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This is the author's manuscript

Original Citation:

Availability:

This version is available <http://hdl.handle.net/2318/1800795> since 2022-02-28T11:36:13Z

Published version:

DOI:10.1111/isj.12328

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(Article begins on next page)

Time, Engagement and Video games: How Game Design Elements Shape the Temporalities of Play in Massively Multiplayer Online Role-Playing Games

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Abstract. Researchers and developers constantly seek novel ways to create engaging applications that are able to retain their users over the long term, make them desire to spend time using the application, or go back to using it after a break. With this aim, video games can be an insightful source of inspiration, as they are specifically designed to maximize playing time, increase players' intentions of playing during the day or enhance their willingness to replay. In a gaming context, "time" is an important factor for engagement because game designers can design the game time to retain players in the game environment. Drawing on the increasing interest in social practice theory in Information Systems (IS) research, I conducted an ethnographic study in World of Warcraft (WoW) to understand how various temporalities are produced within a video game and the effects that they have on players' engagement. The findings show that the game temporalities stem from the complex interaction between the design features of the game and the norms, routines, and expectations that are part of the game practices. Moreover, these temporalities can engender temporal experiences that may stimulate engagement in various ways. The study contributes to IS literature by proposing a novel understanding of how time can be intentionally designed to sustain user engagement. Finally, it suggests that "time design" in video games could inspire designs in broader IS contexts, such as in the gamification of online communities, crowdsourcing platforms and crowd working systems.

Keywords. Video games, time, temporality, game design elements, engagement, ethnography, hedonic information systems, gamification, World of Warcraft, Massively Multiplayer Online Role-Playing Games

INTRODUCTION

Researchers and developers constantly seek novel ways to engage people when interacting with IS (Liu et al., 2017). Albeit there is no clear definition of engagement in literature, the concept points to subjective experiences in the form of, for example, absorption, fulfillment, and enjoyment (Liu et al., 2017; Boyle et al., 2012; Schoenau-Fog, 2011; Agarwal & Karahanna 2000; Santhanam et al. 2016; Webster & Martocchio 1993): engaging applications allegedly retain their users over the long term, make them desire to spend time using the application, or go back to using it after a break (Debeauvais, 2016; Brown & Cairns, 2004; Schoenau-Fog, 2011; Peters et al., 2009). Failing to engage users may result in no sale on an electronic commerce website or no transmission of information from a website, as users go elsewhere to perform their tasks or communicate with friends (O'Brien & Toms, 2008). One of the main challenges in IS research, therefore, is to understand how to design for more engaging experiences (O'Brien & Toms, 2008; Hassenzahl & Tractinsky, 2006).

Video games have a lot to teach us about engagement, because they are specifically designed to provide engaging activities (Boyle et al., 2012) maximizing playing time (Boyle et al., 2012) and increasing players' intentions of playing (Juul, 2010) and willingness to replay (Hamari et al., 2015). In a gaming context, "time" is an important factor for engagement because game designers can design the game time to retain players in the game environment. In other words, time in video games is a design tool that can be manipulated by designers (Tychsen & Hitchens, 2009) to positively affect the players' engagement. Studying time in video games is important, because "time design" is an essential means for creating engaging experiences with a hedonic information system (Berger & Hess, 2018), potentially inspiring new ways of designing more engaging interactions, even in non-gaming IS contexts.

Exploring the link between time design and engagement in video games makes apparent that time is not reducible to the clock time, i.e., "continuous, homogeneous, and, therefore, measurable because

equal parts are equivalent” (Starkey 1989, p. 42), which is the dominant conceptualization of time in IS research (Nandhakumar, 2002). Rather, to understand how video game time relates to engagement, which is a subjective state experienced by the individual (Boyle et al., 2012), we need to look at the phenomenology of time, i.e., how people experience time (Zahavi, 2012).

Social practice theory (Schatzki, 2001) emphasizes that the experience of time is tightly connected with the practices that players perform while playing. This theory focuses on the analysis of practices, i.e., routinized behaviors consisting of a number of interconnected and inseparable elements, like physical and mental activities, background knowledge, artifacts and their use. The theory emphasizes that people are commonly engaged in multiple practices, which entail *multiple temporalities*, i.e., diverse organizations of time that differently articulate relevant temporal dimensions, like duration, tempo, sequence, synchronicity, and periodicity (Southerton, 2006). These temporalities engender specific experiences of time, which may include experiences of engagement with the game. Examining how temporalities are formed, therefore, becomes essential to understand how players are engaged with the game.

In a video game, for instance, players may perform practices that prescribe recurrent activities, which entail a “circular temporality,” i.e., players may enact repetitive tempos, durations and periodicities perceiving time as cyclical, similar to agricultural seasons. At the same time, they may perform practices that promote collective endeavors to achieve difficult goals, leading to a “shared temporality”: namely, players may enact collectively defined tempos, durations and periodicities and perceive time as an experience of assimilation into the time of the community. What is interesting here is that these temporalities are curated and tuned by game designers through the design of certain game design elements, namely the basic design components of a game. The temporalities, in turn, engender specific temporal experiences, which eventually lead to specific ways of being engaged with the game.

By using social practice theory, in this article I point out how multiple temporalities are produced within a video game, resulting in specific temporal experiences that include experiences of engagement. I report on an ethnographic study in World of Warcraft (WoW), which is arguably the most successful and engaging Massively Multiplayer Online Role-Playing Game (MMORPG) ever designed (Calleja 2007). WoW supports three different temporalities, i.e., a linear temporality, a circular temporality, and a shared temporality, which elicit three different temporal experiences of progression, repetition, and assimilation that correspond to different ways of being engaged with the game. This study will eventually lead to seeing that temporal experiences are strictly tied to intentional time design as practiced by video game designers and that engagement is an aspect of the temporal experiences lived by the players.

In sum, I will try to give an answer to the following research question: How are temporalities produced in a MMORPG and what kinds of effects do they have on players' engagement?

BACKGROUND

IS literature has treated time and engagement separately, without linking time design to the opportunities for increasing the users' engagement.

IS research on time can be grouped into three main strands of research: the conception of time, the experience of time, and the impact of technology on time (Shen et al., 2015). Ancona et al. (2001) noticed that the types of time discussed in organizational literature are commonly reduced to the clock time, which is quantitative and objective, and the event time, which is qualitative and subjective. Recent reviews emphasized that IS research has approached time predominantly using the clock view (O'Connor et al., 2017; Shen et al., 2015; O'Riordan et al., 2013; Allen & March, 2005; Gattiker & Goodhue, 2005), which, nonetheless, cannot fully capture the link between time and engagement, as engagement is a subjective state.

In fact, IS research only seldom considered the experiential dimension of time (Shen et al., 2015; O'Connor et al., 2017), which is fundamental for connecting time with engagement. Time experiences have been investigated with reference to social media (Ivaturi, & Chua, 2016) and, especially, to technostress and work productivity, where workers interacting with technology may perceive their time being invaded (Ragu-Nathan et al., 2008; Basten, 2017), or lose their sense of time while involved in a flow of activities (Agarwal & Karahanna, 2000; Mahnke et al., 2014). However, experiences of time have not been related to experiences of engagement with technology. Finally, IS studies investigated how IT features may affect certain time variables (Sarker & Sahay, 2004; Kahai & Cooper, 2003; O'Connor et al., 2017; Shen et al., 2015; Lee, 1999). Nevertheless, they neglected to explore how designers can intentionally design the time of a system to induce effects on user engagement.

Table 1 provides a snapshot of IS literature on time, highlighting that IS research mainly conceptualized time as the clock time, examined how the experience of time can be influenced by technology in the context of work, and identified the effects of technology on specific time variables. This literature, however, hints at a research gap, as it tends to neglect that time in an IT artifact can be intentionally designed in order to stimulate user engagement.

Strands of IS research about time	Research main focus
Conceptions of time	<i>Focus on clock time:</i> Allen & March (2005); Poston, & Speier (2005); Jiang & Benbasat (2007); Gattiker & Goodhue (2005); Cotteleer & Bendoly (2006); Saunders & Kim (2007); Liang et al., (2007)
Experiences of time	<i>Focus on work and productivity:</i> Ragu-Nathan et al. (2008); Basten (2017); Agarwal & Karahanna, 2000; Mahnke et al., 2014
Effects of technology on time	<i>Focus on how technology affects specific time variables:</i> Lowry et al. (2009); Miranda & Saunders (2003); Kahai & Cooper (2003); Kane & Luz, (2006); Sarker & Sahay (2004); Ellis et al. (1991); Lee (1999); Lee & Liebeneu (2000)

Table 1. IS literature on time.

Likewise, IS literature on engagement explored different design strategies to increase the involvement of users (O'Brien & Toms, 2006; Chan & Pan, 2008; Suh & Cheung, 2019), also looking at playful designs (Liu et al., 2017; Suh et al., 2018). Nonetheless, the opportunities to use time as a design tool for enhancing engagement remained substantially overlooked. Similarly, game studies did not investigate how time design impacts on players' engagement (Boyle et al., 2012), albeit they acknowledged that time is involved in a variety of design features (Juul, 2004; Hitchens, 2006; Zagal & Mateas, 2007).

In sum, no research has looked at time as a design tool for increasing the users' engagement: as a consequence, we still have a limited understanding of the links between design, time, and engagement. With this in mind, I will describe how specific game design elements may affect the temporalities of a MMORPG; in turn, these temporalities shape the players' experiences of time, which may include experiences of engagement with the game. In so doing, I will explain that game design elements do not act in isolation; rather, there exist complex ways of structuring game temporalities that involve both the IT artifact and the players' actions. From this perspective, MMORPGs are particularly interesting as they are played for longer periods of time than other video games (Ng & Wiemer-Hastings, 2005; Lee, 2006).

My research in a MMORPG will allow us to challenge a common assumption in the literature, i.e., that time and engagement are separate "entities" entailing different "design matters." This view is limiting because it fails to acknowledge that, on the one hand, temporal experiences include experiences of engagement and that, on the other hand, design can shape the experience of time to produce specific forms of engagement. In so doing, this perspective is not able to fully account for how people are engaged with a hedonic IS where engagement is strictly tied to the users' experiences of time, which, in turn, are intentionally designed by the game designers.

My study findings will show that time, engagement, and design are linked together: time experiences include experiences of engagement and are shaped by specific design elements.

THEORETICAL FRAMEWORK

To develop a perspective that accounts for how temporalities are realized in WoW, I draw on social practice theory. First, I will outline the conceptual pillars of the theory. Then, I will describe a theoretical framework that explains how temporalities are produced in a video game and how they engender the experiences of time, consequently affecting the players' engagement.

Social practice theory

Connecting to the works of Bourdieu, Latour, and Giddens, Reckwitz (2002) and Schatzki (2001) proposed a conceptual framework for the analysis of "practices." A practice is a routinized type of behavior made up of e.g., "*forms of bodily activities, forms of mental activities, 'things' and their use, a background knowledge in the form of understanding, know-how, states of emotion and motivational knowledge*" (Reckwitz, 2002, p. 249). This definition also includes behavioral patterns (Bourdieu, 1977), as well as technological devices involved in the practice (Latour, 1993). Practices are performed by individuals, who reproduce them over time (Reckwitz, 2002), although with variations and resistance (Shove & Pantzar, 2005).

From a social practice perspective, time may be broken down in different dimensions: *duration* reflects the amount of time devoted to the activities composing a practice; *tempo* relates to the rhythms through which such activities are performed; *sequence* refers to the order in which they are conducted; *synchronization* relates to whether or not activities are coordinated with other people; and *periodicity* is connected to the frequency and repetition of these activities (Southerton, 2006). Social practices theory points out that time is not a fixed object but realized through the continuous performance of practices (Orlikowski & Yates, 2002; Langley et al., 2013).

As specific practices produce their own temporality (Shove et al., 2012), social practice theory entails "*multiple temporalities that may exist side by side*" (Nowotny, 1992, p. 424). Each temporality has its own way to articulate the dimensions of time listed above: for example, while

the temporality of the print news production shows variable duration, strong sequence, and daily periodicity, online news production temporality exhibits accelerated duration, partially disrupted sequence, and rapid periodicity (Jones et al., 2008). In other words, temporalities are enactments of time within specific practices realized through the continuous performance of those practices.

Multiple temporalities may engender different time experiences, which may conflict or work together (Orlikowski & Yates, 2002). For instance, collective experiences of time like shared timing of meals have been weakened by the personalized temporalities of the 24-7 society (Southerton, 2012).

This theory has received increasing attention in IS research (Tavakoli & Schlagwein, 2016; Levina & Arriaga 2014; Cecez-Kecmanovic et al. 2014). It has been used to understand how temporality shapes institutional processes (Granqvist & Gustafsson, 2015) and explicate how temporal dimensions may change due to the introduction of novel technologies (Jones et al., 2008).

Temporal framework

In this article, I study the enactments of time that are realized within specific social practices and the experiences of time that result from such enactments. I will now build on the conceptual pillars of social practice theory to propose a theoretical framework that explains how multiple temporalities and their related temporal experiences are produced within a MMORPG. Figure 1 illustrates the process through which game temporalities are realized in a MMORPG.

Game temporalities are particular ways of organizing time in a game: each temporality differently articulates relevant temporal dimensions, i.e., duration, tempo, sequence, synchronicity, and periodicity, as identified in social practice theory (Southerton, 2006). Temporalities in games are realized as a “product” of the continuous performance of a certain game practice (Orlikowski & Yates, 2002), which implies a multiplicity of game temporalities, as each game practice may produce its specific game temporality (Nowotny, 1992).

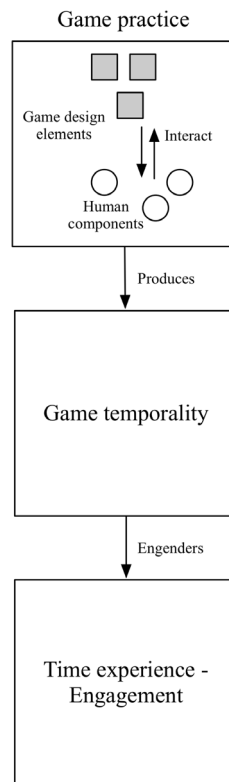


Figure 1. The conceptual framework.

The *game practices* are practices performed by players within a game. They are established ways of carrying out game activities and, according to social practice theory, are made up of “human components,” e.g., routinized behaviors, mutual expectations, and norms that result from the players’ “actions” (Schatzki, 2001; Reckwitz, 2002). The constant (re)production of the routines, norms, and expectations that are part of a particular game practice realizes the game temporality (Shove et al., 2012). This, however, does not mean that players are the only agents involved in the game temporality formation. A game practice, in fact, is not only made up of human components, but is also constituted by a series of *game design elements*, which represent the IT artifact (i.e., the game) and convey the specific ways in which game designers configure the game to encourage its temporalities. Game design elements are the “material components” of a game practice, i.e., those

technological devices that social practice theory identifies as fundamental parts of the nexus of a practice (Latour 1993). Game design elements can be defined as a set of building blocks or design features “*that are found in most (but not necessarily all) games, readily associated with games, and found to play a significant role in gameplay*” (Deterding et al., 2011: p. 12).

I argue that game design elements play a major role in shaping the game temporalities. They establish a variety of temporal opportunities and constraints that players may strengthen, resist, fix, or rearrange, through their routines, norms, and expectations. The interaction between the human and the material components of the practice is highlighted by the double arrows in Figure 1. From this perspective, game design elements are the main agents in producing game temporalities, which, in turn, may engender particular *temporal experiences*, namely experiential states of time (Brannen, 2015), which may include experiences of engagement with the game. Since different temporalities may coexist in a game, players may live different temporal experiences at the same time, which may conflict with each other or work together, as emphasized by social practice theory (Orlikowski & Yates, 2002). This might produce an overarching temporal experience that can be either frustrating or engaging. I argue that if the game is built on a series of intertwined game design elements that coherently tie together multiple temporalities aimed at stimulating engaging experiences, this overarching temporal experience is characterized by extreme engagement with the game. Shaping game temporalities through the careful design of game design elements is thus important, because it allows for the maximization of the players’ engagement.

To summarize, game temporalities stem from the interaction between the material components (i.e., the game design elements) and the human components (i.e., norms, routines, expectations) of specific game practices. Each temporality engenders a particular temporal experience, which may include a specific form of engagement.

Drawing on my ethnographic research, in the remainder of this article I describe how the framework introduced above may explain the production of temporalities and their related temporal

experiences in WoW. Before recounting the method and the findings of my ethnographic research, however, it may be useful to discuss what the gaming context allows us to say about technology and organizing in broad terms.

Playing a video game is a voluntary activity: people carry out game tasks and organize themselves because they want to and not because they have to. This clearly differs from non-hedonic contexts where individuals may have goals that *must* be achieved and are engaged in organizational configurations whose members are committed to mandatory working times, or a salary to be earned. This may result in the freedom of failing and leaving the game without players experiencing any relevant consequence on their material life.

On the one hand, the voluntary nature of the game activity implies the opportunity to observe spontaneous forms of engagement, as well as best design practices supporting them, which could be inspiring for the design of IS in broader contexts. On the other hand, it points out that insights collected in games should be carefully adjusted when transferred to other domains.

Moreover, the way in which a game is coded influences the behaviors of players (Lessig, 2006), who “live” and act in an environment “ruled” by technology. This may result in great effectiveness of design features in shaping temporalities. The strength of the impact of the design elements on the individuals’ practices makes a virtual environment an ideal research field to observe how technology affects time. However, this strength may have a greater magnitude than in “real world” contexts.

This said, game design elements, especially in MMORPGs, can often be rearranged by players. WoW is a complex world in which myriads of game design elements allow players to follow the paths that best fit according to their needs and to resist those that go against their playing attitudes. At the same time, WoW does not leave players completely free to do what they want, suggesting routes to travel. This balance between freedom and constraint allows us to observe the complex

interaction between the material and the human components of practices in producing game temporalities.

SETTING

In this Section, I introduce some basic characteristics of WoW. A supplementary explanation of WoW terms can be found in the Appendix. In WoW, players move across Azeroth, an enormous virtual world, proceeding through 100 (or 90/110/120, depending on the game expansions) levels of play. Here, players can develop their characters by accomplishing *quests* - game missions that require to kill enemies in order to gain gold and gear.

Players can play three different roles, dps (damage per second), in charge of provoking damages, healer, with the responsibility of healing party members, and tank, absorbing damage for all the companions. Differentiated roles foster cooperation among players, who group in temporary (pick-up groups) or structured (guilds) collectivities in order to complete dungeons (also known as instances) and raids. *Dungeons* have to be completed in teams of five, whereas *raids* are accomplished by ten to thirty players. Although players may find casual companions to face these battles, the hardest raids can only be completed by being part of a guild. Once players reach the level cap, the main game activity is to raid with guild companions in order to obtain powerful objects.

WoW defined the MMORPG genre standards (Debeauvais et al., 2011) and actually became the most typical case of MMORPGs (Calleja, 2007). As typicality is crucial to allow for the generalization of results in an ethnographic study (Gobo 2008), I selected WoW as the object of my fieldwork. IS researchers considered WoW as a platform to evaluate how virtual teams organize in complex endeavors (Dannecker et al., 2008); an alternative space where collective action can be carried out (McKenna et al., 2011); a place where to purchase virtual products (Wei & Yongqiang,

2015); an environment where specific changes in design impact the ways of collaborating (Crenshaw et al., 2017).

To study WoW time, ethnography appears to be the election method, as it allows first-hand participation in the game practices and direct experience of their related temporalities. My fieldwork can be framed in the method of virtual ethnography (Hine, 2000), which has been employed to give anthropological accounts of social interactions within online worlds (Lysloff, 2003; Boellstorff, 2008).

METHOD

I carried out an ethnographic research in WoW from October 2012 to September 2016. I employed a reflexive ethnography approach (Rode 2011; Van Maanen 2011), where the ethnographer values her subjective perspective, by adopting a first-person narration that is paired with an auto-ethnographic work (Ellis et al., 2011). Such an approach is useful to understand the players' temporal experiences, as the ethnographer may compare her own experience with those of the other players grasped through observation and interviews. During the fieldwork, I collected a variety of data, as Table 2 summarizes.

Table 2. Data collected during the ethnographic research.

Data source	Data type	Data collected
<ul style="list-style-type: none"> - 1290 hours of participant observation in a PvE (Player vs. Environment) server - 150 hours of participant observation in a PvP server (Player vs. Player) 	<ul style="list-style-type: none"> - Observational notes - WoW documents - Informal conversations 	<ul style="list-style-type: none"> - Observation of players' interaction with the game design elements - Personal experience of direct participation in the game practices - Collection of WoW guides, wikis, and posts in guild forums - Conversations about players' game practices
36 formal interviews	<ul style="list-style-type: none"> - Players' recounts 	<ul style="list-style-type: none"> - Players' personal histories in the game - Players' accounts of the game practices - Game design elements relevant to the players - Effects of game design elements

Research procedures

Participant observation has taken place mainly in an Italian PvE (Player vs. Environment) server (1,290 hours), where fight among players is not allowed apart from certain “special zones.” By contrast, in PvP (Player vs. Player) servers, players can fight each other everywhere.

At the beginning of my fieldwork, I had no previous experience of playing MMORPGs. I studied two WoW expansions, Mists of Pandaria and Warlords of Draenor, participating in all the game practices and reaching the maximum experience level with a night elf mage. Each new expansion of the game slightly changes how some game design elements work (e.g., players may need to reach a higher level of experience to face certain raids) and sometimes introduces novel game design elements. Nonetheless, I did not find any difference between the game design elements of the two expansions that I studied with reference to the purpose of this research: in fact, the core gameplay loops that shape the game temporalities remained stable across these expansions.

I played all the game quests, dungeons and raids available. To understand the guild dynamics, I participated in the everyday life of several guilds, becoming an officer twice and being engaged in guild activities. In so doing, I first learned that the game is able to involve players at different levels, as WoW does not prescribe a unique game path. I also became aware that different temporalities exist side by side: the linear, circular and shared temporalities that I identified in WoW do not conflict – in fact, they are coherently connected. I realized that these temporalities originate from the interaction between the game design elements and the human components of the practices. Furthermore, taking part in the daily life of different guilds led me to explore different possibilities of rearranging the temporal constraints materialized by design. More importantly, by going through all the different “stages” of engagement supported by the game, I was able to experiment first-hand the seductiveness of WoW’s temporal experiences. Observational notes and personal reflections were written down daily in a diary immediately after completing each game session.

Moreover, 36 *formal interviews* (avg. age=28.3; females=15) have been conducted either in WoW's virtual world (18), using the in-game chat, or in the "physical" world (18). Participants were selected by following a purposeful sampling method (Marshall, 1996), focusing on the different levels of players' engagement and social centrality, which relates to their reputation and social connections. These two dimensions were assessed based on the conversations that I had with other players during the first six months of participant observation.

To evaluate a player's level of engagement, I considered three different factors: i) her experience, i.e., her character's level; ii) the age of her WoW account; iii) the hours she played per week.

Interviewees can be grouped into: sixteen *hardcore gamers* (level cap; more than two years of presence in WoW; more than twenty playing hours per week); nine *normal players* (level 80-90 (Pandaria) and 90-100 (Draenor); more than six months of presence; between ten and twenty playing hours per week); and nine *novices* (level 30-80 (Pandaria) or 40-90 (Draenor); less than six months of presence; less than ten playing hours per week). Table 3 depicts the sample composition.

Hardcore gamers are represented the most in the sample, because they were identified as key informants. Two participants who left WoW before being interviewed were included as *outliers* to consider dynamics of disengagement. Hardcore gamers can be further distinguished in *leaders*, with important responsibilities in their guild, and *followers*, who have a minor social role, in order to account for the dimension of social centrality.

Participants were recruited by either exploiting my in-game social network (23) or being randomly involved during playing activities (13) after an interview for the purposes of assessing their level of engagement and social centrality. The former sampling method allowed me to find profiled players covering specific modalities to participate in the game, from players deeply committed to the organizational life of their guilds to players who simply attempted to improve their (still low) skills: my most expert companions helped me focus on those players' characteristics that could entail different ways of performing the game practices, as well as find such profiles, thus guaranteeing

their representativeness (Gobo, 2008). This way of recruiting also enabled me to discover “critical cases” (Marshall, 1996) with somehow extreme features (e.g., a player belonging to the most powerful guild of his server).

Table 3. Sample.

Name	Highest level of education attained	Hours played per week	Age of the WoW account	Experience level	Class	Type	Interview type
Abraxas	High school	45	10 years	Cap	Death Knight	Hardcore gamer - Leader	In person
Kairo	High school	40	10 years	Cap	Shaman	Hardcore gamer - Leader	In person
Mytral	Ph.D.	40	6 years	Cap	Mage	Hardcore gamer - Leader	In person
Niren	Bachelor's degree	35	7 years	Cap	Warrior	Hardcore gamer - Leader	In person
Crane	High school	35	6 years	Cap	Death Knight	Hardcore gamer - Leader	In person
Nikka	Middle school	35	4 years	Cap	Shaman	Hardcore gamer - Leader	In-game chat
Herik	High school	30	8 years	Cap	Priest	Hardcore gamer - Leader	In person
Tera	Master's degree	30	7 years	Cap	Hunter	Hardcore gamer - Follower	In-game chat
Vania	High school	30	5 years	Cap	Druid	Hardcore gamer - Leader	In-game chat
Enea	Master's degree	30	5 years	Cap	Warrior	Hardcore gamer - Follower	In-game chat
Ilynx	Bachelor's degree	30	4 years	Cap	Warrior	Hardcore gamer - Follower	In person
Halo	Master's degree	30	3 years	Cap	Death Knight	Hardcore gamer - Follower	In-game chat
Noein	Bachelor's degree	25	8 years	Cap	Mage	Hardcore gamer - Follower	In person
Casdan	Bachelor's degree	25	5 years	Cap	Rogue	Hardcore gamer - Follower	In person
Erwin	Ph.D.	25	7 years	Cap	Paladin	Hardcore gamer - Follower	In-game chat
Pyros	Middle school	25	7 years	Cap	Warrior	Hardcore gamer - Follower	In person
Gane	Master's degree	20	2 years	90	Mage	Normal Player	In person
Kylian	High school	20	2 years	90	Mage	Normal player	In person
Neyr	Bachelor's degree	20	2 years	90	Paladin	Normal player	In person
Vega	Master's degree	20	2 years	88	Rogue	Normal player	In-game chat
Eloin	Bachelor's degree	15	1 year	95	Rogue	Normal Player	In-game chat
Kaershan	High school	15	1 year	89	Warrior	Normal Player	In-game chat
Daemon	Ph.D.	10	1 year	86	Mage	Normal player	In-game chat
Feilyn	Bachelor's degree	10	1 year	95	Shaman	Normal Player	In-game chat
Uldar	High school	10	1 year	95	Mage	Normal Player	In-game chat
Ludos	Bachelor's degree	8	4 months	74	Rogue	Novice	In-game chat
Elys	High school	8	3 months	39	Mage	Novice	In person
Leika	Middle school	5	5 months	70	Warlock	Novice	In-game chat
Tyran	High school	5	4 months	65	Priest	Novice	In-game chat
Macross	Bachelor's degree	5	4 months	47	Warrior	Novice	In person
Neo	Bachelor's degree	5	3 months	86	Warlock	Novice	In-game chat
Mina	Master's degree	5	2 months	70	Druid	Novice	In-game chat
Kya	Bachelor's degree	5	2 months	90	Priest	Novice	In person
Leda	Master's degree	2	1 month	68	Shaman	Novice	In-game chat
Aion	Ph.D.	0	8 years	85	Death Knight	Ex gamer	In person
Nika	Master's degree	0	5 years	85	Druid	Ex gamer	In person

The latter sampling method increased the sample heterogeneity by being open to serendipity (i.e., discoveries made by accidents), involving players that I casually encountered within the game (e.g.,

because they had an interesting story to tell). Through this technique, I recruited players who, for example, only played with their “real-life” friends, or who preferred to play alone. Recruiting ceased when I became aware that further data would not have granted substantial new results for the aim of my study, following a data saturation criterion (Bowen, 2008).

As I recruited players that were still active at the time of the interview, the sample is skewed towards players who found the game engaging. This highlights that the theory I am developing is limited to individuals that are “sensitive” to the game design elements embedded in WoW. Even though it has been proven that MMORPGs appeal to a variety of players (Yee, 2006; Glas, 2013), WoW is not a game for everyone and it is especially not suitable for “casual players” (Juul, 2010).

Each interview lasted about three hours (max=188 minutes; min=130 minutes). I started asking participants to recount their game history as WoW players. The other questions aimed to investigate how WoW’s game design elements affected the interviewee’s experience and practices. I asked participants to recount what aspects of the game were more important to them and why (e.g., “Recount your personal history in WoW from the beginning;” “Describe the game features that you value more: why are they so important? What kinds of effects do they have on you as a player?”). I then investigated each game design element that they mentioned by requesting to connect it with playing episodes in which it was involved. I also widened the focus of the interview by asking interviewees to recount their social life in WoW and their everyday activities. Participants were free to tackle themes that were not outlined in the interview trace.

Interviews were either audio recorded and transcribed or registered using the chat log of the game. Informal conversations conducted within the game were also recorded through the chat log. The interviewees, the members of my guilds and, by and large, all my in-game connections, were informed of the nature and goals of my research and were aware that our interactions would have been traced. Consenting was considered as an ongoing process throughout the research engagement

(Iphofen, 2013), and players were periodically reminded of the research goals and data usage, as these long-term relationships evolved.

Interactions with players casually and briefly encountered during in-game activities were registered without their awareness when it was not possible to interrupt the game action to obtain the informed consent, since the game chat log automatically keeps track of all the interactions conducted within the chat, once it is turned on. Nonetheless, no private conversations were stored, as the chat log was used only with reference to the public game chats, where anyone can see and record the conversations conducted in there. Players know that their conversations are public and can be registered, like posts in a public forum (Sveningsson, 2004). However, I acknowledged that they could not expect their conversations to be subject to scholarly research. Therefore, I followed guidelines to ensure ethics in covert ethnographies (Homan, 1980; Spicker, 2011; Beekhuyzen, 2015; Marx, 1998) and adopted parts of the “heavy disguise” strategy proposed by Bruckman (2002), by changing names of all these players in the recorded chats (mine included), removing all the information related to their characters (e.g., their level, “race”, stats, etc.), deleting all the parts not specifically referring to in-game activities, and not reporting quotes belonging to participants who did not explicitly give consent in the ethnographic recounting.

Data analysis

Data analysis followed an iterative approach of data collection, coding, and analysis for qualitative research (Saldaña, 2013). I began my analysis by tracing the boundaries of the different game practices that are performed in WoW. I analyzed the field notes, the interviews, and the informal conversations together identifying recurrent themes. More precisely, I listed the various activities that players carry out in the game through provisional open codes. Since different types of players (namely, novices, normal players, and hardcore gamers) are involved in such activities to a different

extent, I compared their different perspectives. Through axial coding, I then identified the game practices that players usually perform in WoW and how they relate to each other.

I then focused the analysis on the practices' temporality: I listed all the game design elements having a "temporal impact" connecting them to the practices in which they were entangled. In so doing, I moved back and forth between the data, the theoretical literature on social practices, the interpretations I was defining and further data collection, in order to find support for my initial understandings and detect their possible inconsistencies with the data. Social practice literature helped me turn the initial open codes, addressed to identify WoW's temporal aspects, into axial codes, which eventually led to the definition of fifteen abstracted categories.

I finally identified three core categories (selective coding) representing the main WoW temporalities: *linear*, *circular*, and *shared temporality*, each related to one of the three main practices of *empowering*, *farming*, and *raiding*. By categorizing the codes, I also deepened how these temporalities are formed and identified their features using the five dimensions listed in the Background Section. As soon as I realized that multiple temporalities coexist in the game, I systematically went through my data to identify the interviewees' perceptions of them. This led me to identify three types of temporal experiences, namely *progression*, *repetition*, and *assimilation*.

FINDINGS

In the following, I will describe three different temporalities, namely *linear*, *circular*, and *shared*, produced by three different game practices: *empowering*, *farming*, and *raiding*. In so doing, I will emphasize the role of game design elements in structuring the game time.

Table 4 summarizes the key findings. The first column ("Temporalities") refers to the types of temporality found in WoW and their key features. "Practices" relates to the game practice in which a specific temporality is produced, while "Game design elements" highlights the relevant parts of the IT artifact that contribute to shape it. "Temporal experiences" summarizes the experiences

engendered by game temporalities, including experiences of engagement. The last column includes further evidence that the results presented emerged in many interviewees.

Table 4. Key Findings.

Temporalities	Practices	Game design elements	Temporal experiences	Illustrative quotes from the interviews
<p><i>Linear temporality:</i></p> <ul style="list-style-type: none"> - does not have an end but progresses linearly toward an undefined future - gradually changes toward increasing duration, tempo, and periodicity - has a strong and linear sequence - is meant to make players feel more fulfilled 	Empowering	<p><i>Objects</i></p> <ul style="list-style-type: none"> - Rapid obsolescence - Random ratio schedule delivery <p><i>Avatar</i></p> <ul style="list-style-type: none"> - Evolving capabilities <p><i>Enemies</i></p> <ul style="list-style-type: none"> - Increasing difficulty 	<p><i>Progression</i> is characterized by a sense of endless advancements towards an unaccomplished future entailing a desiring engagement that makes the players feel fulfilled over the long-term and desire to spend time in the game</p>	<ul style="list-style-type: none"> - Tyran: “I want to improve my gear and advance [...] I always throw away the old weapons, they become pretty useless after a while” - Kairo: “When I completed my first tier set, I thought that I could stop. But then new gear was made available” - Tera: “you need to progress, if you fall behind you may be blamed [...] Sometimes this is stressful indeed”
<p><i>Circular temporality:</i></p> <ul style="list-style-type: none"> - is characterized by recurrence and strong permanent sequences - is extremely regular in terms of duration, tempo, and periodicity - is intended to habituate players 	Farming	<p><i>Resources</i></p> <ul style="list-style-type: none"> - Consumable - Regular spawning times - Rewarding experience 	<p><i>Repetition</i> is hypnotic entailing a mechanic engagement that makes players become absorbed in repetitive behaviors and go back to playing the game regularly</p>	<ul style="list-style-type: none"> - Vega: “Farming is quite annoying, because it’s always the same, but the resources are fundamental to raiding” - Uldar: “I find farming fun, because we always chat about our private matters when we farm” - Mytral: “Farming is a sort of automatic thing you do, I mean, I memorized all the areas where the minerals are, I know their spawn times, so I optimized my tour”
<p><i>Shared temporality:</i></p> <ul style="list-style-type: none"> - is instantiated in different ways - its duration, tempo and periodicity are collectively set – entails total synchronicity - lasts very long periods of time - is meant to create a shared experience 	Raiding	<p><i>Raids</i></p> <ul style="list-style-type: none"> - Co-presence - Coordination 	<p><i>Assimilation</i> is totalizing entailing a durable and cogent social engagement that makes players feel a part of a community and retains them in the game over the long term</p>	<ul style="list-style-type: none"> - Kaershan: “In raids you must execute your duties in a very precise order, if you miss the sequence or lose the rhythm the entire group can be wiped out” - Pyros: “I changed a lot of my habits, especially my dinner times to meet the schedule of my guild” - Kairo: “When I start raiding seriously, I stopped going out with my friends in the evening”

The quotes reported in the ethnographic recounting are taken from the formal interviews made during the fieldwork and were chosen for their representativeness (Gobo, 2008).

Linear temporality

The practice of *empowering* consists in improving the character's stats, which affect its healing, defensive, or offensive capabilities. This, in turn, may allow the player to face harder challenges. Empowering is characterized by a *linear temporality* that is shaped by game designers through the design of three intertwined game design elements: i) the player's *avatar*, which is endowed with evolving capabilities; ii) the *objects*, i.e., accessories and gear that can improve the avatar's skills; and iii) the *monsters*, which release the objects as a reward when they are killed by the player.

Avatars, objects and monsters engage players in the impossible endeavor of creating an ultimate character: on the one hand, avatars can be indefinitely enhanced, by progressively acquiring more powerful objects; on the other hand, objects rapidly decay, losing their powers once the player has achieved a higher level of play.

An episode coming from my personal experience in WoW may clarify this point. I was so happy when I got the Helm of the Shadowy Vanquisher during one of my first raids. Soon, however, it lost its importance. I started thinking of the next helm, because my gear was more and more inadequate as I was facing new raids: when I found a new helm I threw the previous one away. Differently from games that have an ultimate goal and thus terminate at a certain point, this mechanism yields a linear temporality that does not have an end, in which the "object of desire" is continuously moved forward.

Moreover, how the objects are delivered gradually dilates the temporality's duration, as well as increasing its tempo and frequency. Most of the objects are given through a random ratio schedule. This means that players are required to complete a variable (and unpredictable) number of tasks (e.g., slaying a monster) to get the piece of gear that they desire. Nonetheless, while useful objects are easily obtained in the initial phases of the game, later on they require harder work, more time, and more attempts, since the avatar evolves more slowly, more difficult monsters appear and the "ratio" of objects delivery decreases. This process is both sequential and gradual. On the one hand,

the game prescribes a sequence of “temporal stages,” characterized by increasing durations, tempos and frequencies. Players remain in a certain stage until their character has reached a skill level sufficient to defeat the monsters that drop the objects of the next stage (with increased difficulty and decreased ratio). On the other hand, there are no leaps among the stages: the progression is almost imperceptible, made up of extremely small increments in the temporality’s dimensions. As a result, slowly, players are encouraged to increment the tempo of their performances, the duration of their play sessions, and their frequency of play. Abraxas, expressing a habitual experience among the hardcore gamers (12 out of 16), says that “*We have to try tens of times to get what we want. It’s so different from when I was a newbie, when I could easily get new good items... but my feeling it’s the same, I have this, but I want the next, it only takes much more time and much more work.*”

Game design elements, however, do not shape the temporality of empowering alone. The human components of the practice, such as the players’ mutual expectations, strengthen their action, further increasing the temporality’s duration, tempo, and periodicity. When the player advances in the game, she most often joins a guild, because she needs the help of other players to obtain powerful gear. Once enrolled, she must synchronize with her companions, because only those players at the same temporal stage (thus having the character equipped with equivalent objects) can raid together. This entails the need to concentrate more efforts in empowering to match the companions’ expectations. Herik explains: “*There are a lot of expectations about this that come from others, you’re always requested to keep the pace, and to have your character at its best.*”

Linear temporality is thus endless and characterized by gradually increasing duration and accelerating tempo: as the player advances, to obtain more powerful gear requires more time, as well as enhanced efforts. This produces growing periodicity, since the attempts to find specific objects must be carried out more frequently, given the reduced ratio of their delivery. The sequence is linear and strong: players have to follow a precise sequence of temporal stages, in which missions require more time to be completed and the odds to get the yearned rewards progressively decrease.

Game design elements may also encourage forms of synchronization among players in order to obtain the objects distributed in raids.

Linear temporality engenders, phenomenologically, a temporal experience of *progression*, characterized by a sense of continuous advancement toward an unaccomplished future, as described by most of the players I interviewed (29 out of 36). Pyros, for instance, explains that “*I never stopped bettering my character, you’re always in tension, imagining how it will be wearing the next object, and this sensation never fades away.*” This experience becomes more pressing and stressful, as the rhythms of playing increase. Nonetheless, on the one hand, the gradualness of the increase in the temporality’s tempo, duration and frequency makes players almost unaware that they are drifting to longer and more pressing sessions of play.

On the other hand, this stressful experience is balanced with the feeling of being satisfied and, at the same time, wishful for further rewards. Indeed, linear temporality entails a *desiring engagement* that makes players feel fulfilled over the long term. The rapid obsolescence of the objects collected, which projects the player into a future when more powerful gear would be available, and the lack of an end in the character’s development (and thus in the temporality itself) elicit both states of momentary satisfaction and continuous yearnings, avoiding boredom and frustration. In other words, the engagement sustained by linear temporality makes players desire to spend time in the game in order to consume more and more objects.

Of course, there are exceptions. A minority of interviewees (6 out of 36) do not constantly perfect their avatars: they prefer to slow down and avoid continuously chasing new objects. This may signal that game design elements can be resisted leaving players free to appropriate the game practices, in social practice theory terms (de Certeau, 1984; Shove, 2005).

Circular temporality

Farming consists in collecting diversified resources, like herbs and minerals, which can be combined and used to enhance the avatar's equipment or to produce goods useful for the guild. For example, by combining different kinds of meat, fish, and vegetables, players can cook meals that give an expedition team specific stat buffs that are needed to survive during a raid.

Farming produces a *circular temporality* that game designers encourage through the design of resources, i.e., game design elements growing in specific areas and having specific spawn times: once a resource is taken from a place, the player has to wait a certain amount of time to find it again in that specific location.

On the one hand, the consumable nature of resources shapes the temporality of farming into a circle, because players need to repeatedly collect such elements, as soon as they are consumed during raids, in order to ensure the team has constant supplies. Moreover, gathering resources enables players to enhance their gear, or produce useful items; this leads to a continuous rewarding experience that reinforces the player's willingness to farm recurrently.

On the other hand, resources spawn at a very regular rate. This produces a regular temporality in terms of duration (how much time is required to collect a certain amount of resources), tempo (at what rhythms players need to collect it), and frequency (how many times they have to collect it), to which players progressively adapt.

The human components of farming, that is the players' routines, contribute to fix the practice's temporality into an established circular path. In social practice theory terms (Feldman & Pentland, 2003), routines are systems of durable, transposable dispositions that can fix the players' repeated behaviors encouraged by the game design elements into permanent habits. Given the extreme regularity of the resources' spawn times, players can foresee the exact moment and place in which they will be available, finding an optimal temporal path that maximizes their collection among those offered by the resources. As these optimal paths are recurrently traveled, they become

crystallized in routines that are almost immutable. A quote taken from my field notes may exemplify this process: “*This afternoon we farmed again for almost four hours. I repeated the same path two times, as we did two days ago: we farmed three days a week in the last three months. We came to a sort of “perfect route” that takes the maximum amount of herbs we need, and we repeat this route every time.*” Guild companions often collect resources together, synchronizing themselves to the resources’ spawning times and having fun in company, thus adding a supplementary rewarding experience to the activity.

Circular temporality, therefore, has regular duration and tempo, as resources’ spawning times make players keep a constant pace. Periodicity is circular and regular, because farming recurs as soon as resources are consumed during battles. The crystallization of routinized behaviors results in strong permanent sequences that are rarely changed over time. Circular temporality may also imply forms of synchronization with others, when farming is performed in groups.

Circular temporality engenders a temporal experience of *repetition*, which is hypnotic: players are dragged into a loop that is enacted almost automatically. All the interviewees describe farming more or less in the same terms: “*I farm every night from midnight to 3 am. I always do the same route, make the same things, it’s like living in a loop [...] it’s automatic and I simply do it,*” Gane explains. Here, gameplay loops are not meant to support players’ learning and mastery (Nohr, 2013) or to ensure immediate compulsory pleasures (Coyné, 2003), as happens in many games. Rather, circular temporality is intended to habituate players.

This entails a *mechanic engagement* that involves players mindlessly, automatizing their experience of play and making them return to play constantly. In other words, the regular spawning times of resources and their consumable nature (and, consequently, the recurrence and regularity of the temporality) absorb players in repetitive and almost immutable behaviors, inducing them to constantly return to the game in order to refill their supplies.

Shared temporality

Raiding is a game practice that entails defeating a series of extremely hard bosses positioned in a separated area of the game (raid). Raiding guilds are aggregations of players that are devoted to the practice of raiding, which may reward them with the most precious objects.

At first sight, game designers appear only to subtly impact the temporality of raiding, leaving players free to set their own raiding times. This freedom, however, is only illusory: raiding produces a series of *shared temporalities* that are deeply influenced by how raids, meant as game design elements, are designed. First, there exists a time window in which the practice of raiding needs to be performed: every Tuesday the raid resets, cancelling the progresses that players have already made.

Second, raids prescribe the co-presence of a certain number of players. This imposes collective durations and periodicities. Completing a raid implies respecting precise schedules: the delay, defection, or absence of a single player during a play session can jeopardize the guild's endeavor. Every time the guild raids, all the players that are part of the expedition team must be ready to play.

Third, raids require a fine-grained coordination, as bosses can be defeated only through a series of synchronized attacks. Bosses perform precise sequences of behaviors that players need to recognize and counterattack in unison. My fieldnotes can explain this point: "*The team split in two. [...] The dps of the first team had to first tear down the Foreman Feldspar in the shortest time possible, and only afterwards they had to focus on the other mobs. The Heart of the Mountain cast Blast every 25, 15, 10, and 5 seconds depending on its heat and healers had be prepared to fill the healing points of the whole team before each attack happened.*" In order to achieve this coordination and memorize the correct sequence of actions, guild members need to play together for very long periods of time, that is months, or even years. Top raiding guilds are made up of players that have developed perfect synchronization and collective tempos.

If game design elements circumscribe the temporal boundaries of raiding (e.g., by requiring co-presence and synchronization), the human components of the practice instantiate them in specific shared temporalities. Each raiding guild has its own idiosyncratic ways of rearranging these temporal boundaries, by defining norms and routines that give the temporality a shape and a normative status. For instance, a guild may decide to raid every Monday, Tuesday, Friday and Saturday night from 8pm to 1am, imposing high playing frequency, while another guild may opt for a single weekly session on Sundays.

The *shared temporality* of raiding thus takes multiple forms, depending on the rules and routines defined in the guild. Duration, tempo and periodicity are collectively set and synchronization is almost total, because of the extreme coordination needed to succeed in the game battles. The sequence is strong and determined by how the raid bosses perform specific attack sequences. The overall duration of the practice is extremely long, as it may last even for years.

Shared temporalities engender a temporal experience of *assimilation* that is totalizing, as players completely align to the guild's temporality. Slowly, the time of the guild starts setting the pace of the players' life and their believed freedom in setting their play time rapidly vanishes. Mytral, for instance, reports a common experience among the hardcore gamers (12 out of 16): "*I had to anticipate my dinner time, and give up going out on Friday night. [...] Now my whole day revolves around my guild.*"

Many games sustain sociability by designing the game spaces (Ducheneaut et al., 2004), enabling players to communicate with each other (Pena & Hancock, 2006), or allowing them to play together within single sessions of play (Tyack et al., 2016). In WoW, it is the shared temporality that plays a major role in creating a sense of shared experience.

This generates a *social engagement* that makes the players feel part of the same community, which is extremely durable and cogent, extending to hundreds of play sessions: on the one hand, players feel that they have to play together for long periods of time to develop the coordination required to

succeed in raid battles; on the other hand, they feel committed to the collective durations, tempos and periodicities developed within the guild. As a result, players become bounded to each other and to the game and, in this way, end up being retained in WoW over the long term.

Raiding, empowering, and farming are three game practices that are connected to each other through their game design elements. Raiding requires both empowering to strengthen the avatars and farming to obtain goods to be used in raids; empowering requires farming to enhance the avatar's gear, as well as raiding to collect precious equipment. In so doing, game design elements also intertwine the game temporalities and their related temporal experiences.

When players join a guild to raid, they become assimilated into its shared temporality, aligning to its temporal norms and routines. Then, the guild's expectations push players to become more and more involved in the linear temporality of empowering, as their avatars must be fully developed for raiding. At the same time, the opportunity of farming in company further entraps players in the circular temporality of farming.

DISCUSSION

IS literature is not focused on "time design" as a tool to increase user engagement: it overlooks the link between the experience of time and engagement in system design. I then started my research by exploring how the design of time is related to engagement in video games. Social practice theory points out that time is realized within specific social practices, which articulate relevant temporal dimensions in multiple temporalities. Therefore, I defined the following research question: How are temporalities produced in a MMORPG and what kinds of effects do they have on the players' engagement? The study findings show that game temporalities result from the complex interaction between the material components of the game practices, that is the game design elements, and their human components, that is the players' mutual expectations, routines and norms. These temporalities engender specific temporal experiences that include specific ways of engaging with

the game. The study further stresses the major role that game designers play in this process, highlighting that the IT artifact shapes certain temporalities through the actions of specific game design elements. Figure 2 depicts how the three game temporalities I identified are produced in a MMORPG and their effects on engagement.

Linear temporality is produced by game design elements that gradually increase the difficulty of the game (e.g., monsters), by representations of the player that constantly evolve (e.g., avatars), and by rewards distributed through random ratio schedules. The effects of these elements are strengthened by the mutual expectations that players develop, once they become part of a collectivity. This temporality engenders an endless projection into an unaccomplished future and leads to a temporal experience of progression that engages players by making them feel fulfilled over the long term.

Circular temporality is generated by consumable game design elements (e.g., resources) with regular spawning times, and then becomes fixed in quasi-immutable sequences of repeated behaviors by the players' routines. This temporality, which encourages experiences of habituation through the alignment of people's behaviors to recurrent and regular tempos, durations, and periodicities, engenders a temporal experience of repetition that engages players mechanically, making them return regularly to the game. *Shared temporality* is produced by game design elements that require co-presence and coordination (e.g., raids) and then rearranged by routines and norms established within collectivities of players. This temporality, which promotes the development of collective times creating a shared experience, engenders a temporal experience of assimilation that engages players socially, retaining them in the game over the long term.

Game designers can knit together different game practices by making the game design elements pertaining to a specific game practice necessary for the accomplishment of another game practice. In so doing, game design elements intertwine the game temporalities, as well as their related temporal experiences. The temporalities are connected together with no unique directionalities, rather blending in a continuous referral from one to the other, whose dynamics depend on the

players' main goals. The unlabeled double arrows in Figure 2 emphasize the impossibility of establishing unique directionality in these connections.

As the *linear*, *circular* and *shared* temporalities weave together, their related temporal experiences of *progression*, *repetition* and *assimilation* connect to each other and the *desiring*, *mechanic* and *social* engagements add up. The result is an extreme form of engagement that lasts over the long term and sustains the players' desire to play and willingness to replay. I claim, therefore, that temporalities may have strong effects on the players' engagement. By eliciting specific temporal experiences, they are responsible for the players' desire to spend time in the game, return to the game and stay within the game for long periods of time.

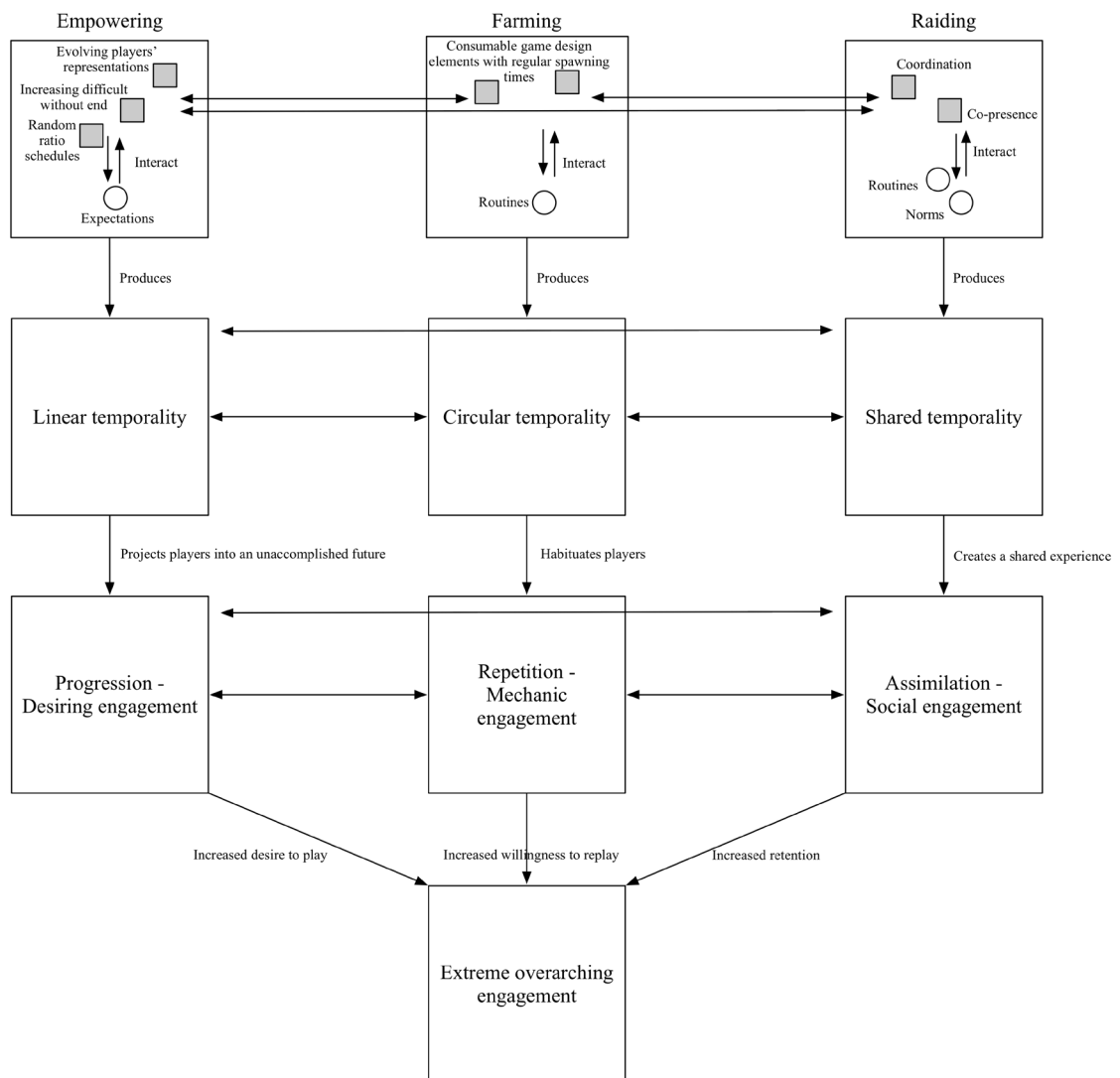


Figure 2. The conceptual model of time in MMORPGs

The conceptual model introduced in Figure 2 provides a novel understanding of how user engagement is induced through the design of an information system's temporalities. In WoW, linear, circular and shared temporalities are connected with the game practices that are specific to the game. However, empowering, meant as a means for evolving the player's character, farming, meant as an activity for regularly collecting items, and raiding, meant as a form of collective endeavor, are typical MMORPG game practices and are shared by almost all MMORPGs (Achterbosch et al., 2008; Lin & Sun, 2015). The proposed model, therefore, may be applicable to MMORPGs other than WoW, allowing for the analysis and understanding of how engagement is elicited in highly engaging video games. The model may also be useful to IS designers who want to design specific temporalities in IS that aim to support extreme forms of user engagement. Several further considerations follow.

Theoretical contribution

The main theoretical contribution of this article refers to a novel understanding of how design, time, and engagement are linked together. Social practice theory allows us to see the time of an IT artifact neither as an object nor as an event, but as the product of specific practices (Nowotny, 1992) (Orlikowski & Yates, 2002). "Time" is an activity realized through people's recurrent practices that (re)produce certain enactments of time (i.e., the temporalities) and their related temporal experiences. This is important for my study, because it enables us to account for both the various objectifications of time that can be found in a game (e.g., how circular temporality becomes fixed in the routines developed by players) and their phenomenological experience (e.g., the temporal experience of repetition).

However, how is time related to engagement in this perspective and what is the role of design in determining the experiences of time? IS research as well as the applications of social practice theory

to the analysis and design of IT artifacts treated time and engagement separately (Tavakoli & Schlagwein, 2016; Rapp et al., 2017; Granqvist & Gustafsson, 2015), overlooking that the phenomenological time can be intentionally designed in an IT artifact in order to increase the users' engagement.

The findings of this study suggest that the experience of time includes experiences of engagement and is the result of shared and continuous activity, a "work-in-progress" carried out by a community of people and "objects" that produces specific temporalities through the continuing performance of certain practices.

On the one hand, the phenomenological time is strictly tied to how individuals are engaged in (or disengaged from) the activities they perform in their everyday life, since, for example, a temporal experience of repetition may imply a mechanical engagement in the activity performed. Flow theory emphasizes that an activity merely done for its own sake may produce a state of deep involvement (i.e., the state of flow) characterized by a distorted temporal experience (Csikszentmihalyi, 1990). Here, I suggest that the kind of engagement we experience in doing an activity follows (or better is an aspect of) the specific temporal experience we are living.

On the other hand, the experience of time may change as the "work-in-progress" carried out by a "community" changes, for instance because new "objects," like new game design elements, are introduced into a practice, producing a new temporality and, consequently, a new temporal experience. This means that designers can intentionally create specific design elements to affect the users' temporal experiences and, through that, impact their experiences of engagement.

It follows that IS researchers who want to increase the users' engagement with an IT artifact should first study what users collectively do in their everyday practices within the IT artifact in order to understand their experiences of time. Then they should attempt to modify such practices by introducing particular design elements aimed at affecting the system's temporalities. This time

design, if well executed, would modify the users' experience of time and, consequently, increase their engagement with the system.

The strict connection between time experience and engagement, which I have highlighted above, points to the second theoretical contribution of this article, that is a novel conception of engagement. However engagement has been defined (Liu et al., 2017; Boyle et al., 2012; Schoenau-Fog, 2011; Agarwal & Karahanna 2000; Santhanam et al. 2016; Webster & Martocchio 1993), the literature stresses that we can be disengaged from or engaged with an IT artifact, or at least engaged with different degrees of intensity. Little has been said about the possibility that users can be engaged with an IT artifact *in different ways*. Here instead, I propose that there exist different kinds of engagement, whose characteristics are determined by the temporal experiences of which they are part. In this perspective, engagement is an aspect of the temporal experiences lived by the user.

I identified three kinds of engagement, i.e., *social engagement*, *desiring engagement* and *mechanic engagement*. The interplay of these kinds of engagement produces an extreme form of engagement. For IS research this implies that designers can create different forms of engagement, each with different experiential and behavioral outcomes: for instance, mechanic engagement automatizes the user's experience and makes her constantly return to the system, while social engagement makes the players feel part of the same community and retains them in the system for long periods of time. Moreover, this multifaceted conception of engagement highlights that IS designers need to support different kinds of engagement at the same time in order to produce an extreme form of user engagement.

A final theoretical contribution of this article is to specify the different kinds of relationships between people and the IT artifact that produce the game temporalities. Here, social practice theory is important because it allows us to frame the role of design features as the "agents" that constitute the nexus of a practice (Latour, 1993), emphasizing that they can directly affect IS temporalities and "collaborate" with humans to shape them. The research findings contribute to identifying the

different actions performed by the material and the human components of practices, outlining various modalities through which the temporalities of an IT artifact are produced.

Game design elements may encourage increasing duration, tempo and periodicity, as in the case of linear temporality, whose action may be strengthened by the players' mutual expectations when they enroll in a guild. Alternatively, game design elements may offer a variety of temporal paths, like in farming, which, nonetheless, point to the same circular temporality. As the players' routines develop, an optimal path is selected among the many afforded by the game design elements and fixed in permanent temporal sequences. Finally, game design elements may circumscribe the temporal boundaries of a practice, allowing players to rearrange them through the establishment of routines and norms, as it happens in shared temporality. It may be worth noticing that players can resist the design elements' action, as it happens when a player slows down her playing activity.

Identifying these actions is important, because it allows IS researchers to reflect upon the various ways in which designers can affect the temporalities of an IT artifact, as well as the different responses that users may enact. This could be insightful for designing effective temporalities in IS.

Practical implications

A key practical implication of this study for IS design relates to the gamification domain. The study findings highlight the importance of time design in increasing the individuals' engagement with an IT artifact. This could be inspiring for IS design in broader contexts, and especially in the domains of online communities, crowdsourcing and crowd working.

Defined as the use of "game design elements in non-game contexts" (Deterding et al. 2011), gamification is gaining increasing attention in IS (Liu et al., 2017; Cheong et al. 2013; Shang & Lin, 2012; Bista et al. 2014). However, research highlighted the difficulty of sustaining user engagement over time by using this technique, because the effects of game elements are often short-lived (Kim et al., 2013; Suh, 2015; Suh et al., 2017).

One of the limits of gamification appears to be related to its focus on a limited set of game design elements, namely points, badges, and leaderboards (Werbach & Hunter, 2012). These elements have been found to deliver behavioral reinforces that often quickly decay when they are withdrawn (Rapp, 2015; Linehan et al., 2014). IS research acknowledged this issue, but kept focusing on them (e.g., Liu et al., 2017; Koivisto & Hamari, 2019), failing to engage with the rich design practice of game designers (Rapp et al., 2019).

The findings I illustrated above stress that certain game design elements, other than points and leaderboards, may yield long-standing engagement by manipulating the game temporalities. These can be inspiring for designing IS that, similar to games, leverage the spontaneous participation of users towards achieving a goal, such as crowdsourcing systems, or online communities.

Alternatively, they can inspire the design of systems where supplementary incentives, beyond monetary rewards, are needed, as in crowd working platforms (Kittur et al., 2013; Al-Ani & Stumpp, 2016).

For instance, transforming points usually distributed in gamified crowdsourcing systems (Morschheuser & Hamari, 2019) in “temporized rewards” that quickly decay, similar to WoW’s objects, could contribute to producing a temporal experience of constant progression toward a future state, making users desire to spend time in the system. A sense of progression has been found to motivate volunteers to continue participating in crowdsourcing projects (Iacovides et al., 2013). Clearly, this and other “design hypotheses” that can be formulated on the basis of my study findings should be trialled in the field during future research to prove their validity.

To summarize, a practical implication of this research is to emphasize the importance of time design in the gamification domain. This suggests that IS researchers should experiment with game design techniques capable of manipulating the time of a system even in non-recreational contexts in order to produce engaging experiences. The study findings also highlight that we need to orchestrate different game design elements if we want to have a major impact on engagement.

Gamification design often relied upon the addition of standalone game mechanics (Jacobs, 2013). I suggest that we should instead explore systemic strategies for designing gamified IS, using game design elements to tie together different user activities and their related temporalities.

This said, there are dark sides to creating systems where people give up ties to their real world and its timings, in favor of online activities. MMORPGs have been reported to be the leading culprit in cases of video game addiction (Council on Science, 2007; Lee et al., 2007; Nardi, 2010). My findings suggest that shared temporality is one of the main ways through which the game creates a shared experience, dramatically increasing players' retention within the game. On top of this, circular temporality automatizes their visits to the game and linear temporality makes them desire to spend time within the game.

From this perspective, a thin line separates extreme engagement from the undesired need to be "always in there." Themes such as a sense of overwhelming compulsion and possible addiction are sometimes implicitly present in the players' accounts: e.g., some players have drastically changed their real-world activities to fit in the game times, spending most of their days and nights in WoW. As the players' engagement may lead to unwanted side-effects generating states of dependency on the game, IS researchers should account for these concerns when they apply the insights outlined in this research to system design. There might be cases in which making an experience more engaging may not lead to a valuable outcome.

LIMITATIONS

A limitation of this work may be that my ethnographic recount, in line with the social practice theory approach, focuses on the game practices' regularities. As the goal of this work was to identify the "typical temporal effects" of WoW's game design elements, non-typical effects may have been overlooked. Furthermore, I may have ignored players who briefly tried the game and then decided to quit. Rapid forms of disengagement may thus have been left unexplored. The

geographical localization of the servers in which I conducted the ethnography might also have impacted on data collection, since players located in other regions of the world, especially in Asia, might live the game differently due to cultural idiosyncrasies. Moreover, my research has been conducted in a PvE server: PvE and PvP servers may entail different playing strategies, so that my findings may not completely account for PvP game practices. Finally, the fieldwork took place in two expansions of WoW, which represent only a part of the temporal evolution of the game. The findings outlined in this article, therefore, might not find complete confirmation if referred to previous or subsequent versions of WoW.

CONCLUSION

In conclusion, in this article I aimed to enrich our understanding of how “time design” can affect individuals’ engagement within an online gaming context. Through an ethnographic study of WoW, I showed that game design elements shape the game temporalities, which, in turn, engender specific temporal experiences that include forms of engagement. On the basis of these findings, I developed a conceptual model linking game practices, game temporalities, temporal experiences and engagement. This model could be used by IS researchers to analyze different MMORPGs and produce experiences of engagement through time design, even in non-hedonic contexts.

The study contributes to the IS literature by providing a new understanding of how time, engagement and design are linked together. Engagement can be seen as an aspect of the temporal experience, which can be intentionally designed by system designers through the introduction of specific design elements. This implies that engagement can take different forms with diversified experiential and behavioral outcomes. Moreover, the study contributes practically to IS by suggesting that IS researchers may use game design elements to shape the temporalities of gamified IS to increase user engagement.

Several paths for future work remain unexplored. For instance, further exploration of the interactions between the material and human components of practices could lead to discovering other modalities through which technology and humans do or may collaborate to produce “time.” Novel forms of engagement connected with other experiences of time could also be identified by further research.

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APPENDIX

Glossary

Bosses. Bosses are powerful enemies that players commonly encounter while raiding. Bosses usually release extremely precious objects.

Gear. Gear is the equipment that the player needs to acquire in order to increase her character's stats.

Expansions. A WoW expansion is additional software that adds new features and content to WoW. The content of a WoW expansion is not available to anyone who does not buy the expansion. Until now, Blizzard has released seven WoW expansions.

Factions. A faction is a group of allies. In WoW there are two playable factions, namely the Alliance and the Horde. Players can only talk and create guilds with players from their own faction.

Gold. Gold refers to the money used in WoW to buy items and pieces of gear.

Helm. A helm is a part of the character's equipment that is worn on its head. It may increase certain character's stats.

Levels. Levels indicate the degree of experience that the character has acquired by accomplishing in-game tasks.

Level cap. The level cap is the maximum level achievable by the character. It may change depending on the game expansion.

Races. Races are types of characters that split WoW creatures into separate groups. Examples of races include elves, trolls, orcs, humans, and gnomes.

Stats. Stats are attributes of the character (e.g., strength, intellect) indicating its basic combat abilities. These attributes need to be enhanced if the player wants to increase the character's power.