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Many times: The perception of temporality in digital environments

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Abstract

The notion of space has always been in the center of studies aiming to explore the nature of digital environments. Especially regarding videogames, the immersion of users in virtual spaces has attracted great theoretical interest. Time, on the other side, has been greatly neglected in digital studies. Although, according to Boellstorff, the relation between spatiality and temporality is co-constitutive, so far we know very little about the ways extremely popular technologies, like social media and digital games, contribute to the transformation of both the perception of temporality and the understanding of past and present. The aim of this paper is to examine how the systematic exposure of high school students to digital environments affects their time perception. The research upon which the paper is based was mainly conducted through semi-structured questionnaires, workshops and participant observation in digital games and social media. The main aim of the research was to find out the transformations in the perception of temporality and how they vary according to the differential exposure of the individuals to particular digital environments (games, social media, educational use). At the same time, it examines whether the members of the group developed particular skills or collective mechanisms to evaluate, organize and manage the flows of nonhierarchical information they engage with. Finally, it tries to investigate the ideas of the individuals about duration, past and present, memory and the irreversibility of history.

Introduction

The work presented here is the culmination of a research project that aimed to examine how systematic exposure to digital environments affects high school students' perception of time. Drawing on the theoretical concepts and methodological tools of digital (and) multimodal anthropology, the research explores how students involved with specific digital media—such as social media (Instagram, TikTok, YouTube etc.) and video games (World of Warcraft, Call of Duty, Assassins' Creed, Fortnite, WWII Online, Grepolis etc.)—as well as with various narrative forms associated with these media (images, videos, sounds, texts, algorithms) make sense of time and shape their temporal experience. In the course of our presentation, we use “digital environments” as an inclusive term denoting a wide variety of societal contexts mediated by online communication. Instead of focusing on “virtual worlds” that would confine our investigation to digitally persistent contexts (Boellstorff et al., 2012, p. 7-8), we preferred to make use of a framework that would enable us to capture “the mutual permeation of the virtual with the physical world” (Frömming et al., 2017, p. 13), as befits the object of our research. It is important to stress that the particular character of digital environments, in combination with the special conditions of COVID-19 pandemic, had a significant impact on the way we employed the tools of multimodal anthropology to produce ethnographic and historical knowledge.

The notion of space has always been at the centre of studies aiming to explore the nature of digital environments. Pierre Levy's virtuality has been closely associated with ubiquity (Levy, 1998, p. 38-39). According to Paul Virilio (2000), the diffusion of information technologies resulted in the end of geography. At the same time, geographical metaphors have been widely used to convey the experience of individuals involved with digital media. The construction of digital spaces (“placemaking”) is a condition of possibility for the creation of virtual worlds and digital game

environments (Boellstorff, 2008, p. 91). Finally, the disengagement of virtual communities from the “natural” space brought about the emergence of cyberspace as the habitat of the so-called digital natives. All these theoretical undertakings and conceptual shifts underscore the centrality of the concept of space in digital environments. Especially regarding videogames, the immersion of users in virtual spaces has attracted great theoretical interest. For Janet Murray (2016 [1997], p. 79-82), spatiality is a crucial feature of procedural media, whereas for anthropologists Boellstorff and Nardi, game designer Pearce, and sociologist Taylor (Boellstorff et al., 2012, p. 7), virtual worlds and online games are not mere simulations but spaces wherein players can move and interact.

Time, on the other hand, has not attracted as much attention. Huysen, writing in the beginning of the millennium, assumed that time had been greatly neglected in digital environment studies (Huysen, 2000, p. 21-22). Although the relation between spatiality and temporality is co-constitutive (Boellstorff, 2008, p. 102), there is not much research about the ways various popular technologies, like social media and digital games, contribute to the transformation of both the perception of temporality and the understanding of past and present. True that time has long been the subject of anthropological research (Levi-Strauss, 1952; Fabian, 1983; Gell, 2001). However, although in the last fifteen years a number of ethnographies have focused on the notion of time in relation to digital media such as virtual worlds (Boellstorff, 2008), database memory and digital mourning (Ryan, 2012; Papailias, 2016), the respective literature remains rather limited. A recent contribution of particular interest to our research is Rebecca Coleman’s work on the ways social media transform users’ perception of the present (Coleman, 2020a; 2020b).

The notion of historical past also poses significant theoretical challenges. Prior to the digital era, the sources considered appropriate for providing historical information beyond school education were limited. Radio broadcasts, TV shows, children’s books and especially the narratives of the adults (for children who could afford such luxuries) provided a general frame for time and history. Today, the available extra-school sources of information are multifarious, especially in technologically advanced societies where children have easy access to digital media. In this new context, historical data and especially their interpretations do not draw exclusively (or even primarily) on the recognized authority of the adults, thus leaving space for heterogeneous creative reconstructions of the past, which blur the boundary between reality and imagination. On top of this, the involvement of individuals with digital media brings into play interaction and performativity that radically alter the experience of temporality.

The aim of this paper is to contribute to the discussion about the ways in which the digital transition affects the perception of temporality. The paper is based upon research that focuses on how time is experienced by individuals who are systematically exposed to digital environments, which are defined as “conglomeration[s] of technologies, events and realities that interpenetrate each other, sometimes co-constitute each other, [thus leading] to changed ways of being” (Frömming et al., 2017, p. 13). Hence, the object of our research was neither the experience of “digital” time per se, nor the experience of “natural” time as opposed to the artificial temporalities of the virtual worlds, but time as a general condition of existence, and the ways digital environments alter its perception. The project took place in Greece between the spring of 2020 and late winter of 2021, meaning that it coincided with the first and second surges of the pandemic. The full name of the project is “Diachronies: The perception of temporality in digital environments” and it was funded by the Operational Program “Development of Human Resources, Education and Lifelong Learning” (National Strategic Reference Framework 2014-2020). It was hosted by the National and Kapodistrian University of Athens, and the research group consisted of an anthropologist, a historian and a historian of science. It goes without saying that, beyond its obvious ethnographic significance, the collection and evaluation of empirical data concerning the transformations of time perception is of crucial importance for education, too: “Why read about Ancient Rome when I can build it [in Minecraft]?” was the rhetorical question asked by an elementary school student at a Game Developer’s Conference (Moulder, 2004, as cited by Squire, 2006, p. 19).

The particular aim of the project was to understand transformations in the perception of temporality and how they varied according to the differential exposure of individuals to particular digital media (games and social media). At the same time, it examined whether the members of the group developed particular skills or collective mechanisms to evaluate, organize, and manage the flows of nonhierarchical information they engaged with. Finally, it tried to investigate individuals' ideas about duration, past and present, memory, and the irreversibility of history.



"Why read about Ancient Rome when I can build it?"

Methodology

The research was mainly conducted through semi-structured questionnaires and participant observation. Twenty-seven high school students, aged between 13 and 16, were interviewed, most of them from schools in Athens and Thessaloniki. The gender distribution was 16 boys and 11 girls. Participant observation was conducted both on social media (mostly Instagram and TikTok) and in gaming sessions (World of Warcraft, World War II Online, Grepolis). Group semi-structured interviews in the form of workshops were also employed as an additional method. This method proved particularly fruitful as it offered us the chance to explore the heterogeneous and, at times, conflicting accounts, attitudes, and rhetorics that emerged from the interaction of the students. Six such workshops were organized with students from various schools in Athens and one in Kozani, a city in Northern Greece. Some of the participants had been individually interviewed before the meeting and, in a few cases, soon after it—but no significant difference was observed in the answers of the various groups (non-interviewed, interviewed before and interviewed after the workshop). All students that participated in the research were middle-class kids with regular access to digital media. They were equally distributed between state and private schools, but the distribution is of no particular importance since both schools follow the same curriculum in history teaching. The main features of this curriculum are ethnocentrism (Greece has been the cradle of civilization throughout the centuries) and historical continuation (Hellenism is a nation/national identity that travels across time taking various shapes, but keeping its core values unaltered) (Φραγκουδάκη & Δραγώνα, 1997; Ανδρέου, 2002; Κουλούρη, 2002).

Before the creation of the semi-structured questionnaires, the researchers reviewed literature, paying special attention to works that recorded the personal experience of users who performed in digital environments, as well as the notion of history and the past associated with such environments. The questionnaire was used both in the case of personal interviews and in the workshops, although in the latter case more loosely. The questionnaire was divided into three parts.

The first part focused on the relationship of the interviewees with digital media (the types of media employed for communication and leisure, and daily time spent in each of them); the next part on the firsthand user-experience they enjoyed in particular digital environments; and the third part on the sense of historical time they developed during their digital activities. The questions were designed in such a way that students would not feel interrogated about time. They were mostly directed to think about the social relations they developed whilst active in digital environments and the techniques they employed to handle them both on a personal and collective level.

Due to Covid-19 restrictions, most of the interviews and all workshops were conducted on videoconferencing platforms, like Zoom, Skype and Webex. It is clear that, generally speaking, research was affected by the pandemic and the respective restriction policies. However, the consequences of this special condition were not detrimental—one might even assume that they were beneficial. On the one hand, participant observation was already planned to take place on social media platforms and in digital games, so social distancing didn't impact this aspect of the research. On the other hand, it seems that interpersonal interaction through videoconferencing platforms did not significantly affect the performativity of the participants since, as Nik Yee et al. note, "social interactions in online virtual environments [...] are governed by the same social norms as social interactions in the physical world" (Yee et. al, 2007).

At the same time, the fact that a number of participants conceded to be video-recorded during the interviews allowed us to create a digital archive that, beyond verbal communication, also included records of non-verbal expressions, pauses, improvised answers and a wide range of communication signs. As a result, the limitations of the pandemic actually encouraged the creation of a multimodal and polysemiotic repository that captured fieldwork in the making. Varvantakis and Nolas (2019), drawing on Sarah Pink's work, assume that ethnographic analysis entails a time-travel that enables researchers to re-visit the field through memory and imagination. From this perspective, the digital archive we created constitutes an integrated body of evidence that makes this time-travel possible, through the re-enactment of the past rather than through recollection and verbal reconstruction.



Visual repository: Screenshot from a Zoom interview. Notably, the two students use a smartphone to log on to the platform. Courtesy of Eleftheria Salapata.

Beyond methodology, however, it is important to stress that pandemic restrictions dramatically affected the everyday practices of the students by further intensifying their already intense relationship with digital media. Home confinement and distance learning made computers and smartphones the dominant means of communication with the external world. Thus, we should keep in mind that research findings concerning the perception of time have been heavily affected by this particular condition. But, again, there is a positive aspect here. The naturalization of digital media and computational processes—the so called "post-digital condition" (Fielitz and Thurston, 2019, p. 11)—has been heavily questioned by the fact that it is being experienced as a restriction rather than as an emancipation from the limitations of the natural space and time. Pandemic circumstances created the conditions for a global social experiment concerning the relationship of people with digital environments. Thus, for an unfortunate but precious moment, the process of digital transformation became transparent and could be clearly accounted for.

Variations of temporality

The ways students experienced time in digital environments varied significantly. This variation results, on the one hand, from the diversification of digital media and, on the other, from the different ways users get involved with them. As we shall see, the mechanics of each game or social media platform, the form of sociability it encourages, and its general corporate policy radically affect the modes of user involvement. The students mostly played single-player games (Total War, Assassins' Creed), massively multiplayer online role-playing games (World of Warcraft), first person shooter multiplayer games (Call of Duty, Battlefield) and multiplayer online games that aim at personal distinction (Fortnite). One important difference stressed by the majority of interviewees with gaming experience is that in multiplayer games, it is difficult to fully immerse into the gaming environment because the need for cooperation constantly keeps team members in a distinct spatiotemporal framework (neither game's nor room's time). On the contrary, in single-player games full immersion and attachment to the narrative is much easier.

Political economies of attention vary accordingly. Games like League of Legends require constant presence and communication among the players, either during the gameplay or during training sessions aiming to promote the efficiency and coordination of the team. In strategy or life simulation games, like Ikariam and The Sims, respectively, the distribution of attention is different. Such games require consecutive log-ins for the player to adjust particular parameters and direct the development of the story. It is clear that the sense of temporality associated with each category is different. In the former case, the players need to withdraw from their conventional context and, although they do not experience full immersion into the game's environment, switch to a distinct spatiotemporal context shared with the other team members. In the latter case, game time does not form a separate context, but gets intertwined with players' conventional time. Most interestingly, game timescale in this case is usually significantly different from players' timescale, which means that decades or even centuries are intertwined with minutes or hours, producing a hybrid experience of temporality.

Similar taxonomies apply to social media platforms, but in this context time is mostly incremental. Even on platforms such as TikTok, where immersion is strongly encouraged, time is not continuous but consists of discrete time "clips". In theory, at the end of each micro-session, users may log off and reconnect later; the fact that they don't is related to the techniques employed by the platform to maintain users' attention. A 16-year old student brought forth TikTok as a successful example of attention economy management (without mentioning the term): the sequence of short videos activated through a simple scroll effectively keeps users connected with the platform and distracts them from their immediate environment.

It is important that the students who participated in the research were aware of all these differentiations. Indeed, the differentiation between the continuous game time and the incremental social media time came up during the first workshop, and was subsequently shaped through the exchange of experiences among the participants.

Guilty pleasures

Another important finding of the research concerns the feeling of guilt associated with the time spent in digital media. danah boyd has stressed the fact that American media persistently display the relationship of teenagers with social media in terms of addiction—an assumption deriving from a covert technological determinism. As a result, the use of social media by young people is often associated with pathological conditions, as a situation that lies beyond their ability to control (boyd, 2014, p. 78-79). However, in our research, students expressed a more nuanced attitude. On the one hand, they seemed to share their parents' concern about their involvement with digital activities, but, on the other, they seemed confident that they were able to control the time they spent in games and on social media (cf. Liam Berriman's and Rachel Thomson's [2015] account about the ways teenagers get actively involved in negotiating privacy and digital rights in social media environments). This became particularly evident in the case of older students. The preparation for

the national admission exams marks a crucial turn in their lives. When high school students start preparing for the great ordeal (that every year seriously affects around 100,000 Greek families), they also start to evaluate time in a different way. Thus, time spent in digital media is considered less important than time devoted to study. During the first workshop, but also in some interviews, we had the chance to realize that this is a central concern for older students: “In our age, we cannot spend time in gaming as we did while in primary school”; “we are grownups and set limits in the time we spend in digital games”; “doing our lessons is a priority as compared to play”. However, nobody stated that they intended to terminate the use of digital media, as was the case with one of boyd’s interlocutors (p. 77-78).

Obviously, the feeling of guilt is linked with cultural classifications, according to which social media and games are considered a waste of time, while other activities such as reading, exercise, or hanging out with friends are considered “constructive” (Παπαηλία & Πετρίδης, 2015). Along this line, interviews revealed a finer differentiation that does not relate to the concern about national admission exams: time spent in gaming is associated with guilt more often and to a greater extent than time spent on social media platforms. This is particularly the case for teenagers who have established a “professional” profile on social media (the so-called influencers), who tend to be more at home with their practice as they feel they are doing something useful. It should be noted, however, that the pandemic has caused a widespread sense of frustration: “We spent all our time in front of a screen; it’s not the best we can do, we need to escape”.

Leisure, Labor, Learning

It is a truism that, in the era of Web 2.0, content is primarily produced by the users, who continuously generate data and metadata, value and knowledge for themselves and the platform owners. However, users of digital media tend to reproduce the mainstream narrative about the “waste of time”, overlooking the fact that gaming and social media often involve productive practices. “Influencers” seem to be more aware of this dimension of digital practices and this is apparently why they are less prone to guilt.

In 2008, professor of digital culture Scott Rettberg assumed that World of Warcraft players perceive their gaming experience primarily as labor and not as recreation which, from a Weberian perspective, legitimizes the time spent in the game. Legitimization may also come from the fact that particular achievements are associated with “hard work” and “commitment”, which count as positive values (Nardi, 2009, p. 99, 102). In our case, however, it seems that such a legitimization does not work. Things have significantly changed since 2008, of course. Today it is clear that MMORPGs (Massively Multiplayer Online Role-Playing Games) like World of Warcraft are quite demanding in terms of time and dedication and this is a matter of concern for high school students. Most of them admitted that they or their parents set limits on the time they spend gaming or on social media platforms. Although at younger ages they would log in every day, as school life becomes more and more demanding, they tend to cut down the time spent in digital environments.

On the other hand, however, the fact that digital games are extensively used for educational purposes, either as supportive media or through the gamification of the educational process, leads to new cultural valuations, which classify some uses of digital games as constructive and others as counterproductive. This change is clearly reflected in the fact that COVID-19 quarantine has largely removed the guilt associated with the use of digital media. The realization that digital games and social media significantly contributed to communication, education, and socializing during the harsh times of social distancing affected the criteria of the distinction between productive and counterproductive time. Along the same lines, the ban of physical contact redefined the notion of “live”, assigning digital media a crucial role in retaining social cohesion. In all those cases, though, the use of social media is more straightforward than gaming: “I spend more time in social media because I follow the news” (girl 16); “generally, I don’t spend much time, but I prefer social media to games, because I get more and more diversified information” (boy 15); “time [in social media]

passes without noticing" (girl 16); "I mostly watch the news on social media; if I feel that this affects me negatively, I'll change it" (girl 15).

It is important, though, that many students also stressed the cultural and educational importance of games. They stated that they learnt and keep learning important things that they didn't have the chance to learn at school or through other educational activities. For some of them (roughly one third of the participants), the gaming experience played a crucial role in motivating them to explore particular historical periods or events, like medieval history, 19th-century American history, or the Second World War. This does not mean that they perceive historical games as knowledge resources. Quite the opposite; the very fact that they came in touch with knowledge that seemed unreliable motivated them to seek further historical evidence, primarily on the Internet (Wikipedia) and, to a lesser degree, from parents and teachers. Maybe it should be stressed at this point that fact-checking tends to acquire a self-referential character in this context. The precision of historical representations is no longer verified by means of "external" academic resources but through the comparison of gameplay (and social media feeds) with information that can be found on other sites on the Internet ("when I get something in social media, I double check it on the Internet"). Thus, everything takes place in the virtual multiverse, but with a clear distinction among different modes of practice. While sense-making emerges from the entanglement of different audiovisual resources provided by the media platforms, fact-checking is performed by navigating through hypertexts acknowledged as valid knowledge resources.

Another important aspect of this process is the possibility of substantiating alternative historical scenarios by means of "modifications". Particular "mods" enable players to alter a game's historical context and allow, for example, for the victory of Axes Forces in Second World War or the prevalence of the USSR in the Cold War, or even for wiping out Hitler and the Nazis to "play" with a democratic Germany in the Second World War. If games are algorithmic allegories that represent situations transcending their design worlds (Galloway, 2006), the choice of alternative history seems to represent a disposition towards a hardcore historical revisionism. This does not necessarily mean that players who favor Nazi Germany are sympathetic to Hitler. They may well be in the process of creating multiple historical pasts that will allow them to interpret history in a variety of alternative ways, since this is considered a democratic right—"it has to do with what everyone wants", a student noticed. The very fact that "modifications" are created by gamers themselves results in closing the gap, on the one hand, between the allegory and the actual stake and, on the other, between experts (historians and game designers) and non-experts. Thus, they function as multimodal expressions that aim to adapt the original narrative of the game to the cultural, aesthetic, and intellectual needs of individual users. This movement seems to mark a liberating experience, especially for young people who experience history teaching at school as repression.

Algorithmic Universe

Another distinction made by research participants has to do with the quality of time devoted to games and social media. In games, the engagement is more demanding. The time of the gameplay is, for the most part, continuous. The players must be present and active throughout the game session. On the other hand, social media platforms allow for greater flexibility: users may log off and return later, participating in discussions without being continuously present. The general sense conveyed by the students implied that they feel rather restricted by the scenarios and the rules of gameplay. In this context, they experience time as a succession of tasks. Many students stated that although the multimodal context of the games (graphic design, animation, audio environment) encourages immersion, what actually counts is gameplay itself *and* the corporate policies aiming at user engagement. In other words, they assume that the process of sensemaking is not primarily linked to the multimodal character of the games but to what is allowed and what is inhibited by the algorithmic rules of the games. This results in an internal differentiation of the experience of temporality. If, for example, players have paid a subscription for a certain time, they feel obliged to play intensely so that they get the most out of it. Similarly, gaming practices like "grinding" or

particular “chain quests” also intensify gamers’ engagement. If the aim is to achieve a particular rating or collect artifacts (“badges”), which are available every day in limited numbers (so that if you don’t get them today, you won’t be able to get double the next day—a policy that aims at forcing players to log in every single day), time is perceived as “obligation” and thus as unpleasant time. As a result, during the gameplay, two distinct times coexist: leisure time—which is connected with pleasant moments, achievements, and socializing with other players—and labor time, which is associated with obligations and “the boring stuff”. The students brought up this distinction but, interestingly enough, they seemed not to pay special attention as they took it for granted: “besides... everybody knows that games also have grinding”.



A hyperbolic setup from World of Warcraft depicting the work that must be done by the player to control the various parameters of the gameplay. Image source: [Game Design Snacks Wikia](#) (available under CC-BY-SA).

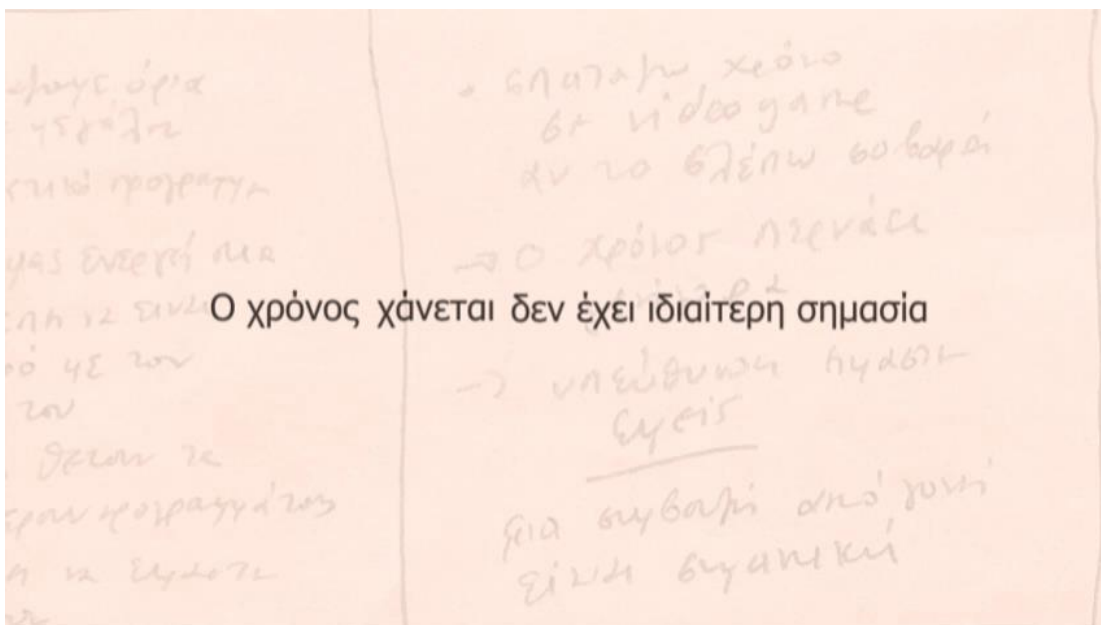
This unconditional acknowledgement seems to align with theoretical accounts that stress the relationship between the function of the algorithmic structure and the procedural character of games. For Ian Bogost (2007), the notion of procedural rhetoric implies the articulation of (social and political) arguments by means of game rules. These arguments convey images of the world or of how the world should be, not through words (as is the case with “traditional” rhetoric) or images (as is the case with visual rhetoric), but by forcing players to conform with particular rules, which are taken for granted.

Contrary to the commitment they experience in gaming environments, the majority of interviewees stated that they feel freer on social media. Although the mechanics of social media concerning the permanence of the posts varies, they generally feel that they don’t need to be continuously online for fear of missing something. Hardware also plays a role in this. The fact that most of the users sign in to social media platforms from their mobile devices enables them to spend short time intervals online from wherever they are. At this point, it would be interesting to focus on the linguistic means employed by the users to describe the relationship between online and everyday time. Whilst time

in everyday life always comes to an end (“you go out for coffee and at a certain point this ends and you get back home”), time on social media flows endlessly. You can always return and check for new posts, photos, and videos, or chat with other people. The function that makes this possible is—as Manovich has stressed since the early 2000s—database. Databases that support social media can store, organize, classify, and redistribute a wide range of everyday experiences, producing discontinuous narratives *on demand*. This is probably why students found it difficult to understand the question of how they experienced the possibility of being in a different time zone to their interlocutor(s). You *don’t need to be in the same time zone* to have access to facts and discourses. Social media temporality is asynchronous by default. The conversation pauses (“stays where you leave it”—even if it is for the limited life cycle of Instagram’s stories) until you resume it. Thus, time on social media is experienced as the sum of partial durations that represent the active engagement of the user.

In addition to this, users may simultaneously participate in more than one conversation, where time moves forward at different speeds. This instills a sense of multi-temporality, a *polychronia* where users move from one time to another, skillfully weaving their personal narrative: “It’s like building a bricolage, like piecing together independent time-fragments” (boy 15). When students were asked to further elaborate on this notion of *polychronia*, both on social media and in gaming environments, they noted the existence of a distinct timeframe. Multiple subjective times of the participants boil down to a *shared time* within the platform: a pure duration linked with the narrative produced through the interaction of the users but located outside the conventional timeframe of each of them.

A relevant expression used by a student to denote the notion of temporality while playing games such as World of Warcraft was “frozen time”. The meaning of this expression is that when users are absorbed in the gameplay, the experienced time is disconnected from their natural surroundings. They feel that they have withdrawn to an environment where there is no time at all or where time flows in a different manner: “I feel like I reside in a void”, noted the same student. Indeed, she stressed that it takes her *some time* to switch from game time to “real life” time. Closely related to the notion of “frozen time” is the fact that many students reported that while in games, they don’t really think; they rather respond to challenges and tasks without trying to capture the big picture. In other words, they experience a state of suspense.



“Time fades away. Time does not matter much.”

Meaning and time

A crucial difference between games and social media from the perspective of temporal experience seems to be that in games, emphasis is placed on purpose and reward, whereas on social media, it is placed on meaning and communication. This is to say that when the game mission is completed, time is over too—although the next round may soon begin. On social media, time never ends because new meanings arise all the time. Thus, time on social media is like a worm screw: every new feed gives a turn to the screw but does not bring it closer to an end. However, although this is an important difference, there is not a clear boundary between social media and games. Games function as social media too, even before the advent of the latter, in the sense that they form a context of communication, hanging out with friends and chatting. Social media, on the other hand, are highly gamified themselves. Elements of game mechanics like the collection of badges, rewards and level progression have been employed to promote user engagement. At the same time and for the same purpose, they also offer their users a wide range of digital games specially designed to be played in social media environments (although in the present study we don't consider them). As a result, in our research, rather than stressing the difference between digital games and social media, we chose to focus on how the affordances of various media were seamlessly incorporated into the daily practices of the students. In other words, we tried to look at the temporalities that emerge from interactions where “natural” and “digital” experiences conflate to constitute uniform digital environments. Thus, according to some students, in multiplayer digital games time flows faster, precisely because, as one of them stated, “games in this context are also a kind of social media”. Another student emphasized the opposite disposition, noting that, in single-player digital games, the fact that players are alone makes time flow slower. Both statements confirm the same thing: communication with other users, no matter whether it takes place genuinely on social media or in digital games, is the crucial factor that, by enhancing the emotional content of temporal experience, speeds up time flow.

Although our ethnography does not exclusively focus on the concept of the present, at this point, we find ourselves on a similar path to Rebecca Coleman. Coleman focuses on how “the now” is produced by the interplay between human and non-human practices, particularly between the affordances of media and the understandings of professionals working in the field of digital media. She suggests that, since the experiences of “the now” seem to become dominant in digital societies, the theoretical and empirical focus on how it becomes the object of creation and management is essential. For her, “the now” is not coherent and unified but composed of a range of “nows” (Coleman, 2020a, 1680-1681). On a similar account, our findings confirm that, although there is no doubt that games' design plays a crucial role in shaping the experiences of temporality, social practices are also vital. Hence, the experience of temporality cannot be solely reduced to the medium; it should rather be examined as an overall experience encompassing participation modes, communication patterns and interpersonal bonds developed during digital interactions.

Both on social media and in games, the distinction between “digital time” and “room time” is clear. Although individuals experience, for the most part, a hybrid space emerging from the intertwining of virtual and domestic sensory data (pictures, sounds, video, smells, placement of human bodies etc.), in the case of time, this hybridization occurs only under specific circumstances. As already mentioned, one important element reported by the students was the sense that conventional time comes to an end when a task is completed—“you get back home”—while digital platforms employ techniques aiming at keeping users endlessly busy. The students were asked about the way they experience the relation between the two distinct timeframes. Their answers indicate a quasi-antagonistic relationship. When they are immersed in game narrative, any sign from the other side of the time boundary causes a kind of disruption: “When your mother enters the room”, she disturbs time flow. The same holds on a more technical level: lags that occur due to network or server failure also disrupt smooth time flow and the experience of a shared virtual space (cf. Boellstorff, 2008, p. 101-106). The unexpected emergence of a different timeframe temporarily throws users into a hybrid context where they experience a “double time”. This is closely related to another issue. When activity in digital media comes to an end, one needs some time to “decompress” and align with the

“room time”. During this process, “room time” is experienced as sparse time and users need to slow down: “You can’t be killing monsters for two hours and then just start talking to your mom!” [it’s always mom!].



"You can't be killing monsters for two hours and then just start talking to your mom..." (image from World of Warcraft, Blizzard Entertainment®).

Double time is experienced in “historical” terms as well. As already mentioned, research showed that, in some cases, historical games motivated players to further inquire into the factual details of the game’s narrative. However, this interest never coexists with gameplay itself. While they are active in the game, students are not particularly interested in historical precision or historical context per se. This is a post-game interest incited by the *memory* of the gameplay and, as stated by a student, by the expectation that understanding the historical context will allow him to perform better. While in gameplay, however, players respond to immediate calls—they interact with the algorithm itself—and do not pay particular attention to the texture of historical narrative. Thus in-game and post-game frames of mind establish a distinction between two different perceptions of *the same* time as performative and historical time.

Future

One important issue arising from our research has to do with the meager presence of the future. With the exception of the answers of just three students, no other reference was made to the future as part of time or history. The great majority of the collected answers clearly implied that time *is* the present or the past. This disposition most likely results from the fact that, in school, emphasis is primarily placed on the past (especially the “glorious” historical past of the Greek nation). The few references to the future came from students playing games that take place in future worlds (The division 2, Outer Wilds, Eve Online) and reflect their ideas about how life will be in fifty years from now. An interesting twist in their accounts is that whilst, on the one hand, they tend to project current life’s features to future societies, on the other, they are aware that the game’s design forces them to see the future as radically different. They feel that they can create imaginary stories for the future, but always in a context specified by the designers of the game. So, again, a duality of temporal experience emerges: present and future coexist but this coexistence is experienced as a tension.

The majority of the students, though, don't seem to bother about the future. To be more precise, it is as if the future were compressed into the short time that lapses between sending a message and receiving a response (cf. Rebecca Coleman's [2020a] account about "the now"). And this time, as already mentioned, is never continuous but always incremental. It is as if all dimensions of temporality were absorbed by the (perpetually moving) urgency of the present. Maybe it is important here to be reminded of the approaches that view games as allegories of social life. For example, Janet Murray (2016 [1997]) claims that even a game without literal storytelling, like Tetris, may *narrate* the everyday life experiences of Americans in the 1990s. Contrary to a jigsaw puzzle that at a certain point comes to a completion, Tetris never ends. Every time a line is successfully completed, it instantly dissolves to free space for the next challenge. According to Murray, this speaks for the experience of Americans who feel compelled to undertake a new assignment every time a task is completed.

This experience of a continuously moving, urgent (though in a more playful sense) present was conveyed by many students who were interviewed by the researchers. The metaphor of worm screw mentioned earlier applies in this case, too, indicating that the future does not exist because it is perpetually absorbed by a powerful present. Of course, generally speaking, there may be cases of children who forcefully express their concern about the future, as the widely publicized Greta Thunberg's interventions indicate. There might even be children's movements associated with environmental issues that find their way into the public sphere (Nolas, 2021). But this is not the case for the children in post-financial crisis Greece who attend a school dominated by the looming prospect of "Panellinies" (national exams). In fact, the students who participated in the research were born between 2004 and 2008. Thus, they are not simply "digital natives", but also denizens of local and global financial, political and social crises. Of course, not all of them experience these crises in the same manner, but the successive cultural shocks that culminated with the global quarantine and a widespread feeling of insecurity undoubtedly prohibit the emergence of a comprehensive vision for the future.

Many times

The coverage of the research presented here is quite limited both in terms of numbers and in terms of social representation. Thirteen to sixteen-year-old high school students in post-financial crisis Greece may not represent the global average. But due to the particular nature of digital media (which, by definition, transcends locality), it may indeed capture some important aspects of the ways people experience time in digital environments. There is no doubt that further research is required to specify the fine texture of this kind of temporal experience and accurately locate possible cultural and social differentiations. However, we assume that "Diachronies" may contribute to an initial mapping of the area under investigation by setting some reference points for studies to come. One such important point has to do with the discourse about guilt. Cultural taxonomies cross the border between everyday life and virtual environments. Particularly for students approaching the age of 16—when the preparation for national exams begins—digital activities like gaming and social media increasingly take the form of wasted time. However, the peculiar condition of the pandemic and the wide use of digital media in education contributed to a certain legitimization and "moralization" of these activities. They not only function as a fail-safe against social isolation but also have been adopted by official authorities for the organization of education and social life at large. This results in students developing an ambivalent attitude towards time spent in digital media. Concerning temporal experience itself, the research showed that there is not a single "digital time" opposed to a single "natural time". In fact, it seems that individuals who are active in digital environments participate in a *polychronia*, a multiplicity of temporal experiences that depend on the specificities of the various digital platforms but also, and most importantly, on the ways users get involved with them. This realization is significant as it destabilizes stereotypical views about the duality of time that often offer the basis for discourses about "social isolation", "addiction", and the "dangers" of digital activities.

Time experience in games is different from time experience in social media: continuous and discontinuous, finite and indefinite, respectively. In gaming environments, time resembles (or, might be said, imitates) conventional time, and this facilitates immersion. However, this is only a tiny part of the user's overall experience, as different perceptions of time come into play even in such "straightforward" practices as gaming. On social media, time is experienced primarily as duration—the sum of independent moments that are linked with the "database narrative" gradually built through users' communication.

Qualitatively speaking, an important distinction is the one between leisure time and labor time, especially associated with different tasks performed during gaming sessions. A third "I", learning time, refers to both games and social media but acquires different meaning in each context. Learning in social media is synchronous and concerns useful information gathered whilst users are active on the platform. Learning in gaming is primarily asynchronous, as it is a process incited by the game's narrative but taking place in other media (such as Wikipedia and other online educational resources) after or between the gaming sessions. This leads to an "expansion" of virtual time into users' conventional timeframe and a partial conflation of the two contexts.

Polychronia is expressed in another way, too. Immersion in a game's narrative cuts off individuals from their "room time", and indeed many stated that it takes them some time to get back to "real life". But it seems that whilst absent from their room, individuals spend more of their time in a "communication bubble", a distinct temporal context where they intensely interact with other users, make plans, implement strategies, and share affects. Indeed, many students noted that time flows faster when they are in this state. We call the time spent in this communication bubble "performative time"; students' accounts seem to indicate that this, and not immersion, is the prevalent context of their temporal experience.

In many games, agility is considered an important trait of game characters. Our research indicated that the same quality characterizes the so-called digital natives. None of the students we interviewed seemed to worry about the *polychronia*. They all take it for granted and develop intuitive ways to efficiently and profitably handle the transition from one context to another. They are able to quickly adapt to the qualitative features of each context, be functional within it, and even control the "jet lag" they experience when they land in their room. New qualities, new skills. Many sections of social life, especially education, will surely profit from a more detailed and in-depth survey of the new *habitus* arising from the conflation of virtual and actual worlds.

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