STS Invaders: Gaming as an emerging theme for Science and Technology Studies

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Abstract
Video games represent a significant part of the digital revolution that swept over our contemporary society. Although these socio-technical artefacts can be seen as a network of human and non-human actors, STS literature on this theme remain scarce. Therefore, this *Scenario* aims to fill this gap by delving into gaming through a three-sided move: first, it will present a review of the few extant works that tackle, even tangentially, the theme through an STS lens; secondly, it will draw from game and media studies to highlight concepts that may bridge the different scholarships and be useful for future STS contributions on video games, but also how gaming evolved into eSports (i.e., competitive gaming) and what it means for STS; finally, it will display through the empirical example of gaming houses how an STS approach may benefit the study of gaming. Conversely, these structures where professional players gather to live and work/play together will show how gaming and its declinations may constitute a useful breeding ground for original STS conceptualisations.

Keywords
gaming; eSports; sociomateriality; STS.

1. Introduction

During a dazzling history, games have evolved from technical efforts to diffused pastimes (Borowy and Jin 2013; Kent 2001, 2021). Even if their roots date back to the first digital infrastructures, these playful technologies have only recently swept over the broader social panorama, contaminating even the supposedly distant spheres of work and education (Venero 2020; Walz and Deterding 2015). This development resulted in a "ludic society" (Mäyrä 2017) in which digital games replaced or reshaped multiple sectors of daily life. The further introduction of eSports (i.e., competitive gaming) confirmed video games as one of the leading entertainment economies (Newzoo 2022), constituting both a profitable and sportive venture able to attract millions of followers (Ludwig et al. 2021; T.L. Taylor 2012, 2018).

Although scholars from different fields have already demonstrated interest in gaming (e.g., Thornham 2016; Vesa et al. 2017), academic literature still looks skewed, with most contribu-

tions focusing on either the technical features (e.g., Sjöblom et al. 2019) or the economic specificities (e.g., Scholz 2019). But what would an STS scholar see when entering an arcade or turning on their favourite console? This *Scenario* will try to answer this by introducing gaming as an area of research through a brief exploratory review of extant STS literature touching on this theme, but also a case study highlighting a possible way to bridge gaming with an STS approach.

The exploration of the varied, although limited, papers will present the core insights explicitly linking STS with gaming. Instead, the in-depth analysis will describe one of eSports most peculiar phenomena: gaming houses. These structures represent a research field where the socio-material components may particularly benefit from an STS perspective, as the activities defining them are mainly built upon a complex network of social and technological elements. Moreover, plunging into an empirical example may symbolise the most straightforward way to bridge the inchoate STS scholarship on games and eSports with insights from other academic fields, such as media and organization studies, which have already produced works about games and gaming.

Finally, before delving into the core of this *Scenario*, it may be useful to draft an orienting definition of what gaming is and how (video) games can be conceptualised. Since the first pioneering studies of Huizinga (1938) and Caillois (1958), the study of games has struggled to define its research object. As brilliantly highlighted by Mäyrä (2008), some authors decided to focus on the functions of games, giving birth to what are defined as "formalist" approaches (e.g., Sutton-Smith 1997). In contrast, others preferred reflection over the "dualism" of games, i.e., their essence as "half-real" systems organised by rules and fictional elements (Juul 2005)[1]. For the sake of this *Scenario*, the following definition will be adopted: "[a game is:] an interactive structure of endogenous meaning that requires players to struggle toward a goal" (Costikyan 2002). In other words, games are built around the interaction of a structure, mainly shaped by the rules forming the gameplay, and the activity of both players and fictional elements that imbue the actions with a meaning arising from the playing itself (Mäyrä 2008). Following this definition, gaming represents the act of playing digital games, i.e., digital artefacts that usually implement a network of technologies, like consoles, monitors, and peripherals, to frame the players' goal-oriented struggle. To introduce some of the points that will be further elaborated during the *Scenario*, it must be noted how the already cited eSports phenomenon posed some criticisms to the abovementioned definitions. The distinction between casual and professional gaming reveals how ephemeral the division between work and play is, thus further underscoring the fluidity of games and the difficulty of unequivocally circumscribing such artefacts and the practices surrounding them (Mäyrä 2008).

2. A brief voyage into the STS literature on gaming and games

At first sight, an activity created and sustained by a complex and interdependent network of technological, material, and social components, i.e., playing (video)games, should constitute an elective affinity for STS, as one of this field of study's main interests relies on unpacking the sociomaterial assemblages that form both non-human and human activities. However, a quick look into academic literature will reveal how few studies have tried to approach games with an STS perspective, leaving aside the deepening of development and playing practices

related to modern ludic technologies. Nevertheless, the attention drawn by STS and their core concepts and theories, like ANT (Latour 2005) and infrastructures (Star and Ruhleder 1996), has brought scholars to adopt this perspective to enrich their discussion on games. Therefore, in the following lines it will be presented a brief review of the extant contributions touching, even tangentially, the theme of gaming through STS lenses, showing how gaming has benefited from STS concepts and how, in turn, games have contributed to enrich STS literature with new insights. This exploration will present the results of a set of searches conducted by the author in the scientific database Scopus. Even though the query used was simple, i.e., a combination of "game(s)" and "STS" words, the results were limited, concentrated over the last two decades, and almost all written in English. Therefore, the author has decided to include contributions dealing with analogic games, like cards or tabletop, because of their connection with their digital counterparts. Analytically those games represent proper antecedents of video games in many aspects, such as "immersiveness" and the affordances they entail through rules (e.g., the permitted moves in chess) and material artefacts (e.g., dice).

Delving into the literature explicitly linking games with STS themes and concepts, it stands out how some researchers have tried to adapt this wide-ranging scholarship to the study of games in multiple ways, as will be presented in the following lines. The contributions mainly used STS as a theoretical background to further enrich their framework or present reflections on socio-technical elements tackling just partially video games. Nevertheless, some works dealt with more fine-grained analyses of technical assemblages related to games, using ludicrous artefacts to deepen or describe STS theories. Finally, the papers which constitute the most structured endeavours in integrating an STS perspective toward the study of games, intended as networked entities made of relations between heterogeneous elements, will conclude the section.

The first effort of "transposition" of STS concepts to games was made by Jakobsson and Pargman (2005), who used the concept of black-boxing to describe how an open-world massive multiplayer online role-play game (MMORPG) called *Project Entropia* hid to players the microtransactions needed to remain in the game. Although black-boxing should here be intended as an unquestionable conceal of developers' ideas inside the technology, authors also present resistance practices emerging from players, such as cheating or exploiting game "bugs" (i.e., errors or glitches), viewed as processes of "open the box".

Also, Lammes (2011) adopted a concept from STS, Latour's immutable mobiles (Latour 1990), to grasp how spatial representations are constructed and played out in various digital games. Although better explained in her subsequent papers (Lammes and de Smale 2018; Lammes and Wilmott, 2018), the author analyses map-based games (e.g., *RunZombieRun*) as Latourian mediators performatively engaged in producing new spatial meanings (Lammes 2011; Latour 1990, 1993b, 2004), as well as "navigational interfaces" (Juul 2010; Lammes 2011) signifying the movements of players well beyond a simple mirroring of their moves on a game-board.

O'Donnell's works (2013, 2014) approach the topic from another side by examining the network of technical and social elements incorporated in the development of video games. The author shows how sociotechnical entities like homebrew communities and "pirate" MODs chips are involved in the negotiation of the meanings related to (co)creation practices and development processes of Nintendo's video games (O'Donnell 2013, 2014).

Continuing the explorations on how contemporary games are constructed, Whitson

(2018) underlined how game-developing software implemented by creative teams exhibits magical agential properties. Importing the concept of "boundary object" from STS literature (Star 2010; Star and Griesemer 1989), her paper shows how this third-party software transforms from silent and obedient objects to "voodoo software" which expresses their unique agency by intersecting the different communities of practice involved in the creation of videogames (such as artists, engineers and managers).

Hansbøl (2010) and Hansbøl and Meyer (2011), instead, move into the didactic use of playful artefacts, as they merge an STS-informed analysis with a focus on an educational game (called *Mingoville*) to assess how students incorporate such technologies into their studying and playing practices. Notably, the use of games inside schooling contexts is also the focus of the ground-breaking paper from Muñoz and El-Hani (2012), further commented by Kwah (2012), who elaborate a framework for including more commercial games (e.g., *Fallout 3*) into a learning "cyborg curriculum". For these authors, citizenship education must help students build their identities through the technical and social influences they experience inside and outside school, for example, by accounting for (and criticising) the technopoly we live in nowadays (Postman 2011). Also, Anupam (2021, 2022) explored the games' affordances and constraints when applied in learning contexts, focusing on their ability to convey concepts of positionality and situatedness into the teaching of scientific inquiry.

The pedagogical standpoint was not the only field of study "contaminated" by STS ideas. The implementation of concepts related to technological assemblages and the reciprocal influence they share with society is a trait also shown by Schoppmeier (2021), who intersected such scholarship with critical race theory to analyse the depiction of surveillance regimes and their impact on BIPOC people in a famous videogames series, Ubisoft's *Watch Dogs*.

On the other hand, both Argamakova (2017) and Ghys (2012) dealt with different representations of technological progress and how they relate to social change. Although Argamakova's (2017) work about socially shaping technologies only skims serious games and gamification, the study of Ghys (2012) delves deeper into how technological determinism is embedded into historical games and represented as a relentless force determining social structures and political configurations.

If the previous works were mainly carried on by including STS concepts into reflections on games, another part of the extant literature is involved in an opposite effort, including games and ludic interfaces in science and technology studies. The most theoretical papers going in this sense are the ones by Nowak (2017, 2018), who uses the Chinese game *Go* (or *Weiqi*) to materially depict the philosophical paradigm change represented by the ANT model (Latour 2005). In his reflection on the demarcations between classic ontologies and relational ones embedded in Latour's works (Latour 1993a; Law 2004), he parallels such distance to the differences between Western chess and the game of *Go*: the lack of internal properties of pieces, as well as the non-linearity of the development and reading of the chessboard, are some of the notable distinctions that Nowak reflects upon (2017, 2018).

Interestingly, Mair and colleagues (2021) also use *Go* as a rhetoric artifice to linger on theoretical positions. Specifically, they engage a specific move of the renowned match between Google DeepMind's AlphaGo (an algorithm designed to outperform human players in the game of *Go*) and the human world champion at the time, Lee Sedol. In this human-versus-machine challenge where the AI blatantly defeated the champion, a nonsensical move made by AlphaGo and the

associated commentaries are read as a "descriptive assemblage" (Sacks 1963) able to reveal the politics of anthropomorphisation and familiarisation of AI technologies in our contemporary society.

Only few authors, though, merged STS and game studies in ways that enriched both scholarships. Indeed, the contributions from Bienia (2018), De Paoli and Kerr (2010), Johnson (2018), and Taylor (2020) constitute significant examples of how gaming and eSports could benefit from an STS perspective, but also how such influence can flow the opposite way.

Starting from the chapter drafted by Bienia (2018), he expounds on the core STS concepts before delving into a review of the studies dealing with role-playing games (RPGs) tackling the issues by analysing their networks of actors. Then, he highlights how the "material turn" happening in game studies echoed with the adoption from many scholars of STS theories and introduces a reflection on the role of material artefacts in a table-top RPG session (and house).

That materialities like dice and cards can actually "make other actors do things" (Bienia 2018; Latour 2005) is also the starting point of the study from Johnson (2018), who analysed the sociotechnical controversy emerged between two professional gamblers and casinos. The gamblers used a set of collaborative social processes and, most of all, technical faults to engage in "edge-sorting", a convoluted process of determining cards' values through their patterned back. The core of the dispute was the tweaking utilisation gamblers made of the automated dealing machines that, when coupled with a specific set of cards chosen by the gamblers, could be translated into an advantage for the two gamblers. Thus, the players could unmistakably detect the value of the cards after some warming-up deals thanks to this network of "translated" actors' relations. In other words, the two baccarat players were accused of cheating, as they won millions by exploiting flaws in the global gambling system and reconverting material affordances in their favour.

Practices to obtain an unfair advantage are also the focus of the work by De Paoli and Kerr (2010), who draw from a sundry literature to propose a rethinking of cheating as an "imbroglio". Thoroughly examining a set of empirical examples ranging from (illegal) fishing to MMORPG's third-party software, the authors deconstruct the essentialist view on cheating by highlighting how are multiple actors' interactions that translate some actions into cheating and some others not. Then, they build upon the concept of "assemblage" (DeLanda 2019) and the Italian term "imbroglio" used by Latour (1999) to suggest how this form of counterplay relies on a multiplicity of sociotechnical elements, like bots and other automated procedures run by cheating gamers.

The impact of automated machines resonates with the pioneering study by Nicholas Taylor (2020), who projected the STS into the eSports scene. His interest revolves around the translations occurring inside eSport teams, springboarded by the field research he performed with a collegiate U.S. team of *League of Legends*. After discussing the digital affordances of the title itself, Taylor underscores how game mechanics shape sports outlets and players' performances (2020). Metas, a *League of Legends*' jargon meaning temporarily overpowered moves or characters, and the banning process taking place before the matches, are prime examples of in-game elements that influence the enactment of the sport performance. Moreover, the author delves into the role that statistics and match replays are starting to assume in both digital and analogical sports disciplines. Taylor claims that eSports may be seen as the peak point of a quantifying paradigm that is knocking out how athletic feats are intended (2020). This "lateral surveillance" (Andrejevic 2004) was deeply rooted in the game's affordances, third-party technologies tweaking them, community habits and policies redacted to organise such behaviours in official leagues. Indeed,

the data-intensive approach fuelled by the pervasive spreading of technologies into sports disciplines, so clearly exhibited by eSports competitions, may constitute an innovative translation of the significance attached to (human) athletic gestures, which become traceable and measurable (even by automated machines) but also quantitatively refinable (N. Taylor 2020).

To conclude this explorative search in the literature touching the theme of games treated through an STS lens, it must be highlighted how some papers dealing with platforms and infrastructures have shown interest in digital games as well. If in some works of the conference track on platforms reviewed by Bonini and Magaudda (2022) the reference to games is just referential, the contribution from Rudenko and Shirokov (2018) is more oriented toward the entanglement these media infrastructures displays with digital games. Finally, the recent paper from Köhn and Siré (2022) highlights how Cuban gamers communities play a crucial role in the grassroots computer network of the isle and how materialities, social structures and collaborative politics are all played out and geared into a vernacular infrastructure pushing for new relations and new political identities.

3. The evolution of gaming into eSports

The scattered and dispersed nature of the scholarly production dealing with games and eSports is somehow countered by the rich and emerging field of game studies and the deep interest that other academic areas, like media and organization studies, have shown in the late years (e.g., Thornham 2016; Vesa et al. 2017). Even from the first core works, which pointed out how gaming plunges its roots into the digital revolution and the first steps of computers (Jin 2020; Scholz 2019), gaming and eSports have been depicted as a complex system of material and social innovations (Kent 2021, 2021; T.L. Taylor 2018). Furthermore, distinguishing the competitive facet of gaming is beneficial not only as an analytical nuance but, most remarkably, because the competitive declination of playing video games seems to exacerbate the sociotechnical entanglement that the more casual postures may not reveal (N. Taylor 2020). As authors have already highlighted (Consalvo 2017; Scholz 2019; N. Taylor 2020; T.L. Taylor 2012), professionalisation stances went along with a progressive translation of the meaning associated with playing practices, thus transforming this leisure pastime into a set of activities built on a relation of human and non-human nodes of influence (Bienia 2018).

Since the early Eighties, when the so-called "arcade explosion" (Borowy and Jin 2013) brought in games like *Space Invaders*, *Pac-Man*, and *Donkey Kong*, these technological advancements joined the steep rise of entertainment industries, interested in translating playful pastime activities into value-laden products (Borowy and Jin 2013; Scholz 2019). Despite some failures (Scholz 2019; T.L. Taylor 2012), the first aspirational tournaments coupled with the growing digital industries (Woodcock 2019) and the diffusion of the experience economy (Borowy and Jin 2013), drastically raising the number of users and showing a propensity to datafication of playing practices through top scores and official, although amateurish, gamers rankings (Scholz 2019; Seppala 2018).

A further step toward the networking and professionalisation of gaming was the rise of Internet communication, which gave birth to new relations between competing players and machines (Scholz 2019; T.L. Taylor 2012; Woodcock 2019). Moreover, the opportunity to

transform standalone computers into (temporary) networks of communicating devices (T.L. Taylor 2012), i.e., Local Area Networks (LANs), signalled the emergence of new forms of social assemblage (see also Köhn and Siré 2022). The talented gamers emerging from these provisional and often amical clusters (Thornham 2016), then, expressed the desire to compete on higher levels, pushing for the mobilisation of humans and machines to establish the first LAN parties (T.L. Taylor 2012). These events comprised both the materialities of gaming practices and some primaeval forms of organization and institutionalisation (Scholz 2019), as gamers had to carry their machines and peripherals to the venues. Thus, the construction of LANs requested both the possibility to relocate for a weekend and some technical knowledge to operate the connections (T.L. Taylor 2012).

The final shapeshifting of gaming coincides with the appearance of the first teams between the 90s and the early 2000s. New organizational features, as well as the definitive grasp of professionalising ambitions among players and developers (Scholz 2019; T.L. Taylor 2012), brought the by-now-established gaming industry to support local leagues, where more stable groups of players shifted from aspirational labour to the first forms of contracts (T.L. Taylor 2012). This was the official birth of eSports (i.e., electronic sports) or organized video game competitions (Jenny et al. 2017). In a more substantive definition offered by Taylor (2016), eSports entail:

> the enactment of video games as spectator-driven sport, carried out through promotional activities; broadcasting infrastructures; the socio-economic organization of teams, tournaments, and leagues; and the embodied performances of players themselves. (ibidem, p. 116)

As the definition highlights, the organizational, material, and human actors involved in this new form of activity are multiple, different and deeply entangled with each other (Hölzle et al. 2022; Scholz 2019). Neither a sport discipline nor a leisure form of pastime, the core figures of eSports are professional players (or pro players), seen alternatively as consumers and athletes (Jenny et al. 2017), who are engaged by teams and platforms into contemporary forms of playbour (e.g., Kücklich 2005; Woodcock and Johnson 2019).

The following section will present gaming houses, one of the most intriguing peculiarities that emerged in gaming. An emblematic space blossoming around the competitive structures and entailing many of the technological innovations shaping the field, like modern consoles, high-end PCs, and audio-visual peripherals, these houses will be tackled through the analytical lenses gathered in the introductory paragraphs.

4. An empirical ground

Gaming houses can be described as cooperative living arrangements where groups of professional gamers (or "pro players") live and compete together (ESL 2014)[2]. These houses entail an ecosystem of human and non-human actants, creating a technologically dense environment where the material, digital and social dimensions are played together to build what is considered one of the main tools for professionalisation in gaming (Byrne 2019). The analysis of gaming houses will be divided through three axes, comprising what can be seen as

the organizational pillars around which they construct their activities: digital infrastructures, physical and built environment, and social structures. These three thematic cores recall and resonate with fundamental elements the gaming communities highlight when discussing the specificities of gaming houses and are used to (self)represent the role of these same houses inside the broader gaming ecosystem (Billy 2015; Jacobs 2015).

4.1 Digital infrastructures

The first essential feature of gaming houses is their embedding of digital components and how they reflect upon the other two facets of the social and physical structure. First and foremost, Internet connection quality is claimed as an unavoidable element (Fogaça 2021) and is used to transform the players (repetitive) activities into value-laden, meaningful acts of training, streaming and competing for prizes.

If the primaeval tournaments took place face-to-face and were built upon a local network of interconnected computers (Scholz 2019; T.L. Taylor 2012), the bandwidth available nowadays makes physical presence unnecessary. Guaranteeing playability and reducing the latency are now achieved through "invisible" infrastructures that manifest themselves only at their breakdown (Star and Ruhleder 1996) or when they impose physical implementations to function (Köhn and Siré 2022). For example, this infrastructural element lies behind the clustering tendency of gaming houses: not only do they gather around tournament venues to reduce travel expenditures, but they also muster near well-serviced zones, supporting further investments by local authorities (Jin 2020).

Digital infrastructures are crucial also to allow streaming practices among pro players, as both grey and academic sources show that pro players and teams dedicate a significant amount of their daily time to streaming their online efforts (Hölzle et al. 2022; Hood 2018). Gaming houses fostered such practices by implementing technical and material innovations: new spaces for streaming started to be a commonality inside facilities, as well as soundproofing materials, video making props, specific gear and dedicated peripherals (e.g., Di Donfrancesco 2021; NemosTV 2019).

Organizations which decided to follow this new professionalising track, allocating most of their resources to the "streamability" of their environments, also had to face the maintenance practices associated with the choice. As instalments like the "Thoom House" highlight, the efforts required for upkeeping the infrastructural resources constitute a potential weakness for gaming houses. As a matter of fact, simple network problems and connection failures can bring a social backlash that negatively affects teams' brands for a significant period (Victoria F, 2022).

However, streaming is not the only activity taking place through the digital infrastructures of gaming houses, as they are also crucially related to social media and digital platforms for tournament organizing, as well as for establishing relations with users and consumers. This fuelled the establishment of a network of collaboration where professionals and services are consequently played out for either enhancing the media presence of gamers or their performance in official tournaments. Thus, amenities and services entailed in the houses, from jacuzzis to video making, are translated as unavoidable supplements for those seeking to shift from casual to professional gaming.

Indeed, these new technological actors also present "side effects" over the life of gaming house dwellers, which even the players often underestimate. Health concerns like the psycho-

logical effects of intimacy disruption (e.g., Izento 2019), stressful environments (e.g., Jacobs 2015), and more severe psychophysical consequences related to heavy gaming and poor living conditions are among the most stinging points in the eSports field. Platforms' politics related to users' commodification and infrastructural requirements, like forced co-presence inside houses, often lead gamers to dangerous situations where temporal boundaries disappear into a chaotic concoction of endless screen hours, eating disorders and substance abuse (theScore esports 2019). Therefore, a more careful study of how these technologies act as mediators in the network of relations composing professional teams, as well as the broader eSports environment, may give essential suggestions on how their agencies are differently enacted and translated by the actors (N. Taylor 2020), and eventually tackle their fallacies.

4.2 Physical structures and built environment

If space constitutes the material substrate of many social processes (Löw 2016), then a careful look at gaming houses' objects and architectural arrangements will reveal the affordances houses' artefacts allow, as well as the honing through which many of these objects went through the practices of pro players. Most of the artefactual implementations join the digital services inside the walls of the shared households to respond to a drive for improvement, as gaming houses rhetorically justify themselves with discourses over talents' convergence and crafting similar to narratives outlined by other emerging sports disciplines (Hood 2018; Mattei 2021).

In their transmogrification of housing spaces into a fully-equipped sports facility, many gaming teams centred their efforts around the "scrim room" (i.e., "scrimmages", a jargon term from *League of Legends*), which often occupies the central and larger zone of the household (e.g., HyperX 2015). Through their central positioning, these collaborative areas unambiguously concur with the houses' tendency toward reconverting shared spatial temporalities into training and performing practices, thus also re-signifying the social connections among inhabitants. Remarkably, the centrality of this space is also due to the infrastructures needed for official gaming matches and training, as linked computers and robust networks require a stable energy supply, space to host the hardware, human resources, and props to enhance both gamers' likeability and their performance (Jacobs 2015). Architectural elements, like lighting and sounding furniture, are not only used to simulate the official face-to-face tournaments situations, but also to "constantly stage" players, both metaphorically and literally (through vlogging).

Gaming houses are engaged in a spatial and temporal orchestration of activities and relations inside their walls. A hyper-specialisation of spaces where one or more rooms of the houses are reconverted to specific purposes and re-signified through the re-organization of their furniture and scope (Jacobs 2015). As a matter of fact, houses' spaces are also structured to arrange gamers' spare time, which is implemented as spatially and temporally complementary to training. Gyms, cafés, cinema rooms, and courtyards are the nodes of the spatial scheduling around which players' daily routines are constructed. Nevertheless, professional players often find themselves moving from one desk to another or even playing (and streaming) from their beds, which invariably stand in front of one of the ubiquitous screens (Zelauskas 2018).

Moreover, physical training spaces are added to the digital services in the performance-enhancing program of gaming houses: gyms filled with high-tech equipment transform the

healthy "workout" into a job itself, part of professionals' duties. Nevertheless, the performance-centred translation frequently overflows even over the social areas, leading to their use as socialising tools that boost team coordination or as streamable props (Marsh 2022). In other words, the architectural affordances and the digital infrastructures entailed in gaming houses "offer" professional players the opportunity to move from (digital) gaming for professional reasons to playing (analogically and digitally) for leisure, in a nearly inescapable choice that centres their life over the (constantly re-translated) playing practice.

4.3 Social structures

The third pillar, or group of actors, enforced in the translation of playing practices is the gaming houses' entire social structure, which supports gamers' professionalisation and maximises their performance. Because many players deem life inside gaming houses as socially exhausting and unsustainable for extended periods (Izento 2019; theScore esports 2019), the implementation of additional figures represents a double-edged attempt: on the one hand, professionals are implemented for a healthier workspace (Hood 2018); on the other hand, the support fosters the shift toward professionalisation of players, both through performance enhancement and a progressive alignment of gaming practices to other sport disciplines (Sacco 2019; Rawles 2021). Many of the professionals guiding pro players during their training (and leisure) moments are (ex)gamers who managed to build a career on the knowledge and experience gathered in the field (e.g., 100Thieves' founder, Nadeshot). Thus, the resulting network of know-hows and professional experience is often deployed through the mediation of digital infrastructures, which helps manage schedules and boundaries between working hours and free time (Retegno 2017).

In some cases, the players have to bear the additional tasks and responsibilities, like housecleaning or cooking for the rest of the team (e.g., Jacobs 2015; Retegno 2017). Interestingly, some gaming houses assign work-life boundary features to other domestic resources, like disanchoring objects or specific areas: an example in this sense are foyers and corridors, which see their material significance further layered by being assigned the role of spatial mediators. Alongside performance-centred professionals, also service labourers entered gaming houses' walls: housekeepers and chefs divide the living spaces with other maintenance figures, like technicians and handypersons.

Finally, the collaboration with videomakers and marketing managers further enmesh streaming and social media networks into pro players' practices, thus producing complex assemblages where people and infrastructures merge to create some of the core organizational features of a prototypical gaming house. The variety of actors presented contribute in different ways to the enhancement of players' performances, as well as houses and equipment maintenance; however, they also reinforce the professionalisation of the players by defining the figure of the "e-athlete" (i.e., the professional player) and delimiting its rights and duties inside a more formal training and gaming environment (Hood 2018; Zelauskas 2018; theScore esports 2019; Rawles 2021).

5. Conclusions

This *Scenario* has tried to summarise the emergent works of STS, media and game scholars to organically present gaming as a viable theme for the analysis through STS concepts. As the literature review has highlighted, the possibilities to approach this theme are endless, as games have spread into nearly every facet of contemporary societies. The fluidity of the term "game" allows the researchers to tackle such objects through many perspectives, from pedagogy to production studies. Notwithstanding the field from which the contributions came, all authors discussed and agreed on attributing agency to games, either through their materialities (like cards or gameboards) or by scoping their digital affordances (from game mechanics to streaming processes). Facing such variability in the assemblages that result when dealing with people playing games, papers used concepts elaborated by STS scholars to detect, follow, and assess the weight of technologies and material artefacts in the playing practices. For example, boundary objects and infrastructures, both concepts coming from Star and her colleagues (Star and Griesemer 1989; Star and Ruhleder 1996), were used to retrace the role of both software (Whitson 2018) and physical entities (Köhn and Siré 2022; O'Donnell 2013) in the different stages of game development, diffusion, usage and spillover into surrounding social environments.

The empirical example of gaming houses displayed the richness of possibilities that an analysis guided by STS can bring to the gaming environment. Redirecting the attention to a physical space inside which gaming represents the core activity allowed to depict the assemblage of human and non-human actors involved in the households, thus deepening the understanding of the composition of these eSports venues and their inhabiting practices. By highlighting how technological, social, and physical structures enmesh to form a working gaming house, the hope was to stress the importance of these facets, as well as hint at the possible expansions that STS scholars may contribute for. As a matter of fact, gaming and its linked eSport disciplines constitute a prime example of networks in which even small changes in peripheral nodes, like technical faults to be exploited (e.g., Johnson 2018), may radically alter the power relations between the actors. The gaming houses, then, represent a field where it is possible to trace these actors moving and interacting, given the material and expressive bordering that households' walls represent.

Moreover, a study of gaming houses may also include a thoroughgoing analysis of the surging role that both games and digital technologies are assuming in our contemporary society, where the apparent vectors of dematerialisation pair with a silent rising of importance by the infrastructures sustaining that same virtuality. Indeed, games are one of the empirical terrains where many contemporary technologies are deployed or engaged for critical discussion (e.g., Schoppmeier 2021; N. Taylor 2020), thus an elective field for any scholar interested in unbiasedly appraising the role of such innovations. If, like the extant contributions shown, some researchers have already cached the opportunity that gaming offers for novel academic insights, much more can be done. More fine-grained analyses may tap into the role of gaming technologies in fostering "cyborg identities" (Muñoz and El-Hani 2012) in both casual or professional gamers or how the skills refined through hours of "grinding" (i.e., repetitive goal-oriented playing) could spillover to other (social) practices (Köhn and Siré 2022). Finally, the "double-edgedness" of gaming houses and the practices they host may constitute a crucial reservoir for innovative conceptualisations, like the ones proposed by De Paoli and Kerr (2010) or the

"platform" explorations presented by Bonini and Magaudda (2022). The match between STS and games is beginning, and it could offer some spectacular counterattacks from both fronts.

Notes

[1] To give a sense of this elusiveness, an independent game developer even created a random generator of plausible definitions of "game", which can be found at http://www.gamedefinitions.com.

[2] Although gaming houses represent an established phenomenon for eSports, the academic literature describing their structuring and functioning is minimal. Therefore, many of the sources tapped in the following paragraphs will be non-academic: even if these sources may decay or be unavailable in other geographic areas, they currently allow for a good compromise to ground the claims of this contribution.

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