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This is a pre print version of the following article:

Original Citation:

Availability:

This version is available <http://hdl.handle.net/2318/1981090> since 2024-06-03T10:23:31Z

Publisher:

Bloomsbury Publishing

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(Article begins on next page)

Playing as the World Falls Apart: The Use of Video Games During the COVID-19 Crisis. The Case of Italy

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The COVID-19 Crisis and the Role of Technology

In the last few years, a large part of the humankind has been affected in different ways by the COVID-19 crisis, i.e., the global public health emergency declared due to the spread of the virus SARS-CoV-2 and the government measures that were implemented in most countries to contain it. Individual and collective everyday practices have been disrupted by the events, together with the economy, the international relations, and the rest of human life. Bengtsson and Van Poeck (2021) conceptualized the crisis as a “hyperobject” (Morton 2013), to emphasize the various ways in which the pandemic upended the material life and the most fundamental aspects of everydayness, as well as the impossibility to define its spatial and temporal boundaries. The public understanding of and concern for the crisis changed in one with institutional communication, which started minimizing the threat (De Rosa and Mannarini 2021) only to turn to a level of alarm never witnessed in decades, and finally claiming that no expectations for return to normalcy were possible.

The Coronavirus has been perceived as a pervasive, “invisible enemy” (de Rosa and Mannarini 2021; Shaw 2020). The crisis did not dismantle the world in a physical and “objectified” way (for instance by destroying one’s dwelling or the cities, like a war or an

earthquake would); rather, it silently introduced new social practices, transformed the meaning of the everyday spaces, and modified the routines people were accustomed to (Chatterjee 2020). The citizens' ability to understand the ongoing threat was limited, and so was their personal experience of the emergency: most people were not called upon for any direct and active intervention to face the pandemic but were simply forced to stay at home patiently. Some people even claimed that this made them feel guilty in the face of the healthcare professionals who were at the forefront of the crisis (Kanemura et al. 2022). Despite this apparent inactivity, the situation required a considerable effort to adapt to the new circumstances and to take up novel social behaviors (e.g., Lupton and Willis 2021). The massive modifications of everyday habits often had detrimental effects on the psychological and physical health of the citizens (Zhang S.X. et al. 2020).

In this chapter we focus on Italy, which was initially perceived as the epicenter of the European outbreak (Schnirring 2020). People living there faced a particularly uncertain situation as they were hit by the emergency at a time when information was still scarce, and awareness was low. Furthermore, the measures adopted by the government were among the strictest in the world (Horowitz 2020; Camporesi et al. 2022). In addition to the distress caused by the medical aspects of the pandemic (Rodriguez-Morales et al. 2020), the Italians had to deal with the everyday difficulties caused by the state of emergency, which lasted a total of more than two years, January 31, 2020 to March 31, 2022, and then was gradually eased. The first nationwide lockdown, which confined the vast majority of the population to their household from March to May or June (according to specific situation) 2020, and the additional lockdown periods implemented in the following months (Camporesi et al. 2022), disrupted collective life, profoundly altering everybody's work and personal and social habits (e.g., Amerio et al. 2021a;

Prete et al. 2021), as well as affecting mental health in several ways (e.g., Amerio et al. 2021b; Gualano et al. 2020).

Of course, mundane activities did not stop completely and most people continued to work, carry out their daily tasks, teach and learn, and communicate with each other using digital information technologies (e.g., Caldeira et al. 2022; Haesler et al. 2021). This helped save and recover spaces of normalcy, however small and distorted. Long before the pandemic plenty of studies highlighted the beneficial effects technologies could have for societal resilience, including mobile applications (Tan et al. 2017) and social media (Palen et al. 2018). People in Italy also began to rely more on digital communication tools during the lockdown to maintain social connections (Bastoni et al. 2021) and to find psychological relief from feelings of anger, loneliness, and irritability (Gabbiadini et al. 2020).

Video games have often been looked at with suspicion, due to the documented harmful effects that may result from their excessive or maladaptive use (for a review, see King and Delfabbro 2014). Nevertheless, in these unprecedented circumstances it seems that they have been viewed more leniently by both institutional actors and the public opinion. At the beginning of the quarantine, the World Health Organization (WHO) endorsed the #PlayApartTogether social media campaign launched by the gaming industry (King et al. 2020), to promote compliance with the “stay-at-home” mandate. As a matter of fact, people engaged in gaming significantly, and global sales of video games increased during the lockdowns (Broughton 2020).

There is indeed scientific literature about the positive role of play (Kleinman et al. 2021; Riva et al. 2020) and its effect on psychological well-being (e.g., Barr et al. 2022). Prior research on gaming practices under exceptional circumstances focused mainly on the individual. Based on the studies conducted by Formosa et al. (2022) and by Ballou et al. (2022) during the

COVID-19 crisis, we know that certain psychological factors (like the need of social support) may significantly alter the players' experience during difficult life moments. However, these studies did not consider in depth how this happens, that is the role that certain video games and video game genres may have during a crisis. We will try to add to this discussion building on empirical data collected through an online survey that we distributed to players living in Italy during the first lockdown. The data are described and discussed in better detail in Boldi et al. (2022); here we focus on their significance in the context of the crisis, discussing them with reference to recent studies that contributed to the exploration of the role of video games during difficult life moments. Our main aim here is to outline new possible perspectives for the study of the psychological significance of gaming in the context of a crisis.

Video Games During the Pandemic

The Coronavirus crisis may be viewed as an all-encompassing phenomenon in everybody's life (Bengtsson and Van Poeck 2021). On this premise, we expected to witness a change both (1) in the way players interacted with games during the lockdowns and (2) in the narratives with which they connected the experiences they lived in the virtual worlds with those they lived in the material world. To explore these transformations, we conducted a qualitative study from April 1, 2020 (one month after the beginning of the Italian lockdown) to May 3, 2020 (when the strictest lockdown measures were finally lifted). The study included 330 players who were administered an online qualitative questionnaire (257 males, 69 females, 4 non-binary; ranging in age from 18 to more than 65 years). Participants were recruited from several Italian game forums, like Everyeye, SpazioGames and IGN Italia. Furthermore, we shared the link to the survey on several social networks such as Instagram and Facebook and via e-mail sent to acquaintances; and, since

a snowball sampling technique was fit to capture more casual gamers, we also asked them to forward the link to anyone they knew. A *player* thus was just *someone who plays*, regardless of other characteristics. We wanted to explore the everyday gaming habits of all kinds of people who happened to play: casual gamers might have become avid users during the lockdown, or conversely heavy gamers might have decreased their activity, due to a decreased desire or a change of interests or routines; others might have changed the preferred genre of games, or the meanings attached to play, and so on.

The participants were asked to answer both closed and open-ended questions aimed to capture their subjective account of the crisis and describe: 1) their gaming habits before and after the beginning of the quarantine, namely the time spent playing, the genres and types of the games (single player or multiplayer) they played; 2) the context in which they were living during the lockdown, e.g., their material situation, social life, working life, etc. The answers were read through the lens of thematic analysis.

In this chapter we summarize some of the most interesting insights that emerged from the study and discuss them in the context of recent research on video games and crises. Compared to what was reported in Boldi et al. (2022), here we focus more on the specific video games and video game genres chosen by the participants and how these impacted their “pandemic life.”

Psychological Effects of the Pandemic in the Italian Context

Nearly all the participants reported alterations in their everydayness during the lockdown; these changes typically affected more than one “dimension” of existence, such as their experience of time and space, their emotions, and their social life.

Research on the COVID-19 crisis has focused on the emotional reactions to the new circumstances and the overall impact on mental health (Xiong et al., 2020). Unsurprisingly, we too found that the affective life of a vast majority of respondents had been compromised by the lockdown, yielding distressing emotions like tension and alert, accompanied by overthinking, rumination, fears and worries, as well as states of gloominess characterized by sadness and lack of energy. As participants reported, this emotional turmoil was caused both by the idea of a frightening enemy, i.e., the virus and the damages it could bring to the individuals and the whole society, and by the impossibility to deal with one's emotions in the same ways as before the crisis, like by hanging out with friends, finding comfort in a partner, playing sports, cultivating interests and passions and so on.

Sociality is another key topic investigated by recent crisis-related studies. From basic social interactions with acquaintances (Mondada 2020) to romantic and sexual life (Federici et al. 2022; Myles et al. 2021), everybody's social sphere was disrupted by the lockdown. Several participants (13.9%) in the survey remained completely alone during those months, but most (86.1%) lived with one or more housemates or family members. Nevertheless, all emphasized that the government measures forced them to keep a distance from significant ones like parents, siblings, and friends, which made them suffer from loneliness. To make things worse, cohabitation was not always positive, due to the lack of privacy or the worsening of already difficult relationships.

We also found significant changes in the experience of time and space. Almost all the participants experienced time as slow and boring, or even empty and repetitive. Alterations in the perception of time in relation to emotional suffering are in fact common in cases of psychological trauma and major psychological threats (Holman and Grisham 2020). In the

course of the COVID-19 crisis, the experience of a slowed passage of time was found to be related to feelings of boredom and sadness in a population sample in France (Droit-Volet et al. 2020) and to stress in the United Kingdom (Ogden 2020). Our subjects found it difficult to manage time as usual insofar as the national lockdown caused their daily activities and work routines to disappear.

Moreover, with the suspension of many industrial and commercial activities, the closure of schools and universities, offers and services, recreational businesses, restaurants, and sport facilities, many of which doomed to never reopen, most participants found themselves working remotely or simply lost their job. As a result, they spent most or all of their time inside their apartment: a limited space that could quickly become physically and socially claustrophobic both for those who were alone and those who found themselves in forced coexistence with loved ones or more or less unknown people. Situations of this kind could generate suffering has also been highlighted not only by simple common sense, but also by other studies conducted in Italy. Moretti and Maturro (2021), for example, found that the experience of domestic spaces was often altered and ambivalent in the inhabitants, who ended up considering home as a refuge and, at the same time, as a hostile environment.

These novel conditions of life profoundly affected the participants, also modifying in several ways their approach to video games: most of them found that playing helped them adapt to and cope with the new life circumstances, thus revealing the richness of the opportunities offered by these tools.

Rebalancing the Emotional Life

While before the COVID-19 crisis entertainment was a common reason for playing, during the lockdown the idea of gaming as mere leisure was overshadowed. Less than 9% of the participants reported “fun” as the main reason for playing video games during the lockdown, while more than 70% reported that had been a major drive before the outbreak. The replies to other, less direct questions appear to confirm this evolution. Many participants consciously employed video games as a means to rebalance their emotional life disrupted by the crisis. Playing helped them refocus their attention on less worrisome events, relieving them from the negative emotions induced by their current situation. For some of them, the simple fact of playing could have a soothing effect, especially when it reminded them of similar previous experiences. One expressly reported that just manipulating the joystick was often enough to trigger feelings of calm and well-being. This can be understood in the light of the literature on Game Transfer Phenomena (Ortiz de Gortari 2017), whereby physical objects or events occurring in the game can lead the player to re-experience memories, thoughts, or different haptic sensations.

Certain video games seemed more capable than others of helping reframe tension-related emotions and intrusive negative thoughts. This was reported by more than half the sample (54.2%). The main factors here appeared to be either the presence of an elaborate storyline or the offer of a work-alike routine in which the player can be stuck. This is especially the case of Role-Playing Games like those of the *Mass Effect* saga (e.g., *Mass Effect: Andromeda* [BioWare 2017]), which entail a complex and deeply immersive world and have a sophisticated narrative that may deeply engage the player, as if they were “watching a movie”, as one participant (P263) put it. Strategy and management games cited by participants, such as *Age of Empires* (Ensemble

Studios 1997), *Rise of Nations* (Big Huge Games 2003), *Tropico* (PopTop Software, Feral Interactive 2001), or *Saint Seiya Awakening* (Tencent's TiMi Studio Group 2019), were often employed to the same effect. These types of games keep the player's mind focused on a variety of tasks, like decisions to make, resources to collect, opposing forces to allocate, or problems to solve with limited resources (Zhang et al. 2022).

Several participants (45.1%) were passionate about strategy games that hinge on the control of a nation or the shaping of a civilization, like the popular *Civilization VI* (Firaxis Games 2016) or *Europa Universalis IV* (Paradox Interactive 2013). Playing such games is an intense cognitive activity that encourages reflecting and acting in deliberate ways (Voorhees, 2009). Our participants reported that their mind was occupied with a world for which they were responsible. This required consistent care, planning, and foresight abilities; at the same time, these were all manageable tasks, which probably helped appease the anxiety generated by the external situation. This distraction effect is probably explained by the energy invested in the activity: effort commonly goes hand in hand with concentration, this may have provided a shield against mind wandering and (potentially negative) thoughts unrelated to the tasks at hand (Sörqvist and Marsh 2015). Moreover, the specific content of these games, often relating to the governance and welfare of a simulated society, may have offered a metaphorical context that could support the player's feeling or hope that the real world was somehow under the control of a benevolent, well-meaning authority.

Participants expressing depressive-like states, such as fatigue, sadness, and lack of motivation, appeared to choose games more on the basis of their ability to enhance their emotions than to foster feelings of comfort, control, or relaxation. Action or horror-themed games, such as *Doom* (Id Software 2016), *The Last of Us* (Naughty Dog 2013), or *Resident Evil*

6 (Capcom 2016), elicited intense emotions and bodily feelings and thus balanced the monotony and numbness of lockdown life. What these participants enjoyed the most was the “adrenaline rush” that came with an exciting game session. Indeed, there is literature (e.g., Bopp et al. 2016; Juul 2013) to the effect that players are not necessarily driven by enjoyment, which is only one possible facet of the complex gaming experience (Koster 2014). Sometimes players may seek out emotions that would generally be considered unpleasant, or not give up in the face of failure. So-called negative emotions evoked by games may be as appreciated as “pure fun” and are often accompanied by significant self-reflection. Video games allow for different uses and interpretations, so that the same game or game genre may be beneficial for some participants but not for others, or the same individual may change genre as the conditions change. In a few cases (7.2 %), whole genres were abandoned, like open-world games, which in certain cases were probably dismissed because they require the investment of creative energies in the development of an avatar and allow for the free exploration of the game world. With the protraction of the state of emergency, which according to the government's initial declarations shouldn't have lasted more than a couple of weeks, many players became fatigued and unable or unwilling to devote as much cognitive efforts to the game world as they did at the beginning. This problem with “open-world” games was not captured by other studies, perhaps because of their timings: for instance, when Kleinman et al. (2021) distributed their survey the most restrictive measures had already been lifted in the United States, while we collected our data when Italy was in the throes of a rigid national lockdown. The different results are likely due to the different psychological states of the respective participants.

Rebalancing the Social Life

Video games offered a way to escape from the sense of isolation coming from the lockdown, the constrictive and possibly toxic sociality of the household, or both. Playing ameliorated the relationship with the housemates, encouraged the formation of social relationships online, or immersed and isolated the player from disturbing vis-à-vis interactions.

Only seldom did digital games bring the household members together. This might depend on several reasons: different tastes; different time windows available to play; the socio-technological transformations that video games underwent in recent years, which yielded the gradual disappearing of the co-located experience of playing video games (Herodotou 2009). However, party games like *Just Dance* (Ubisoft 2019) or digital board games, that entail a co-located interaction among players, were chosen by only five participants, which hints at a lack of desire to play with the cohabitants. Whatever the case, playing mostly was a physically isolated activity. While this condition or behavior is generally traced to problematic gaming or broader difficulties in emotional regulation (Blasi et al. 2019), in the context of our study it was framed as a deliberate choice aimed at preventing or mitigating the interpersonal conflicts generated by forced cohabitation. Likewise, the quality of romantic relationships was also often negatively affected during the lockdown (Romeo et al. 2022; Donato et al. 2021).

Conversely players were generally happy to connect with other people via the internet. Some took the opportunity to strengthen already established relationship, e.g., they found moments to play together with friends and loved ones who were trapped elsewhere, with whom there was no such habit before the crisis; playing in this case was in some way a “substitution” for the evening spent together in a beer garden or at the movies. Others made new acquaintances or friends within the online communities they began to frequent. Sometimes, the change in social

life was less pleasant: e.g., one of our participants was a lady who used to play in presence with her granddaughter when they could spend some time by themselves; during the lockdown they had to give up this habit because the girl's mother, i.e., our participant's daughter, did not want her to play on her cell phone.

During the lockdown many Italians relied on digital technologies to maintain social relations and address their feelings of loneliness (Gabbiadini et al. 2020). The players who took part in our research used social networks and multiplayer games to feel less alone: a “stranger living on the other side of the world” could provide a sense of connection, as reported by, for example, P262. Even meeting or interacting with the Non-Playing Characters (NPCs) that populate digital worlds could restore a sense of communality. These results extend prior research on the importance of *companions* (i.e., NPCs that support and accompany the player during the game: Emmerich et al. 2018) in favoring the sense of immersion in the game world and the enjoyment that ensues (Tremblay and Verbrugge 2013).

Rebalancing Temporal and Spatial Boundaries

Playing helped the participants deal with the temporal and spatial transformations that the crisis had generated in their daily experience. As for the former, survey data suggest that playing was also part of a strategy aimed to recover a feeling of control over the new, disrupted temporality. For example, it sustained the recreation of boundaries between work and non-work hours and enabled the players to perceive the passage of time as more meaningful. For some participants the simple fact that, as one of them said, playing involves “*a definite activity in a definite time*” was enough to compensate for the loss of the temporal reference points separating professional and free time, which remote work had blurred. Especially multiplayer games provided a curb on

overwork, as the participants felt that they had a commitment to their fellow players that could not be missed.

This perception of the transitions between work time and free time was clearer when the participants played from a console or personal computer than from mobile devices. This was the same function that before the lockdown was performed by commuting or physically leaving the workplace. Casual games, which are mostly played on mobile phones both during work hours and on one's way home, did not contribute to reinstate these transitions. This may indicate that people forced to work remotely often intertwined play with work: casual games are better suited for short breaks (Hsu et al. 2007; Reinecke 2009; Alexandrovsky et al. 2019) than for marking a caesura between different activities.

Video games, especially those that foster a sense of immersion, were also used to fast-forward through the day: titles like *The Last of Us* (Naughty Dog 2013), *Uncharted* (Naughty Dog 2017), *Death Stranding* (Kojima Productions 2019), and *The Witcher* (CD Projekt RED 2007) were often compared to the immersive experience granted by other media, such as movies or books.

Retro games and games that belonged to a distant past in their biography were chosen because they reminded participants of lost "positive" periods of their life, when they were free to play without any social or professional responsibility or stigma. This reminded us of the principles of *Daydream* (Jin and Nishino 2020), a retro-style serious game whose aim is to elicit nostalgia, believed to be beneficial to the player thanks to the retrieval of happy memories and feelings from the past.

As for the spatial transformations, video games were used by several participants as tools to mentally escape their claustrophobic household. Most effective in this regard, for some

participants, were games with a carefully designed environment, such as open-world or action-adventure ones, which allow explorative actions that are not necessarily connected to goal achievement. Games that simulate real life, such as *The Sims 3* (The Sims Studio 2009), could help some players find a substitute for the significant places that normally grounded their daily routines and were no more accessible. Virtual spaces resembling real-world landscapes favored a sense of immersion and partially compensated for the impossibility to travel to faraway places. The characteristics of the environment are known to affect the player's feelings of immersion and presence (e.g., Wissmath et al. 2010), and recent evidence suggests that a realistic virtual environment may evoke positive emotions (Newman et al. 2022).

It was important, as expressed by some participants, like P13 and P319, to be able to mold the game spaces – as is the case with sandbox games like *Minecraft* (Mojang 2011) and *Animal Crossing: New Horizons* (Nintendo EPD 2020) – or to have multiple opportunities for action available. *Minecraft* (Mojang 2011) and other sandbox games may encourage the player's self-expression and foster a sense of freedom from the boundaries of the “real world” (e.g., Ringland et al. 2017). Kleinman et al. (2021) found that games offering “virtual real-world” locations to be experienced were preferred during the lockdown, with the intent to substitute for reality. As we mentioned above, however, we found that these types of games tended to be abandoned when isolation was prolonged, and many participants became increasingly fatigued and depressed.

What Role for Video Games During a Crisis?

The COVID-19 crisis has shaken up the nation in several ways, disrupting and subverting everybody's “taken for granted world” (Gardiner 2000), which is made of the routines that

regulate individual and collective life. Other respiratory outbreaks that occurred before the information technology era, like the flu pandemic of 1918-1920 (so-called Spanish), those of the 1950's and 1960's, or even the recent SARS-1 and MERS, impinged upon society in vastly different ways. The potential role of information technologies in disaster mitigation and emergency response planning has been studied since the early 1970s (Stephenson and Anderson 1997). The research area known as "crisis informatics" has shown that information and communication technologies may help shape emergency-related activities, such as the exchange of crucial information, the professional training of first responders (Sanders and Rhodes 2007) or the coordination of operations (Palen et al. 2015). With the advent of COVID-19 the literature has focused on the use of social media, for instance with reference to the collective production, diffusion, and discussion of information (e.g., Pine et al. 2021; Zhang et al. 2021).

So far, video games have remained underexplored in this regard, despite their diffusion and the importance they have in the lives of innumerable persons. Research efforts have mostly been directed towards the design and development of serious games for a variety of objectives, such as supporting the personnel who are institutionally called upon to intervene in an emergency (Wuertz et al. 2018) or training the so-called formal responders (Toups et al. 2015). Another strand of serious games has been addressed to citizens, with the aim to teach them about crises (Gampell et al. 2020a) or to train them act appropriately in emergency contexts (Chittaro and Buttussi 2015; Chittaro and Sioni 2015). Video games are considered an innovative way to educate people who might be involved in a crisis (Gampell et al. 2020b) and to support disaster mitigation by reducing citizens' vulnerability, which is supposed to stem from their unawareness and unpreparedness (Sudarmilah et al. 2019). Despite its advancements, this literature appears to

conceive games mostly as tools that can be leveraged to facilitate control of threatening events and their effects on society.

As these years have shown, however, a major crisis may look like nothing you can train the general population for: its precise nature, unfolding, and consequences may be too difficult, complex, and far-reaching to forecast and depend more on the measures taken by the governments than the preparedness of the population. To provide psychological support to the citizens during and after a stressful experience (Saltzman et al. 2017) may be at least as important as preparing them in advance for a crisis whose profile is likely very uncertain. This perspective broadens and transforms the scope, sense and usefulness of video games, opening up to any type thereof, including also, if not mostly, commercial ones. The literature here is sparse and mostly interdisciplinary: however, there are both theoretical arguments and practical evidence that play can be helpful in treating distress caused by difficult situations. Video games offer several kinds of emotional and social benefits: they can help improve mood and relieve negative feelings (Bowman and Tamborini 2015; Reinecke et al. 2012), complement social needs (Vella et al. 2016), and provide a sense of belonging to counteract feelings of loneliness (Iacovides and Mekler 2019).

While commercial video games are not primarily, or at all, designed with the user's psychological well-being in mind, their employment in clinical interventions to address a wide spectrum of disorders is not uncommon. Game-based protocols have been implemented and tested for anxiety and depression (Kühn et al. 2018) and for Post-Traumatic Stress Disorder (PTSD) (Colder Carras et al. 2018; Elliott et al. 2015). The latter is particularly interesting since the mental health of otherwise sane persons can be compromised when they become victims of unpredictable and stressful life-changing events (American Psychological Association 2013). Of

course, video games are extremely diverse in terms of design features, background narrative, gameplay experience, duration, social interaction and so on, and therefore in terms of the mental states and emotions evoked in each user, so that each can be more or less suitable for integration into a certain therapeutic protocol. For example, first-person shooter games have been used with the same logic that underlies virtual-reality exposure therapy (VRET) to desensitize veterans from frightening stimuli, namely by immersing them in a simulation which recalls the previous traumatic experiences; role-playing games (RPGs) may be useful in the psychotherapy of several conditions in the developmental age (Boldi and Rapp 2022). Our findings fully support this perspective, insofar as we found a strong relationship between the distinctive features of the games and the way the players utilized them in a sort of self-treatment.

Other research suggests that virtual gaming environments should be considered “altered realities” (Rosegrant 2012) that give players the opportunity to not only temporarily detach themselves from a discomforting reality, but also re-enact feelings of distress in a more protected and non-judgmental environment (Hicks et al. 2019). There are several examples of how specific video games may be used, e.g., to psychologically “reconnect” with the world (Hicks et al. 2019; Guhde 2017). The narrative structure of games and the symbolic elements they are rife with can, each in its own way, promote a better life and better management of emotions (Gerhardt and Smith 2020). The participants in our study played more prominently, or conversely dismissed, specific games or types of games depending on how they were dealing with the crisis and its evolution over time. For example, games set in dystopian or apocalyptic contexts were abandoned from the very beginning of the lockdown, because they could over-amplify certain features of the pandemic world or of the fears that it generated. The choice of a certain gaming experience thus is not only a matter of previous preferences, of individual disposition or of the

availability or popularity of a title; instead, it is more strictly connected to the player's experience of the crisis and its unfolding.

Given the key role of such processes in human psychological life (Bruner 1990; Neimeyer and Mahoney 1996; Mahoney and Granvold 2005), the effectiveness of video games in supporting them has remarkable consequences for their employment during a crisis (De Schutter & Vanden Abeele 2010; Zhang et al. 2020). Maintaining the ability to make sense of the world under difficult circumstances, like those of the COVID-19 crisis (Castiglioni and Gaj 2020), is crucial insofar as the disruption of the routines that structure and regulate most of our daily lives interferes with the process of meaning-making (Kelly 1995) and jeopardizes the ability to recover from distressing experiences.

Conclusions

In this chapter we built on both previous literature and our own work (Boldi et al., 2022) to discuss the use of video games during the COVID-19 crisis, pointing out that, and how, commercial video games have helped people rebalance the profound life transformations engendered by the crisis. Research on the spontaneous use of video games during crises was scarce before the pandemic, while several studies have been conducted on this topic since 2020, investigating whether video games can be a valuable resource to cope with highly complex, pervasive, hyperobject-like crises.

Recent literature has viewed playing video games as one of the meaningful activities that can offer some benefit during a critical situation (Mekler & Hornbæk 2019), provided that those involved are adequately shielded from its undesirable effects, like isolation or the triggering of disturbing traumatic memories (Elliott et al. 2015). However, a clear-cut universal answer to the

enquiry about the benefits and threats of playing is unattainable, not only because of the platitude that not everybody likes to play, but, more interestingly, because games offer a myriad of opportunities and ways to play, that is a myriad of local *affordances* (Gibson 1979), which makes each interaction between a player and a game unique and tremendously complex. Each of us has a different set of resources available to cope with vexatious life events (Benight and Harper 2002) and is driven by individual motivations to play (Yee 2006), which can develop and change under complex circumstances. Therefore, it is no surprise that there is a lot of heterogeneity in how people have used video games during the COVID-19 crisis, as well as in how this affected their lives. In the face of some regularities in its effects, this situation has also emphasized individual differences, as it has affected citizens in different ways depending on whether they could count on a strong and supportive social network, a stable job position and a solid financial situation, a serene home environment, psychological resilience, on whether their job remained in presence, went online or was simply lost, and so on. In the same vein Ballou et al. (2022) concluded that gaming can effectively offset psychological needs, but that such positive effects appear to be experienced mostly by those who were previously satisfied with their daily lives. This draws attention to the uniqueness of personal experience and its role in fostering the effects of video gaming in difficult times.

Yet we believe that the use of video games can be interesting to observe per se, and not merely to investigate its more or less positive effects on mental health. How people play under critical circumstances may reveal something about their individual meaning-making processes, experiences, and representations of threatening events, and ways to cope with them.

Future research should explore in depth what factors may account for the individual differences in play and how they shape the experience of the crisis. One simple hypothesis, for

example, is that more experienced players might benefit more than novices from playing in challenging situations. Because gaming has long been an active part of their lives, they are likely more aware of the complex effects that different games may have on them, and therefore more proficient at choosing a specific game for a specific purpose, managing the ways and times in which to play it, abandoning it for another one, or stopping playing altogether when the benefits diminish or harmful effects emerge.

Our final consideration is about serious games, which have been the main focus of crisis informatics. We hope that these reflections can open up new challenges for researchers and practitioners studying and developing serious games aimed, with a healing intent, at those who are going through a crisis. In particular, we believe that these games should take into account both the specificity of each crisis and the uniqueness of each individual's response to it.

References

- Alexandrovsky, D., M. A. Friehs, M. V. Birk, R. K. Yates and R. L. Mandryk (2019), "Game Dynamics That Support Snacking, Not Feasting", *Proceedings of the Annual Symposium on Computer-Human Interaction in Play*, 573–88, Barcelona Spain: ACM.
- American Psychiatric Association and American Psychiatric Association, eds. (2013), *Diagnostic and Statistical Manual of Mental Disorders: DSM-5*, 5th ed, Washington, D.C: American Psychiatric Association.
- Amerio, A., A. Lugo, C. Bosetti, T. Fanucchi, G. Gorini, R. Pacifici, A. Odone and S. Gallus (2021), "Italians Do It ... Less. COVID-19 Lockdown Impact on Sexual Activity: Evidence From a Large Representative Sample of Italian Adults", *Journal of Epidemiology*, 31 (12): 648–52.

- Amerio, A., A. Lugo, C. Stival, T. Fanucchi, G. Gorini, R. Pacifici, A. Odone, G. Serafini and S. Gallus (2021), “COVID-19 Lockdown Impact on Mental Health in a Large Representative Sample of Italian Adults”, *Journal of Affective Disorders*, 292: 398–404.
- Ballou, N., S. Deterding, I. Iacovides and L. Helsby (2022), “Do People Use Games to Compensate for Psychological Needs During Crises? A Mixed-Methods Study of Gaming During COVID-19 Lockdowns”, *CHI Conference on Human Factors in Computing Systems*, 1–15, New Orleans LA USA: ACM.
- Barr, M. and A. Copeland-Stewart (2022), “Playing Video Games During the COVID-19 Pandemic and Effects on Players’ Well-Being”, *Games and Culture*, 17 (1): 122–39.
- Bastoni, S., C. Wrede, A. Ammar, A. Braakman-Jansen, R. Sanderman, A. Gaggioli and L. van Gemert-Pijnen, L. (2021). “Psychosocial effects and use of communication technologies during home confinement in the first wave of the COVID-19 pandemic in Italy and The Netherlands”, *International journal of environmental research and public health*, 18 (5): 2619.
- Bengtsson, S. and K. Van Poeck (2021), “What Can We Learn from COVID-19 as a Form of Public Pedagogy?”, *European Journal for Research on the Education and Learning of Adults*, 12 (3): 281–93.
- Benight, C. C. and M. L. Harper (2002), “Coping Self-Efficacy Perceptions as a Mediator between Acute Stress Response and Long-Term Distress Following Natural Disasters”, *Journal of Traumatic Stress*, 15 (3): 177–86.
- Blasi, M. D., A. Giardina, C. Giordano, G. L. Coco, C. Tosto, J. Billieux and A. Schimmenti (2019), “Problematic Video Game Use as an Emotional Coping Strategy: Evidence from a Sample of MMORPG Gamers”, *Journal of Behavioral Addictions*, 8 (1): 25–34.

- Boldi, A. and A. Rapp (2022), “Commercial Video Games as a Resource for Mental Health: A Systematic Literature Review”, *Behaviour & Information Technology*, 41 (12): 2654–90.
- Boldi, A., A. Rapp and M. Tirassa (2022), “Playing during a Crisis: The Impact of Commercial Video Games on the Reconfiguration of People’s Life during the COVID-19 Pandemic”, *Human–Computer Interaction* 0 (0): 1–42.
- Bopp, J. A., E. D. Mekler and K. Opwis (2016), “Negative Emotion, Positive Experience?: Emotionally Moving Moments in Digital Games”, *Proceedings of the 2016 CHI Conference on Human Factors in Computing Systems*, 2996–3006, San Jose California USA: ACM.
- Bowman, N. D. and R. Tamborini (2015), “‘In the Mood to Game’: Selective Exposure and Mood Management Processes in Computer Game Play”, *New Media & Society*, 17 (3): 375–93.
- Broughton, M., (2020), “Europe mobile game revenue hits record high; riot acquires hypixel”, *The Gaming Economy*, 17 April. Available online: <https://www.thegamingeconomy.exchangewire.com/2020/04/17/europemobile-game-revenue-hits-record-high-riot-acquires-hypixel/> (accessed May 10, 2023).
- Bruner, J. S. (1990), *Acts of Meaning*, The Jerusalem-Harvard lectures, Cambridge, Mass: Harvard University Press.
- Caldeira, C., C. R.B. De Souza, L. Machado, M. Perin and P. Bjørn (2022), “Crisis Readiness: Revisiting the Distance Framework During the COVID-19 Pandemic”, *Computer Supported Cooperative Work (CSCW)*, 1-37.
- Camporesi, S., F. Angeli, and G. Dal Fabbro, (2022), “Mobilization of Expert Knowledge and

- Advice for the Management of the Covid-19 Emergency in Italy in 2020”, *Humanities and Social Sciences Communications*, 9 (1): 1–14.
- Castiglioni, M. and N. Gaj (2020), “Fostering the Reconstruction of Meaning Among the General Population During the COVID-19 Pandemic”, *Frontiers in Psychology*, 11: 567419.
- Chatterjee, S., (2020), “Making the invisible visible: how we depict COVID-19”, LSE COVID-19 blog, 10 July. Available online: <https://blogs.lse.ac.uk/impactofsocialsciences/2020/07/10/making-the-invisible-visible-how-we-depict-covid-19/> (accessed May 10, 2023).
- Chittaro, L. and F. Buttussi (2015), “Assessing Knowledge Retention of an Immersive Serious Game vs. a Traditional Education Method in Aviation Safety”, *IEEE Transactions on Visualization and Computer Graphics*, 21 (4): 529–38.
- Chittaro, L. and R. Sioni (2015), “Serious Games for Emergency Preparedness: Evaluation of an Interactive vs. a Non-Interactive Simulation of a Terror Attack”, *Computers in Human Behavior*, 50: 508–19.
- Colder Carras, M., A. Kalbarczyk, K. Wells, J. Banks, R. Kowert, C. Gillespie, and C. Latkin (2018), “Connection, Meaning, and Distraction: A Qualitative Study of Video Game Play and Mental Health Recovery in Veterans Treated for Mental and/or Behavioral Health Problems”. *Social Science & Medicine*, 216 (November): 124–32.
- De Rosa, A. S. and T. Mannarini (2021), “Covid-19 as an “Invisible Other” and Socio-Spatial Distancing within a One-Metre Individual Bubble”, *URBAN DESIGN International*, 26 (4): 370–90.
- De Schutter, B. and V. Vanden Abeele (2010), “Designing Meaningful Play within the Psycho-

- Social Context of Older Adults”, *Proceedings of the 3rd International Conference on Fun and Games*, 84–93, Leuven Belgium: ACM.
- Donato, S., M. Parise, A. F. Pagani, M. Lanz, C. Regalia, R. Rosnati and R. Iafrate (2021), “Together Against COVID-19 Concerns: The Role of the Dyadic Coping Process for Partners’ Psychological Well-Being During the Pandemic”, *Frontiers in Psychology*, 11: 578395.
- Droit-Volet, S., S. Gil, N. Martinelli, N. Andant, M. Clinchamps, L. Parreira, K. Rouffiac, M. Dambrun, P. Huguet, B. Dubuis, B. Pereira, COVISTRESS network, J.-B. Bouillon and F. Dutheil (2020), “Time and Covid-19 Stress in the Lockdown Situation: Time Free, ‘Dying’ of Boredom and Sadness”, *PLOS ONE*, ed. M. Faber, 15 (8): e0236465.
- Elliott, L., A. Golub, M. Price and A. Bennett (2015), “More than Just a Game? Combat-Themed Gaming Among Recent Veterans with Posttraumatic Stress Disorder”, *Games for Health Journal*, 4 (4): 271–77.
- Emmerich, K., Patrizia R., and M. Masuch (2018), “I’m Glad You Are on My Side: How to Design Compelling Game Companions”, *Proceedings of the 2018 Annual Symposium on Computer-Human Interaction in Play*, 141–52, New York, USA: ACM.
- Federici, S., A. Lepri, A. Castellani Mencarelli, E. Zingone, R. De Leonibus, A. M. Acocella and A. Giammaria (2022), “The Sexual Experience of Italian Adults during the COVID-19 Lockdown”, *PLOS ONE*, ed. P. K. Jonason, 17 (5): e0268079.
- Formosa, J., D. Johnson, S. Türkay and R. L. Mandryk (2022), “Need Satisfaction, Passion and Wellbeing Effects of Videogame Play Prior to and during the COVID-19 Pandemic”, *Computers in Human Behavior*, 131: 107232.
- Gabbiadini, A., Cristina B., Federica D., R. R. Valtorta, M. De Rosa, and M. Gallucci (2020),

- “Together Apart: The Mitigating Role of Digital Communication Technologies on Negative Affect During the COVID-19 Outbreak in Italy”, *Frontiers in Psychology*, 11.
- Gampell, A. V., J. C. Gaillard, M. Parsons, and L. Le Dé (2020), “Exploring the Use of the Quake Safe House Video Game to Foster Disaster and Disaster Risk Reduction Awareness in Museum Visitors”, *International Journal of Disaster Risk Reduction*, 49 (October): 101670.
- Gampell, A., J. C. Gaillard, M. Parsons and L. Le Dé (2020), “‘Serious’ Disaster Video Games: An Innovative Approach to Teaching and Learning about Disasters and Disaster Risk Reduction”, *Journal of Geography*, 119 (5): 159–70.
- Gardiner, M. (2000), *Critiques of everyday life: An Introduction*, London and New York: Routledge.
- Gerhardt, L., and J. Smith (2020), “The Use of Minecraft in the Treatment of Trauma for a Child with Autism Spectrum Disorder”, *Journal of Family Therapy*, 42 (3): 365–84.
- Gibson, J. J. (1979), “The Theory of Affordances”, In J. J. Gibson (ed.), *The Ecological Approach to Visual Perception*, 127–137, Boston, MA: Houghton Mifflin.
- Gualano, M. R., G. Lo Moro, G. Voglino, F. Bert and R. Siliquini (2020), “Effects of Covid-19 Lockdown on Mental Health and Sleep Disturbances in Italy”, *International Journal of Environmental Research and Public Health*, 17 (13): 4779.
- Guhde, A. (2017), “The Other Game: A Journey into the World of Warcraft”, *Psychoanalytic Inquiry*, 37 (1): 35–45.
- Haesler, S., S. Schmid, A. S. Vierneisel and C. Reuter (2021), “Stronger Together: How Neighborhood Groups Build up a Virtual Network during the COVID-19 Pandemic”, *Proceedings of the ACM on Human-Computer Interaction*, 5 (CSCW2): 1–31.

- Herodotou, C. (2009), “Game Appropriation: Where Does the Gamer Fit?”. PhD diss., Institute of Education, University of London, London.
- Hicks, B., A. Innes and S. R. Nyman (2020), “Exploring the ‘Active Mechanisms’ for Engaging Rural-Dwelling Older Men with Dementia in a Community Technological Initiative”, *Ageing and Society*, 40 (9): 1906–38.
- Holman, E. A. and E. L. Grisham (2020), “When Time Falls Apart: The Public Health Implications of Distorted Time Perception in the Age of COVID-19.”, *Psychological Trauma: Theory, Research, Practice, and Policy*, 12 (S1): S63–65.
- Horowitz, J. (2020), “Italy Announces Restrictions Over Entire Country in Attempt to Halt Coronavirus”, *New York Times*, 9 March. Available online: <https://www.nytimes.com/2020/03/09/world/europe/italy-lockdown-coronavirus.html> (accessed May 10, 2023).
- Hsu, Y.-P., K.-C. Hsu, and C.-M. Ko (2007), “Casual Games Provide Stress Relief for Female Gamer in Taiwan”, In *European Conference on Games Based Learning*, ECGBL 2007, 123–26.
- Iacovides, I. and E. D. Mekler (2019), “The Role of Gaming During Difficult Life Experiences”, *Proceedings of the 2019 CHI Conference on Human Factors in Computing Systems*, 1–12, Glasgow Scotland UK: ACM.
- Ji, C. and H. Nishino (2020), “Daydream: A Healing Game for Mitigating Quarantine-Induced Negative Emotions with Music Adventure”, *Extended Abstracts of the 2020 Annual Symposium on Computer-Human Interaction in Play*, 64–67, Virtual Event Canada: ACM.
- Juul, J. (2013), *The Art of Failure: An Essay on the Pain of Playing Video Games*, Playful

- thinking, Cambridge, Mass: MIT Press.
- Kanemura, R., O. Chan, and A. Farrow (2022), “The impact of covid-19 on the volunteer experience”, *NCVO*, 22 July. Available online: <https://www.ncvo.org.uk/news-and-insights/news-index/time-well-spent-research-impact-of-covid-19-on-the-volunteer-experience/#/> (accessed May 10, 2023).
- Kelly, G. A. (1955), *The Psychology of Personal Constructs*, New York, NY: Norton.
- King, D.L., and P.H. Delfabbro. 2014. “The Cognitive Psychology of Internet Gaming Disorder”. *Clinical Psychology Review* 34 (4): 298–308.
- King, D. L. and P. H. Delfabbro (2014), “The Cognitive Psychology of Internet Gaming Disorder”, *Clinical Psychology Review*, 34 (4): 298–308.
- Kleinman, E., S. Chojnacki and M. Seif El-Nasr (2021), “The Gang’s All Here: How People Used Games to Cope with COVID19 Quarantine”, *Proceedings of the 2021 CHI Conference on Human Factors in Computing Systems*, 1–12, Yokohama Japan: ACM.
- Koster, R. (2014), *A Theory of Fun for Game Design*, 2. ed, Sebastopol, Calif: O’Reilly Media.
- Kühn, S., F. Berna, T. Lüdtke, J. Gallinat, and S. Moritz (2018), “Fighting Depression: Action Video Game Play May Reduce Rumination and Increase Subjective and Objective Cognition in Depressed Patients”, *Frontiers in Psychology*, 9.
- Lupton, D., and K. Willis (2021), “Covid Society”, in D. Lupton and K. Willis (eds.), *The COVID-19 Crisis – Social Perspectives*, 3-13, Oxon and New York: Routledge.
- Mahoney, M. J., and D. K. Granvold (2005), “Constructivism and Psychotherapy”, *World Psychiatry*, 4 (2): 74–77.
- Mekler, E. D. and K. Hornbæk (2019), “A Framework for the Experience of Meaning in Human-

- Computer Interaction”, *Proceedings of the 2019 CHI Conference on Human Factors in Computing Systems*, 1–15, Glasgow Scotland UK: ACM.
- Mondada, L., J. Bänninger, S. A. Bouaouina, L. Camus, G. Gauthier, P. Hänggi, M. Koda, H. Svensson and B. S. Tekin (2020), “Human Sociality in the Times of the Covid-19 Pandemic: A Systematic Examination of Change in Greetings”, *Journal of Sociolinguistics*, 24 (4): 441–68.
- Barchielli, B., M. Baldi, E. Paoli, P. Roma, S. Ferracuti, C. Napoli, A. M. Giannini and G. Lausi (2021), “When ‘Stay at Home’ Can Be Dangerous: Data on Domestic Violence in Italy during COVID-19 Lockdown”, *International Journal of Environmental Research and Public Health*, 18 (17): 8948.
- Morton, T. (2013), *Hyperobjects: Philosophy and Ecology after the End of the World*, Minneapolis, London: University of Minnesota Press.
- Myles, D., S. Duguay, and C. Dietzel (2021), “#DatingWhileDistancing: Dating apps as digital health technologies during the COVID-19 pandemic”, in D. Lupton and K. Willis (Eds.), *The COVID-19 Crisis – Social Perspectives*, 78-89, Oxon and New York: Routledge.
- Neimeyer, R. A., M. J. Mahoney and E. T. Dowd (1996), “Constructivism in Psychotherapy”, *Journal of Cognitive Psychotherapy*, 10 (3): 227–29.
- Newman, M., B. Gatersleben, K. J. Wyles and E. Ratcliffe (2022), “The Use of Virtual Reality in Environment Experiences and the Importance of Realism”, *Journal of Environmental Psychology*, 79: 101733.
- Ogden, R. S. (2020), “The Passage of Time during the UK Covid-19 Lockdown”, PLOS ONE, ed. A. Nishi, 15 (7): e0235871. <https://doi.org/10.1371/journal.pone.0235871>
- Ortiz De Gortari, A. B. (2018), “Empirical Study on Game Transfer Phenomena in a Location-

- Based Augmented Reality Game”, *Telematics and Informatics*, 35 (2): 382–96.
- Palen, L., and A. L. Hughes (2018), “Social Media in Disaster Communication”, in R. T. Serpe (ed.), *Handbooks of Sociology and Social Research*, 497–518.
- Palen, L., R. Soden, T. J. Anderson and M. Barrenechea (2015), “Success & Scale in a Data-Producing Organization: The Socio-Technical Evolution of OpenStreetMap in Response to Humanitarian Events”, *Proceedings of the 33rd Annual ACM Conference on Human Factors in Computing Systems*, 4113–22, Seoul Republic of Korea: ACM.
- Pine, K. H., M. Lee, S. A. Whitman, Y. Chen, and K. Henne (2021), “Making Sense of Risk Information amidst Uncertainty: Individuals’ Perceived Risks Associated with the COVID-19 Pandemic”, *Proceedings of the 2021 CHI Conference on Human Factors in Computing Systems*, 1–15, New York NY USA: ACM.
- Prete, M., A. Luzzetti, L. S. A. Augustin, G. Porciello, C. Montagnese, I. Calabrese, G. Ballarin, S. Coluccia, L. Patel, S. Vitale, E. Palumbo, E. Celentano, C. La Vecchia and A. Crispo (2021), “Changes in Lifestyle and Dietary Habits during COVID-19 Lockdown in Italy: Results of an Online Survey”, *Nutrients*, 13 (6): 1923.
- Reinecke, L., R. Tamborini, M. Grizzard, R. Lewis, A. Eden and N. David Bowman (2012), “Characterizing Mood Management as Need Satisfaction: The Effects of Intrinsic Needs on Selective Exposure and Mood Repair”, *Journal of Communication*, 62 (3): 437–53.
- Reinecke, L. (2009), “Games at Work: The Recreational Use of Computer Games During Working Hours”, *CyberPsychology & Behavior*, 12 (4): 461–65.
- Ringland, K. E., L. Boyd, H. Faucett, A. L. L. Cullen and G. R. Hayes (2017), “Making in

- Minecraft: A Means of Self-Expression for Youth with Autism”, *Proceedings of the 2017 Conference on Interaction Design and Children*, 340–45, Stanford California USA: ACM.
- Riva, G., F. Mantovani and B. K. Wiederhold (2020), “Positive Technology and COVID-19”, *Cyberpsychology, Behavior, and Social Networking*, 23 (9): 581–87.
- Rodriguez-Morales, A. J., J. A. Cardona-Ospina, E. Gutiérrez-Ocampo, R. Villamizar-Peña, Y. Holguin-Rivera, J. P. Escalera-Antezana, L. E. Alvarado-Arnez, D. K. Bonilla-Aldana, C. Franco-Paredes, A. F. Henao-Martinez, A. Paniz-Mondolfi, G. J. Lagos-Grisales, E. Ramírez-Vallejo, J. A. Suárez, L. I. Zambrano, W. E. Villamil-Gómez, G. J. Balbin-Ramon, A. A. Rabaan, H. Harapan, K. Dhama, H. Nishiura, H. Kataoka, T. Ahmad and R. Sah (2020), “Clinical, Laboratory and Imaging Features of COVID-19: A Systematic Review and Meta-Analysis”, *Travel Medicine and Infectious Disease*, 34: 101623.
- Romeo, A., L. Castelli, A. Benfante and M. D. Tella (2022), “Love in the Time of COVID-19: The Negative Effects of the Pandemic on Psychological Well-Being and Dyadic Adjustment”, *Journal of Affective Disorders*, 299: 525–27.
- Rosegrant, J. (2012), “Technologically Altered Reality inside the Therapist’s Office”, *Psychoanalytic Psychology*, 29 (2): 226–40.
- Saltzman, L. Y., L. Solomyak and R. Pat-Horenczyk (2017), “Addressing the Needs of Children and Youth in the Context of War and Terrorism: The Technological Frontier”, *Current Psychiatry Reports*, 19 (6): 30.
- Sanders, R. L., and G. S. Rhodes (2007), “A Simulation Learning Approach to Training First Responders for Radiological Emergencies”, *Proceedings of the 2007 Summer Computer Simulation Conference*, 1–3, San Diego CA USA: SCSC.

- Schnirring, L. (2020), “WHO: Europe now world’s COVID-19 epicenter”, *CIDRAP News*, 13 March. Available online: <https://www.cidrap.umn.edu/news-perspective/2020/03/who-europe-now-worlds-covid-19-epicenter> (accessed May 10, 2023).
- Shaw, D. M. (2020), “Invisible Enemies: Coronavirus and Other Hidden Threats”, *Journal of Bioethical Inquiry*, 17 (4): 531–34.
- Stephenson, R. and P. S. Anderson (1997), “Disasters and the Information Technology Revolution”, *Disasters*, 21 (4): 305–34.
- Sudarmilah, E. (2019), “Game Education of Disaster Mitigation: A Systematic Literature Review”, *International Journal of Advanced Trends in Computer Science and Engineering*, 8 (6): 2940–43.
- Tan, M. L., R. Prasanna, K. Stock, E. Hudson-Doyle, G. Leonard and D. Johnston (2017), “Mobile Applications in Crisis Informatics Literature: A Systematic Review”, *International Journal of Disaster Risk Reduction*, 24: 297–311.
- Toups, Z. O., W. A. Hamilton, C. Keyes-Garcia, S. Perez and R. Stanton (2015), “Collaborative Planning Gameplay from Disaster Response Practice”, *Proceedings of the 2015 Annual Symposium on Computer-Human Interaction in Play*, 715–20, London United Kingdom: ACM.
- Tremblay, J., and C. Verbrugge (2013), “Adaptive Companions in FPS Games”, *International Conference on Foundations of Digital Games*.
- Vella, K., D. Johnson and J. Mitchell (2016), “Playing Support: Social Connectedness Amongst Male Videogame Players”, *Proceedings of the 2016 Annual Symposium on Computer-Human Interaction in Play Companion Extended Abstracts*, 343–50, Austin Texas USA: ACM.

- Voorhees, G. A. (2009), “I Play Therefore I Am: Sid Meier’s Civilization, Turn-Based Strategy Games and the Cogito”, *Games and Culture*, 4 (3): 254–75.
- Wissmath, B., David W., and F. W. Mast (2010), “The Effects of Virtual Weather on Presence”, In F. Lehmann-Grube and J. Sablatnig (eds), *Facets of Virtual Environments*, 68–78, Lecture Notes of the Institute for Computer Sciences, Social Informatics and Telecommunications Engineering, Berlin Heidelberg: Springer.
- Xiong, J., O. Lipsitz, F. Nasri, L. M. W. Lui, H. Gill, L. Phan, D. Chen-Li, M. Iacobucci, R. Ho, A. Majeed and R. S. McIntyre (2020), “Impact of COVID-19 Pandemic on Mental Health in the General Population: A Systematic Review”, *Journal of Affective Disorders*, 277: 55–64.
- Yee, N. (2006), “Motivations for Play in Online Games”. *Cyberpsychology & Behavior*, 9 (6): 772–75.
- Zhang, M., Q. Xing, C. He and H. Long (2023), “The Influence of Video Game Types on Inhibiting Interference Stimuli under Different Perceptual Loads”, *Computers in Human Behavior Reports*, 9: 100250.
- Zhang, R., N. N. Bazarova and M. Reddy (2021), “Distress Disclosure across Social Media Platforms during the COVID-19 Pandemic: Untangling the Effects of Platforms, Affordances, and Audiences”, *Proceedings of the 2021 CHI Conference on Human Factors in Computing Systems*, 1–15, Yokohama Japan: ACM.
- Zhang, S. X., Y. Wang, A. Rauch, and F. Wei (2020), “Unprecedented Disruption of Lives and Work: Health, Distress and Life Satisfaction of Working Adults in China One Month into the COVID-19 Outbreak”. *Psychiatry Research*, 288 (June): 112958.
- Zhang, X., X. Gui, Y. Kou and Y. Li (2020), “Mobile Collocated Gaming: Collaborative Play

and Meaning-Making on a University Campus”, *Proceedings of the ACM on Human-Computer Interaction*, 4 (CSCW2): 1–24.

Lists of Games

- Big Huge Games (2003). *Rise of Nations* [Windows, macOS]. Microsoft Game Studios.
- BioWare (2017). *Mass Effect: Andromeda* [Microsoft Windows, PlayStation 4, Xbox One] Electronic Arts.
- Capcom (2016). *Resident Evil 6* [PlayStation 3, Xbox 360, Microsoft Windows, PlayStation 4, Xbox One, Nintendo Switch]. Capcom.
- CD Projekt RED (2007). *The Witcher* [Microsoft Windows]. Atari.
- Ensemble Studios (1997). *Age of Empires* [Microsoft Windows, macOS]. Microsoft.
- Firaxis Games (2016). *Civilization VI* [Microsoft Windows]. 2K Games.
- Id Software (2016). *Doom* [Microsoft Windows, PlayStation 4, Xbox One, Nintendo Switch, Google Stadia]. Bethesda Softworks.
- Kojima Productions (2019). *Death Stranding* [PS4]. Sony Computer Entertainment.
- Mojang (2011). *Minecraft* [Microsoft Windows, macOS, Linux]. Mojang AB.
- Naughty Dog (2013). *The Last of Us* [PlayStation 3, PlayStation 4, PlayStation 5, Microsoft Windows]. Sony Computer Entertainment.
- Naughty Dog (2017). *Uncharted: The Lost Legacy* [PlayStation 4, PlayStation 5, Microsoft Windows]. Sony Interactive Entertainment.
- Nintendo EPD (2020). *Animal Crossing: New Horizons* [Nintendo Switch]. Nintendo.
- Paradox Interactive (2013). *Europa Universalis IV* [Microsoft Windows, macOS, Linux]. Paradox Interactive.

PopTop Software, Feral Interactive (2001). *Tropico* [Microsoft Windows, macOS]. Gathering of Developers, MacSoft, Feral Interactive.

Tencent's TiMi Studio Group (2019). *Saint Seiya Awakening: Knights of the Zodiac* [Android, iOS, Windows]. YOOZOO Games.

The Sims Studio (2009). *The Sims 3* [Microsoft Windows, macOS, iOS, Android, Windows Phone, PlayStation 3, Xbox 360, Wii, Nintendo DS, Nintendo 3DS]. Electronic Arts.

Ubisoft (2019). *Just Dance 2019* [PlayStation 4, Xbox 360, Xbox One, Wii, Wii U, Nintendo Switch]. Ubisoft.