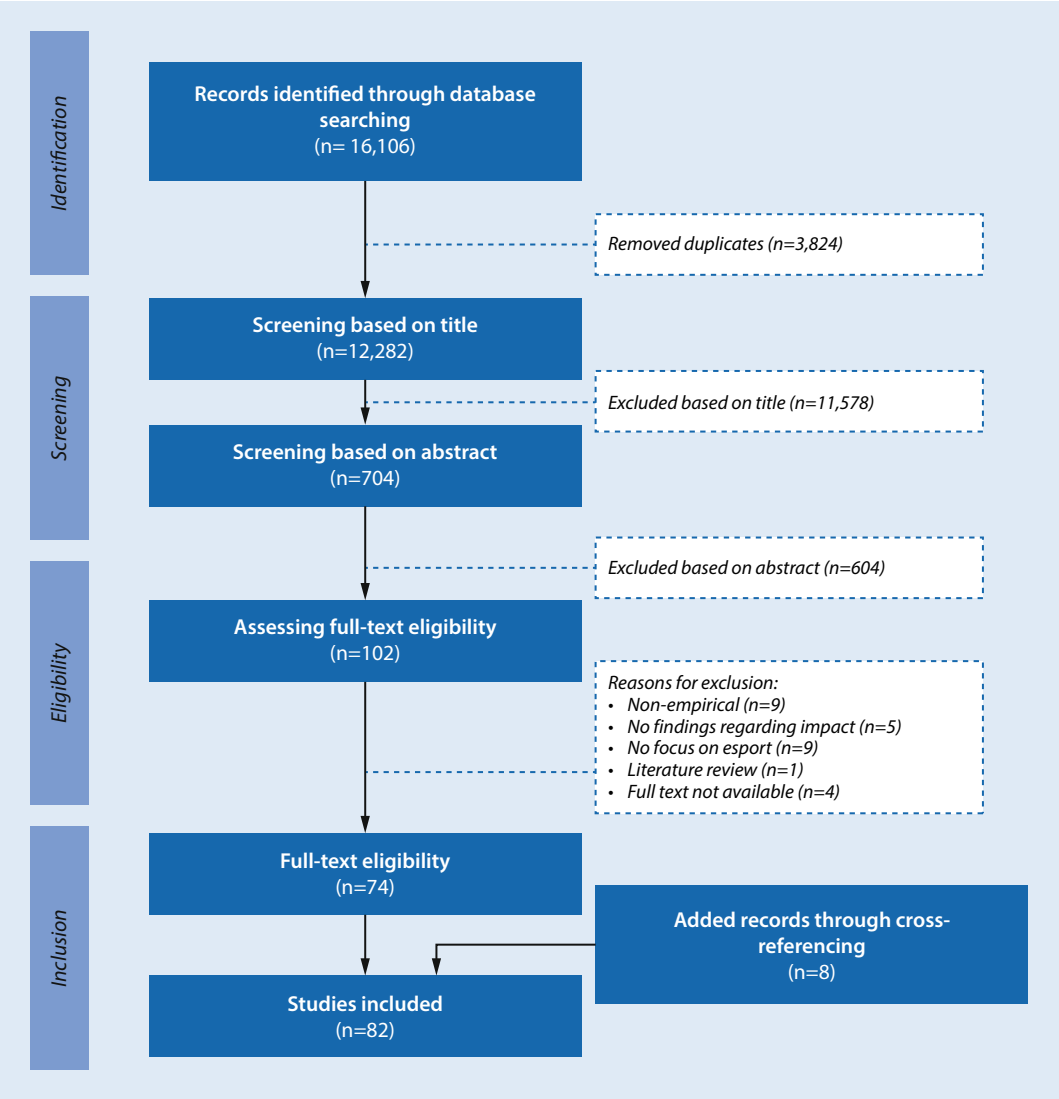

Fig. 1 ◀ Flow diagram adapted from the PRISMA-ScR guidelines (Tricco et al., 2018)

(1) Social equality and inclusion. A total of 13 studies covered topics related to the first category. Studies delivered insights on integration (Freeman & Wohn, 2017), promoting social equality (Taylor & Stout, 2020), and inclusion (Hayday & Collison, 2020; McCauley et al., 2020; Pizzo et al., 2019; Xue et al., 2019), as it is a platform for like-minded people regardless of their origin, gender or (dis-)abilities. One study reveals how normative gender-roles exist in esport and can therefore lead to the opposite of the aforementioned, despite theoretical accessibility and equal opportunities, as there is no skill difference between males and females in esport (Ratan et al., 2015). Several studies thematize condescending behavior towards women like sexist behavior and exclusion, namely harassment or male hedonism (Jansz & Martens, 2005; Ratan et al., 2015; Ruvalcaba et al., 2018), low acceptance of other genders and lacking political correctness (Hayday & Collison, 2020; Xue et al., 2019), and application of gender normative roles in games (Ratan et al., 2015). On collegiate or amateur level, there are barely programs or approaches which tackle discriminatory and exclusive issues (Taylor & Stout, 2020). Generally, discriminatory behavior is becoming an overarching problem for sports that are consumed mainly online and anonymously, which is even intensified in casual gaming and semi-professional esport due to its anonymous exertion (Hayday & Collison, 2020; Kwak et al., 2015; Mattinen & Macey, 2015; Peng et al., 2020). Players, willing to go pro, who do not see their performance being recognized also sense a feeling of exclusion (Schaeperkoetter et al., 2017).

(2) Collective identity and pride. Community identity is evolving and growing among esport enthusiasts (Fiskaali et al., 2020; Freeman & Wohn, 2017; Pizzo et al., 2019; Seo, 2016; Xue et al., 2019). This can be fostered by attending live events or LAN-parties (Jang et al., 2020; Jansz & Martens, 2005; Whalen, 2013), which also contribute to the findings that esport is a platform for socializing opportunities. This can occur in dedicated live events (Jang et al., 2020; Jansz & Martens, 2005; McCauley et al., 2020; Whalen, 2013) or generally by engaging in the esport environment both online and offline (Baltezarević & Baltezarević, 2019; Fiskaali et al., 2020; Freeman & Wohn,

Table 3 Categories and subcategories covered across all studies

Category (*n*; %)	Subcategory	*n* (%)	Study
Social Equality & Inclusion (*n* = 13; 15.85%)	Integration	1 (1.22%)	Freeman & Wohn, 2017
	Social Equality	1 (1.22%)	Taylor & Stout, 2020
	Inclusion	4 (4.88%)	Hayday & Collison, 2020; McCauley, Tierney, & Tokbaeva, 2020; Pizzo, Jones, & Funk, 2019; Xue, Newman, & Du, 2019
	Sexism	5 (6.10%)	Hayday & Collison, 2020; Ratan, Taylor, Hogan, Kennedy, & Williams, 2015; Ruvalcaba, Shulze, Kim, Berzenski, & Otten, 2018; Taylor & Stout, 2020; Xue et al., 2019
	Exclusion	6 (7.32%)	Hayday & Collison, 2020; Jansz & Martens, 2005; Ruvalcaba et al., 2018; Schaeperkoetter et al., 2017; Taylor & Stout, 2020; Xue et al., 2019
	Discrimination	4 (4.88%)	Hayday & Collison, 2020; Kwak, Blackburn, & Han, 2015; Mattinen & Macey, 2015; Peng, Dickson, Scelles, Grix, & Brannagan, 2020
Collective Identity & Pride (*n* = 24; 29.27%)	Community identity	8 (9.76%)	Fiskaali, Lieberoth, & Spindler, 2020; Freeman & Wohn, 2017; Jang, Kim, & Byon, 2020; Jansz & Martens, 2005; Pizzo et al., 2019; Seo, 2016; Whalen, 2013; Xue et al., 2019
	Socializing opportunities	18 (21.95%)	Baltezarević & Baltezarević, 2019; Fiskaali et al., 2020; Freeman & Wohn, 2017; Jansz & Martens, 2005; Karsenti & Bugmann, 2018; Lee, Lin, Teo, Tan, Lin, & Acm., 2018; Lobel et al., 2019; McCauley et al., 2020; Pizzo et al., 2018; Qian, Wang, Zhang, & Lu, 2020b; Schaeperkoetter et al., 2017; Seo, 2016; Trepte, Reinecke, & Juechems, 2012; Weiss, 2011; Weiss & Schiele, 2013; Whalen, 2013; Wohn & Freeman, 2020; Xiao, 2020
	Opposition & rivalry	1 (1.22%)	Hayday & Collison, 2020
	Chauvinism	3 (3.66%)	Hamari & Sjöblom, 2017; Ratan et al., 2015; Xue et al., 2019
Ethics & fair play (*n* = 11; 13.41%)	Ethics	1 (1.22%)	Seo, 2016
	Symbolism & Rituals	1 (1.22%)	Schaeperkoetter et al., 2017
	Fair play	5 (6.10%)	Baltezarević & Baltezarević, 2019; Brown, Billings, Murphy, & Puesan, 2018; Martončik, 2015; Seo, 2016; Whalen, 2013
	Social debate	1 (1.22%)	Tjønndal, 2020
	Deviant examples	4 (4.88%)	Adachi & Willoughby, 2011; Adachi & Willoughby, 2013; Choi, Hums, & Bum, 2018; Schmierbach, 2010
Feel good & passion (*n* = 11; 13.41%)	Pleasure	2 (2.44%)	Jang et al., 2020; Seo, 2016
	Special experiences	2 (2.44%)	Jang et al., 2020; Martončik, 2015
	Well-being	2 (2.44%)	Baltezarević & Baltezarević, 2019; Fiskaali et al., 2020
	Passion	8 (9.76%)	Bertran & Chamarro, 2016; Choi, 2019; Garcia-Lanzo & Chamarro, 2018; Jang et al., 2020; Lee et al., 2018; Macey & Hamari, 2018; Pizzo et al., 2018; Seo, 2016
Fans & media attraction (*n* = 20; 24.39%)	Fandom	5 (6.10%)	Brown et al., 2018; Choi, 2019; Karakus, 2015; Kim & Kim, 2020; Xiao, 2020
	Celebrities	1 (1.22%)	Ward & Harmon, 2019
	Media consumption	12 (14.63%)	Brown et al., 2018; Choi, 2019; Hamari & Sjöblom, 2017; Kim & Kim, 2020; Lee & Schoenstedt, 2011; Macey et al., 2020; Mangeloja, 2019; Qian, Wang, & Zhang, 2020a; Qian et al., 2020b; Qian, Zhang, Wang, & Hulland, 2020c; Wohn & Freeman, 2020; Xiao, 2020
	Sport knowledge	1 (1.22%)	Brown et al., 2018
	Gambling (addiction)	6 (7.32%)	Bertran & Chamarro, 2016; Choi et al., 2018; Macey et al., 2020; Macey & Hamari, 2019; Sweeney, Tuttle, & Berg, 2019; Whalen, 2013
	Drop sports' image	2 (2.44%)	Hou, Yang, & Panek, 2020; Macey et al., 2020
Prestige & Image (*n* = 8; 9.76%)	Globalization	5 (6.10%)	García & Murillo, 2020; Parshakov, Paklina, Coates, & Chadov, 2020; Postigo Fuentes & Fernández Navas, 2020b; Postigo Fuentes & Fernández Navas, 2020a; Ward & Harmon, 2019
	International Prestige	2 (2.44%)	Lin & Zhao, 2020; Pizzo et al., 2019
	Political Power	1 (1.22%)	Lin & Zhao, 2020
	Country/city marketing	2 (2.44%)	Lin & Zhao, 2020; Zhao & Lin, 2020
	Soft power	2 (2.44%)	Lin & Zhao, 2020; Pizzo et al., 2019
	War propaganda	1 (1.22%)	Lin & Zhao, 2020
Athletes ability & quality of life (*n* = 12; *n* = 14.63%)	Fame	1 (1.22%)	Ward & Harmon, 2019
	Role model function	3 (3.66%)	Kari & Karhulahti, 2016; Schaeperkoetter et al., 2017; Kari, Siutila, & Karhulahti, 2019
	Life skills	8 (9.76%)	Baltezarević & Baltezarević, 2019; Freeman & Wohn, 2017; Lobel et al., 2019; Nielsen & Hanghoj, 2019; Paravizo & de Souza, 2019; Postigo Fuentes & Fernández Navas, 2020b; Postigo Fuentes & Fernández Navas, 2020a; Seo, 2016
	Pressure	2 (2.44%)	Paravizo & de Souza, 2019; Perez-Rubio, Gonzalez, & Garces de los Fayos, 2017
	Post-career depression	1 (1.22%)	Perez-Rubio et al., 2017

Table 3 (Continued)

Category (*n*; %)	Subcategory	*n* (%)	Study
Sport participation & health (*n* = 29; 35.37%)	Identification	3 (3.66%)	Karsenti & Bugmann, 2018; Pizzo et al., 2019; Schaeperkoetter et al., 2017
	Sport participation	19 (23.17%)	Abbasi, Nisar, Rehman, & Ting, 2020; Adachi & Willoughby, 2011; Adachi & Willoughby, 2013; García & Murillo, 2020; Gray, Vuong, Zava, & McHale, 2018; Jang & Byon, 2019; Jang & Byon, 2020; Jansz & Martens, 2005; Kwak, Hwang, Kim, & Han, 2020; Lobel et al., 2019; Marcano Lárez, 2012; Matuszewski, Dobrowolski, & Zawadzki, 2020; Rudolf et al., 2020; Schaeperkoetter et al., 2017; Schmierbach, 2010; Stankovic & Kostadinovic, 2017; Trotter, Coulter, Davis, Poulus, & Polman, 2020; Weiss, 2011; Weiss & Schiele, 2013
	Adoption qualities	5 (6.10%)	Hagiwara, Akiyama, & Takeshita, 2019; Hyun et al., 2013; Kari et al., 2019; Karsenti & Bugmann, 2018; Matuszewski et al., 2020
	Health awareness	10 (12.20%)	Bayraktar, Yıldız, & Bayrakdar, 2020; DiFrancisco-Donoghue, Balentine, Schmidt, & Zwibel, 2019; DiFrancisco-Donoghue, Werner, Douris, & Zwibel, 2020; Gray et al., 2018; Hagiwara et al., 2019; Hyun et al., 2013; Kari & Karhulahti, 2016; Kwak et al., 2020; Peng et al., 2020; Trotter et al., 2020
	Unhealthy lifestyle	3 (3.66%)	DiFrancisco-Donoghue et al., 2019; DiFrancisco-Donoghue et al., 2020; Kwak et al., 2020
Sponsors & commercial activity (*n* = 8; 9.76%)	Economic boost	1 (1.22%)	Zhao & Lin, 2020
	Sponsorship	2 (2.44%)	Abreu Freitas, Contreras-Espinosa, & Correia, 2020; Elasri-Ejjaberi, Rodriguez-Rodriguez, & Aparicio-Chueca, 2020
	Commercial activity	7 (8.54%)	Bertschy et al., 2020; Elasri-Ejjaberi et al., 2020; Karakus, 2015; Mühlbacher & Bertschy, 2020; Peng et al., 2020; Wohn & Freeman, 2020; Zhao & Lin, 2020
Local consumption & living conditions (*n* = 3; 3.66%)	Consumption	1 (1.22%)	Jang et al., 2020
	Tourism	2 (2.44%)	McCauley et al., 2020; Vegara-Ferri, Ibáñez-Ortega, Carboneros, López-Gullón, & Angosto, 2020
	Sport infrastructure	1 (1.22%)	McCauley et al., 2020

2017; Karsenti & Bugmann, 2018; Lee et al., 2018; Lobel et al., 2019; Pizzo et al., 2018; Qian et al., 2020b; Schaeperkoetter et al., 2017; Seo, 2016; Trepte et al., 2012; Weiss, 2011; Weiss & Schiele, 2013; Wohn & Freeman, 2020; Xiao, 2020). However, esport enthusiasts try to distinguish themselves based on the game they play (Karakus, 2015; Kim & Kim, 2020), which results in tribal behavior among the different player bases (Hayday & Collison, 2020). Furthermore, various chauvinistic tendencies in esport can be observed regarding gender (Hamari & Sjöblom, 2017; Ratan et al., 2015; Xue et al., 2019).

(3) Ethics and fair play. Specific ethics, norms, and codices such as fair play, sportsmanship, and respect for the opponent are crucial elements of esport (Baltezarević & Baltezarević, 2019; Brown et al., 2018; Martončik, 2015; Seo, 2016), although they can occur in distinguished manner compared to traditional sport (Whalen, 2013). This also expresses itself through the fact that esport players see themselves as athletes (Schaeperkoetter et al., 2017). The comparison with traditional sport however sparks debates about potential threats coming from esport towards traditional sport and society because it undermines the physical connotation and threatens its worthiness of financial support (Tjønndal, 2020). Four studies investigate the relationship between competitive video or computer games and aggressive behavior, concluding that competition, not violent or explicit content, leads to aggressive behavior (Adachi & Willoughby, 2011, 2013; Choi et al., 2018; Schmierbach, 2010).

(4) Feel good and passion. Engaging in esport, both passive and active consumption, is seen as pleasureful and special experience by enthusiasts (Jang et al., 2020; Martončik, 2015; Seo, 2016), raising well-being among peers (Baltezarević & Baltezarević, 2019; Fiskaali et al., 2020). Esport players show both obsessive (Macey & Hamari, 2018) and harmonious passion (Garcia-Lanzo & Chamarro, 2018; Jang et al., 2020; Lee et al., 2018; Pizzo et al., 2018; Seo, 2016) with the former predicting problematic gaming behavior and the latter being a protection from negative consequences (Bertran & Chamarro, 2016; Choi, 2019).

(5) Fans and (media) attraction. Like in traditional sports, fandom expresses itself by loyalty towards players and teams (Brown et al., 2018; Choi, 2019; Xiao, 2020), but fans also feel a strong loyalty, towards their favorite esport title (Hayday & Collison, 2020; Karakus, 2015; Kim & Kim, 2020). Ward and Harmon (2019) identify superstar economics establishing in esport, like in traditional sport, music, or acting. Twelve studies deliver insights on media consumption in esport, several of which show that esport consumption motives are similar to traditional sport consumption, like socialization, fandom and acquiring game related knowledge (Brown et al., 2018), fandom and uncertainty of outcome (Mangeloja, 2019), drama, escapism, and aesthetics (Xiao, 2020), competition and peer-pressure (Lee & Schoenstedt, 2011). Choi (2019) distinguishes between fans, passionates and addicts, and shows the different motives for each. Although drama and entertainment are drivers for each type of attachment, escapism is a motive

for addicts. Qian et al. (2020b) highlight a slight divergence of esport consumption motives and name skill improvement, appreciation, vicarious sensation, and socializing opportunities as main motives. Hamari and Sjöblom (2017) describe escapism, acquiring knowledge, novelty—such as new teams and players emerging—and enjoyment of aggressive behavior as motives. There are motives that initially developed through esport and gaming context which go beyond traditional sport consumption motivation, like chat rooms included in the stream, personality traits of the streamer, virtual rewards, or the quality of streams (Qian et al., 2020a, c). Streamers as a distinctive feature of esport consumption is also mentioned by Wohn and Freeman (2020). Furthermore, Xiao (2020) observes that spectators tend to watch esport alone, rather than in company. Two studies show that spectators experience flow and subjective well-being (Kim & Kim, 2020) or a sense of achievement (Choi, 2019), during and after the consumption of esport events. Esport consumption can also be an indicator for gambling and eventually gambling disorder, mainly for young males (Macey et al., 2020; Macey & Hamari, 2019). The esport gambling and betting market is currently barely arbitrated, therefore, susceptible to irregularities, match fixing, or betting abuse (Sweeney et al., 2019). Addictive gaming behavior in the context of esport is treated thrice, indicating that a risk of developing gaming disorder or addiction, heavily depends on psychological and social factors of the consumer, not necessarily by the games themselves (Bertran & Chamarro, 2016; Choi et al., 2018; Whalen, 2013). Overall, media attraction of esport is rising and differentiating throughout the past two decades with more positive coverage on the topic (Hou et al., 2020), and scholars argue that esport is becoming mainstream (Macey et al., 2020).

(6) Prestige and image. Although esport is a global phenomenon, contributing to international communication in competition (Postigo Fuentes & Fernández Navas, 2020a, b), especially for the younger male generations (García & Murillo, 2020), there is a divergence in popularity of esport (Parshakov et al., 2020) and genres or games played as esport (Hayday & Collison, 2020; Karakus, 2015; Kim & Kim, 2020; Ward & Harmon, 2019) in different nations and regions worldwide. Two studies find that esport players and teams can be used to obtain prestige for a certain cause whether it be representing a university (Pizzo et al., 2019) or a nation (Lin & Zhao, 2020). Furthermore, studies imply that esport is used to propagate political power or create nationalism based on a meritocratic neoliberalist approach where whoever outperforms his opponents earns the right to represent and bring glory to the home country (Lin & Zhao, 2020; Zhao & Lin, 2020).

(7) Athletes' ability and quality of life. Regarding the characterization of esport athletes, studies show how up and coming esport players thrive to become professionals and identify as athletes (Schaeperkoetter et al., 2017). Ward and Harmon (2019) indicate that "superstardom" exists in esport and esport players can act as role models. Eight studies conclude that playing games competitively helps to improve communicative skills (Nielsen & Hanghoj, 2019; Paravizo & de Souza, 2019), social interaction among peers and problem solving skills (Baltezarević & Baltezarević, 2019; Lobel et al., 2019), and soft skills (Freeman & Wohn, 2017). Esport, due to the internationality, helps to improve foreign language skills (Postigo Fuentes & Fernández Navas, 2020a, b). On the other hand, one study shows that pro gamers endure pressure from their team or organization, the fans, and themselves (Paravizo & de Souza, 2019), while another describes the danger of burn-out on a professional level (Perez-Rubio et al., 2017).

(8) Sport participation and health. Most findings can be matched to this category, with its subcategories being treated 40 times in total by 29 studies. People who play esport on an organized competitive level identify as athletes (Karsenti & Bugmann, 2018; Pizzo et al., 2019; Schaeperkoetter et al., 2017). From a demographic perspective, esport is predominantly played by young males (García & Murillo, 2020; Jansz & Martens, 2005; Lobel et al., 2019; Marcano Lárez, 2012; Rudolf et al., 2020; Stankovic & Kostadinovic, 2017). Competitive gaming can lead to short-term aggressive behavior, regardless of the game played and whether it contains violence (Adachi & Willoughby, 2011, 2013; Schmierbach, 2010), short-term boost of concentration (Hagiwara et al., 2019) and after a certain duration increase testosterone, dehydroepiandrosterone and androstenedione (Gray et al., 2018). Furthermore, it fulfills hedonistic needs like escapism or competitive needs like challenge or competition (Jang & Byon, 2019, 2020; Weiss, 2011; Weiss & Schiele, 2013). Quantitative survey studies show increased social capital among esport players (Schaeperkoetter et al., 2017) and improved behavioral and emotional status (Kwak et al., 2020). A mixed method study finds improved team behavior knowledge among esport players (Karsenti & Bugmann, 2018). Players of higher level are more determined, less agreeable and less extroverted than low level players (Matuszewski et al., 2020); however, agreeableness and extroversion as well as consciousness and openness to experience are described as triggers of esport consumer engagement (Abbasi et al., 2020). Higher time spent playing, positively correlates with performance level and with physical activity (Trotter et al., 2020) and career length of professional StarCraft gamers correlates with cortical thickness in three brain regions, with the frontal gyrus positively correlating with rate of winning (Hyun et al., 2013). Two studies show that pro gamers perform above average physical exercise than recommended by the World Health Organization, as they consider it to help their competitive strength (Kari & Karhulahti, 2016; Kari et al., 2019). Contrary to these findings, two studies find a connection between esport activity and reduced physical activity with negative effects regarding the players' body composition (Bayraktar et al., 2020; DiFrancisco-Donoghue et al., 2020). DiFrancisco-Donoghue et al. (2019) conclude that esport sees

similar clinical pictures as sedentary desk jobs. Another study shows how the esport community can oppose a threat to the players mental health, due to toxic behavior and almost no regulatory systems preventing such (Peng et al., 2020).

(9) Sponsors and commercial activity. Qualitative and quantitative data show that brands, both sponsors and clubs, enter esport to reach a new younger, mostly male, target group (Bertschy et al., 2020; Elasri-Ejjaberi et al., 2020; Mühlbacher & Bertschy, 2020) and bring added value to consumers and fan experience (Abreu Freitas et al., 2020). Two qualitative studies observe that game developers and publishers are the dominant player in esport, since it is a major revenue business, and it can be used as a marketing tool for games distribution (Peng et al., 2020; Zhao & Lin, 2020). Quantitative data shows how, along with esport, streaming is developing into an essential economic field, which esport players use to earn money from fans by donations or sponsors (Karakus, 2015; Wohn & Freeman, 2020).

(10) Local consumption and living conditions. Only three studies provide insights on the tenth category. LAN parties and esport tournaments are popular events among esport-enthusiasts and can enhance touristic value of the host cities (Jang et al., 2020; McCauley et al., 2020; Vegara-Ferri et al., 2020).

Discussion

This scoping review examines the current state of research regarding literature of esport on the societal impact of esport. It helps to map out the research environment, illustrate key findings, and explore gaps of knowledge. In the past few years, the frequency of studies treating the subject is rising and their origin and the topics are diversifying. This indicates that esport is a popular but still emerging area and field of research. The MESSI framework delivers an adequate approach to contextualize findings into ten categories depicting its potential societal impact. Regarding the categories, the impact of esport seems like the one from traditional sport, although not all potential areas of impact could be addressed. A reason could be that not all categories are transferable to esport (greening, hooliganism) or topics are yet to be studied (corruption, fraud, doping). Eventually, this section derives four areas of key findings, proposes theoretical implication, and states research desiderata.

Active and passive esport consumption

Esport is consumed for mainly the same reasons as traditional sport but there are a variety of distinctive motives which cannot be found in traditional sport, like participation in chats, or earning virtual goods. Fandom towards players and teams exist as well but loyalty towards the game is also a crucial part of esport fandom. Furthermore, esport players see themselves as athletes and pro gamers show similar traits like professional athletes, in terms of ethics, superstardom, willingness to go pro, or the wish to represent their country as athlete. On the other hand, pro gamers also suffer from fear of failure and pressure from their professional environment. Despite the online nature of esport, local events like tournaments or LAN parties are important occasions for enthusiasts.

Potential beneficial traits

Despite the negative image and skepticism (Borggrefe, 2018; Pack & Hedlund, 2020; Parry, 2019; Willimczik, 2019a, b), this study's findings show that esport is a new platform with strong socializing potential for long-established enthusiasts, but also for children and adolescents who see themselves struggling in the conventional sporting world. Although the world of esport has its own values, norms, and behaviors, which beginners are facing, there are no entry barriers for playing and engaging in esport regarding age, gender, sexuality, origin, healthiness, etc. These findings go along with existing propositions of the potential of esport (Heere, 2018). Educational and pedagogical benefits of sport, beyond physical and gross motoric benefits, can be transported, for example to people who are not able to compete in traditional sport. With sport clubs or schools as multiplicators, esports can not only promote communicative skills, fine motoric or cognitive benefits (Jonasson & Thiborg, 2010; Thiel & John, 2018), but also teach media competences and a responsible approach for behavior in digital environments, which is becoming more and more relevant in today's digitalized society (Thiel & Gropper, 2017).

Mental and physical health-related issues

The review also shows that behavior among players is barely regulated and can therefore be abused as a platform for verbal discrimination or cyberbullying, which can be harmful to mental health and psychosocial status (Kwan et al., 2020). On a clinical level active esport participation in the population can lead to an increase of esport specific illnesses. On a physical level, intensive playing can lead to lacking physical activity with respective consequences; however, this is not exclusive to esport, but rather to gaming in general (Marker, Gnambs, & Appel, 2019; Schmidt, Kowal, & Woll, 2018). Although the included studies show no clear evidence that esport triggers addictive gaming disorders, the mixed results indicate the relevance of this topic when approaching esport. Eventually, not only in-game mechanics such as virtual item gambling, but also an unregulated esport betting market poses a threat for the young consumer base.

Popularity of esport

The review shows that both, playing and watching esport is especially popular among young males. Active and passive consumption seem to have a big overlap (Breuer, 2011; McCauley et al., 2020), which can be led back to the complexity of the games or the relatively young existence of esport. However, the popularity of esport differs from nation to nation (Parshakov et al., 2020; Parshakov & Zavertiaeva, 2018). Potential impact needs always to be considered regarding

the respective nation and title which is involved in the game. Although there is reason to believe that currently esport does not appear to challenge traditional sport in its popularity, the findings show that esport is becoming mainstream (Macey et al., 2020) and future generations can possibly grow up as fans of esport instead of other sports (Brown et al., 2018; Tjønndal, 2020).

Theoretical implications

Based on this review's findings, several implications can be derived. It is necessary to identify potential threats and benefits resulting from the evolution of esport. The esport market is widely unregulated on a governmental level. Up to this point, publishers and game developers are a dominant stakeholder, holding most intellectual property and rights, thus access to esport, with commercial interest. This indicates a potential infiltration of sport structures and systems by the owners of esport titles, usually profit-oriented corporations. Although there are esport associations, based on the model of traditional sport associations, their impact is limited. Other than in traditional sports, where associations function as rule makers, organizer of competitions, and major stakeholder for the sport (Thiel et al., 2013), esport associations are unable to do so, not least because they rely on the collaboration with the publishers, developers and tournament organizers (Pack & Hedlund, 2020). This underlines that esport does not rely on the existing sportive structures but has already created its own ecosystem, where conventional clubs and associations struggle to fit in if they do not manage to adapt (Breuer, 2012). Still, grass-roots sport can open towards esport for both altruistic and economic reason. In sport clubs, esport divisions can help acquiring new target groups and raise awareness for the threats, potentials, and handling of esport and new media in a safe environment not least this fosters the need for socializing opportunities, both off- and online for esport enthusiasts. This could also be used to address the problem of sport drop-outs (Eime, Harvey, & Charity, 2019), or attracting an audience which otherwise would not be interested in joining a club (De Martelaer, van Hoecke, De Knop, Van Heddegem, & Theeboom, 2002; Schmidt et al., 2018). However, including esport in the common sport environment like clubs or in schools must not be seen as a substitution for sports which focus on physical activity, but rather as a supplemental new facet for a post-modern understanding of sport. Furthermore, the positive aspects like socializing opportunities and integrative elements of esport could be used as a healthy approach towards gaming, opposing threats like obsessive gaming for reasons of escapism with negative social and occupational consequences (Kardefelt-Winther, 2014).

Potential research desiderata

Due to little evidence, mixed results or knowledge gaps, several research desiderata can be identified: (1) why is esport a male-dominated activity, although there are practically no gender barriers; (2) what is the relation between physical activity and both passive and active esport consumption; (3) is there a causality between esport and addictive gaming behavior; (4) what is the origin of frequent discriminatory and toxic behavior in esport and how is it possible to tackle this problem; (5) what role does deviant behavior like doping or cheating play; (6) what impact does esport have in a (sport)political context? When approaching these exemplarily research strands, scholars should also consider, depending on the research question, investigating esport-titles individually, since popularity and requirements can vary considerably.

Limitations

Conducting the scoping review, there were some limitations that need to be addressed. First, the broad research question and the variety of individual topics being treated reduce the depth of analysis for each of the addressed topics. The demographics of the sample sizes differed significantly; therefore, it was difficult to compare many of the studies with each other. The research landscape can still be considered novel and not as differentiated as for traditional sports. This also manifests itself in 33 out of 79 subcategories of the framework not being treated in this scoping review. Second, due to the scoping review's nature, quality appraisal was not conducted for the included studies (Arksey & O'Malley, 2005; Tricco et al., 2018). Third, although studies in five languages (German, English, French, Italian and Spanish) were considered, the search was conducted only in English. Furthermore, just a few papers from the Far East, where esport plays a major role, were included due to language restrictions. Fourth, while the selection process was conducted with two researchers, only one author scanned full texts for eligibility. A higher number of researchers could have increased methodological rigor. Fifth, definitions of esport and societal impact are both abstract and can differ depending on the used sources. Although the definition of societal impact and esport, and the MESSI framework used in this review are considered adequate and reasonable, there might be other frameworks and definitions which can be used to investigate the research question. Sixth, nuanced differences between the degree of professionalization are difficult to elaborate regarding certain topics, since the included studies treat all four (i.e., professional, semi-professional, amateur, and casual) gamers.

Conclusion

The present scoping review provides an overview on the current research of the societal impact of esport focus and shows under which scope esport is yet to be investigated. It can be stated that esport challenges traditional sport and to a certain extent initiates a change of paradigm in sport, which has been predicted by scholars of various fields of research (Cunningham et al., 2018; Heere, 2018). Although it was stated initially that this paper should not be understood as proclamation in favor or against the concept of considering esport as sport, it does intend to shed light on this discussion, underlining arguments from both sides with further insights

to adequately extend the knowledge on esport. The findings show that people engage in esport for motives similar to those in traditional sports, but it offers some peculiarities originating from its digital nature which cannot be found in other sports. Still, players consider themselves and behave like athletes, regarding skill or dedication, but also regarding performance pressure. Playing esport can develop communicative, cognitive, and fine motoric skills, but can also lead to physical and mental health risk. Nevertheless, esport is finding its way into the mainstream and will presumably play a more important role in various areas of society. It opens new possibilities for stakeholders from traditional sport like players, clubs, associations, stakeholders from the gaming branch, like publishers, game developers, but also for third party systems, like educational or pedagogical institutions. However, low evidence or gaps regarding some topics shows that the field of research is still very fragmented, and more research is needed to foster existing evidence and develop new insights into the role and impact of esport in society. Because of the intense evolution of esport throughout the past decades, there is still a lot to be learned about it in terms of threats and benefits of this new global sport-like activity, which also shows in the fragmented body of research as certain topics of the framework only being addressed scarcely or not at all. Future research can pick up on this research, test the existing findings and show how its positive or negative manifestations can be guided accordingly.

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Declarations

Conflict of interest. P. Riatti and A. Thiel declare that they have no competing interests.

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Appendix

Appendix 1 Characteristics of all studies (72) used in the paper including assigned category and subcategory that are primarily based on probands

Author/Year/Origin	Aim	Study design		Sample Size[2]	Population	Age	Category/ Subcategory[3]									
		Methodology	Framework[1]				1	2	3	4	5	6	7	8	9	10
Jansz and Martens (2005) Netherlands	Analyze social aspects of gaming using esport-related titles as a proxy	(1) exploratory field research (2) quantitative survey	BVG U&G	n=176 [F: 3,53%]	Esports players (LAN party participants)	11-35 [Ø19,55]	7	1 3						2		
Schmierbach (2010) USA	Analyze the relationship between specific game characteristics and aggressive behavior	(1) exploratory field research (2) quantitative survey	GAM	n=102 [F: 58%]	University students	n/a			7					2		
Adachi and Willoughby (2011) Canada	Analyze the effect of video game violence and competitiveness on aggressive behavior	experimental trial	GAM *(Hot sauce paradigm)*	n=102 [F: 44,12%]	Psychology Students	Ø18,4			7					2		
D. Lee and Schoenstedt (2011) USA	Analyze motivational and behavioral patterns of eSports consumption and compare it to traditional sport consumption	quantitative survey	U&G	n=515 [F: 16,1%]	Sport management students & Collegiate sports fans	Ø20,02					4					
Weiss (2011) Germany	Investigate competitive and hedonic need gratifications regarding esports use	(1) qualitative interviews (2) quantitative survey	U&G	(1) n=10 [F: n/a] (2) n=360 [F: n/a]	(1) Esport industry experts (2) Esport players	n/a		3						2		
Marcano Lárez (2012) Spain	Investigate the sociological characteristics of esport enthusiasts	quantitative survey	n/a	n=368 [F: 2,17%]	Esport players (Call of Duty)									2		

Author/Year/Origin	Aim	Study design Methodology	Framework[1]	Sample Size[2]	Population	Age	Category/ Subcategory[3] 1	2	3	4	5	6	7	8	9	10
Trepte, Reinecke, and Juechems (2012) Germany	Map out psychological factors that generate bridging and bonding social capital in esport teams	quantitative survey	n/a	n=811 [F: 3,2%]	Esport players	Ø19,08		3								
Adachi and Willoughby (2013) Germany	Investigate the longitudinal relationships between competitive gaming and aggression	quantitative survey	n/a	n=1492 [F: 50,8%]	School students (9-12 graders)	13-16			7					2		
Hyun et al. (2013) South Korea	Investigate the effect of esport on cognitive flexibility and cortical thickness	(1) MRI Brain Scans (2) quantitative survey (3) qualitative interviews	n/a	n=23 [F: 0%]	Pro Gamer (Starcraft)	Ø19,8 ± 1,7								4 5		
Weiss and Schiele (2013) Germany	Investigate competitive and hedonic need gratifications regarding esports use	(1) qualitative interviews (2) quantitative survey	U&G	(1) n=10 [F: n/a] (2) n=360 [F: n/a]	(1) Esport industry experts (2) Esport players	n/a		3						2		
Whalen (2013) USA	Examine esport players' lived experience of video game tournaments	qualitative interviews	n/a	n=12 [F: 2,17%]	Esport players	18-23 [Ø21]		1 3	3		6					
Karakus (2015) USA	Explore similarities and differences between eSports and traditional sports considering income and fan loyalty	(1) exploratory field research (2) quantitative survey	n/a	(1) n=23 [F: n/a] (2) n=68539 [F: n/a]	(1) Twitch Steamer (2) Esport fans	n/a					2				5	

Author/Year/Origin	Aim	Study design Methodology	Framework[1]	Sample Size[2]	Population	Age	Category/ Subcategory[3] 1	2	3	4	5	6	7	8	9	10
Martončik (2015) **Slovakia**	Compare different types of esport players from the perspective of their personality traits and explicit motives and compare them with players with selected life goals	quantitative survey	GOALS questionnaire Personality inventory KUD	(1) n=108 [F: n/a] (2) n=54 [F: n/a]	(1) Esport players (2) Casual players	(1) Ø20 ± 3,27 (2) Ø23 ± 5,44			3	2						
Mattinen and Macey (2015) **Finland**	Investigate how young video game players perceive and experience verbal abuse during online gaming	quantitative survey	n/a	n=364 [F: 5,8%]	Esport Players (DOTA2)	n/a	9									
Ratan, Taylor, Hogan, Kennedy, and Williams (2015) **USA**	Understand how gender disparities inside shape the gaming experience of female gamers	(1) observation (2) qualitative interviews (3) quantitative survey	n/a	n=15 [F: 13%] n=16281 [F: 4,1%]	Esport players (League of Legends)	n/a Ø21,90 ± 5,22	6	5								
Bertran and Chamarro (2016) **Spain**	Explore the influence of passion on abuse and performance, using the dualistic model of passion	quantitative survey	Passion Scale CERV	n=369 [F: 11,7%]	Esport players (League of Legends)	Ø21,59 ± 3,58				4	6					

Author/Year/Origin	Aim	Study design Methodology	Framework[1]	Sample Size[2]	Population	Age	Category/ Subcategory[3] 1	2	3	4	5	6	7	8	9	10
Seo (2016) New Zealand	Examine the unique elements of eSports' social world that make it attractive for consumers to embark on a professionalized career, explore why consumers pursue a professionalized career in eSports, and detail how consumers transform themselves to acquire a professionalized gamer identity.	(1) observation (2) qualitative interviews	n/a	n=10 [F: n/a]	Pro gamers	19-30		1 3	1 3	1 4			4			
Kari and Karhulahti (2016) Finland	Examine training, physical exercise, and players' perception of pro gamers	quantitative survey	n/a	n=115 [F: 2,61%]	Pro gamers	Ø20,8 ± 4,4							2	5		
Freeman and Wohn (2017) USA	Investigate types of social support that esport players can experience from their gameplay	qualitative interviews	n/a	n=26 [F: 15,38%]	Esport Players	Ø21,5	1	1 3					4			
Hamari and Sjöblom (2017) Finland	investigate the motivation of people watching esport	quantitative survey	MSSC	n=888 [F: 7,09%]	Esport fans	Ø22,75		5			4					
Perez-Rubio, Gonzalez, and Garces de los Fayos (2017) Spain	Analyze relationships between personality variables, sociodemographic variables and burnout for pro gamers	quantitative survey	NEO-FFI IBD-R	n=42 [F: n/a]	Pro gamers (League of Legends)	16-28 [Ø19,95 ± 2,55]							5 8			

Author/Year/Origin	Aim	Study design Methodology	Framework[1]	Sample Size[2]	Population	Age	Category/ Subcategory[3] 1	2	3	4	5	6	7	8	9	10
Schaeperkoetter et al. (2017) USA	Explore the role of athlete identity and social capital concerning current esport scholarship athletes	qualitative interviews	n/a	n=33 [F: 3,03%]	Collegiate Esport players	n/a	7	3	2				2	1 2		
Stankovic and Kostadinovic (2017) Croatia	Create a realistic image of esport to objectively view further perspectives of the development of this sport.	quantitative survey	n/a	n=100 [F: 50%]	Middle school students	n/a								2		
Brown, Billings, Murphy, and Puesan (2018) USA	Analyze and compare the uses and gratifications of esport and traditional sport consumption	quantitative survey	U&G	n=1319 [F: 2,1%]	Esport Players	Ø21,67 ± 4,04			3		2 4 5					
C. Choi, Hums, and Bum (2018) South Korea	Investigate which online game addiction factors drive juvenile delinquency and analyze the effects of changed family form on esport game addiction, delinquency, and esport participation motivation	quantitative survey	GAS MSSC	n=246 [F: 18%]	Middle school students	12-18 [Ø14,4 ±1,924]			7		6					

Author/Year/Origin	Aim	Study design Methodology	Framework[1]	Sample Size[2]	Population	Age	Category/ Subcategory[3] 1 2 3 4 5 6 7 8 9 10
Garcia-Lanzo and Chamarro (2018) Spain	Explore whether knowledge of the degree of frustration of gamers' basic psychological needs in everyday life, users' passion, and their motives to play makes it possible to distinguish between amateur and semi-professional players	quantitative survey	Passion Scale PNTS SVGM	n=195 [F: 7,2%]	Esport Players	Ø21,72 ± 4,48	4
Gray, Vuong, Zava, and McHale (2018) USA	Investigate the effects of playing a coalitionary-based esport on young men's steroid hormone levels	naturalistic study - controlled trial testing Salvia for hormone density	n/a	n=26 [F: 0%]	Esport Club members	18-23 [Ø20,46 ± 1,42]	2 5
Karsenti and Bugmann (2018) Canada	Identify social and professional recognition of esport on a collegiate level	(1) quantitative survey (2) qualitative interviews (3) observation	n/a	(1) n=522 [F: 11%] (2) n=22 [F: n/a]	Esport players	(1) Ø20,4 (2) n/a	3 1 4
S.-S. Lee et al. (2018) Taiwan	Explore the inner history of the behavior of esport game video viewers and the relationship between motivation, experience, and perceived value to behavioral intention.	quantitative survey	n/a	n=365 [F: 15,1%]	Esport fans	19-24	3 4
Macey and Hamari (2018) Finland	Investigate the relationship between increased video games and esport consumption and increased levels of gambling	quantitative survey	GAS PGSI	n=613 [F: 6,2%]	Middle school students	n/a	4

Author/Year/Origin	Aim	Study design Methodology	Framework[1]	Sample Size[2]	Population	Age	Category/ Subcategory[3] 1	2	3	4	5	6	7	8	9	10
Pizzo et al. (2018) USA	Compare spectator motives for attending traditional sport and esport contests	quantitative survey	MSSC SII	n=517 [F: 26,1%]	Sport & Esport fans	n/a		3		4						
Ruvalcaba, Shulze, Kim, Berzenski, and Otten (2018) USA	Examining differences in women's and men's experiences while playing competitive online video games.	(1) quantitative survey (2) observation	n/a	(1) n=92 [F: 66,3%] (2) n=87 [F: 44,83%]	(1) Esport Players (2) Twitch Streamer	n/a	6 7									
Baltezarević and Baltezarević (2019) Serbia	Determine if there is a connection between playing esport video games and sports knowledge, competition skills, social interaction, skill building for problem-solving, and pleasurable stimulation which leads to emotional well-being	quantitative survey	n/a	n=256 [F: 45,3%]	Esport players	n/a		3	3	3			4			
Chulhwan Choi (2019) South Korea	Understand consumer behaviors of eSports spectators & investigate eSports spectators' motivations to discover the motives for their attachment to eSports, and explore differences in motivations among levels of addiction, fan identification, and passion	quantitative survey	MSSC SFMS GAS PAI Passion scale	n=368 [F: 31,8%]	Esport fans	18+				4	2 4					

Author/Year/Origin	Aim	Study design Methodology	Framework[1]	Sample Size[2]	Population	Age	Category/ Subcategory[3] 1 2 3 4 5 6 7 8 9 10
DiFrancisco-Donoghue, Balentine, Schmidt, and Zwibel (2019) **USA**	Characterize lifestyle habits of collegiate esport players and a proposed healthcare model for eSport athletes	(1) quantitative survey (2) observation	n/a	n=65 [F: n/a]	Collegiate Esport players	18-22	5 7
Hagiwara, Akiyama, and Takeshita (2019) **Japan**	Identify positive effects on cognitive function and psychological statements of esport	Electroencephalography (EEG)	SCWT	n=8 [F: 0%]	(1) Esport players & Control group (2) Esport players (Pro Evolution soccer)		4 5
Kari, Siutila, and Karhulahti (2019) **Finland**	Investigate training routines of top level (pro) gamers with focus on physical exercise	(1) quantitative survey (2) qualitative interviews	n/a	(1) n=115 [F: 2,6%] (2) n=7 [F: n/a]	Pro gamers	Ø20,8 ±4,4 n/a	4
Macey and Hamari (2019) **Finland**	Provide an overview of esport betting/gambling	quantitative survey	PGSI	n=582 [F: 5,5%]	Esport fans	n/a	6
Nielsen and Hanghoj (2019) **Denmark**	Analyze which skills esport players develop with a particular focus on communicative competencies	(1) observation (2) qualitative interviews	Affinity Space Dialogical Self Theory	n=10 [F: 0%]	Esport players (CS:GO)	n/a	4
Paravizo and de Souza (2019) **Brazil**	Identify constraints and issues faced by esport athletes in their work	quantitative secondary data analysis	n/a	n=36 [F: 0%]	Pro gamer (CS:GO)	n/a	4 5
Pizzo, Jones, and Funk (2019) **USA**	Identify the institutional creation strategies and challenges associated with integrating collegiate esports programs	qualitative interviews	n/a	n=16 [F: n/a]	Representatives & Directors of Universities	n/a	3 1 2 6 1

Author/Year/Origin	Aim	Study design Methodology	Framework[1]	Sample Size[2]	Population	Age	Category/ Subcategory[3] 1	2	3	4	5	6	7	8	9	10
Lobel, Engels, Stone, and Granic (2019) Switzerland	Describe potential benefits which may come with children playing competitive video games	qualitative interviews	SDQ	y1 n=Discarded [F: n/a] y2 n=184 [F: 51,1%] y3 n=174 [F: 52,22%]	School Children	8-11 8-12 [Ø10.23 ±1.14] 9-13 [Ø11.16 ±1.14]		3					4	2		
Abbasi, Nisar, Rehman, and Ting (2020) Pakistan	Uncover novel insights into personality factors and consumer video game engagement modeling	quantitative survey	HEXACO-Model	n=250 [F: 21,2%]	Middle school students	14-19								2		
Abreu Freitas, Contreras-Espinosa, and Pereira Correia (2020) Spain	Determine what types of relevant-added value esport fans most want sponsors to bring to them and the competitive gaming industry	quantitative survey	n/a	n=1324 [F: 4,98%]	Esport fans	Ø23,3 ±6.6									2	
Bayraktar, Yıldız, and Bayrakdar (2020) Turkey	Examine the effect of esport on physical activity level and body composition	biometric analysis	n/a	n=137 [F: 0%]	Esport players	Ø19,92 ±2,21								5		
DiFrancisco-Donoghue, Werner, Douris, and Zwibel (2020) USA	Investigate activity levels, body mass index (BMI), and body composition in collegiate esports players as compared to age-matched controls	biometric analysis	n/a	n=13 [F: 0%] n=11 [F: 0%]	(1) Esport players (2) Control Group	Ø20.2 ±1.7 Ø19.2 ±1.3								5 7		
Elasri-Ejjaberi, Rodriguez-Rodriguez, and Aparicio-Chueca (2020) Spain	Investigate the effect that esport sponsorship has on the perception of a brand	quantitative survey	n/a	n=1619 [F: 49,8%]	Convenience sample of internet users	8-25									2 5	

Author/Year/Origin	Aim	Study design Methodology	Framework[1]	Sample Size[2]	Population	Age	Category/ Subcategory[3] 1	2	3	4	5	6	7	8	9	10
Fiskaali, Lieberoth, and Spindler (2020) Denmark	Investigate the effect of esport-participation on psychological measures of mental well-being, social and academic self-efficacy as well as loneliness and gaming addiction	(1) quantitative survey (2) observation	SWEMWB SEQ-C TILS GAS	n=104 [F: 18,27%]	School students	15-25		1 3		3						
García and Murillo (2020) Spain	Investigate the correlates of playing esport (and its intensity) in their complementarity with traditional sports and their perception as sport	quantitative survey	SSH	n=11018 [F: 51,25%]	Spanish society	Ø48,09						1		2		
Hayday and Collison (2020) United Kingdom	Examine the current esport landscape and the utility of esport as a space to enact social inclusion and more specifically, in-line with SfD agendas and goals, positive experience for women and girls	(1) focus groups (2) qualitative interviews	Social Inclusion Theory Spatial Theory	(1) n=65 [F: 27,69%] (2) n=16 [F: 25%]	Esport players, Esport stakeholders & Sport for development stakeholders	n/a	3 6 7 9	4								
W. Jang and Byon (2019) USA	Examine the antecedents and consequences associated with playing esport	quantitative survey	UTAUT2	n=348 [F: 32%]	Esport fans	18+								2		

Author/Year/Origin	Aim	Study design Methodology	Framework[1]	Sample Size[2]	Population	Age	Category/ Subcategory[3] 1	2	3	4	5	6	7	8	9	10
W. Jang and Byon (2020) USA	Identify and develop the definition of esport game genres to determine how genre affects consumers' esports gameplay intention and to examine drivers of esports gameplay intention by group differences based on the identified genre categories	quantitative survey	ESC	n=978 [F: 49,9%]	Esport fans	19-69								2		
W. W. Jang, Kim, and Byon (2020) USA	Conceptualize social atmospherics in the context of esport attendance and examine the relationship among social atmospherics, affective responses, and behavioral intention	quantitative survey	SOR	n=372 [F: 28,3%]	Esport fans	19+		1		1 2 4						1
Kim and Kim (2020) USA	Examines how esport spectatorship motivation on live streaming influences esport fans' flow experience, subjective well-being, behavioral intention, and ultimately, game loyalty	quantitative survey	n/a	n=399 [F: 15%]	Esport fans	20+					2 4					

Author/Year/Origin	Aim	Study design Methodology	Framework[1]	Sample Size[2]	Population	Age	Category/ Subcategory[3] 1	2	3	4	5	6	7	8	9	10
K. H. Kwak, Hwang, Kim, and Han (2020) South Korea	Investigate the differences in excessive gaming due to pro gaming activity and internet gaming disorder	(1) MRI Brain Scans (2) quantitative survey	CBCL	(1) n=14 [F: n/a] (2) n=12 [F: n/a]	(1) IGD Adolescents (2) Pro gamers	(1) Ø17,1 ±0,3 (2) Ø16,5 ±1,2								2 5 7		
Lin and Zhao (2020) China	Explore why and how Chinese esport practitioners have transformed themselves into self-enterprising subjects practices	qualitative interviews	n/a	n=35 [F: n/a]	Esport stakeholders	n/a						2 3 5 6 8				
Macey, Abarbanel, and Hamari (2020) Finland	Investigate how demographics, alongside consumption of video games, esports, and gambling can predict esport betting activity	quantitative survey	MSSC	n=1368 [F: 41,6%]	Esport Players	18-80 [Ø37,83]					4 6 8					
Matuszewski, Dobrowolski, and Zawadzki (2020) Poland	Examine the link between personality traits and success in esport	quantitative survey	NEO-FFI	n=206 [F: 8,74%]	Esport Players (League of Legends)	Ø19,99 ±1,88								2 4		
McCauley, Tierney, and Tokbaeva (2020) Sweden	Examine how local esport actors and government shape local markets	qualitative interviews	n/a	n=17 [F: 5,88%]	Esport Stakeholder	21-51	3	3								3 4
Vegara-Ferri, Ibáñez-Ortega, Carboneros, López-Gullón, and Angosto (2020) Spain	Analyze the tourist impact of esport events	quantitative survey	RETED	n=390 [F: 7,4%]	Esport fans	Ø21,65 ±5,62										3

Author/Year/Origin	Aim	Study design Methodology	Framework[1]	Sample Size[2]	Population	Age	Category/ Subcategory[3] 1	2	3	4	5	6	7	8	9	10
Peng, Dickson, Scelles, Grix, and Brannagan (2020) United Kingdom	Investigate the sustainability of the esport governance model	(1) focus groups (2) qualitative interviews	n/a	n=20 [F: n/a] n=6 [F: n/a]	Esport Stakeholders (Player, Manager, Game developer, Researcher)	18+	9							5	5	
Postigo Fuentes and Fernández Navas (2020a) Spain	Analyze how the language learning process occurs in the esport context	(1) observation (2) qualitative interviews (3) document analysis	n/a	n=29 [F: n/a] 8 Audio documents 2 Video documents	Esport Players	n/a						1	4			
Postigo Fuentes and Fernández Navas (2020b) Spain	Analyze how the language learning process occurs in the esport context	(1) observation (2) qualitative interviews (3) document analysis	n/a	n=29 [F: n/a] 8 Audio documents 2 Video documents	Esport Players	n/a						1	4			
Qian, Wang, Zhang, and Lu (2020) USA	Develop a new measuring tool for esport consumption and identify what motivates people to watch esport in an online environment	(1) qualitative interviews (2) open-ended survey (3) quantitative survey	MSES	(1) n=8 [F: 12,5%] (2) n=207 [F: n/a] (3) n=1309 [F: 4,51%]	Esport fans	n/a		3			4					
Qian, Zhang, Wang, and Hulland (2020) USA	Explore the commonalities and distinctions between esport online spectatorship and traditional sports spectatorship and validate the pertaining demand factors	(1) qualitative interviews (2) open-ended survey (3) quantitative survey	SESD	(1) n=8 [F: 12,5%] (2) n=207 [F: n/a] (3) n=1309 [F: 4,51%]	Esport fans	n/a					4					
Rudolf et al. (2020) Germany	Examine demographics and health behavior of video game and esport player	quantitative survey	n/a	n=1066 [F: 8,9%]	Esport Players	Ø22,9 ±5,9								2		

Author/Year/Origin	Aim	Study design Methodology	Framework[1]	Sample Size[2]	Population	Age	Category/ Subcategory[3] 1	2	3	4	5	6	7	8	9	10
Taylor and Stout (2020) USA	Examine conditions promoting gender inclusivity in an amateur/collegiate esport scene undergoing rapid expansion and investment	qualitative interviews	n/a	n=21 [F: n/a]	Collegiate esport club manager	n/a	2 6 7									
Trotter, Coulter, Davis, Poulus, and Polman (2020) Australia	Investigate the association between obesity, self-reported physical activity, cigarette smoking, alcohol consumption, and perceived health in esports players, and the influence of player in-game rank	quantitative survey	n/a	n=1772 [F: 9,4%]	Esport players	n/a								2 5		
Wohn and Freeman (2020) USA	Investigate the relationship between playing a game, watching others play a game, streaming one's play, and spending behaviors both in-game and in live streams	quantitative survey	SPS LS UCLA LS EPQ	(1) n=246 [F: 20%] (2) n=158 [F: 26%]	(1) Esport players (Fortnite) (2) Esport fans	(1) Ø28,6 ±7,79 (2) Ø28,7 ±6,57			3		4				5	
Xiao (2020) USA	Examine factors that correlate with the behavioral intentions of watching esport	quantitative survey	TRA MSSC U&G	n=295 [F: 21%]	Esport fans	18-54 (Ø31 ±7,62)			3		2 4					
Qian, Wang, and Zhang (2020) USA	Investigate push and pull factors that influence esport online viewers' consumption behaviors	quantitative survey	MSES SESD	n=1309 [F: 4,51%]	Esport fans	18+					4					

Author/Year/Origin	Aim	Study design		Sample Size[2]	Population	Age	Category/ Subcategory[3]									
		Methodology	Framework[1]				1	2	3	4	5	6	7	8	9	10
Zhao and Lin (2020) China	Analyze the rise of platform capitalism in Chinese esport and the Chinese government's contradictory policies toward esport	(1) document analysis (2) qualitative interviews	n/a	n=35 [F: n/a]	Esport Stakeholders (Managers, players, coaches)	n/a					5				15	

Appendix 2 Characteristics all studies (10) used in the paper including assigned category and subcategory that were primarily based on documents

Author/Year/Origin	Aim	Study design		Sample characteristics	Category/ Subcategory									
		Methodology	Framework[1]		1	2	3	4	5	6	7	8	9	10
H. Kwak, Blackburn, and Han (2015) South Korea	Explore cyberbullying and toxic behavior in competitive online gaming	quantitative secondary data analysis	n/a	*Reports of misdemeanors in League of Legends:* 10.898.958 *Timespan:* 05.2011 – 08.2013	9									
Mangeloja (2019) Finland	Explore different characteristics of the esports market compared to the traditional sport environment by testing the uncertainty of outcome hypothesis in the esport context	quantitative secondary data analysis	UOH	*Data about prize money (37.476.248 $), professional players (4.440), professional tournaments (546), professional teams 226, different games (59), and countries (93) for esport.* *Timespan:* 1998 – 2019					4					
Sweeney, Tuttle, and Berg (2019) USA	Describe and contextualize esports gambling markets, concerning their similarities and differences compared to traditional sports, and investigate whether the esports gambling market is efficient and, if not, identify any market biases and how these biases manifest across the different video games and types of betting markets.	quantitative secondary data analysis	n/a	*Betting data about 5171 matches from two different websites for esport betting.* *Timespan*: 19.04. – 05.05.2017 & 10.10.2017 – 30.11.2017					6					

Author/Year/Origin	Aim	Study design Methodology	Framework[1]	Sample characteristics	Category/ Subcategory 1	2	3	4	5	6	7	8	9	10
Ward and Harmon (2019) **USA**	Analyze careers of esport players based on age, experience, game, rank, country, and prize money and check if a superstar effect exists for esport	quantitative secondary data analysis	Superstar Effect	*Data from players (25.471) of the top 10 Esport games and their earnings (309.024.646 $)* *Timespan*: 1998 – 2017					3	1	1 2			
Xue, Newman, and Du (2019) **USA**	Investigate how story-narrative is utilized to mark boundaries for the commercial, cultural, and identity politics which gamers perceive are infiltrating the online gaming field	narratological analysis	*n/a*	*Data from 120 esports-related posts (incl. comments on said posts ranging from 77 to 1.100) about individual narratives of players' experiences* *Timespan:* 23.06.2005 – 31.01.2019	3 6 7	1 5								
Mühlbacher and Bertschy (2020) **Monaco**	Analyze the effect of a sports club's esport section influence the meaning of its brand	netnographic analysis	n/a	*Data from 12 different online platforms, social media channels, websites, and forums* *Timespan:* 06.2016 – 07.2018									5	
Bertschy, Mühlbacher, and Desbordes (2020) **Monaco**	Analyze the effect of a sports club's esport section influence the meaning of its brand	(1) netnographic analysis (2) qualitative interviews	n/a	*Data from 12 different online platforms, social media channels, websites, and forums + 4 qualitative interviews with fans & Head of Digital from AS Monaco* *Timespan*: 06.2016 – 07.2018									5	
Hou, Yang, and Panek (2020) **USA**	Investigate the change in mainstream media's and public relations' presentation of esport-related stories in different stages of esport's 2-decade-long history.	document analysis	n/a	*Data from 400 news reports of two major Chinese online news organizations* *Timespan:* 2000 – 2017					8					
Parshakov, Paklina, Coates, and Chadov (2020) **Russia**	Examine whether video games increase the rate of unemployment (using esport as a proxy)	quantitative secondary data analysis	n/a	*Data about esport prize money distribution, youth unemployment, and video game popularity in 191 countries* *Timespan:* 2000 – 2015						1				
Tjonndal (2021) **Norway**	Develop an understanding of which arguments lay behind the resistance to the inclusion of esport into existing sport governance bodies	document analysis	n/a	*Text documents expressing resistance to the introduction of the professional FIFA league Eserien as part of the Norwegian Football Federation (23 texts and 2 forum threads including 243 posts)* *Timespan:* 12.2018 – 12.2019			4							

Author/Year/Origin	Aim	Study design		Sample characteristics	Category/ Subcategory									
		Methodology	Framework[1]		1	2	3	4	5	6	7	8	9	10

[1] If possible, the theoretical framework is reported. Abbreviations: BVG = Barnett's Videogames questionnaire; U&G = Uses and gratifications theory; GAM = General aggression model; CERV = Videogames-related experiences questionnaire; MSSC = Motivational scale of sports consumption; NEO-FFI = Neo Five-Factor-Inventory; IBD-R = Inventario de burnout en deportistas Revisado (Revised sport burnout inventory); GAS = Game addiction scale for adolescents; PNTS = Psychological Need Thwarting Scale; SVGM = Scale of Video Game Play Motivations; PGSI = Problem Gambling Severity Index; SII = Sport Interest Inventory; SFMS = Sport Fan Motivation Scale; PAI = Points of Attachment Index; SCWT = Stroop and Color Word Test; UOH = Uncertainty of Outcome Hypothesis; SDQ = Strengths and Difficulties Questionnaire; SWEMWB = Short Warwick-Edinburgh Mental Well-Being Scale; SEQ-C = Self-Efficacy Questionnaire- Children; TILS = Three-Item Loneliness Scale; SSH = Survey of Sporting Habits; ESC = Esports Consumption Model; UTAUT2 = Unified Theory of Acceptance and Use of Technology 2; SOR = Stimulus–Organism–Response; CBCL = Child Behavior Check List; RETED = Cuestionario sobre la repercusión turística de los eventos deportivos; MSES = Motivational Scale for Esports Spectatorship; SESD = Scale for Esports Spectator Demand; SPS = Social Provisions Scale; LS = Likeability scale; IA = interpersonal attraction measures; UCLA LS= UCLA Loneliness Scale; EPQ = Eysenck Personality Questionnaire; TRA = Theory of reasoned action

[2] Gender distribution (F: female). Age range, mean, and standard deviation are reported as available.

[3] Numbers of categories and their respective subcategories refer to the assigned numbers in the MESSI-Framework (Table 1)

5.2 Article 2: “The role of the body in electronic sport: a scoping review”

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The role of the body in electronic sport: a scoping review

Supplementary Information

The online version of this article (https://doi.org/10.1007/s12662-023-00880-z) contains supplementary material, which is available to authorized users.

Introduction

The body can be considered the central element for many sports or sports-related activities. From a historic perspective, physical exercise has commonly been used to form, shape, or discipline the body, with competitive sport following the credo of *citius, altius, fortius*. The differentiation of sport has led to the relevance of the body in sport and exercise becoming more multifaceted. While sport is usually connoted with coordinative or physical skills, the importance of topics like aesthetics and health has been rising, not only for sports but for society as a whole (Bette, 2017; Dimitriou, 2019; Rail & Harvey, 1995; Sabiston, Pila, Vani, & Thogersen-Ntoumani, 2019; Stichweh, 1990; Thiel, Seiberth, & Mayer, 2013). Thus, the relevance of the body is changing with the ongoing differentiation of sport. This is closely related to current changes in society since sport can be seen as a forerunner for societal changes (Armstrong & Giulianotti, 1998; Davenport, 2014). Especially digitalization is a driving force for societal change and therefore also for changes in sport (Miah, 2014; Ratten, 2019). Concerning sport, we see new movement practices involving virtual and physical practices, including exergames (Peng, Lin, & Crouse, 2011), motion-based video games (Ahir, Govani, Gajera, & Shah, 2020; Jenny, Manning, Keiper, & Olrich, 2017), or electronic sport (esport), which is presumably the most popular example. Two approaches to defining esport can be distinguished in literature: first, there are game-related definitions that mention the degree of organization, competitiveness, or professionalization in esport (Şentuna & Kanbur, 2016; Weiss & Schiele, 2013). Secondly, sport-related definitions refer to the relevance of physical and mental skills while using information technology to compete against each other (Hemphill, 2005; Wagner, 2006). However, none of the said definitions are mutually exclusive but instead complement each other. For this review, we describe esport as organized competitive video and computer gaming. Depending on the game played, two or more parties face each other under equal starting conditions, trying to outperform the opponent based on strategical, tactical, mental, and physical prowess. Various games from different genres can be considered esport if the competitions are held according to the abovementioned criteria (Riatti & Thiel, 2021).

Esport originated from the gaming industry but has become part of the sporting environment up to the point that nowadays, many nations accept it as a sport (Edgar, 2019; Schmidt, Heil, Fleischer, & Woll, 2019; Taylor, 2012). Meanwhile, it outperforms many traditional sports in terms of professionalization, spectatorships, prizemoney, or sponsoring, with the peak of popularity yet to be reached (Ballhaus, Vitale, Advani, & Akman, 2020; Schmidt, Schlör, & Woll, 2020b). Since the very first esport tournaments (actually, this terminology did not exist back then; Wagner, 2006), hegemonic esport games have changed often, with only a few of them maintaining their status as prominent titles, like *League of Legends* (Riot Games, USA), *Defence of the Ancients (DOTA2)*, or the *Counter-Strike* franchise (both Valve Corporation, USA). Esport-related terminology has also changed over time. Until today, there has still been no consensus reached about a predominant terminology since its first mention in 1999 (Wagner, 2006). Common expressions are e-sport, esport, cybersport, both in singular or plural form, pro gaming, or professional gaming. Esport athletes at a top level are usually referred to as pro gamers (Taylor, 2012). The German Olympic Sports Confederation (DOSB) distinguishes between esport including games simulating traditional sports like football or basketball, and egaming which refers to shooter, action, or strategy games (Willimczik, 2019). However, it must be stated that the DOSB's suggestion is not acknowledged by the community, associations, or the industry (Fröhlich, 2018). It is comprehensible to argue that motion-based video games (like exergames) or virtual sports like golf simulations can also be mentioned in the context of esport since they are simulations of physical activity or sport with the use of electronic devices (Jenny et al., 2017). Still, these types of games play no major role in competitive computer gaming. The many terms describing esport show a similarity to the discourse about which activities can be described as sport: physical activity, exercise, training, or the term sport itself, which refers to competitions, can all be labeled sport, although referring to different activities (Caspersen, Powell, & Christenson, 1985; Thiel et al., 2013).

Despite the body-related demands of competing, such as physical prowess or hand–eye coordination, and even though esport is already recognized as a sport

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Table 1 Search terms for literature search adjusted to fit the EBSCOHost database

Set	Search terms
#1	''electronic sport*'' OR e-sport* OR esport* OR cybersport OR ''professional gam*'' OR ''pro gam*'' OR ''competitive gam*'' OR ''elektronischer sport'' OR ''sport electronic*'' OR ''deporte* electronic*'' OR ciberderporte* OR ''sport electronique''
#2	body OR körper OR cuerpo OR corpo OR corps
#3	#1 AND #2

by various national umbrella sport governmental organizations, there is still an ongoing debate about the question of whether esport should be included in national and international sporting organizations (Thiel & John, 2020; Willimczik, 2019). Skeptics bring up a presumable lack of physicality and the fact that the players' movement is mediated through a digital environment. The corporeality in esport seems to be incompatible with what is hegemonically recognized as a sport. Some scholars argue that esport stands in contradiction to the values of traditional sports (Borggrefe, 2021; Holt, 2016; Parry, 2019). In contrast, esport can be seen as a logical development of sport, fitting well into the modern digitalized, individualized, and disembodied world. It bears high educational, pedagogical, and social potential for various stakeholders of the existing sport system including clubs, associations, or educational institutions (Jonasson & Thiborg, 2010; Riatti & Thiel, 2021; Schmidt et al., 2019; Thiel & Gropper, 2017; Thiel & John, 2020).

In the debate about whether esport can be regarded as a sport in a traditional sense, many arguments refer to the domain of execution and application (Parry, 2019; Thiel & John, 2020). This indicates where the execution of an action takes place and where the effect of the action, the competitive performance, happens (Holt, 2016). While in traditional sports both domains overlap, in esport, the former takes place in real life while the latter is in the digital environment of the games. The mediation of the players' movement through digital avatars is unprecedented in traditional sports since the athletic corporeality representing the in-game action is located in a virtual reality. Hence, the body, the key element in many areas of traditional sport (Bette, 2017; Rail & Harvey, 1995; Sabiston et al., 2019; Stichweh, 1990; Thiel et al., 2013), is presumably detached from the actual competition.

However, although the body might not be on display as in traditional sports, it does not mean that the body is absent or irrelevant in esport. It plays a role in both the digital and analogous world and is present in four different ways: 1) the executing player's physical appearance (height, weight, attractiveness, etc.); 2) the esport-specific athletic abilities of the player (hand and finger movements, neuromuscular coordination, etc.); 3) the interrelation between corporeality and the digital avatar (the embodiment of virtual actions by the executing player); and 4) the physical appearance of the avatar (style, clothes, height, weight, etc.). The first two types of the body's involvement in esport do not differ in principle from the role the body plays in traditional sports. The latter two represent a key distinction between esport and traditional sports, not only regarding the relation between player and avatar but also regarding the selection of the avatar's virtual physical characteristics.

To our knowledge, there is no systematic literature analysis that investigates the role of the body in esport considering these four facets. Therefore, this paper examines the question of which role the body plays in esport to contribute to a more differentiated discussion about the similarities and differences between esport and traditional sport. A scoping review approach has been chosen because it is regarded as a gold standard for reviewing research that is not yet characterized by empirical evidence or RCTs. It helps to 1) give an overview of existing literature on a very broad and unsystematic topic; 2) specifically depict characteristics of the role of the body in esport based on current literature; and 3) elaborate research gaps and desiderata that allow derivation of theoretical and practical implications as well as delivering a basis for future research about esport (Arksey & O'Malley, 2005; Peters et al., 2017; Tricco et al., 2018).

Methods

Esport literature has greatly increased over the past few years, but it is still considered a novel field of research. While the early publications were mainly focused on definitions and descriptions of esport, research is diversifying and becoming more interdisciplinary (Reitman, Anderson-Coto, Wu, Lee, & Steinkuehler, 2020; Riatti & Thiel, 2021). When trying to understand specific phenomena within the field of esport, such as the role of the body in this paper, it is helpful to elaborate on what has been investigated so far and identify open research paths in this field for future research. For this purpose, we chose to conduct a scoping review, as these are well suited for treating broad research questions and gaining an overview of the current state of research (Arksey & O'Malley, 2005; von Elm, Schreiber, & Haupt, 2019). We use the Preferred Reporting Items for Systematic Reviews and Meta-Analysis extension for scoping reviews (PRISMA-ScR) guidelines (Tricco et al., 2018). The PRISMA-ScR standard optimizes the methodological rigor when compared to the classic approach of scoping reviews, such as the one by Arksey and O'Malley (2005). It features a checklist of 20 essential and two optional reporting items which help to standardize scoping reviews. The outline of this scoping review was specified in a protocol in advance, including objectives, eligibility criteria, and method (https://osf.io/h8rke). Since this methodology can be followed iteratively, deviations from the protocol might occur (Arksey & O'Malley, 2005; Tricco et al., 2018; von Elm et al., 2019). Any divergences or modifications are noted in the following chapters.

Search strategy

The search strategy was developed and tested based on the heterogeneous termi-

nology of esport. It was matched to the term "body" and adapted for the relevant databases. **Table 1** exemplarily shows the search terms for the EBSCOHost database, including the use of search operators to increase methodological rigor (Kugley et al., 2017). The search terms were not only used for the title but in all pieces of information provided by the databases about potential publications. This was done because the word count for the title and abstract is limited and might not mention the relevant terminology, or because other synonyms for esport were used in these fields. Since literature in English, German, Italian, Spanish, and French was eligible for this review, we translated the search terms for each language. Still, the most common terms describing esport are unilingually accepted. Overall, this resulted in a heterogeneous search strategy that fits the scoping review approach, since it does not call for a deep dive into the topic but examines it on a broad level. For the same reason, no publication date limitation was set. The search was conducted on March 28, 2022. This review followed the proposed four steps for conducting the search (Arksey & O'Malley, 2005; Tricco et al., 2018): 1) searching electronic databases (EBSCOHost, PubMed, Web of Science, and SagePub); 2) checking reference lists of eligible works; 3) additional research on GoogleScholar and hand-searching key journals to prevent omitting relevant papers and grey literature; 4) checking existing networks, relevant organizations, and conferences for publications.

Selection process and data extraction

As described in the protocol (https://osf.io/h8rke), this scoping review follows specific criteria regarding the inclusion and exclusion of studies: 1) all types of empirical research studies, including qualitative, quantitative, and mixed-method research studies, both experimental and observational, were eligible; 2) all types of publications were considered, such as books, book sections, theses, journal papers, conference and workshop proceedings, grey literature, and such like; 3) there were no restrictions regarding the publication date: 4) research in English, French, German, Spanish, and Italian was eligible, regardless of its geographical origin; 5) full-text availability was mandatory. Literature was excluded if it 1) was non-empirical, like reviews, editorials, comments, essays, abstracts, or conference submissions; 2) did not discuss esport in terms our framework sets out; or 3) did not discuss corporeality regarding the four different ways in which it can be observed in esport (player's physical appearance, player's skills and abilities, interrelation between corporeality and digital avatar, and avatar's physical appearance).

Articles were first scanned by title, then by abstract, and lastly by full text. If the title or abstract demonstrated that the publication did not refer to our topic as intended based on our inclusion and exclusion criteria, it was excluded from the sample. During the full-text search, we checked whether the studies were empirical and whether their findings were relevant to our research question. If an article had an overarchingly different topic, but still offered findings for our research question, the relevant findings were nonetheless extracted. This selection process is illustrated in the flow diagram (**Fig. 1**). Since the PRISMA-ScR guidelines recommend conducting the sifting process with more than one reviewer, we conducted the search with two reviewers independently. This helps to increase the methodological precision of the scoping review (Tricco et al., 2018; von Elm et al., 2019). Any disagreement between the reviewers was settled via constructive debating.

The study selection was an iterative process, so we used the knowledge gained throughout the search to adapt and redefine the inclusion and exclusion criteria and the search strategy, for example by including Boolean operators. Further, the data extraction tool was slightly altered throughout the process compared to what we defined in the protocol. This is also in line with the iterative nature of a scoping review (Tricco et al., 2018). Eventually, the following data were extracted and assigned: Author, year, origin, language, aim, methodology, sample characteristics, and relevant findings for the scoping review.

Results

The initial search yielded 4644 records. After removing duplicates, scanning titles and abstracts, and checking the full texts, 30 publications were deemed eligible. 13 additional records were added via cross-referencing and four records were added through other sources. In

Abstract

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The role of the body in electronic sport: a scoping review

Abstract

The popularity of competitive computer and videogaming, also known as electronic sport (esport), has been rising rapidly during the past decades. Because of many parallels with traditional sports, like competitiveness, skill requirements, degree of professionalization, or the way it is portrayed in the media, esport has been adopted as part of the sport canon in many countries. Still, critics argue that playing computer games lacks the physicality commonly seen in traditional sports. A significant part of the competition is mediated through digital platforms and the spotlight shifts from the players' appearance and actions to their digital avatars. This paper takes on this issue by exploring existing evidence about the role of the body in esport via a scoping review approach. According to the findings of 47 studies, the body's role in esport is akin to that in traditional sport, including specific motoric requirements or biometric responses. Beyond that, the body can be seen as a link between the digital and physical worlds. Players embody digital avatars in the form of esport-specific movements, transfer of norms and ideals, and identification with the in-game characters. Future research can use this review as a basis for scientific approaches to individual phenomena regarding corporeality in esport and intercorporeality.

Keywords

Esport · Sociology · Gaming · Digitalization · Corporeality · Physicality

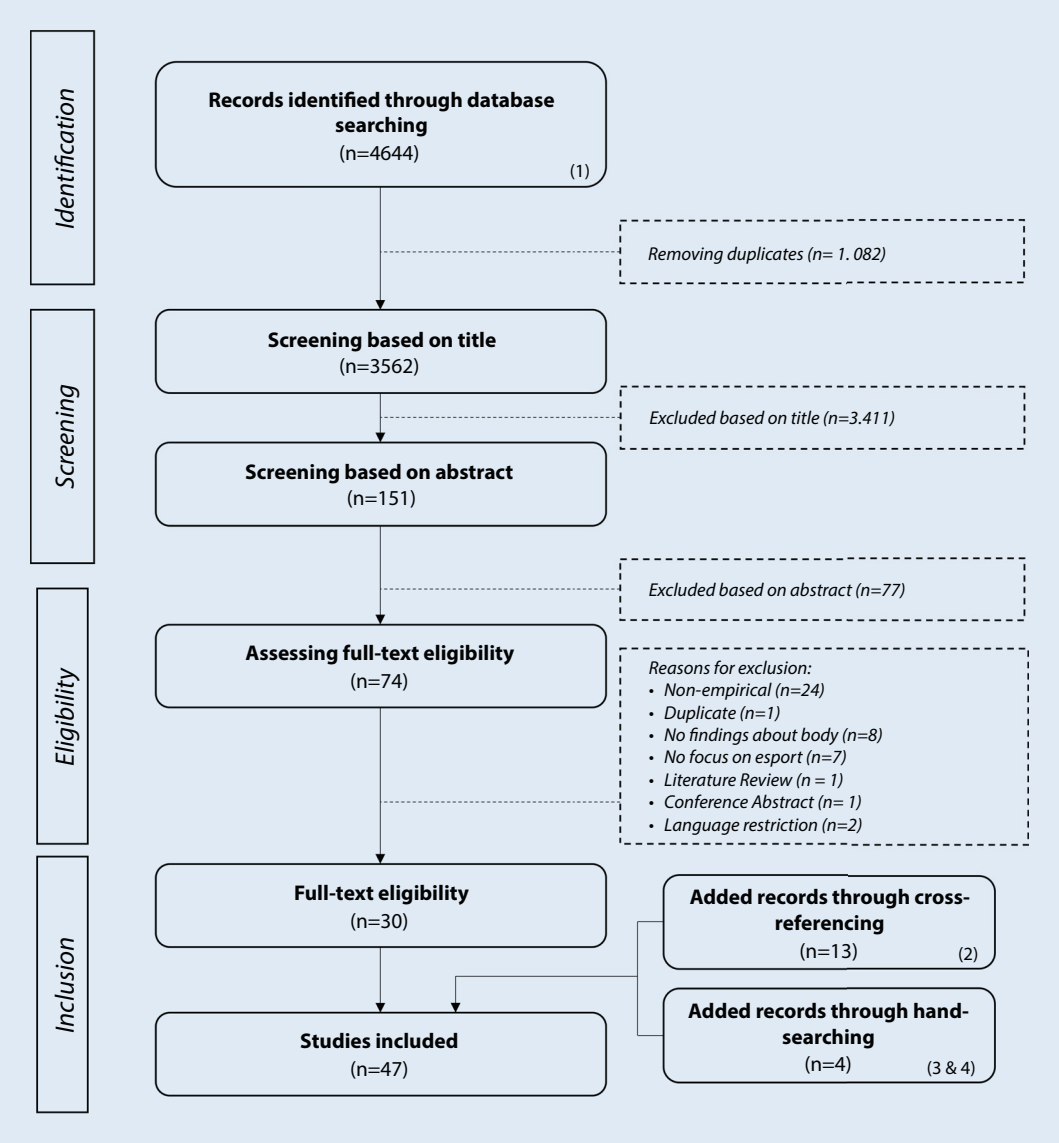

Fig. 1 ◀ Flow diagram adapted from the PRISMA-ScR guidelines (Tricco et al., 2018)

the end, 47 publications were included in this scoping review (◘ **Fig. 1**).

The earliest publication is from 2007, with more than three quarters published from 2018 onwards ($n = 37$, 78.72%) and most studies ($n = 16$, 34.05%) published in 2020. Although studies in five languages were eligible, eventually, only articles in English ($n = 43$, 91.49%) and German ($n = 4$, 8.51%) were found to be suitable. Still, literature from 16 different countries was identified for the review. Most articles are from the USA ($n = 15$, 31.91%) and Germany ($n = 6$, 12.44%). Cumulatively, nine research pieces are from Nordic countries including Denmark ($n = 4$, 8.51%), Sweden ($n = 2$, 4.26%), Finland ($n = 2$, 4.26%), and Norway ($n = 1$, 2.13%). Eight different methodological approaches were found, with most studies applying one method ($n = 34$, 72.34%), 12 research pieces using two (25.53%), and one using three (2.13%). Respective data were collected mainly by quantitative surveys ($n = 19$, 40.43%), qualitative interviews ($n = 12$, 25.53%), and biometrical analysis ($n = 10$, 21.28%). Five mixed-methods analyses combined qualitative interviews with observations. Biometrical analyses were used twice with observations and once with a quantitative survey. Quantitative surveys were matched twice with experimental trials and once with observation. One article combines qualitative interviews and secondary data analysis. One publication used three methods, namely qualitative interviews, observations, and secondary data analysis.

◘ **Table 2** shows information about the population of the included studies. The sample sizes of the research pieces using a quantitative survey as the main method range from 34 (Roncone, Kornspan, Hayden, & Fay, 2020) to 15,392 (Ratan, Fordham, Leith, & Williams, 2019). Qualitative interview studies include seven (Poulus, Coulter, Trotter, & Polman, 2021; Smith, Birch, & Bright, 2019) to 34 subjects (Pargman & Svensson, 2019; Rambusch, Jakobsson, & Pargman, 2007). Both qualitative interview studies with 34 subjects are based on the same sample. One article

Table 2 Description of studies' samples, including size, population, age, and gender

Study	Sample size	Population[a]	Age	Gender (F)
Rambusch et al. (2007)	34	Pro gamers	19–25	n. a.
Taylor, Jenson, and de Castell (2009)	n. a.	n. a.	n. a.	n. a.
Witkowski (2012)	19	Pro gamers	n. a.	0.00%
Kari and Karhulahti (2016)	115	Esport players	20.8 ± 4.4	2.61%
Anderson (2017)	n. a.	n. a.	n. a.	n. a.
Ford (2017)	n. a.	Esport players	n. a.	n. a.
Hamari and Sjöblom (2017)	888	Esport fans	22.75	7.09%
Schaeperkoetter et al. (2017)	33	Esport players	n. a.	3.03%
Ruvalcaba, Shulze, Kim, Berzenski, and Otten (2018)	179	Esport players	n. a.	(1) 66.30% (2) 44.83%
Schmidt, Kowal, and Woll (2018)	346	Esport players (68) Control group (278)	18–46	0.00%
Diankun, Weiyi, Tiejun, Yuening, and Dezhong (2019)	60	Pro gamers (26) Esport players (34)	(1) 25.35 ± 2.39 (2) 24.59 ± 2.13	0.00%
Myers (2019)	393	Esport players	18–30	4.50%
Pargman and Svensson (2019)	34	Pro gamers	19–25	n. a.
DiFrancisco-Donoghue, Balentine, Schmidt, and Zwibel (2019)	65	Esport players (collegiate)	18–22	n. a.
Ratan et al. (2019)	15,392	Esport players (League of Legends)	18+	4.00%
Smith et al. (2019)	7	Esport players (CS:GO)	20.57 ± 2.07	0.00%
Thomas, Rothschild, Earnest, and Blaisdell (2019)	9	Pro gamers (League of Legends)	20.8 ± 2	0.00%
Bayrakdar, Yildiz, and Bayraktar (2020)	137	Esport players	19.92 ± 2.21	0.00%
Choi, Slaker, and Ahmad (2020)	n. a.	n. a.	n. a.	n. a.
DiFrancisco-Donoghue, Werner, Douris, and Zwibel (2020)	24	Esport player (13) Control group (11)	(1) 20.2 ± 1.7 (2) 19.2 ± 1.3	0.00%
Egliston (2020a)	24	Esport players (DOTA2)	n. a.	n. a.
Egliston (2020b)	24	Esport players (DOTA2)	n. a.	n. a.
Hao et al. (2020)	475	Esport players	18–22	100%
Lindberg et al. (2020)	188	Esport players	17.1 ± 2.3	2.10%
Rudolf et al. (2020)	1066	Esport players	22.9 ± 5.9	8.1%
Sainz, Collado-Mateo, and Coso (2020)	15	Pro gamers	22 ± 3	n. a.
De Las Heras, Li, Rodrigues, Nepveu, and Roig, (2020)	18	Pro gamers (League of Legends)	22 ± 3.0	11.11%
Nagorsky and Wiemeyer (2020)	1835	Esport players	13–47 (20.9 ± 4.5)	4.00%
Sousa et al. (2020)	17	Esport players (Overwatch & League of Legends)	20.1 ± 1.8	0.00%
Trotter, Coulter, Davis, Poulus, and Polman (2020)	1772	Esport players	n. a.	9.40%
Roncone et al. (2020)	34	Esport players (collegiate)	18–23 (20.02 ± 1.46)	0.00%
Glass and McGregor (2020)	9	Esport players (Overwatch)	n. a.	22.22%
Schmidt, Gnam, Kopf, Rathgeber, and Woll (2020a)	23	Esport players	23	17.39%
Buzzelli and Draper (2021)	120	Esport players (collegiate)	n. a.	8.3%
Ekdahl (2021)	10	Esport coaches (League of Legends)	n. a.	0.00%

Table 2 (Continued)

Study	Sample size	Population[a]	Age	Gender (F)
Ekdahl and Ravn (2021)	12	Esport coaches (League of Legends & CS:GO)	n. a.	0.00%
Giakoni-Ramírez, Duclos-Bastías, and Yáñez-Sepúlveda (2021)	53	Pro gamers	21.01 ± 0.39	n. a.
Hussain et al. (2021)	9	Esport players	19–29	100%
Poulus et al. (2021)	7	Pro gamers	24 ± 4.2	0.00%
Schelfhout, Bowers, and Hao (2021)	n. a.	n. a.	n. a.	n. a.
Silva, Correia, and Silva (2021)	7	Esport players	24–34	85.71%
Tjonndal (2021)	n. a.	n. a.	n. a.	n. a.
Paramitha, Hasan, Ilsya, Anggraeni, and Ramadhan (2021)	50	Esport players	21.5 ± 1.01	0.00%
Haupt, Wolf, and Heidenreich (2021)	1	Esport players	32	0.00%
Giakoni-Ramírez, Merellano-Navarro, and Duclos-Bastías (2022)	260	Pro gamers	18–30 (21.30 ± 2.26)	0.00%
Rudolf et al. (2022)	1038	Esport players	23.0 ± 5.4	8.8%
Yu, Brison, and Bennett (2022)	479	Esport fans	18–39	n. a.

[a]If the skill level is not mentioned or includes various skill levels, it is described as *esport*

applies a qualitative survey yielding data from 393 participants (Myers, 2019). The studies' population includes all skill levels of competitive gaming, ranging from world-class professionals to collegiate players, to amateur and casual players. Some papers focus only on specific esport titles, namely *League of Legends, Counter-Strike: Global Offensive (CS:GO), DOTA2, Overwatch* (Activision Blizzard, USA), or *Fortnite* (Epic Games, USA). On average, the age of the participants is in the early and mid-twenties, with an overall range from 13 to 47. 14 articles include no information regarding the ratio of the participants' genders, or this cannot be reported due to the studies' designs. Only four research pieces have more female participants than males. Three of them focus on the experiences of women in esport, with two deliberately including only female esport players. 14 papers have significantly more male participants (2.1 to 22.22%) and the samples of 15 studies consist entirely of males. Only a few studies mention information about the cultural background, ethnicity, or nationality of the subjects, for example when it was relevant to the research question (Hao et al., 2020; Hussain, Yu, Cunningham, & Bennett, 2021).

Concerning the different forms of how the body is displayed in esport, 27 studies can be classified under the topic "appearance and attributes of the player's body" (1), 34 under the theme "esport-specific physical performance requirements" (2), 11 under the subject "interweaving between physicality and digitality" (3), and three fall under the area "appearance of players' avatars" (4). In the following subsection, each topic is treated individually, giving the possibility to further elaborate on the distinctive findings. 22 articles can be assigned to one of the four categories, another 22 to two topics, and three studies to three topics. Therefore, some works are reported multiple times in the following section. **Table 3** summarizes all included publications according to the respective subject areas they fall under.

(1) Body appearance and attributes

Overall, 27 studies fall under this topic. All findings are related to what is known about the physical attributes and appearance of the players' bodies. The general physical activity of esport players is reported as above average, for example according to WHO recommendations (DiFrancisco-Donoghue et al., 2020; Kari & Karhulahti, 2016; Paramitha et al., 2021; Roncone et al., 2020; Rudolf et al., 2020; Rudolf et al., 2022). Buzzelli and Draper (2021) mention that for competitive gamers, body perception is less important than social benefits through esport. According to Tjonndal (2021), there is a public perception of competitive gamers being obese, unhealthy, and not physically active. One research piece investigates the competitive gamers' self-perceived fitness level, revealing that 21% claim to have a very low to low fitness level, 46% intermediate, and 33% consider themselves as having good or very good fitness (Nagorsky & Wiemeyer, 2020). Regarding a self-reported health status, few claim to have very poor (0.2%) or poor health (4.8%), while 38.2% report a very good and 18.2% report an excellent health condition (Rudolf et al., 2020).

Several analyses determined the body-mass-index to describe the body of esport players. While some simply surveyed the BMI (Lindberg et al., 2020; Schmidt et al., 2020a), others used it to depict an image of physical health among esport players. However, the findings are mixed: a few studies imply that the average BMI of esport players is above average (Thomas et al., 2019), with trends toward obesity (Rudolf et al., 2020; Schmidt et al., 2018; Trotter et al., 2020). Trotter et al. (2020) compared data from respondents from 65 different countries and found no significant difference between the origin of the players. The same findings

Table 3 Subject areas treated across all studies

	Subject area	*n*	(%)	Studies
(1)	Physical bodily appearance and attributes	27	57.45	Anderson (2017); Bayrakdar et al. (2020); Buzzelli and Draper (2021); Choi et al. (2020); DiFrancisco-Donoghue et al. (2020); Giakoni-Ramírez et al. (2021); Giakoni-Ramírez et al. (2022); Hamari and Sjöblom (2017); Hussain et al. (2021); Kari and Karhulahti (2016); Lindberg et al. (2020); Nagorsky and Wiemeyer (2020); Paramitha et al. (2021); Rambusch et al. (2007); Roncone et al. (2020); Rudolf et al. (2020); Rudolf et al. (2022); Ruvalcaba et al. (2018); Schelfhout et al. (2021); Schmidt et al. (2020a); Schmidt et al. (2018); Smith et al. (2019); Taylor et al. (2009); Thomas et al. (2019); Tjonndal (2021); Trotter et al. (2020); Yu et al. (2022)
(2)	Conditional and coordinative requirements of esport-specific movement	34	72.34	Bayrakdar et al. (2020); Buzzelli and Draper (2021); de Las Heras et al. (2020); Diankun et al. (2019); DiFrancisco-Donoghue et al. (2019); DiFrancisco-Donoghue et al. (2020); Egliston (2020a); Egliston (2020b); Ford (2017); Giakoni-Ramírez et al. (2021); Giakoni-Ramírez et al. (2022); Glass and McGregor (2020); Haupt et al. (2021); Kari and Karhulahti (2016); Lindberg et al. (2020); Nagorsky and Wiemeyer (2020); Paramitha et al. (2021); Pargman and Svensson (2019); Poulus et al. (2021); Rambusch et al. (2007); Rudolf et al. (2020); Rudolf et al. (2022); Sainz et al. (2020); Schaeperkoetter et al. (2017); Schmidt et al. (2020a); Schmidt et al. (2018); Silva et al. (2021); Smith et al. (2019); Sousa et al. (2020); Taylor et al. (2009); Thomas et al. (2019); Tjonndal (2021); Trotter et al. (2020); Witkowski (2012)
(3)	Interweaving between body and digitality	11	23.40	Egliston (2020a); Egliston (2020b); Ekdahl (2021); Ekdahl and Ravn (2021); Ford (2017); Hao et al. (2020); Hussain et al. (2021); Myers (2019); Poulus et al. (2021); Rambusch et al. (2007); Witkowski (2012)
(4)	Digital bodily appearance and attributes	3	6.38	Ford (2017); Hussain et al. (2021); Ratan et al. (2019)

were reported by Bayrakdar et al. (2020) as they investigated the BMI of esport players from the USA, Turkey, and South Korea. Other studies found that esport players commonly have an average BMI (Paramitha et al., 2021; Rudolf et al., 2022) but slightly higher body fat percentage (DiFrancisco-Donoghue et al., 2020), and two studies unveiled the finding that the BMI of esport players is similar to the BMI of average or healthy traditional sport athletes (Giakoni-Ramírez et al., 2021; Giakoni-Ramírez et al., 2022). Among the test subjects, higher BMI indicates longer sedentary behavior (Rudolf et al., 2020; Rudolf et al., 2022), lower physical activity (Bayrakdar et al., 2020; Trotter et al., 2020), and lower perceived general health (Rudolf et al., 2022; Trotter et al., 2020). DiFrancisco-Donoghue et al. (2020) stated that except for the BMI, all other statistics in their study indicated lower general physical health of esport players, including increased sedentary behavior, lower physical activity, lower lean body mass, lower bone mineral content, and higher body fat percentage. Lower physical activity through increased esport play time was also mentioned by Bayrakdar et al. (2020). The work by Schmidt et al. (2018) reports no difference between gamers and the control group regarding health-relevant parameters.

Nutrition among esport players is discussed in three papers. One study asserts that diet may be important for pro gamers to maintain a sportive appearance (Rambusch et al., 2007). This is partially supported by looking at the general fruit and vegetable consumption among gamers, which reveals that although only 11% fulfill recommendations by the German Nutrition Society, professional gamers and former professional gamers follow a healthier diet than other competitive gamers. However, the latter differences are not significant (Rudolf et al., 2020). Trotter et al. (2020) reported that alcohol consumption and smoking behavior among esport players is lower than average compared to global data.

Sleep habits were investigated by six studies. Smith et al. (2019) argue that it is important for esport players to keep track of their sleep for performance purposes. Two articles imply that competitive gamers do not suffer bad sleeping behavior (DiFrancisco-Donoghue et al., 2020; Paramitha et al., 2021), while three studies identified problematic sleeping behavior among esport players, presumably because of long periods of sitting in front of the screen (Buzzelli & Draper, 2021; Rudolf et al., 2020; Rudolf et al., 2022). Contrarily, Rudolf et al. (2020) found evidence that current professional players have significantly better sleeping behavior than former professionals.

As for the physique of players, one article found that pro gamers gesture, taunt, and communicate via body language during offline tournaments like traditional athletes (Schelfhout et al., 2021). In addition, there are mixed results regarding the connection between the players' bodily appearance and the spectators' motivation for esport consumption (Anderson, 2017; Hamari & Sjöblom, 2017; Yu et al., 2022). While Hamari and Sjöblom (2017) found no evidence that the professional players' aesthetics and body appearance are motivational drivers for spectating esport tournaments or leagues, Yu et al. (2022) argue that for female spectators, physical attractiveness is a motive for watching esport. The depiction of emotional outbursts and physical aggressiveness of professional players is well-perceived by esport fans and is seen as a motivating factor for consumption (Hamari & Sjöblom, 2017). According to Anderson (2017), the looks of professional gamers are important for their external image. On streaming platforms like *twitch.tv*, the players' appearance can be monitored through profile pictures, live streams, or videos. Corporeal aspects like

physical attractiveness help to draw attention, viewership, and ultimately profit. Two analyses show that there is a trend toward female pro gamers using their bodily appearance in a sexualized way to increase attention and audience (Anderson, 2017; Taylor et al., 2009). Ruvalcaba et al. (2018) examined different experiences between women and men in competitive gaming and observe an objectification of women on streaming platforms. For female streamers, the body is often the main object of feedback in form of discrimination, insults, inappropriate comments, or compliments (Anderson, 2017; Ruvalcaba et al., 2018). Still, staging the body while live streaming generally helps to interact with the audience by implying a corporeal presence which eventually helps to promote a broadcast (Anderson, 2017; Ruvalcaba et al., 2018). Anderson (2017) concludes that the inclusion of the body in the broadcast is a crucial element for streamers and pro gamers. Another aspect of the marketing value can be observed when looking at the advertisement of esport events which show pro gamers in sport-like aesthetics depicting the sportive competitive appearance of esport for marketing purpose (Taylor et al., 2009). Rambusch et al. (2007) imply that pro gamers are aware that athletic or healthy looks, or being in shape, are important for potential sponsorship deals, as the sponsors want their ambassadors to represent a certain positive image. However, pro gamers do not pursue athleticism or physical activity primarily for their looks, but because a healthy physique is perceived as beneficial to better performance (Kari & Karhulahti, 2016; Rambusch et al., 2007; Roncone et al., 2020; Rudolf et al., 2020; Trotter et al., 2020).

The perspective of considering the body as representative of the gender shows that esport is a terrain influenced by hegemonic masculinity. This increases the entry barrier for female players (Hussain et al., 2021; Ruvalcaba et al., 2018; Schelfhout et al., 2021; Taylor et al., 2009). Further, female gamers are more likely to be judged by fans and journalists according to their feminine appearance instead of their skill (Choi et al., 2020; Schelfhout et al., 2021). The female body is more likely attributed to femininity than to esport-relevant performance (Choi et al., 2020).

(2) Esport-specific physical requirements

A total of 34 studies treat the specific physical requirements and skillset for competitive gaming. Generally speaking, reduced physical activity because of sedentary behavior is a common trait of competitive gaming (Bayrakdar et al., 2020; DiFrancisco-Donoghue et al., 2019; DiFrancisco-Donoghue et al., 2020; Giakoni-Ramírez et al., 2021; Giakoni-Ramírez et al., 2022; Lindberg et al., 2020; Rudolf et al., 2020; Rudolf et al., 2022; Trotter et al., 2020). Common clinical pictures in competitive gaming are hand, wrist, neck, and back pain, and eye fatigue (DiFrancisco-Donoghue et al., 2019) or musculoskeletal pain (Lindberg et al., 2020), especially from overstrain. Additionally, there is a connection between increased esport activity and decreased lean body mass, bone mineral content, and increased body fat (DiFrancisco-Donoghue et al., 2020). While Giakoni-Ramírez et al. (2021) observed no connection between time spent playing esport and BMI, Bayrakdar et al. (2020) conclude that decreased physical activity through increased esport activity leads to a higher BMI.

Performance indicators for esport can be physical fitness, excellence, hard work, endurance, and pursuit of athleticism (Rambusch et al., 2007), or a balanced body, specific precise movement skills, human–machine interplay, and body posture (Witkowski, 2012). Ford (2017) compares playing competitive fighting games to playing a musical instrument and highlights the importance of rhythm, mechanical, and expressive potential. Players must be capable of executing and incorporating perfectly timed fine motoric motion sequences. Several publications show that bodily requirements in form of motoric skillset and physicality differ significantly from esport title to esport title (Egliston, 2020a; Egliston, 2020b; Ford, 2017; Nagorsky & Wiemeyer, 2020; Sousa et al., 2020). The motoric skills for each game must be learned and incorporated to execute optimal gameplay. Two studies investigating *DOTA2* gameplay conclude that amateurs copy pro gamers based on the theoretical knowledge they gain by watching professional games. They observe pro gamers while doing specific movements and try to imitate them, for example a technique called "manta dodging," which needs to be perfectly timed to avoid an incoming attack. However, many pro gamer moves need excellent timing and hand–eye coordination, which amateur players lack. This skill gap is described as "bodily tension" regarding fine motor and sensorimotor skills, timing, coordination, and regulation of affective states, implying that non-professionals fail to copy the gameplay of professionals. Even within a single game, the physical requirements can differ between different playstyles, positions, or characters used in the match. Both works argue that watching games works as mnemotechnic but fails to train physical skills (Egliston, 2020a; Egliston, 2020b). One study recommends extracting data for performance diagnostics directly from the input devices—keyboard, mouse, controller—where the physical and performance-related action takes place (Silva et al., 2021).

Four qualitative interview studies, two of which use similar data, show that pro gamers see themselves as sportspersons or athletes despite the reduced physical requirements (Pargman & Svensson, 2019; Rambusch et al., 2007; Schaeperkoetter et al., 2017; Taylor et al., 2009). Pargman and Svensson (2019) extend this by arguing that physicality is an essential part of sportification, which describes the process of an activity, a game, or a play becoming a distinctive sport. However, the sole distinction based on physical demand for a practice is not enough to distinguish between sport or non-sport, and esport shows various other traits of sportification. Still, in their quantitative, survey Buzzelli and Draper (2021) found that collegiate esport players don't see athleticism, in terms of physical fitness, as a relevant attribute for esport. According to Tjonndal (2021), there is a public discourse about

the corporeal aspects of esport indicating that the body plays no performative role and esport leads to the opposite of athleticism. Haupt et al. (2021) investigated cardiovascular activity and energy expenditure during competitive gaming and concluded that esport is no substitute for physical exercise. It also shows that blood glucose is slightly raised during competitive play. Other findings show short-term effects on the body, stating that physiological arousal during play raises the cortisol level significantly (Schmidt et al., 2020a), increases heart rate and respiratory rate (Glass & McGregor, 2020; Haupt et al., 2021), or increases heart rate and systolic blood pressure—indicators for a response to an aerobic strain without physical exertion (Sousa et al., 2020). Long-term effects are depicted in one research piece which reveals a change in the brain's plasticity leading to improved local functional connectivity density and default mode network (Diankun et al., 2019). Three articles imply a positive connection between physical fitness and performance level of esport players (Kari & Karhulahti, 2016; Paramitha et al., 2021; Roncone et al., 2020), and de Las Heras et al. (2020) show how short intense cardiovascular exercise before competing can have a positive effect, for example on in-game accuracy. Further, specific breathing patterns can help regulate the performance level under a stress situation (Poulus et al., 2021; Smith et al., 2019).

Two studies investigated the effect of caffeine intake on performance in esport, with mixed results. Thomas et al. (2019) found no significant short-term physical (and mental) skill improvement through caffeine consumption in the form of energy drinks among professional *League of Legends* players. Sainz et al. (2020) reported an improvement in accuracy and reaction time among *Fortnite* and *Counter-Strike: Global Offensive* players using a generic first-person shooter simulation.

(3) Interweaving between the physical and digital worlds

A total of 11 studies yielded findings about interweaving between the physical body and the digital world in the context of competitive gaming. Peripherals like keyboards and mouses can be understood as extensions of the body for a sportive purpose and make the players feel connected to the digital world and the avatars (Ekdahl, 2021; Ekdahl & Ravn, 2021; Poulus et al., 2021; Rambusch et al., 2007; Witkowski, 2012). The players are not actively conscious of using a mouse, keyboard, or controller when playing a game as long as they are in a flow state (Poulus et al., 2021). Any haptic or physical disturbance, however, leads to discomfort in the body, device, and digital realms, and can result in performance issues for the players (Ekdahl, 2021; Rambusch et al., 2007). Ford (2017) argues that players see the digital characters as musical instruments which allow them to express their skill and individual style. Especially pro gamers can anticipate and reduce the timespan between physical input and in-game reaction (an essential ability in competitive gaming), because they can "feel the digital avatars and their actions and steer the maneuvers more efficiently" (Egliston, 2020a; Egliston, 2020b).

Ekdahl and Ravn (2021) explicitly investigated inter-corporeality in esport. Their study shows how the human body extends into virtuality in the form of common bodily expressions executed through digital avatars. The way players move and behave in-game via their avatars is like the way athletes behave in traditional sports. This means that intentions, expressions, or skills are embodied through the virtual bodies controlled by the players. The players don't feel a gap between virtuality and reality and refer to the character's movements as if they were their own: "If I take one step forward, my opponent will take a step back" (Ekdahl & Ravn, 2021, p. 309). The digital characters portray the intentions of the players in the form of body language like athletes do in traditional sports. Therefore, not only do players train these movement practices but they must also learn how to read the digital movements to outperform the opponent. In competitive gaming, reading the virtual body language is more important than reading the real body language. Myers (2019) shows that body language and physical gestures are mimicked in competitive gaming settings. He describes how the digital avatar is used in games to show virtual and physical dominance over the opponent. In this sense, physical body language is willfully mediated through digital avatars, for example in the form of taunting and expressing dominance (Myers, 2019), or unintentionally, when executing strategical or tactical maneuvers like feinting (Ekdahl & Ravn, 2021).

Hao et al. (2020) observed the practice of gender swapping among Chinese female gamers to avoid gender-based resentments. This implies that women and girls tend to represent a different gender in-game and they try to break the physical–digital connection to be less exposed to discriminatory behavior. This eventually leads to self-efficacy and higher motivation to participate. Hussain et al. (2021) find comparable results when investigating the motives and lived experiences of Muslim women for competitive gaming. They conclude that esport is used as a vehicle of liberation and self-expression. Hence, esport is considered a means to escape common societal norms and values, especially the culturally imposed role of the body including obligatory dress codes for women.

(4) Digital avatar

Three studies (the lowest number in the sample) discuss findings regarding the appearance and attributes of the digital body. Hussain et al. (2021) found evidence that digital bodies can be used to carry normative sociocultural ideals and values, like gender, ethnicity, or skin color. Thus, players may individualize their digital appearance to represent desirable norms and express themselves freely beyond any sociocultural standards. Considering the gender of the digital avatars, Ratan et al. (2019) observed that female players tend to choose female characters, while men show no

preference regarding the physical appearance of their avatars. Ford (2017) found that the virtual appearance of digital avatars plays no role in competitions but instead, the characters' mechanics and in-game skills are central matters.

Discussion

The present scoping review identified the existing literature to better understand the role of the body in esport. It illustrates key findings, explores research gaps, and therefore offers a foundation for future research in this direction. The amount of literature that can be processed in exploring the research question has increased exponentially over the past years and is diversifying regarding origin and topic. This trend has been mentioned by other scholars, but compared to the literature about traditional sports, research dealing with aspects of the body in esport is still in its infancy (Reitman et al., 2020; Riatti & Thiel, 2021; Schmidt et al., 2020b). Our analysis reveals four forms of how the body may be present in esport: 1) the players' physical appearance; 2) the conditional and coordinative skill required to play; 3) the interweaving between the real body and the digital world; and 4) the digital appearance of the in-game characters. The review shows that the way the body is considered in esport and competitive gaming does not differ much from traditional sports. Hence, in esport, topics like physical health, motoric skillset, or bodily appearance are considered relevant for both the player in the analog world and the connection between the player and the digital avatar. However, comparably few publications look beyond the physical aspects of the body and treat the interplay with the digital world, although this is a key trait of esport and a strong distinction between traditional and esport. Observing esport in a sport scientific scope needs to address this intersection, because we see that the physical input does not stop at the domain of execution—here the computer or console—but the players also sense feedback from their digital characters which needs to be incorporated into playing practice.

Inter-corporeality

Considering the connection between the body and virtuality, our findings reveal that esport is characterized by an experiential immersion of the player in virtual reality. However, while the sense of being immersed in a virtual realm is rather a stylistic element to increase gaming experience in non-competitive computer games, in esport it is a side effect that players need to adapt to (Cranmer, Han, van Gisbergen, & Jung, 2021; Sawan et al., 2020). In this sense, the player's body has not only the purpose of giving input but becomes an integral part of competitive gaming both experientially and practically. One of our most important findings is that peripherals (mouse, keyboard, etc.) are understood as extensions of the body while competing. It appears to be like the way equipment is perceived in traditional sports. Players embody the mouse, keyboard, and the in-game character, and perceive controlling them as natural movements. This also means that players prefer characters, playstyles, or avatar setups which they feel most comfortable playing. Therefore, the capabilities of a digital avatar become part of the optimal gaming setup and form an interplay between input devices and players. The slightest divergence from this setup results in a disturbance of this sensorimotor connection and a loss of performance. This can be compared, for example, to racket sport. The athletes do not sense their racket as an exogenous object when competing, but rather understand it as an extension of their body to play the ball. Hence, the physical traits of the rackets are experienced as integral bodily traits when anticipating, adjusting, and adapting to game situations; even more, players sense incorrect racket positions as a physical discomfort (Biggio, Bisio, Avanzino, Ruggeri, & Bove, 2017).

This scoping review also reveals that the motoric skills for esport significantly differ among genres, games, and even within a game. It can be expected that there are sensorimotor or fine motor skill transfers within certain genres, so that shooter players are more likely to adapt to other shooters than to strategic games and vice versa. Further, the discrepancy between the motoric skills of professionals and non-professionals depicts that understanding theoretical, tactical, and strategical skills does not suffice to play at a top level but that the game must be embodied in the sense indicated above. This underlines that esport-specific motion needs to be internalized and it could imply that genetic disposition is as important as it is in traditional sports, for example when pursuing a professional career.

Aesthetics and appearance

Our findings show that physical aesthetics play an important role in the competitive gaming cosmos. The image of the body in competitive gaming is strongly influenced by clichés evolving around the physis of gamers (Taylor, 2012; Tjonndal, 2021). However, our findings suggest that this aspect needs to be investigated in a more differentiated manner. For example, according to numerous studies investigating the body composition of players, the image of the players being obese and unhealthy is not proven right. This aspect refers not only to athletic performance in esport. In fact, especially professional gamers understand that maintaining physical health and fitness is not only beneficial to their performance but also helps in marketing themselves. Although the play action takes place in a virtual world, people behind the screens are the focus of attention and are judged by their appearance. Female gamers face objectification and are not seldomly reduced to their outer appearance, which can be seen as a side effect of the hegemonic masculinity in competitive gaming (Taylor et al., 2009). However, female gamers tend to use femininity to stage themselves when appearing publicly, for example in streams. The integration of the body helps to create a connection with the spectators and is considered beneficial for increasing the audience (Anderson, 2017).

Some traditional perceptions of athleticism (like being fit, muscular, in shape, etc.) cannot be attained by playing esport. However, this must not be regarded as a counterargument against the sportive-

ness of esport. Many other sports based on fine motoric prowess are commonly accepted within the sport canon, like darts or shooting sport. Furthermore, esport is characterized by in-game gestures which can be interpreted in the same way as if they occurred in the real world. Body language, including taunting, feinting, and gestures, are used in the virtual and physical realms of esport competitions, which means that players transfer common bodily norms in the game. Additionally, our findings therefore help to explain the practice of cosmetic modifications for in-game characters. Players can buy "skins" to change the looks of and individualize their digital avatars. This is an important source of income for the publishers and developers of the games and a well-perceived feature within the communities (Macey & Hamari, 2019). Individuality is promoted through playstyle or cosmetic alteration of in-game characters, which is also observable in traditional sports. Cristiano Ronaldo's signature goal celebration, Eric Cantona's distinctive way of popping up the collar of his jersey, and Serena Williams' eccentric tennis outfits are prominent examples of how professional athletes stage themselves. Pro gamers can do so as well in the real world and have the possibility to extend characteristic traits into the digital world which support their marketing strategies. Still, while the physical and digital appearance is relevant for players, it is unlikely that they will sacrifice in-game functionality or performance for looks (Ford, 2017; Ratan et al., 2019).

Physical health

The BMI is used as a metric to assess players' health in many papers that investigate the physiological health aspect of esports. A crucial finding is that studies show that there is no significant difference between the body composition of esport players compared to common average non-gamers. Rather, the use of the BMI in research hints at the fact that among researchers, there is a cliché regarding the perception of the bodily appearance of gamers, as they are considered lazy and overweight (Tjonndal, 2021). Overall, the articles analyzed in our review reveal that it is difficult to determine the specific bodily appearance of gamers. What can be attested is the fact that esport is no substitute for physical exercise. Knowing this and understanding the importance of being healthy to perform well in esport competitions shows that it is necessary to maintain physical fitness when competing. Therefore, it is recommended to include fitness training as compensation for the sedentary nature of esport. The data imply that professionals are especially aware of this fact and behave accordingly, not only regarding physical activity but also regarding sleep behavior and diet. Therefore, professionals adopt behaviors that are common to traditional sports. Another similarity between research on esport and studies on traditional sport relates to physical injuries relevant to competition. A central finding is that injuries in esport mainly stem from overstressing and posture issues, occurring, for example, because of the sedentary nature, which is why more professional medical supervision is called for in esport (Pereira, Brito, Figueiredo, & Verhagen, 2019; Yin et al., 2020). Regarding inter-corporeality, it can be expected that pain plays a different role in esport than in traditional sports. Since the domains of execution and application (Holt, 2016) exist in different realms, the in-game action has no direct impact on the player's health. For example, being eliminated in a match has no consequences on the player's physical state. However, health problems due to sedentary behavior or reduced physical activity are a problem in esport (DiFrancisco-Donoghue et al., 2019; Trotter et al., 2020; Yin et al., 2020). Still, since it is not a contact sport, the injury risk is lower than in many other sports. In traditional sport, "playing hurt" is perceived to be normal or even glorified. It is a sign of effort or compassion to compete despite being injured or after taking a rough hit (Nixon, 1994; Roderick, Waddington, & Parker, 2000). For example, Bastian Schweinsteiger was described as a hero during the World Cup final 2014, which saw him bleeding and taking hits, though he kept playing. The differing domains of execution and application can be a reason this marginalization of pain might not occur in esport. Players' injuries are not visible and physical fouls do not exist. From an external perception, there is less space for the glorification of "playing hurt."

Even though the importance of nutrition in sport is well elaborated (Kerksick et al., 2018), literature regarding esport-specific diet is still scarce. While some research pieces investigate the relevance of caffeine or energy drinks on performance, others imply the relevance of dieting to maintain fitness or for a healthy body appearance. A reason for the lack of studies in this field could be the low physical exertion of competitive gaming (Ribeiro, Viana, Borges, & Teixeira, 2021).

To sum up, it can be said that although esport is commonly referred to as a disembodied sport, lacking physicality and therefore struggling to fit into existing ideas about sport (Borggrefe, 2021; Holt, 2016; Parry, 2019; Willimczik, 2019), this scoping review shows that the body plays an important part in esport, both in the analog and the virtual world. This finding complements the arguments of scholars who underscore the importance of the corporeal ambiguity of esport (Cranmer et al., 2021; Ekdahl & Ravn, 2019; Thiel & John, 2020; van Hilvoorde & Pot, 2016).

Practical and theoretical implications

The following implications are derived from our findings: 1) despite esport being often labeled disembodied, the body is the subject of research from many different perspectives in esport literature, ranging from the analysis of the players' physical attributes to the physiodigital interplay between player and avatar. 2) Our review shows that the body in esport functions as an intersection between the real and digital worlds. The connection between body and game is, in contrast to the opinion of some esport-critical researchers, not a one-way direction. In-game mechanics also affect the players' motor execution and neurophysiological processing of the gameplay. Considering this linkage, we can assume a difference between esport and casual computer games. While in casual games,

experiencing the virtual worlds is seen as a relevant part of the gaming experience (Cranmer et al., 2021), effective dealing with immersion has to be considered a performative trait in competitive gamers, which players need to pay attention to. 3) Esport is no substitute for physical activity; therefore, players should consider including physical exercises in their esport training program. Nowadays it is already common for professionals to have athletic coaches and supervision from physicians. However, amateurs and young athletes need guidance in this field. Governing bodies like associations or clubs may create the conditions for players to learn about how to maintain an equilibrium between practicing esport and counteracting the risks of the sedentary nature of the game. If sporting clubs were to introduce esport departments in which players could benefit from a supporting environment comparable to traditional competitive sports at a higher level, the possible downsides could be reduced (Riatti & Thiel, 2021). For example, the DGI in Denmark, a national umbrella organization for sporting associations, supports clubs that want to include esports within their portfolio. Their support ranges from helping with IT solutions to developing training concepts (DGI, n.d.). 4) Clubs could also benefit from esport departments because they could appeal to people who do not see themselves fitting in at traditional sporting clubs. Since the entry barrier for competitive gaming is lower than for many traditional sports, this could be a future strategy for the recruitment of new members (DGI, n.d.; Hayday & Collison, 2020; Hewitt, 2014). 5) When considering the low physical exertion of competitive gaming, nutrition might become more important to maintain physical fitness and health. This could also be a pillar of training control in esport (Ribeiro et al., 2021).

Research desiderata

Our review confirms that the esport research landscape is still in its infancy (Reitman et al., 2020; Riatti & Thiel, 2021). According to our analyses, several knowledge gaps and research desiderata exist regarding the role of the body in esport. 1) Although the area of research is growing and diversifying, research predominantly deals with the physical attributes of the body necessary for high performance. In contrast, literature regarding the physical–digital interplay or about embodiment and digital corporeal phenomena in esport is scarce. More research is necessary because the relationship between the analog and the virtual is essential and unique for esport, but difficult to interpret based on the current state of research (Cranmer et al., 2021). Possible research questions comprise, for example, positive and negative effects deriving from the duality of the body or changes in the general perception of the analog body in virtual worlds. It would also be interesting to analyze in detail how competitive players identify themselves with their digital avatars and as how important common normative values regarding the body are seen by them. For example, little is known about the reciprocal effects which might influence body image, ideals, or beauty standards in both worlds. Longitudinal studies are particularly relevant in this context. A possible question that is interesting from a longitudinal point of view is whether the popularity of esport and the physical and digital roles of the body can have an impact on the body ideals within the community, sport, or society. 2) Considering the different motoric requirements for different esport disciplines, it would be interesting to see if there are specific phenotypes or physical preconditions which are beneficial for different games or genres. Eventually, this would also open questions about talent recruitment and promotion. 3) Moreover, it would be worth examining whether and how far it is possible to transfer skills from one game genre to another. 4) An additional open question refers to the structuring and planning of training in esport. To date, there is not much evidence regarding whether training must differ from genre to genre, and just as little is known about how much physical activity is necessary for top performance. 5) Although research about pain and injuries in esport has been treated in this scoping review, competing under pain was not a topic of the selected publications. It may be interesting to investigate whether "playing hurt" can also be observed in esport.

Limitations

The first limitation stems from the sample demographics of the included works. The fact that the studies do not paint a representative picture for countries of origin, age, gender, etc. makes comparisons difficult, since the role of the body can differ significantly because of cultural origins. Particularly the fact that the participants in the experiments of the processed publications mainly consist of males in their early twenties is problematic, because there is a significant number of professional female e-athletes (Hedlund, 2021), and the findings of the existing studies are more likely to be valid for males than for non-males. Secondly, we included all types of publications regardless of their quality, which is characteristic for conducting scoping reviews but can also be interpreted as an issue (Arksey & O'Malley, 2005; Tricco et al., 2018). In addition, there is only one longitudinal analysis included, which makes it difficult to extract profound long-term findings. Thirdly, we cannot rule out that several relevant papers were excluded because of language restrictions, despite searching in five languages. We assume that the sample's quality could improve if research pieces from more countries, for example from the Far East, where esport is particularly popular (Taylor, 2012), were included. Fourthly, although we conducted the searching process with two reviewers working simultaneously on the sample, only one reviewer checked the full-text eligibility. Methodological rigor could have been increased by including more reviewers in this step.

Conclusion

This scoping review explores literature that helps to understand the role of the body in esport and competitive gaming. The body is a crucial subject area in sport research (Rail & Harvey, 1995; Sabiston et al., 2019; Thiel, John, & Frahsa, 2019), and it is necessary to study this topic when researching esport. This review

shows that corporeality can be observed on the physical but also the digital side of esport. Contrary to established assumptions (Holt, 2016; Parry, 2019), esport should not be considered a disembodied sport or activity. Since the popularity and relevance of esport are continuously growing and esport is on the way to becoming mainstream (Jonasson & Thiborg, 2010; Riatti & Thiel, 2021; Schmidt et al., 2020b), the sociology of sport and body should pay more attention to esport in the future. Hence, the body is not only worth studying for the player's physical health or competition-related motor skills, but also for addressing body-related issues that may not be immediately apparent when engaging with esport. This ranges from the analysis of discriminatory and toxic behavior towards the players' bodies, to the question of the "social reality" of "physical" interactions in the virtual space.

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Declarations

Conflict of interest. P. Riatti and A. Thiel declare that they have no competing interests.

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Appendix

Appendix 3 Details about the 47 included studies regarding the role of the body in esport

Author(s)/Year/Origin/ Language[1]	Aim of study	Methodology	Sample characteristics[2]			Findings for scoping review[3]			
			Sample Size	Population	Age	(1)	(2)	(3)	(4)
Rambusch, Jakobsson, and Pargman (2007) Sweden	Illustrate theoretical and methodological issues of analyzing esport in terms of how players' individual activities, the game's design, and interface and the culture and business are related	(1) qualitative interviews (2) observation	n=34 [F: n/a]	Pro gamers	19-25	X	X	X	
Taylor, Jenson, and de Castell (2009) Canada	Map out how women participate in a set of practices around the organization, promotion, and performance of the predominantly male environment in competitive gaming	(1) qualitative interviews (2) observation (3) secondary data analysis	n.a.	n.a.	n.a.	X	X		
Witkowski (2012) Denmark	Investigation of sporting ontologies in terms of how players realize and perform their networked sporting actions.	(1) qualitative interviews (2) observation	n=19 [F: 0%]	Pro gamers	n.a.		X	X	
Kari and Karhulahti (2016) Finland	Analyze training routines of pro gamers especially focusing on physical exercise routines.	quantitative survey	n=115 [F: 2,61%]	Esport players[4]	20,8 ± 4,4	X	X		
Anderson (2017) USA	Examine design strategies on streaming platforms to direct awareness to the presence of players and viewers.	secondary data analysis	n.a.	n.a.	n.a.	X			
Ford (2017) USA	Investigate how players perceive and treat virtual characters in competitive gaming	secondary data analysis	n.a.	Esport players	n.a.		X	X	X
Hamari and Sjöblom (2017) Finland	investigate the motivation of people watching esport	quantitative survey	n=888 [F: 7,09%]	Esport fans	22.75	X			
Schaeperkoetter et al. (2017) USA	Explore why people are participating in competitive gaming and investigate their identity and social capital	qualitative interviews	n=33 [F: 3,03%]	Esport players	n.a.		X		
Ruvalcaba, Shulze, Kim, Berzenski, and Otten (2018) USA	Examine female gamers' experiences considering positive and negative feedback and sexual harassment in	(1) quantitative survey (2) observation	(1) n=92 [F: 66,30%] (2) n=87 [F: 44,83%]	Esport players	n.a.	X			

	the predominantly male environment in competitive gaming							
Schmidt, Kowal, and Woll (2018) Germany *(German language)*	Compare the body composition of hobby gamers and examine the effects of intensive use of computer games (gaming) on body composition.	biometric analysis	n=346 [F: 0,00%]	Esport players (n=68) Control group (n=278)	18-46	**X**	**X**	
Diankun, Weiyi, Tiejun, Yuening, and Dezhong (2019) China	investigated the relationship between esport experience and brain plasticity	biometric analysis	n=60 [0,00%]	Pro gamers (n=26) Esport players (n=34)	(1) 25.35 ± 2.39 (2) 24.59 ± 2.13		**X**	
Myers (2019) USA	Examine communicative gestures mediated by digital avatars in competitive gaming	qualitative survey	n=393 [F: 4,5%]	Esport players	18-30			**X**
Pargman and Svensson (2019) Sweden	Investigate processes of sportification in esport by comparing it to cross-country skiing	qualitative interviews	n=34 [F: n/a]	Pro gamers	19-25		**X**	
DiFrancisco-Donoghue, Balentine, Schmidt, and Zwibel (2019) USA	Analyze common health issues that occur in competitive gaming and outline a healthcare model to prevent and treat common health concerns for pro gamers	quantitative survey	n=65 [F: n/a]	Esport players (collegiate)	18-22		**X**	
Ratan, Fordham, Leith, and Williams (2019) USA	Investigate avatar gender choice within competitive gaming	quantitative survey	n=15392 [F: 4%]	Esport players (League of legends)	18+			**X**
Smith, Birch, and Bright (2019) United Kingdom	Examine various psychological stressors competitive gamers are exposed to and adequate coping strategies	qualitative interviews	n=7 [F: 0%]	Esport players (CS:GO)	20.57 ± 2.07	**X**	**X**	
Thomas, Rothschild, Earnest, and Blaisdell (2019) USA	Examine cognitive and physical changes associated with consuming energy drinks for competitive gamers	(1) experimental trial (2) quantitative survey	n=9 [F: 0%]	Pro gamers (League of legends)	20.8 ± 2	**X**	**X**	
Bayrakdar, Yildiz, and Bayraktar (2020) Turkey	Examine the effect of esport on physical activity level and body composition	(1) quantitative survey (2) biometric analysis	n=137 [F: 0%]	Esport players	19.92 ± 2.21	**X**	**X**	
Choi, Slaker, and Ahmad (2020) South Korea	Examine the occurrence of sexism in professional computer gaming	document analysis	n.a.	n.a.	n.a.	**X**		
DiFrancisco-Donoghue, Werner, Douris, and Zwibel (2020) USA	Investigate activity levels, body mass index (BMI), and body composition in collegiate esports players as compared to age-matched controls	biometric analysis	n=24 [F: 0%]	Esport player (13) Control group (11)	(1) 20.2 ± 1.7 (2) 19.2 ± 1.3	**X**	**X**	
Egliston (2020a) Australia	Analyze the discrepancy of skill between watching and trying to recreate techniques in esport	qualitative interviews	n=24 [F: n/a]	Esport players (DOTA2)	n.a.		**X**	**X**

Egliston (2020b) **Australia**	Analyze the discrepancy of skill between watching and trying to recreate techniques in esport	(1) qualitative interviews (2) secondary data analysis	n=24 [F: n/a]	Esport players (DOTA2)	n.a.		**X**	**X**
Hao et al. (2020) **China**	Investigate the relationship between gender-swapping and females' continuous participation intention in esport, the mediating effect of self-efficacy, and the moderating effect of discrimination	quantitative survey	n=475 [F: 100%]	Esport players	18-22			**X**
Lindberg et al. (2020) **Denmark**	Investigate the prevalence of Musculoskeletal (MSK) pain, the association between MSK pain and esport-related training volume, and the association between MSK pain and physical activity levels for competitive gamers	quantitative survey	n=188 [F: 2,1%]	Esport players	17.1 ± 2.3	**X**	**X**	
Rudolf et al. (2020) **Germany**	Examine the demographics and health behavior of video game and esport players	quantitative survey	n=1066 [F: 8,1%]	Esport players	22.9 ± 5.9	**X**	**X**	
Sainz, Collado-Mateo, and Coso (2020) **Spain**	Analyze the effect of caffeine intake on reaction time and accuracy during a first-person shooting game	experimental trial	n=15 [F: n/a]	Pro gamers	22 ± 3		**X**	
de Las Heras, Li, Rodrigues, Nepveu, and Roig (2020) **Canada**	Analyze the short-term effects of a single session of cardiovascular exercise on the performance of competitive games and explore psychosocial mechanisms linked to it	(1) experimental trial (2) quantitative survey	n=18 [F: 11,11%]	Pro gamers (League of legends)	22 ± 3.0		**X**	
Nagorsky and Wiemeyer (2020) **Germany**	Investigate training habits in different esports regarding relevant competencies and training areas	quantitative survey	n=1835 [F: 4%]	Esport players	13-47 (20.9 ± 4.5)	**X**	**X**	
Sousa et al. (2020) **USA**	Investigate physiological and cognitive changes after gaming competitively for two types of genres (first-person shooter and multiplayer online battle arena)	(1) observation (2) biometric analysis	n=17 [F: 0%]	Esport players (Overwatch & League of Legends)	20.1 ± 1.8		**X**	
Trotter, Coulter, Davis, Poulus, and Polman (2020) **Australia**	Investigate the association between obesity, self-reported physical activity, cigarette smoking, alcohol consumption, and perceived health in esports players, and the influence of player in-game rank	quantitative survey	n=1772 [F: 9,4%]	Esport players		**X**	**X**	

Roncone, Kornspan, Hayden, and Fay (2020) **USA**	Analyze the relationship between physical activity and the mental toughness of esports athletes	quantitative survey	n=34 [F: 0%]	Esport players (collegiate)	18-23 (20.02 ± 1.46)	**X**			
Glass and McGregor (2020) **Canada**	Investigate how in-game events affect players' mental health to develop resilience-building approaches for esport athletes.	(1) biometric analysis (2) observation	n=9 [F: 22,22%]	Esport players (Overwatch)	n.a.		**X**		
Schmidt, Gnam, Kopf, Rathgeber, and Woll (2020) **Germany**	Measure physiological arousal, flow experience, and anxiety as well as the performance itself during a real-life competitive situation without artificially manipulating the underlying conditions	biometric analysis	n=23 [F: 17,39%]	Esport players	23	**X**	**X**		
Buzzelli and Draper (2021) **USA**	Investigate whether collegiate esport athletes see themselves as sportsmen	quantitative survey	n=120 [F: 8,3%]	Esport players (collegiate)	n.a.	**X**	**X**		
Ekdahl (2021) **Denmark**	Provide a phenomenological analysis of bodily presence in one case of screen-based virtuality	(1) observation (2) qualitative interviews	n=10 [F: 0%]	Esport coaches (League of legends)	n.a.			**X**	
Ekdahl and Ravn (2021) **Denmark**	Examine social understanding of embodiment in virtual worlds by looking to esport practitioners' experiences of interacting with each other during the performance	(1) observation (2) qualitative interviews	n=12 [F: 0%]	Esport coaches (League of legends & CS:GO)	n.a.			**X**	
Giakoni-Ramírez, Duclos-Bastías, and Yáñez-Sepúlveda (2021) **Chile**	Determine the influence of years of practice on the body composition of pro gamers	biometric analysis	n=53 [F: n/a]	Pro gamers	21.01 ± 0.39	**X**	**X**		
Hussain, Yu, Cunningham, and Bennett (2021) **USA**	Investigate the motives and lived experiences of Muslim women in playing competitive games	(1) observation (2) qualitative interviews	n=9 [F: 100%]	Esport players Muslim women	19-29	**X**		**X**	**X**
Poulus, Coulter, Trotter, and Polman (2021) **Australia**	Investigate the perceived determinants of success in pro gamers	qualitative interviews	n=7 [F: 0%]	Pro gamers	24 ± 4.2		**X**	**X**	
Schelfhout, Bowers, and Hao (2021) **USA**	Examine gender inclusion in competitive gaming	document analysis	n.a.	n.a.	n.a.	**X**			
Silva, Correia, and Silva (2021) **Portugal**	Discuss the potential value of physiological monitoring within esport	biometric analysis	n=7 [F: 85,71%]	Esport players	24-34		**X**		
Tjonndal (2021) **Norway**	Study virtual resistance towards the introduction of Norway's first professional esport league and its inclusion in the Norwegian Football Federation	document analysis	n.a.	n.a.	n.a.	**X**	***X***		

Paramitha, Hasan, Ilsya, Anggraeni, and Ramadhan (2021) Indonesia	Analyze the physical activity and lifestyle of esport athletes competing in annual sporting events throughout Indonesia	quantitative survey	n=50 [F: 0%]	Esport players	21.5 ± 1.01	**X**	**X**
Haupt, Wolf, and Heidenreich (2021) Germany	Investigate the effect of esport on the cardiovascular system and energy expenditure (EE) and compare them with those occurring during dynamic exercise.	biometric analysis	n=1 [F: 0%]	Esport players	32		**X**
Giakoni-Ramírez, Merellano-Navarro, and Duclos-Bastías (2022) Chile	Analyze the relationship between physical activity levels and motivational orientations for pro gamers	quantitative survey	n=260 [F: 0%]	Pro gamers	18-30 (21.30 ± 2.26)	**X**	**X**
Rudolf et al. (2022) Germany	Examine the demographics and health behavior of video game and esport players (follow-up study to Rudolf et al. (2020))	quantitative survey	n=1038 [F: 8,8%]	Esport players	23.0 ± 5.4	**X**	**X**
Yu, Brison, and Bennett (2022) USA	Examine gender differences in esport spectating motives and points of attachment	quantitative survey	n=479 [F: n/a]	Esport fans	18-39	**X**	

5.3 Article 3: “Using panopticism to theorize the social role of the body in competitive gaming and electronic sport”

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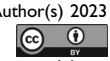
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Using panopticism to theorize the social role of the body in competitive gaming and electronic sport

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Abstract

The role of the body is a common topic for discussions concerning competitive gaming, also known as electronic sport (esport). In esport, the focus on the body shifts from its physical presence towards digitality and therefore differs significantly compared to traditional sports. It is therefore questionable whether disciplinary mechanisms typical for sport that originate from the physical body being surveyed can be observed in competitive gaming as well. This conceptual paper uses Michel Foucault's concept of *panopticism* to theorize what consequences of deviant or normative behaviour can be derived from a (partially) absent physical corporeality in esport. Our approach reveals that esport and competitive gaming are lacking disciplinary mechanisms typical for traditional sports. We introduce the term *dysopticon* as a concept where players are not exposed to surveillance like in traditional sports, because of a perceived absence of the players' physical bodies while competing. This can result in arbitrariness and deviant behaviour but also be an opportunity for inclusion or self-expression regardless of hegemonic corporeal norms and standards. Stakeholders, including players, clubs, associations, and corporations, can build upon these insights to develop and promote esport beneficially for sport and society.

Keywords

electronic sport, corporeality, body, Foucault, panopticism

Introduction

Corporeality is a central topic in many discussions about electronic sport (esport), so competitive video and computer gaming. The term esport includes all forms of competitive computer and video gaming where at least two parties try to outperform each other

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based on strategic, tactical, mental, and physical, mainly fine motor prowess (Hemphill, 2005; Jenny et al., 2017; Riatti and Thiel, 2021). The role of corporeality is often referred to in the so-called 'can-esport-be-sport' debate considering a presumable lack of physicality while playing esport, compared to traditional sports (Borggrefe, 2018; Ekdahl, 2021a; Parry, 2019; Riatti and Thiel, 2021; Thiel and John, 2020). Currently, the research in this area mainly focuses on physical traits, like the ones in traditional sports, including fine motoric requirements, affective responses, clinical pictures, or impact on physical health in general (Lam et al., 2020; Schary et al., 2022; Vaamonde et al., 2018). The body's social role as a communicative point of reference – a key feature of the body (Thiel et al., 2013) – remains largely unexplored. A peculiarity about the body in esport is that corporeality goes beyond what is happening in front of the screen. On top of a player's physical appearance and the physical fine motoric skills (like hand–eye coordination), two additional corporeal aspects can be observed: being interwoven with the digital avatar and the appearance of the avatar in the game (Ekdahl, 2021b; Ekdahl and Ravn, 2021; Ford, 2017; Riatti and Thiel, 2023). Compared to traditional sports where the athlete's body is the central aspect of each sport (Loy, 1991; Thiel et al., 2013), in esport, we see a shift from the physical towards the digital body (Ekdahl, 2022; Holt, 2016; Riatti and Thiel, 2023; Thiel and John, 2020). Particularly in non-professional competitive gaming or, for example, exclusively online competitions, players remain largely unidentifiable. This leads to anonymity while competing – atypical for traditional sports – because the players are not physically interacting with each other and the physical body as a means of social interaction has no use. Scholars see in anonymity the origin of increased deviant and arbitrary behaviour in competitive gaming (Hayday et al., 2021; Irwin and Naweed, 2020; Kwak et al., 2015; Lapidot-Lefler and Barak, 2012).

The connection between deviant or normative behaviour and the role of the body is specially treated in the works of French sociologist Michel Foucault (Foucault, 1977; Kammler et al., 2014). Particularly, his concept of *panopticism*, describing how surveillance and disciplinary mechanisms form docile and disciplined bodies, is a proven approach to analysing interaction and behaviour in modern sports (Alkemeyer and Pille, 2006; Cole, 1993; Cole et al., 2004; Pringle, 2014; Rail and Harvey, 1995; Reinhart, 2014; Wolf, 2014).

Panopticism is typical for modern sports since the physical body is always under surveillance. Foucauldian scholars argue that athletes being observed by referees, spectators, teammates, opponents, or coaches are disciplined according to certain norms (game rules, moral codes, and sports etiquette). Eventually, this turns them into 'docile bodies' (Duncan, 1994; Lang, 2010; Lenneis et al., 2021; Rail and Harvey, 1995). However, the role of corporeality in esport appears to be different from traditional sports. Even though top performance in esport requires fine motoric prowess and hand–eye coordination on a high level, the 'steering' physicality of the performance is invisible, whereas only the mediated performance through the digital body is relevant to the observers (Riatti and Thiel, 2023). The physical body is not the focus of the sportive performance, but the digital avatar is (Borggrefe, 2021; Holt, 2016; Thiel and John, 2020). Most likely, disciplinary mechanisms cannot be observed in competitive gaming, which may eventually be a reason for arbitrary or deviant behaviour (Kwak et al., 2015;

Lapidot-Lefler and Barak, 2012). This conceptual paper closes in on this topic by drawing on the idea of *panopticism* to theoretically investigate how far the social role of the physical body (regarding disciplinary mechanisms) differs when compared to traditional sports and elaborates on the implications which can be derived for players and other actors in esport, based on this particular role of corporeality.

In the following sections of this paper, we first explain the concept of *panopticism* and why it is an appropriate theoretical background for our analysis. Secondly, we draw on this theory to elaborate on the disciplinary mechanisms in esport and introduce the term *dysopticon* to illustrate the role of the (partially) absent physical body in competitive gaming. On this basis, we finally discuss the practical and theoretical implications which can be derived from our analysis.

Elaborating on panopticism and its alterations

Panopticism is a term introduced by Michel Foucault in his work *Discipline and Punish* (Foucault, 1977). He analyses the social mechanisms behind the changes in the criminal justice system of Western societies. Some scholars argue that this book has an exceptional position in its oeuvre, being particularly influential for politics and (sport) sociology (Reinhart, 2014; Wolf, 2014). The term *panopticism* refers to the panopticon, an architectural idea by Jeremy Bentham from the late 18th century (Bentham, 1791; Foucault, 1977). His concept is designed particularly for prisons but can be transferred to other institutions where people are kept under supervision, like penitentiary houses, schools, or hospitals. The architectural alignment of Bentham's idea allows that a single ward can watch over all inmates at once from a central point, without the inmates knowing they are being observed. It explains how mechanisms of surveillance or discipline, namely hierarchical observation, normalizing judgment, and examination, create docile bodies. A 'normalizing gaze' leads the inmates to a perpetual feeling of being surveilled and – alongside any form of deviance resulting in punishment – induces normative behaviour (Foucault, 1977).

Panopticism does not only concern the penitentiary system but also schools, hospitals, sanatoriums, and sports grounds. Still, Foucault used the prison analogy to showcase how surveillance induces disciplinary power in an idealized way (Cole et al., 2004; Foucault, 1977). The normalizing, normative, or panoptic gaze does not have to be visible to create docile bodies. The idea of a surveilling authority is sufficient because the effect of surveillance is permanent, although it is implemented only on occasion (Foucault, 1977; Markula-Denison and Pringle, 2007). Even when the authority is physically absent, people will act according to the norm, as they internalize the normative behaviour, resulting in self-surveillance (Andrews, 1993; Foucault, 1977; Markula-Denison and Pringle, 2007; Rail and Harvey, 1995; Rinehart, 1998). Foucault was critical of the panopticon, stating that the panoptical power not only is to be regarded as a repressive, insidious force but may also be productive by inducing benevolent behaviour and creating new perceptions of reality (Foucault, 1977; Rail and Harvey, 1995).

While some critiques of *panopticism* in the digital age argue that the concept is outdated and no longer applicable, other scholars suggest that *panopticism* is still a relevant

and valuable theory for understanding contemporary surveillance practices (Galič et al., 2017; Haggerty, 2006; Haggerty and Ericson, 2000; Lyon, 2006). Haggerty and Ericson (2000) introduce the concept of the *surveillant assemblage*, which emphasizes the multiplicity and diversity of contemporary surveillance technologies and practices but does not reject the panopticon model entirely. Galič et al. (2017) argue that *panopticism* is one of several useful surveillance theories and that it remains relevant today because it helps us to understand how surveillance practices are justified and legitimized. While some scholars critique *panopticism* for its focus on the physical architecture of surveillance, others argue that the theory can be adapted to analyse the digital realm. For instance, Lyon (1993) proposes the concept of the 'electronic panopticon', which applies the principles of *panopticism* to digital surveillance practices and emphasizes the importance of including social, cultural, and economic contexts when applying the theory. Overall, while there are certainly valid critiques of *panopticism* in the digital age, the theory continues to be a valuable foundation for understanding contemporary surveillance practices. Scholars can continue to use the panopticon model to critically analyse the complex and evolving landscape of surveillance (Boyne, 2000; Lyon, 2006). Especially considering the adaptation in digital realms and the shift from the idea of a physical architecture toward a virtual one opens new possibilities to use the concept of *panopticism* in an increasingly *digitalized* world.

Some articles connect *panopticism* and gaming (Kerr et al., 2014; van Nuenen, 2015), and a few specifically link it to competitive gaming or esport. Krassen and Aupers (2022) show that players can feel subordinated to disciplinary mechanisms of *panopticism*, like requiring to train individually or in teams, but they have always the option to opt out. Tomkinson and van den Ende (2022) describe an in-game function that allows players to judge deviant behaviour of other players as a panoptic mechanism. The idea behind these mechanisms is that players sense the gaze of an endorsement and punishment system and act accordingly. Their study shows that the said mechanisms are effective with players and it appears that deviant and toxic behaviour can be reduced with such a system. However, none of the mentioned papers uses the physical body as an immediate starting point for the investigation, compared to the present study. Considering that esports and competitive gaming can be understood as new forms of sports, it is important to include corporeality when examining social phenomena in esport and competitive gaming (Riatti and Thiel, 2023).

In modern sports, panoptical mechanisms are omnipresent. Scholars use the term *sporting panopticon* for various expressions of disciplinary mechanisms. For example, the depiction of women's bodies in fitness magazines is regarded as a panoptic phenomenon that triggers self-surveillance due to the pursuit of idealistic body aesthetics (Duncan, 1994; Markula, 1995). Coaches monitor athletes on and off the sports grounds in such a way that athletes sense the coach's normalizing gaze and survey themselves. In their personal lives, they follow the induced normative ideals to achieve performative and competitive goals. These can be special diets, abstinence, or additional exercise (Cole et al., 2004; Heikkala, 1993; Lang, 2010; Lenneis et al., 2021). The architectural alignment of sports stadia with security systems during sports events can also be labelled as *panoptical*. Security checks and video surveillance, as well as broadcasting systems, tribune design, or seating regulations, create an environment where subjects

are exposed to a normalizing gaze. Anyone attending must subordinate to it at sports events (Bale, 1994; Sugden, 2012; Turner and Lee Ludvigsen, 2022). However, while Foucault describes the panopticon as a means where the few survey the many, in a stadium or during a broadcast, a conversely normalizing gaze originates from the spectators observing the few players. This can be described as an *inverse panopticon* or a *synopticon* (Galič et al., 2017; Mathiesen, 1997; Tjostheim and Waterworth, 2020). If we extend this idea to competitive gaming, the first thing to say is that there is factually no one surveying the player's physical body. The contender's corporeality and action are mediated by digital avatars. Therefore, it could be described as the opposite of a pan- or synopticon. We propose the term 'dysopticon', composed of the Greek word *dys*, which means missing, and *opticon*, referring to visibility. In the following sections, we elaborate on the disciplinary mechanisms of hierarchical observation, normalizing judgment, and examination and how these occur in a competitive gaming setting. We also put forth some reflections on the *dysopticon* and its accuracy in the context of competitive gaming.

Investigating the disciplinary mechanisms in esport

The role of physicality in esport is – like the foregoing arguments show – much disputed. From a Foucauldian perspective, physicality can be expressed in esport in three ways: as a hierarchical observation, as normalizing judgment, and in the form of an examination (Cole et al., 2004; Foucault, 1977). (1) Hierarchical observation describes the spatial organization and architectural features necessary to create a panopticon. The specific spatial arrangement allows an efficient, constant observation of entities. For esport, this could refer to the setup of the computer where a player competes. (2) Normalizing judgment implies the existence of an authority observing behaviour and punishing or rewarding it, depending on the defiance or docility shown. In this context, sanctioning should always be corrective towards normativity. In esport, computer game developers may impose norms in the form of rules or mechanics within the game physics on the players. (3) Examination combines observing hierarchy and normalizing judgment, thus allowing to qualify, classify, or punish via a normalizing gaze (Foucault, 1977). This occurs, for example, in tournaments where referees are monitoring the players physically and virtually, according to the previously defined rules of the competition and the game.

Hierarchical observation in esport and competitive gaming

A crucial distinction between traditional sports and esport regarding the means of observation is spatial organization. Sports grounds, like facilities, pitches, and gyms, are physical and accessible, and therefore, the athlete is observable. Although they are rather distinctive in size, shape, etc., nearly all sports grounds share attributes of a panopticon (Fiske and Hancock, 2016). The gaze of all participants in this system – passers-by, spectators, other athletes, coaches, etc. – is part of the hierarchical observation (Foucault, 1977; Turner and Lee Ludvigsen, 2022).

However, competitive gaming or esport is not bound to a certain location but depends on the device played on. The computer or console used for competitive gaming is commonly located in the players' home, a private, not openly accessible location, hidden from external observation. The gameplay takes place in a digital environment, with the actions being mediated by a digital avatar. The player is isolated from physical interaction with others and invisible to a hierarchical observation unless his or her in-game actions can be linked to the physical body. This usually only happens at a certain level of performance, when players start competing against each other on offline events, for example in sports stadia, arenas, or similar venues. Therefore, it can be argued that, especially in the case of the basic levels of competition, gaming happens in a *dysoptic* environment.

Except for the publishers of the games, there are practically no hierarchical institutions controlling this player group, which forms the majority of the player base (Hayday et al., 2021). The physical bodies don't show up, so hierarchical observation cannot be enforced. As a result of the 'unidentifiability', online spaces can potentially trigger deviant and toxic behaviour (Lapidot-Lefler and Barak, 2012). Therefore, an extended practice in games is 'smurfing', which refers to a high-skilled player using the account of a low-skilled player to play against other low-skilled players – a common problem in amateur competitions (Hippe et al., 2017). Other examples are players' toxic behaviour against teammates or opponents or reduced willingness to collaborate, which can be critical for team-based esport titles (Cress and Kimmerle, 2008; Lapidot-Lefler and Barak, 2012). Eventually, because of computer mediation, the observation of the physical body is not possible. This means that the representative function of the body and its role as a means of identification can't be carried out.

Normalizing judgment in esport and competitive gaming

Compared to traditional sports, in esport, we see few institutions in charge of setting up norms, ethics, or moral values or being able to monitor and sanction deviant behaviour (Czegledy, 2021). Some rules of the game are predetermined by the way game developers and publishers design in-game physics and mechanics (Hayday et al., 2021). However, these mechanisms are rather the constitutional rules of the game and have no impact on behavioural rules and ethics. While the game mechanics define what is possible in the game and what is not, rules for behaviour or social interaction cannot be implemented within them. Because of the lacking normalizing judgment, the role of corporeality as a representative of values (and therefore normative behaviour) diminishes. Although there is a basic perception of what can be considered etiquette in gaming or adequate social behaviour, the breaking of these rules is difficult to monitor (Taylor, 2009).

Immediately sanctioning misdemeanours is almost impossible, due to the lack of physical enforcers. In traditional sports, participants have a certain control function towards each other, based on hegemonic normative values. For example, a player may act according to the rules of the game (enforced through the referee), stick to a strategy (made by the coach), exercise to become healthy (as advised by a physician), or pursue normative aesthetics (according to beauty standards) (Thiel et al., 2013). So, in traditional sports, deviance becomes visible and interventions are applied: The player who commits a rough foul is expelled, and the patient who skips rehab is exposed by his physician or is not

recovering. In esport overarching institutions, defining these values is not like traditional sports. Players compete in the games according to the rules and environment created by profit-orientated developers or publishers, with limited means of monitoring deviant behaviour or sanctioning it (Czegledy, 2021). Therefore, social interaction or behaviour in games is arbitrary and can easily shift towards deviant behaviour (Hayday et al., 2021; Kwak et al., 2015; Lapidot-Lefler and Barak, 2012), as it cannot be sanctioned adequately to prevent it from happening. For example, temporary or permanent exclusion from a game can be bypassed by acquiring a new anonymous account. Physical punishment is not possible due to the digital environment in which the competition takes place. Lastly and since competitive gaming is no substitution for physical exertion, we must remind that aesthetics or health is not promoted (Haupt et al., 2021; Schmidt et al., 2018). Authorities that would usually monitor these attributes in traditional sports, including self-surveillance or beauty standards (i.e. practitioners or physicians) may not exist in the immediate physical actual environment.

The body's relevance for reproducing norms only emerges when players become part of organized structures like the ones in traditional sports. Here, gamers must accept the norms of an entity beyond the digital realm of the game itself, and also social environments like clubs, teams, leagues, or loosely organized casual competitions (Thiel et al., 2013). In these environments, the players understand that for example their club can sanction them if they miss practice, behave unsportsmanlike, damage the reputation of the club, etc. However, in competitive gaming, the majority of the player bases are not competing in any organized environment and are therefore not exposed to external judgment. The sanctioning of the normalizing judgment is feeble and might therefore not be perceived as threatening. For example, if a player gets ejected immediately from a game due to misbehaviour, he or she can simply join another match. A (temporary) ban on the gaming account might take weeks to be implemented and may easily be evaded by creating a new (anonymous) account (Tomkinson and van den Ende, 2022). If normative behaviour cannot be induced through the physical body, like in traditional sports, this particular role could be fulfilled through different means, such as linking one's identity to the gaming account. This would strengthen the sanctioning and could support the normalizing judgment. The implementation, however, would be challenging to achieve considering the necessity of monitoring vast numbers of players at the same time (Kwak et al., 2015). Further, players can figure out how to avoid or abuse existing monitoring systems to their advantage. Therefore, any monitoring and sanctioning by the publishers require good care to adjust to the players' behaviour (Foucault, 1977; Tomkinson and van den Ende, 2022).

Examination in esport and competitive gaming

If neither normalizing judgment nor hierarchical observation may be carried out like in traditional sports, the element of examination in esport barely exists (Foucault, 1977). Typically, the physical body is not the centre of attention and is usually not present. So, its role as a point of reference for communication, and interaction, and as a behaviour-inducer, diminishes. Sanctioning is seldom as immediate as in traditional sports because of the missing authorities, and if punishment is executed, it is not productively corrective,

as described by Foucault, but excluding, by being kicked or banned from a game (Irwin and Naweed, 2020; Kwak et al., 2015). The anonymity in gaming, therefore, stands in contradiction to the disciplinary mechanisms (Lapidot-Lefler and Barak, 2012). Further, an overwhelming amount of toxic behaviour is fuelled by the idea that there is no serious control or sanctioning and preventive mechanisms and that these are not implemented, not working, or not being seriously taken (Irwin and Naweed, 2020; Kwak et al., 2015; Tomkinson and van den Ende, 2022). This, of course, depends on the type of game and the involvement of the publisher (or any similar authority). Further, the role of examination is limited considering that competitive gaming is no substitute for physical exercise (Haupt et al., 2021; Schmidt et al., 2018). The body's role as a mirror of normative aesthetic values (Markula, 1995; Thiel et al., 2013) cannot be executed through esport, which diminishes the relevance of self-surveillance while playing competitively even more.

So, despite being in communication and interacting with players or teammates, disciplinary mechanisms have no effect and extrinsic motivation for normative behaviour might be missing (Tomkinson and van den Ende, 2022). Theoretically, social interaction with teammates or opponents can be corrective for the players in sports and the same works for face-to-face competitive gaming (Jansz and Martens, 2005; Taylor et al., 2017). The anonymity of the internet, however, has a subversive effect on this (Jansz and Martens, 2005; Kwak et al., 2015; Lapidot-Lefler and Barak, 2012). Further, the high turnover of players in competitive gaming may amplify this. In traditional sports, competitors are in direct contact with each other and are recognizable even beyond the competition. Presumably, this amplifies the importance of sports etiquette because the social interaction or the conflicts do not necessarily finish when the competition comes to an end: In football, a retaliatory action because of a conflict during the game may also be executed after the final whistle. In online gaming, the players are randomly assigned based on their skill level to compete. The interaction only occurs during the match and because of the high number of players, it is unlikely to meet the same players again and the anonymity of the internet complicates the possibility of identifying each other (Lapidot-Lefler and Barak, 2012). Just like for the hierarchical observation and the normalizing judgment, the examination is non-existent for most competitive gaming. Players who are competing in casual or loosely organized competitions can remain unidentifiable. The body as an object to induce normative behaviour does not appear, and disciplinary mechanisms therefore cannot work as explained by Foucault (1977).

Although there are many similarities between traditional and esport in what concerns competitiveness, physical and mental prowess, or degree of professionalization (Riatti and Thiel, 2021), the panoptic mechanisms show a distinction when the players are physically absent while competing. Unlike in traditional sports, the normalizing gaze is only relevant for organized (and therefore most likely for professional levels), representing a minor proportion compared to the overall number of players (Julkunen et al., 2021). Regarding *panopticism*, one could argue that we can observe a *dysopticon* for casual competitive gaming. On this basis, it is possible to introduce a new perspective considering competitive gaming as referring to the different interplay between the panoptical mechanisms as depicted further above.

Conceptualizing the gaming *dysopticon*

Hierarchical observation, normalizing judgment, and examination are, at the very most, partially observable. Potential positive effects of the panopticon evoked through the presence of the physical body in the form of a productive and constructive force inducing normative behaviour, action, or change might not function (Deleuze, 1992; Foucault, 1980; Rail and Harvey, 1995; Tjostheim and Waterworth, 2020).

Contrary to traditional sports, normative behaviour like sportsmanship or netiquette is difficult to mediate when the physical body is not on display competing (Irwin and Naweed, 2020; Lapidot-Lefler and Barak, 2012; Tomkinson and van den Ende, 2022). Behaviour or interaction between teammates and competitors can become arbitrary. Nobody except the player herself or himself is watching, evaluating, controlling, or sanctioning behaviour with limited feedback or consequences for misdemeanours. Disciplinary power can barely be induced in the players, and docility is less likely to be achieved since neither gaze nor physical body is present in competitive matches. The downside of this missing normalizing gaze can be seen in frequent toxic behaviour or other misdemeanours, during competitive matches, because of the anonymity of the players (Hayday et al., 2021; Irwin and Naweed, 2020; Kwak et al., 2015; Lapidot-Lefler and Barak, 2012). Further, it reduces or removes the role of aesthetics, health, or fitness – common indicators for panoptic mechanisms (Cole et al., 2004). This can also be seen in the fact that competitive gaming or esport is no substitute for physical training (Haupt et al., 2021; Schmidt et al., 2018). So, esport is not favourable for physical activity and its desirable beneficial traits, unlike what is usually denoted by traditional sports (Heinemann, 2007; Thiel et al., 2013).

The player's physical movement, despite being elemental for playing, is not the centre of attention. Instead, the depiction of the movement by the digital avatars in the game becomes the centre of attention (Ekdahl and Ravn, 2019, 2021; Hamari and Sjöblom, 2017). This implies a disruption between corporeality and the sport and diminishes the physical body's significance according to a common sportive attribution of the physical body. Thus, it is not unlikely to see professional gamers competing on the highest levels, with body compositions diverging from the hegemonic social image of an athletic body (DiFrancisco-Donoghue et al., 2020; Jenny et al., 2017; Riatti and Thiel, 2021). However, the differing focus on the body and the departure from an ideal athletic body are not signs against sport. Sport-specific movements are performed regardless of onlookers, and each sport has its own conditional or coordinative requirements (Thiel et al., 2013). This makes a comparison between highly athletic sports and sports with minimalistic movement requirements problematic. Further, a lacking normalizing gaze implies high participatory potential. Theoretically, dispositions like aesthetics, religion, gender, sexual orientation, ethnicity, or disabilities are not burdens for the interaction in competitive gaming as the player may be protected from discrimination or exclusion. Therefore, the *dysopticon* may be regarded as an inclusive and barrier-free sportive environment (Hayday et al., 2021; Hayday and Collison, 2020).

However, it must be mentioned that these dispositions are often the target of insult, discrimination, or other toxic behaviour in competitive gaming, provided that aggressors have access to this information (Hayday et al., 2021; Hussain et al., 2021). Thus, a

dysopticon represents, on the one hand, a space of open expression free from stigmas, but on the other hand, a 'lawless space' that allows for deviant behaviour. Assuming the idea of online embodiment (Sundén, 2003), which states that a user always feels connected to and can represent their physical body online, this means that the user can still be defamed despite the supposed absence of the physical body. This can be seen, among other things, in toxic behaviours based on genetic dispositions. Therefore, there is a certain duality between the free expression of personality independent of genetic, physiological, or other physical characteristics that may be perceived to place the user in certain social classes, environments, or demographics (Hussain et al., 2021), and the practical experience that shows that users, once they make themselves recognizable, still use genetic and physical dispositions to insult or otherwise attack the person they are interacting with (Kwak et al., 2015). It is therefore important to consider the extent of the information that a player reveals about themselves in order to avoid remaining in a *dysopticon* while interacting with others. However, this is not to be understood as a communication barrier, as it only refers to the information a player gives about their status, identity, or physicality.

On a structural level, the dysoptical state is comparable to informal sports like skateboarding or surfing, which can be considered counterparts to the existing hierarchical sports structures (Reinhart, 2014; Reinhart and Krüger, 2007). Competitive gaming can therefore be used as a practice for personal self-expression without having to match hierarchical or normative standards (Hao et al., 2020; Hussain et al., 2021). It can be stated that the physicality, movement practice, and body functional techniques in esport or competitive gaming are in line with theories about the differentiation of sport (Heinemann, 2007; Thiel et al., 2013). Therefore, one can argue that esport is a contemporary approach towards and a logical development of modern sport concerning the trend of increasing disembodiment in society (Riatti and Thiel, 2021; Thiel and John, 2020).

Based on the theoretical approach of research on the social roles of the body regarding disciplinary mechanisms, one can argue that current competitive gaming and esport are diverging from what can be considered a sporting panopticon. Many established values, norms, or structures from traditional sport, ranging from fair play or sportsmanship to an athletic body, up to associations of public utility, might be underrepresented, non-existent, or difficult to establish and promote, especially at a grass-roots level. On the other hand, the gaming *dysopticon* is theoretically a barrier-free and therefore an inclusive space in the field of sport. Players can compete with and against each other regardless of genetic or personal dispositions. Anyone who might not fit into existing sport structures can find self-expression in competitive gaming and esport (Hao et al., 2020; Hussain et al., 2021; Trepte et al., 2012). With this background, the question arises about how the characteristics of the gaming *dysopticon* can be perceived by stakeholders from the esport environment, like players, teams, publishers, or politics.

Theoretical and practical implications

The description of the gaming *dysopticon* reveals that the interweaving of physical and digital worlds in competitive gaming is uncommon for traditional sports. There is a

shift of attention from the physical towards the virtual body. This can also be observed in society and might change the perception of corporeality in general (Goebeler et al., 2021; Riatti and Thiel, 2021; Thiel and Gropper, 2017). However, the physical body is still elemental and indispensable for competitive gaming (Ekdahl and Ravn, 2019; Riatti and Thiel, 2023). Considering this and the fact that players are the core key actors of the esport and competitive gaming ecosystem (Julkunen et al., 2021), various implications for the many stakeholders of this system can be derived.

First, as described in the preceding sections, hierarchical observation, normalizing judgment, and examination are less likely to function compared to traditional sports. Thus, the proclaimed productivity of *panopticism* might not exist (Foucault, 1977; Wolf, 2014). Although publishers and developers have similar functions like organizational structures from traditional sports, the mediation of the said values is not within their scope (Breuer, 2012; Julkunen et al., 2021). Therefore, introducing central governing bodies for esport could help implement and enforce overarching rules and codes of conduct for all organized leagues and tournaments from amateur to professional level (Abanazir, 2019; Abanazir, 2022). This could include guidelines on how to tackle problems such as cheating, doping, and match-fixing but also endorse values such as sportsmanship or (n)etiquette. Publishers can outsource these responsibilities to associations, which would be accountable for tournaments, leagues, and esport activities within their region (Czegledy, 2021). This is already being done by esport organizers, for example in working together with the (inter)national anti-doping agencies (WADA/NADA), the Esports Integrity Commission (ESIC), and national non-profit esport associations (Abanazir, 2019; Ghoshal, 2019; Taylor, 2012; Tweedie et al., 2022). Misconduct, like toxic behaviour, cheating, or rule violations in competitions could be monitored, and the sanctions would be valid for all associations under the overarching governing institution. Still, taking the sport system as an example, this would require the help of volunteers managing these structures and the willingness of the for-profit organizations to collaborate and support this beneficial role (Thiel et al., 2013). A step in this direction could be acknowledging the common benefit of esport in a similar vein to traditional sports and therefore adopting it within the existing sports structures. For example, the past two German governmental coalition agreements mention this as a goal (CDU et al., 2017; SPD et al., 2021). This would open the possibilities for clubs to acquire subsidies to set up an esport division and associations to organize competitions. Some (non-profit) entities have already devoted resources towards this purpose but it requires help from politics and IP-holders to establish a similar standing to traditional sports associations (Willimczik, 2019).

Second, it is possible to create governmental regulations which can be connected to political interventions in the gaming branch. It is crucial that these interventions are incentive and benevolent for the stakeholders and not repressive or invasive. For example, the governmental interventions in China, ranging from forcing players to identify themselves via face recognition to banning interaction with foreign communities and players, as well as limiting play time (Tapsell, 2019; Xiao, 2021), counter the traits of the gaming *dysopticon* but also jeopardize fundamental traits of sport like self-expression or intercultural exchange (Thiel et al., 2013). Despite interventions from governmental bodies, the integrity of the sport, in this case, esport, must not be subverted. Possible

options could be encouraging publishers and developers to implement educational systems within their games that allow a conscientious interaction with gaming and esport (Czegledy, 2021).

Third, publishers can normalize the players by implementing a system in which players need to verify their identity to play and are only allowed to own one account. This would also call for a neutral referee to evaluate the players' behaviour in matches. However, based on the vast player numbers of certain games, it is a logistical and economic challenge for a single entity. Outsourcing these tasks to other entities like clubs or associations could help cope with this problem. Still, publishers profit monetarily from people with multiple accounts, as players might need to repurchase the game when their accounts become void. Corporate ownership implies limited access to the games, and the potential downfall increases drastically through misdemeanours. Several examples show how professional gamers or streamers have been banned from games or leading streaming platforms because of cheating, match-fixing, or toxic behaviour (Taylor, 2012). Since streaming services and especially games can be regarded as monopolistic (Abanazir, 2019), exclusion from these can be career-threatening for professional gamers and streamers.

Fourth, when playing in an organized club, defiance can be sanctioned with exclusion from the club or a league and can result in a loss of reputation (Thiel et al., 2013). Authorities attempting the construction of a normative or panoptical gaze can be teammates, opponents, coaches, managers, a league, or associations. Players who used to be anonymous and compete under a nickname now appear as personas and become visible. In such an environment, topics like etiquette, sportsmanship, media literacy, and many social conventions could be conveyed (Riatti and Thiel, 2021). So, organized clubs and associations might be essential not only to prevent and monitor but also in taking on a role as an educational player teaching adequate behaviour for esport (Robertson et al., 2019).

Fifth, if players are willing to go pro, sooner or later, they will have to identify themselves to compete in higher-level tournaments or leagues and at offline events. Still, during the pandemic, many tournaments were entirely held with players only having a webcam installed, so they were also visible to the spectators. This can also be seen on streaming platforms: there, players become visible to a normalizing gaze of their audience, and indirectly also from the platform they are streaming on and from the games they are playing. Certain misdemeanours eventually lead to exclusion from each of the platforms or systems, depending on the gravity of the misconduct. Spectators might stop tuning in, the platform can withdraw access to streaming, or players may be banned from the game. However, in this case, we must mention that opening oneself to a normalizing gaze via streaming is optional and voluntary, a trait similar to what Johns and Johns (2000) see in traditional sports.

Sixth, when visiting offline events for casual competitive gamers like LAN-Parties, the negative aspects of the *dysopticon* become obsolete. Suddenly, misdemeanours may be prevented or penalized on the spot, just like in the above-mentioned example on the football pitch, via exclusion or loss of reputation. So, it is to expect that the amount of deviant behaviour is significantly lower at offline events than online, not least because the direct human interaction has a gratifying effect on the players (Jansz and Martens, 2005). This

thought can also be picked up by sports clubs when establishing esport teams within their structures, or by governing bodies when wanting to promote esport: By creating a physical space for competitive gamers to meet and compete with and against each other, the potential beneficial traits of esport, like self-expression, socializing, or developing skills, can be promoted while preventing deviant traits like cyberbullying or toxic behaviour (Riatti and Thiel, 2021; Robertson et al., 2019).

Eventually, it needs to be stressed that Foucault was critical of the way a panopticon works. Despite saying that the enforced power through surveillance must not always be regarded as repressive but also as productive, he labelled the disciplinary mechanisms as insidious and cruel because it puts the surveyed within a system under general suspicion (Foucault, 1977). The power asymmetry between the surveyor and the surveyed creates a one-way induction of behaviour and eventually docile bodies (Galič et al., 2017). Therefore, an imbalance between the different stakeholders, players, teams, associations, publishers, developers, politics, etc. can result in undesirable repressive traits and damage the system, as stated above (Julkunen et al., 2021). For example, the publishers have full authority over who can or cannot play their game. If they use this position against the player base, the players can boycott the game and cause economic damage to the profit-oriented publishers.

These implications and thoughts are not intended to be exhaustive. Still, they show how a different rapport towards the body in esport due to its physical isolation while playing or the disconnection from the activity reveals problems that need to be tackled. On the other hand, this also opens interesting opportunities for sport and society to grasp the potentially positive aspects of esport and competitive gaming. Leaving esport entirely unregulated can lead to arbitrariness, while over-regulating is either not possible (as it matches repressive traits towards the players) or subverts potential positive aspects. Nevertheless, the physical body is a central element of sport and it becomes evident that not only do the distinctive physical and motoric requirements in esport require research but also that the body is represented in competitions in a variety of ways since the digital mediation of the movements diminishes the physical social interaction which is usually implied by sport.

Conclusion

In this paper, we have discussed the social role of the physical body in esport. We used Foucault's (1977) *panopticism* to discuss how the ambiguity of physical and digital corporeality affects disciplinary mechanisms in competitive gaming. Since the physical body is not on display, the disciplinary mechanisms are unlikely to work like in traditional sports. This results in a different perception of the body's social traits as a point of reference for social interaction, communication, and identification. It is unclear how far these roles can be picked up by corporeality in the digital realms: On the one hand, players identify with their in-game characters (Hao et al., 2020; Hussain et al., 2021; Riatti and Thiel, 2023), on the other hand, it is unclear whether the players can be exposed to disciplinary mechanisms via their digital avatars. Eventually, more research is needed to understand how far social traits of the physical body are embodied by digital corporeality.

Since sport is often regarded as a forerunner to future trends which will be adopted by society, it is possible to transfer some findings to other societal branches (Davenport, 2014). Esport, as a new form of sport providing a new movement practice compared to traditional sport, is a descendant of digitalization. Physical contact and therefore physical corporeality are reduced, and social interaction is mediated through electronic devices. Physical corporeality gives way to a digital embodiment, eventually affecting the way we need to consider the (social) role of the body (Thiel and Gropper, 2017). Still, scholars have shown how important it is to track physical corporeality even in situations where the physical body might not be visible (Thiel et al., 2019). Therefore, although in esport, corporeality can be perceived differently than in traditional sports, its physical aspect must be upheld. Generally speaking, the role of the body is not only changing in sportive contexts but presumably also in other societal areas and future research must keep track of the physical, psychological, and sociological implications which come along with this process.

Since this paper focuses on the physical body, it should be noted that the relevance of the digital body also needs thorough investigation. Therefore, this paper can be regarded as an initial approach treating the duality of the physical and digital body in esport from the physical perspective. The importance of the body (both physical and digital) in esport is undeniable, and it is an interesting field for sport science, while research about it is still in its infancy (Ekdahl, 2021a; Riatti and Thiel, 2023).

Author Contributions

Paolo Riatti did the conceptualization of the theoretical framework, reviewing the literature, formal analysis, writing, and revision – original draft; Ansgar Thiel did the conceptualization, supervision, and writing – review & editing.

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6 Final Discussion

The present dissertation aims to contribute to a better understanding of the mass phenomenon of esport by approaching it through a sport scientific and sociological scope. It focuses on different social dimensions of esport, including its societal impact and corporeality. Therefore, section 2 gives a broad overview of definitions, and deals with the background of esport. This is followed by an outline of the current state of research on esport and the compiling of relevant research desiderata and gaps. For a better understanding of the topic, section 3.1 delivers a deeper understanding of digitalization in sports and what role esport plays within this process. Subsequently, section 3.2 elaborates on the role of immersion in computer games, and especially in competitive gaming. This is particularly of interest since immersion plays no role in traditional sports, and this is an interesting perspective for the comparison between esport and traditional sports. In esport the sportive performance is delivered in the real world, using an electronic device, and mediated into the virtual world. On this basis, the section elaborates on how far the virtual realm in the competitions can be perceived as reality, using the reality-virtuality continuum as a gateway for these considerations (cf. Milgram et al., 1995; Skarbez et al., 2021), and concludes how this duality is observable in the esport ecosystem, beyond the practice of gaming. This theoretical background helps to better interpret and categorize the findings of the three scientific articles, which form the main part of the present dissertation. Section 4 gives a short overview of the dissertation so far and introduces section 5 in which the three scientific articles are presented. The papers discuss the societal impact of esport, the role of the body in esport in general, and the theoretical analysis of corporeality in esport in detail, especially considering the duality of the analog and digital world where esport is taking place.

The findings and implications elaborate the sport scientific and sociological discourse about esport as a new form of movement practice, and potentially, a new form of sport. This can serve as a foundation for future research regarding the sociology of and social issues in esport and competitive gaming in general. Eventually, this dissertation contributes to the debate about whether esport can be considered a sport.

Furthermore, it offers a differentiated perspective on competitive gaming regarding its societal impact, especially for the players and stakeholders, for sport in general, and society. Certainly, this debate will remain a prominent topic for research evolving around esport and is likely to endure (cf. Ekdahl, 2021a). Eventually, this can also be traced back to the difficulties in defining sport in general and the different cultural, societal, or physical perceptions of what the term sport implies (cf. Heinemann, 2007; Thiel et al., 2013; Willimczik, 2019).

6.1 Central Findings

On an overarching level, the findings of this dissertation show that esport has become a sport phenomenon, and its societal influence can be observed on similar levels to traditional sport. It can be seen as a 'social innovation' (cf. Westley & McGowan, 2017), since it translates the ideas of sport onto digital platforms, which allows new forms of social interaction and movement practices. The accessibility and lack of liberty in esport, open up the idea of sport to more people who might not have been able to participate in traditional sports or sport-like competitions, and it can convey positive values of sport to the players. Esport comes with a shift of paradigm considering the term sport. It may be a logical conclusion of the differentiation of sport and a contemporary idea of what sport can be, considering its constant adaption to technological and societal progress.

Esport has become a prominent and frequently discussed topic in sport science as Articles 1 and 2 show. Both reviews underline contemporary findings that esport is not only growing in popularity, player numbers, or degree of professionalization, but also in terms of scientific discourse about esport (cf. Chan et al., 2022; Formosa et al., 2022; Pedraza-Ramirez et al., 2020; Reitman et al., 2020). The research questions are diversifying and, especially in the past five years, the number of scientific publications has increased exponentially. Seemingly, there is a connection between the growing social relevance of esport and the scientific discourse, not only for sport science or sociology but also for disciplines like law, media, economics, etc. This is in line with other findings about the scientific relevance of esport (e.g. Reitman et al., 2020; Tjønndal et al., 2022; Vera et al., 2018). Article 1, particularly, shows how esport has already established itself within certain societal fields that are attributed commonly to

traditional sports. However, there are still many blind spots or underdeveloped topics in research about esport, which can be traced back to both the relatively young age of the phenomenon itself, and to the fact that not all topics where a societal impact of sport is observable are relevant for esport. Future research is recommended to keep track of this societal impact and investigate fields that have not been discussed as much or not at all, for example, according to the MESSI-framework (De Rycke & De Bosscher, 2019). This includes topics like implications deriving from doping issues in esport, its impact in a (sport) political context, or consequences for stakeholders engaging with esport, such as introducing teams in sporting clubs (cf. Abanazir, 2022; Tjønndal et al., 2022). Depending on the research question, esport may be investigated on a macro, meso, or micro-level – just like in traditional sports (cf. Thiel et al., 2013). For instance, it is possible to regard it as a whole practice of multiple genres with overarching phenomena, or specifically focus on certain games and their peculiarities on a micro-level (see section 2.1.3), such as relevance in certain cultural regions, physical and mental requirements, or movement practices for example. However, esport should still be regarded as a field of research relevant to various disciplines linked to sport science, such as media science. This is because esport shares the same phenomena evolving around traditional sports, like medial staging, and is also part of the 'gaming' media. Many typical facets of gaming in terms of immersion, technical and digital literacy, behavioral aspects, or gaming disorders are typically not treated in sport science but could find their way into it regarding the potential future of esport as part of the sport system (cf. Jonasson & Thiborg, 2010).

The results from Articles 1 and 2 show that esport literature is still focusing mainly on esports played with a mouse, keyboard (computer games), or typical controller (console games). This shows a disjunction regarding the way esport can be perceived according to Goebeler et al. (2021) or Jenny et al. (2017). It appears to be like motion-based video games, fully immersive virtual reality competitions like the *Virtual Athletics League* (VAL, 2022), and 'digitally replicated sports' (Goebeler et al., 2021) are hardly mentioned in the broader context of electronic sport. Still, the remarks considering what can be considered esport are logical, since regardless of the way physical input is mediated into

a digital world, digitally transferred, and digitally replicated sports share the same practice of competitive gaming in a virtual environment. Simply, the degree of immersion and presumably the assignment on the reality-virtuality continuum varies (cf. Nilsson et al., 2016; Skarbez et al., 2021). Still, the lack of research can be traced back to the fact that, especially computer gaming, is the dominant and most popular way of playing esport titles (cf. Esport Earnings, 2023; Jenny et al., 2017), and the sophisticated and expensive technology required to play MBVG stands in the way of creating a mass phenomenon. Similar to traditional sports, such as track and field, esport combines not only different games but also different movement practices in one terminology (see section 2.1.3). Although MOBA games like *LOL* and shooter games like *CS:GO* are played with the mouse and keyboard, the motoric requirements are different (Egliston, 2020a, 2020b; Nagorsky & Wiemeyer, 2020), so is the requirement using a controller, for example for SVG like *FIFA or Madden NFL*. Sim-racing – so virtual motorsport – is already very close to what Goebeler et al. (2021) considers digitally replicated sport. The equipment – the rigs – mimics sitting in an actual cockpit, and the mechanics of the steering wheel and pedals imitate the actual force generated in a car and which requires adapting to the feedback generated by the controller. Still, as also mentioned in section 3.1, some external conditions, like the impact of weather or g-force do not affect the player but might play a role in the game's virtual mechanisms. These examples underline that esport is diversifying in style, requirements, degree of (systemic) immersion, and particularly movement practice.

All three Articles support the argument that esport mirrors the societal trend in which corporeality and social interaction are increasingly mediated in digital worlds (cf. Pfeffel et al., 2020; Thiel & Gropper, 2017). In this context, sport may be regarded as a forerunner or a mirror of society's technological development (cf. Ratten, 2019). Therefore, esport can be regarded as a contemporary or new understanding of what sport can look like, ranging from the use of technological equipment to the way it affects the social interaction between participants in competitive gaming. Article 1 discusses the socialization potentials via in-game communication, and this topic is raised particularly when examining the societal impact of esport. The findings show strong

parallels to traditional sports, despite being mediated through online spaces. Players organize themselves in online communities regarding their respective games and create a platform for social exchange. In this context, Article 2 reveals that still many phenomena about corporeality in esport are treated from a typical sportive view: The impact of practicing esport on the body, the correlation between physical activity and competitive gaming, health issues, or biometric analysis. Approaches focusing on intercorporeality between the real and digital world or focusing solely on the digital corporeality in games are scarce. Still, the findings are in line with the idea that the role of the body in esport does not end where the screen begins (Ekdahl, 2021b). Article 2 supports the idea that players build a physical and mental connection with the virtual realm to adequately steer the in-game characters, but they also identify with character traits and the appearance of their digital avatars. It could be stated that the many facets and traits of the physical body in traditional sports, ranging from body control, motoric prowess, body expression, body language, and aesthetics among others, are now stretched onto both representations of corporeality in esport – the digital and the physical one. Thereupon Article 3 challenges the idea that the body's role as a primary point of contact in sport diminishes when competing in the digital world. Therefore, unlike in traditional sport, disciplinary mechanisms that usually depend on surveillance of physical corporeality (Lang, 2010; Lenneis et al., 2021), do not work in esport, where players might identify themselves via their digital avatar. Thus, disciplinary mechanisms may be required to monitor virtual corporeality as well. Eventually, this would need empirical evidence for verification. Still, the change of focus from the physical to the digital body can be a nod toward a different style of social interaction in esport compared to traditional sports. Some scholars argue that toxic behavior, misdemeanor, or cyber bullying are side effects of player anonymity, which is directly related to the physical absence of the body for inter-human connection during online competitive gaming (e.g. Adinolf & Turkay, 2018; Darvin et al., 2020; Kwak et al., 2015; Lapidot-Lefler & Barak, 2012). While such behavior is also an issue in traditional sports, the ecosystem in esport, and the corporeal peculiarities, as described in Articles 2 and 3, raise the idea that these problems need a different scope to that applied in traditional sport. The effect

of anonymity, not least resulting from digital corporeality, but also the lacking institutionalization can be seen as problems when facing misdemeanors in esport (Abanazir, 2019; Hayday & Collison, 2020).

All three articles show that esport provokes a shift of paradigm regarding attributes that are typically assigned to sport. Considering that esport is frequently mentioned in a sportive context, and also considered as a sport in many countries worldwide, the duality of reality and virtuality and the physical requirements may become part of the image of sport. Although the novel movement practice of esport is contrary to the hegemonic image of athleticism, it shares many traits and characteristics with traditional sport, ranging from physical and mental prowess, the pursuit of outperforming the opponents, sports ethos, or the way esport is organized. Esport also functions as a platform for dramatic entertainment and is a socialization driver.

While the values of sport remain the same and are also upheld in esport, bodily involvement is distinctive in esport. Still, this is also true for sports in general, where the body's physical involvement differs significantly between each sport. In the case of esport, it is possible to observe how society's technological progress, in terms of digitalization, is mirrored in sports: There is a shift from the physical toward the digital realms (cf. Thiel & Gropper, 2017; Tillmann & Hugger, 2014). Private and business meetings can be held online, office work gives way to remote working, and physical exercise can be done with the help of online courses. Another aspect of increasing technologization is that people perceive electronic devices as part of their bodies (Liepelt et al., 2017). This is comparable to the way players connect with the input devices and the digital avatars when playing computer games, and perceive them as part of their bodies (Ekdahl & Ravn, 2021; Ford, 2017; Geraci, 2014). The results of Article 2 show that such dichotomy between physical and non-physical/digital neglects the fact that esport is happening in and between both realms at the same time. This contradicts the argument that esport lacks the physicality component to be considered a sport, or is a disembodied practice (cf. Borggrefe, 2021; Parry, 2019; Tjønndal, 2021). Instead, the findings add a new perspective to what role the body can play in sport, and which goes beyond phenotypical, genetic, and physiological traits. It is also necessary to consider its

digital replication as an essential part of the game or – so to say – the sport. Further, not only is sport-specific movement required for each game played (Egliston, 2020a, 2020b; Nagorsky & Wiemeyer, 2020; Toth et al., 2020), but also the ability to link and interweave one's physical body with the digital realm. This practically creates a new movement practice that requires sensorimotor and audiovisual control to adequately perceive and steer, in response to the feedback received from the virtual worlds during competitive gaming. Such interweaving between artificial and real corporeality can also be seen in experiments like the rubber hand experiment (Botvinick & Cohen, 1998)[7] or the body-transfer illusion (Slater et al., 2010)[8]. These works support the idea that the player's physical interaction does not end at the point of input, since instead they are building a physical connection with the virtual realms. Regarding digital and physical corporeality, the dissertation introduced the idea that the body is represented in four different ways in esport: (1) The player's physical appearance; (2) The physical (fine) motoric input from the player; (3) The ability to interweave the digital and physical body; (4) The appearance and identification with the digital avatar. While the former two are also observable in any traditional sport, the latter two are new dimensions that require further investigation. Eventually, this aligns with the idea of Jonasson and Thiborg (2010) that esport becomes a part of the current sport system. Further, as depicted in Article 1, said shift of paradigm is also expressed in the way that esport players consider themselves to be athletes and are also seen as such by fans, universities (collegiate sport programs), the legal system (visa regulations, tax exemptions), the media, and in marketing, where esport is earmarked by many sponsors as an alternative field of advertising to traditional sports.

[7] The rubber hand experiment sees a proband's left hand being visually replaced by an artificial hand, while the real one is concealed. Then the rubber hand and the real concealed hand are stroked at the same time with a brush. This resulted in the proband feeling the stroke on the artificial rubber as if it were the real hand (Botvinick & Cohen, 1998).

[8] The body-transfer illusion can be triggered by replacing a male's virtual body with a female one in virtual reality. Using questionnaires and bio-metrical measuring, Slater et al. (2010) found out that a proband perceives the virtual body as his own, despite the distinctive appearance – in this case – of a female body. In this scenario, even changes in physiological parameters could be monitored when the player's virtual body was strained in the digital environment.

Articles 1 and 2 imply, that the demographics of competitive gamers are young, adolescent, or young adults, and predominantly male. The samples in most of the included studies show that non-males (females, diverse) are underrepresented except in studies focusing particularly on topics concerning gender or the experiences of women in esport. Still, according to market research, including more than 72,000 participants, the distribution of both genders interested in esport and esport enthusiasts is nearly one-third female to two-thirds male (Newzoo, 2022). This discrepancy in the demographics of the empirical studies can be problematic since many findings might be relevant merely for men, such as physical and mental health topics (e.g. Sousa et al., 2020; Trotter et al., 2020), socialization potential (e.g. Jansz & Martens, 2005; Schaeperkoetter et al., 2017; Whalen, 2013), or biometric analysis (e.g. Bayraktar et al., 2020; DiFrancisco-Donoghue et al., 2020). The male prevalence can also be seen irrespective of the players' demographics, and instead considering the gender representation in the playable characters in esport games (Rogstad & Skauge, 2022). The imbalance is regarded as a barrier for non-males to play competitively and is therefore problematic considering that esport has the potential of being a fully inclusive sport where biological or genetic dispositions have significantly less to no impact on the actual performance. Thus, scholars and practitioners should be aware of this gender gap to assure that the empirical evidence can be applied to all genders. For the industry, this implies that game publishers and developers can use this information to design their games to be more inclusive, regarding non-male characters, and therefore promote gender inclusivity (cf. Rogstad, 2021; Rogstad & Skauge, 2022).

The findings about mental health issues and psychological clinical pictures show that research on this topic is still scarce, despite its importance (Palanichamy et al., 2020; Tjønndal, 2022). Currently, these issues in esport are often treated in a general gaming-related context. For example, internet gaming disorder can be used as an argument against the legitimation of esport as a sport (Borggrefe, 2021). Still, since not everything related to gaming can be described as esport, a more differentiated look is required to investigate how the practice of competitive gaming has a different impact on mental and psychological health, compared to non-competitive gaming (Nielsen & Karhulahti,

2017). The motivation to play competitively and to play casually, for example in single-player mode, are significantly different, and one can argue that a more detailed view of competitive gaming is required to elaborate the potential threats to the players' mental and psychological health (Bányai et al., 2019b). Still, especially gaming disorder can be a threat to esport players, and therefore in comparison with traditional sports, it is viewed as a unique negative trait. The results of Article 1 mention that obsessive passion, in comparison to harmonious passion, can lead to negative side effects from gaming. Therefore, these results also emphasize that practitioners should be aware of the importance in monitoring players' psychological health, motivation, and psychological needs (Bányai et al., 2019a; Bertran & Chamarro, 2016). This issue can be crucial not only for the players' health, but also for their performance and their role as part of a team. Although the competitive action itself – the domain of application (Holt, 2016) – happens in the virtual worlds, the effects of esport on the players and stakeholders are observable in real life. Particularly players who try to make a living from competitive gaming can benefit from adequate basic conditions in their respective social esport environment, including psychological supervision, physiological guidance, nutritional counseling, and fitness training (cf. Bonilla et al., 2022; Pereira et al., 2019).

It will become more important to differentiate between esport as a holistic phenomenon and the individual characteristics and traits of esport disciplines, games, or genres. The differences do not only lie in the way the games are played, but also in terms of the required skills, the degree of popularity and relevance, and eventually the impact they can have on society and vice versa (see section 2.1). While some studies look at holistic research questions about esport, regardless of respective games, others look at specific esport games to either draw conclusions for esport in general (e.g. Article 1; Rudolf et al., 2022) or game- and genre-specific phenomena (e.g. Egliston, 2020b; Ekdahl & Ravn, 2021; Toth et al., 2020). When interpreting such findings, it is crucial to ascertain whether the results are valid for the entirety of esport or only for certain titles or genres. This is akin to traditional sports, where findings about certain sports are sometimes transferable to other sports, like the perception of sportsmanship, values,

morals, codes, or doping (cf. Thiel et al., 2013), while others may be not, such as the physical and mental requirements or the degree of popularity.

6.2 Limitations

Certain shortcomings in the scientific process of the dissertation need to be mentioned.

First, esports and competitive gaming can be used synonymously, but depending on the accuracy of a research question or the topic, a differentiation could help paint a more detailed picture. While esport often (not always) refers to professional competitive gaming, it can be possible to distinguish this in research. So, a clearer distinction between professional competitive gamers and casual competitive gamers can be derived. This would make an investigation into phenomena occurring on professional, semi-professional, amateur, or grass-roots levels more precise.

Second, the findings about digital corporeality in esport, including the theoretical assertions from the theoretical background (section 3) require profound empirical research. This dissertation highlights the importance of this topic for sport sociology and sociology of the body and delivers a strong foundation for future research. Still, the current research landscape benefits from additional empirical evidence because of the ambiguity of corporeality between the digital and analog world, considering that this is a distinctive characteristic of esport compared to traditional sports. Especially, considering the differentiation of esport in terms of genres, games, and MBVG shows, this field of research is still young. The findings of this dissertation should therefore be regarded as an initial point for future research.

Third, the linguistic barrier is a shortcoming, especially considering that esport is such a popular topic in the Far East or Nordic countries. The possibility of including literature and empirical studies from these cultural areas can contribute to a better global understanding of esport. While many studies from all around the world are included in the dissertation and particularly the articles - as long as they were in English, French, Italian, Spanish, or German - a plethora of articles not meeting these criteria were therefore unavailable for this work. Since sport, in general, is influenced heavily by and through historical, cultural, and linguistic peculiarities, it is important to keep track of

the difference between the perception of sport in various cultural areas, which is especially interesting for esport, because of its disputed status as a sport.

6.3 Future Research

The findings of this dissertation can be regarded as fundaments for future research endeavors. Therefore, the following describes potential paths of research derived from the results of the three articles:

Article 1 reveals that there are various potential fields of societal impact for electronic sport according to the MESSI-Framework, which are yet to be tackled scientifically. One of the key questions in sport sociology is the impact sport has on society and vice versa (Heinemann, 2007). Therefore, future research can investigate this path to obtain a more concise picture and empirical evidence about the overall societal impact of esport. Potential avenues may include looking at how the acknowledgment of esport within the sporting canon can change the sporting environment, from the way players are organized or how clubs and associations can benefit from it. Further, this reveals the importance of investigating the impact of sport on sport-related societal branches in detail, such as the educational sector or pedagogics.

The findings of this dissertation show that corporeality is a fruitful and important research subject. More empirical evidence is required to understand the interweaving of the analog and digital realms. A prosperous research path can be to further investigate the relationship between the digital and physical body, in terms of interdependencies while playing. Another point of view could be to check for differences between genres and gamers regarding corporeality. Overall, research in this field can foster the scientific understanding of the role of corporeality in esport, regarding the peculiarity of being present in the digital and real world simultaneously, and eventually create another dimension to assigning esport within a sportive context, as a new and contemporary sport discipline.

On this basis, another strand of research can be derived, which focuses on the subject of ‘reality within the virtuality’. It can be interesting to investigate how far players perceive the virtual worlds as real, and how it affects their physical and mental

involvement in the competitions. Especially Articles 2 and 3 show that the presence of the players is not restricted to either the virtual or the real world. Therefore, there is reason to believe that the player's self-awareness is affected by the duality of the digital and analog world, as well as the requirement to shift constantly between both worlds during competitions.

Another mentionable field of research is the anonymity in online gaming and how it affects social interaction and behavior in esport environments. Being anonymous is atypical in sports competitions, and Article 3 shows what theoretical implications can be derived from this. This conceptual paper could be used as a foundation for empirical evidence on the (partial) absence of the body, as a point of reference for social interaction, disciplinary mechanisms, or traits of identification.

Investigating the social dimension of esport is a broad topic The above-mentioned paths of research can be regarded as particularly interesting, based on the central findings of the dissertation, and future research can nearly seamlessly connect to these works.

6.4 Conclusion

This dissertation reflects on the social dimensions of esport from a sport sociological perspective. It looks at the societal impact of esport, which reveals that it is possible to observe its impact in multiple fields of society, just like traditional sport. When investigating social dimensions, one aspect stood out regarding the way sociality is created in esport. In traditional sport, athletes compete with and against each other directly, whereas in esport the players are mediated through digital avatars. Corporeality does not function as a direct and first point of reference for social interaction, since the players are not physically engaging with each other. On top of the social and societal impact, the dissertation investigates the role of corporeality in esport and competitive gaming. It joins and complements the body of literature about social topics and issues in esport and its meaning for the world of sport, which can be regarded as a topic of increasing interest for science and society (cf. Bascón-Seda & Rodríguez-Sánchez, 2020; Thiel & John, 2020). Overall, the findings show that just like for traditional sports, the impact of esport can be observed on different societal levels,

ranging from a macro level (societal impact of esport) to a micro level (implications deriving from the peculiar corporeality for players and stakeholders). Since sport is constantly changing and adapting to societal trends, esport may be regarded as an offspring of the digitalization of sport, and therefore a new and contemporary discipline in the sporting environment. This also affects the overall understanding of the terminology 'sport' and which values, ethics, and norms are aligned with it (cf. Abanazir, 2022). The duality of the real and virtual world creates a novel movement practice in terms of precise (fine) motoric prowess to steer the mouse, keyboard, or controller in alignment with the audiovisual (and partially haptic) feedback from the virtual world. Contrary to some arguments, esport should not be regarded as a digital-analog dichotomy, but as a practice in and between reality and virtuality, which eventually creates a new way of understanding corporeality and intercorporeality in sport (Ekdahl, 2021b; Ekdahl & Ravn, 2021).

Esport has become a promising and important field of research for sport sociology, sociology of the body, and sport science in general. Approaches from these fields can critically observe the phenomena arising from esport, identify benefits and threats for sport and society, and lastly create a foundation for the various stakeholders in the esport ecosystem (cf. Scholz, 2020) to pick up on these thoughts and take the quintessence into account for their practical application.

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Affidavit

I hereby declare that the here presented dissertation thesis was written by me. I indicated all sources and aids. All texts which I quoted directly or paraphrased concerning content by in-text citations are indicated accordingly. The Reference chapter provides full bibliographic information about all citations.

In lieu of an oath, I hereby affirm that this is true and that I have not withheld or omitted anything. I am aware that making false declarations in an affidavit is punishable with a prison term of up to three years or a fine.

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Signature

Paolo Riatti, Tübingen, 09.08.2023