**Drawing Inspiration from World of Warcraft: Gamification Design Elements for Behavior Change Technologies**

**ABSTRACT**

Human-Computer Interaction researchers are increasingly designing technologies for behavior change, drawing on different perspectives, theories and models. In recent years, a new approach has started to be explored within the HCI community: gamification is more and more used by researchers and designers to drive users’ behaviors toward specific directions. However, this design technique has showed several limits, especially for the choice of game elements to be employed. Drawing inspiration from the videogame world, this research wants to suggest the employment of game elements that could contribute and support behavior change processes in different settings. Looking at the Massively Multi Player Online Role-Playing Games (MMORPGs) as a source of inspiration, an ethnographic study in World of Warcraft has been conducted. We found that WoW is capable of driving its players’ behavior by employing incentives and penalties, as well as by providing social support and favoring mentorship. By creating a persistent world, supporting the recollection of players’ past memories, leveraging narratives and designing the time of play, WoW further affects players’ habits, increasing their retention in the game world. Findings from the fieldwork grounded the development of a set of design strategies that suggest how to use such elements in the design of interactive systems addressed to change users’ behaviors: for example, they recommend to design incentives systems that exploit different scheduling, as well as to create digital mementos to trigger positive memories that may support the change. Such strategies were then compared to game elements that can be found in other MMORPGs to allow for a greater generalization, and discussed with reference to HCI literature.

**Keywords**

Gamification; Behavior change; Reflexivity; Ethnography.

**HIGHLIGHTS**

* We conducted an ethnography in World of Warcraft to find how the game influences its players through its design
* We reviewed a series of game elements that impact on players’ behaviors and habits
* We proposed 8 design strategies for improving behavior change systems through game elements
* These strategies recommend to exploit penalties, incentives, groups and stories, as well as design for persistence, memory and time.

**1 INTRODUCTION**

Human-Computer Interaction (HCI) researchers are increasingly designing and developing technologies for behavior change[[1]](#footnote-1) (Hekler, Klasnja, Froehlich, & Buman, 2013). These technologies are addressed to promote a variety of behaviors, from physical activity (Lin Mamykina, Lindtner, Delajoux, & Strub, 2006; Consolvo, Everitt, Smith, & Landay, 2008) and healthy habits (Grimes, Bednar, Bolter, & Grinter, 2008; Denning et al., 2009) to sustainable behaviors (Oakley, Monchu, & Nisi, 2008; Froehlich et al., 2012), learning (Chang et al., 2008; Goh, Seet, & Chen, 2012), security (Bergmans & Shahid, 2012; Hartwig & Windel, 2013) and self-management of chronic diseases (Smith, Frost, Albayrak, & Sudhakar 2007; Gasca, Favela, & Tentori, 2008).

To inform the design of these systems, researchers commonly draw on a variety of theories from psychological and social sciences. Although the Fogg behavioral model (Fogg, 2009) seems dominant in this landscape (Disalvo, Sengers, & Brynjarsdottir, 2010), many other approaches have been used within the HCI community during the last years.

Cognitive models, such as the Social Cognitive Theory (Bandura, 1986), the Transtheoretical Model of Behavior Change (Prochaska & Velicer, 1997), the Theory of Planned Behavior (Ajzen, 1991) and the Health Belief Model (Rosal & Bodenlos, 2009) were involved in the design of many behavior change technologies. At the same time, other perspectives, coming from Applied Behavior Analysis (Cooper, Heron, & Heward, 2007) and Social Practices (Schatzki, 1996) have been explored, taking care of some of the shortcomings that characterize the cognitive approach, like its almost exclusive focus on the rational and conscious individual’s actions.

Among all the behavior change systems that are grounded in theories and models, recently we have seen an increase in the number of games designed for modifying human behaviors (Orij, Mandryk, Vassileva, Gerling, 2013): exergames, computer games designed to promote physical activities, fitness, and gross motor skill development (Mueller, Gibbs, & Vetere, 2008); serious games, videogames aimed at supporting learning and training (Michael & Chen, 2006); and pervasive games, games that extend the game experience to the world of everyday life (Montola, Stenros, & Waern, 2009). All these examples represent a line of research that tries to leverage the enjoyment, engagement and motivation games provide users with, to foster the change of behavior in a desired manner.

In this context, a new approach started to be employed by HCI community, not requiring the development of full-fledged games, but only leveraging a limited set of game design elements to influence users in different contexts. Deterding, Dixon, Khaled, and Nacke (2011) called this phenomenon gamification, defining it as “the use of game design elements in non-game context” (Deterding et al., 2011: 10)[[2]](#footnote-2). Although gamification seems to have some kind of effectiveness in promoting change of users’ behaviors (Hamari, Koivisto, & Sarsa, 2014), several HCI researchers have highlighted its limits, inquiring on how to reconfigure the current most common gamification strategies (Rao, 2013; Nicholson, 2012; Sakamoto, Nakajima, & Alexandrova, 2012; Laschke & Hassenzahl, 2011; Jacobs, 2013).

This research has the aim to draw inspiration from the videogame world, to contribute to support behavior change processes in different settings, promoting, for example, healthier and more sustainable lifestyles. Looking at the Massively Multi Player Online Role-Playing Games (MMORPGs) as a source of enlightenment, we conducted an ethnographic study in World of Warcraft (Blizzard Entertainment Inc., 2004). The fieldwork allowed us to review a series of game elements that deeply affect players’ behavior in the game world. Findings of this research grounded the development of a set of design strategies that try to suggest how to employ game elements in the design of interactive systems addressed to modify users’ behaviors.

The paper is structured as follows. First, we provide a brief literature overview of behavior change theories that commonly inform the design of interactive systems, and of the role that games and gamification played in this landscape. Second, we look at World of Warcraft to find game elements that influence players’ behavior. Then, we describe the ethnographic study and the related findings. We propose 8 design strategies that suggest how to employ game elements when designing behavior change technologies. We conclude the paper comparing the design elements found with other MMORPGs, and discussing the defined design strategies with reference to HCI related literature.

**2 BACKGROUND**

**2.1 Behavior change and HCI**

Much work in psychological sciences focuses on how behaviors can be influenced, and HCI researchers commonly draw on theories to make decisions related to the design of interactive systems. Most of the models used in behavior change technologies rely on cognitive approaches, often also employed in health intervention research (Shumaker, Schron, Ockene, & McBee, 2009).

In the last ten years, HCI researchers have designed and developed a variety of behavior change systems informed by cognitive theories like the Health Belief Model (HBM) (Rosal & Bodenlos, 2009: 48), the Theory of Planned Behavior (TPB) (Ajzen, 1991), the Social Cognitive Theory (Bandura, 1986), and the Goal-Setting Theory (Locke & Latham, 2002). Yun and Arriaga (2013), for example, used the HBM to develop an SMS health intervention for pediatric asthma patients. Instead, Thieme et al. (2012), relying on the TPB, designed BinCam, a social persuasive system on waste recycling. Finally, Consolvo, Klasnja, McDonald, and Landayn (2009) explored individuals’ reactions to various types of goal-setting, by implementing them in UbiFit Garden system.

However, while valuable in identifying some determining factors of human behavior, these models show a variety of shortcomings. For example, they do not address the temporal aspects of performing a specific behavior. To address this point, the Transtheoretical Model of Behavior Change (TTM) (Prochaska & Velicer, 1997) describes human behavior change as a process, made of six stages through which an individual progresses, in order to intentionally modify problematic behaviors. Second, these models are based mainly on the rational and conscious acting, leaving aside other important determining factors of behavior. Shove (2010) provocatively identified these frameworks as examples of a more general ABC model, where change is thought to depend upon values and attitudes (the A), which are believed to drive the kinds of behavior (the B) that individuals choose (the C) to adopt. However, people do not rely on rational choices at all, but often on irrational methods, such as rules of thumb and heuristics (Tversky & Kahneman, 1974; Thaler & Sunstein, 2008).

Recently, HCI researchers started to explore different approaches, seeking for environmental and social factors that can drive human behavior.

Villamarín-Salomón & Brustoloni (2010), for example, used Operant Conditioning to reward users' secure behavior in a security-reinforcing application, delivering different types of rewards to users, underlining the importance of the environmental factors in the behavior change process. Operant Conditioning is one of the fundamental methods of learning in applied behavioral analysis (i.e. behavioral psychology) and it refers to the process and selective effects of consequences on behavior (Skinner, 1953): from this perspective, a stimulus change that follows a given behavior and increase/decrease the frequency of that type of behavior in the future is called a reinforcer/punisher (Cooper et al., 2007).

The work of Pierce, Schiano, and Paulos (2010), instead, exemplifies a recent interest in social practices theories within HCI (Pierce, Strengers, Sengers, & Bødker, 2013). Connecting to the works of Bourdieu (1977), Latour (1992) and Giddens (Giddens, 1984), Reckwitz (2002) and Schatzki (2001) proposed a conceptual framework for the analysis of "everyday social practices”, i.e. routinized type of behaviors “which consists of several elements, interconnected to one another: 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: 249). Drawing on this approach, Pierce et al. (2010) suggest to look at the complex nexus that ties behaviors, habits, values, norms, objects and spaces when designing for promoting energy-conserving interactions.

Taking into account this theoretical background, in the next paragraph we will clarify how games, and gamification, contributed to the debate on behavior change technologies within HCI.

**2.2 Games, gamification and behavior change**

Games have been commonly exploited by HCI researchers to influence user behaviors in a variety of contexts: to promote the adoption of healthy food habits (Orij et al., 2012) and lifestyles (Thompson et al., 2010); to improve physical activity (Macvean & Robertson, 2013) or enhance the control on patients’ diseases (Bassilious et al., 2012); to raise awareness about sustainable behaviors (Antle, Tanenbaum, Bevans, Seaborn, & Wang, 2011) or reduce energy consumptions (Bang, Gustafsson, & Katzeff, 2007).

Along this growing interest in game-based interventions for behavior change, in recent years a new approach has started to be explored within the HCI community, without requiring the design of full-fledged games, but putting to work only some of their elements: gamification is now commonly used in designing interactive systems to foster user engagement (Barata et al., 2013) and motivation (Cechanowitz, Gutwin, Brownell, & Goodfellow, 2013) and, more and more, to drive users’ behaviors toward specific directions (Cafazzo, Casselman, Hamming, Katzman, Palmert, 2012; Stinson, 2013; Berengueres, Alsuwairi, Zaki, & Ng, 2013; Goehle, 2013).

Gamified systems, though, have also received several criticisms (Deterding, 2013) on the accounts that, for example, i) They add stand-alone game elements into existing contexts to merely cover the surface of applications and services (Jacobs, 2013); ii) They elicit mechanical behaviors without creating an engaging experience (Rapp, 2015a); iii) They limit the game design elements used to points, badges and leaderboards, which are commonly employed in the majority of commercial systems (Werbach & Hunter, 2012) and academic studies (Hamari et al., 2014).

Robertson called this phenomenon pointification, highlighting that it takes the thing that is least essential to games and represents it as the core of the game experience (Robertson, 2010), while Bogost referred to it as exploitationware, as “it confuses the magical magnetism of games for simplistic compulsion” (Bogost, 2011).

Furthermore, gamification designs do not seem to be informed by behavior change models and theories: primary theoretical constructs are extrinsic and intrinsic motivations, grounded in the Self-Determination Theory (Deci & Ryan, 2000), but often these concepts are used without a deep understanding on the psychological foundations that rely behind them (Seaborn & Fels, 2015).

All these issues suggest that we are not fully exploiting the potentialities that game elements can provide to HCI. Nevertheless, HCI researchers have begun to explore how game elements can influence users’ behaviors by providing richer experiences, trying to imagine how to overcome the most common gamification techniques. Sakamoto et al. (2012) introduce a value-based design to build services for behavior change, proposing to surpass current game mechanics. Laschke & Hassenzahl (2011) suggest to embrace a perspective that incorporates meanings in gamification, shaping new behaviors into meaningful stories. Rao (2013) stresses how it is necessary to reconsider current gamification competitive strategies when aiming at changing behavior, proposing to focus on cooperative social interactions and altruism.

Building on top of these insights, we suggest to look inside the world of Massively Multi Player Online Role-Playing Games to find inspiration for behavior change design.

**2.3 MMORPGs and World of Warcraft**

In the last few years, MMORPGs involved millions of players all around the world. These games project players in an another world, where deep interpersonal bonds are established and different opportunities related to their identities explored. MMORPGs are an extremely interesting phenomenon for behavior change purposes on the basis of three elements.

First, MMORPGs intensely engage players: Ng & Wiemer-Hastings (2005) showed that they are played for longer periods of time than other videogames, becoming the main responsible for game addiction (Council on Science and Public Health, 2007; Lee et al., 2007). These strong effects on behaviors in terms of absorption and capability of modifying players’ habits make MMORPGs a perfect environment where searching for insights addressed to the design of behavior change systems. Second, in MMORPGs players carry out a variety of tasks that can require strong efforts, such as farming and managing resources, which go beyond the traditional idea of play (Calleja, 2007) and are closer to the world of work: nevertheless, they are accomplished with high compliance. This peculiarity represents an interesting factor to explore when designing systems aimed at influencing users’ behaviors. Third, MMORPGs promote a wider range of forms of social relationships than the other multiplayer games (Drennan, 2007), representing an ideal context to investigate how the social components of games can affect and influence people’s habits.

Among MMORPGs, World of Warcraft (WoW), created in 2004 by Blizzard, with over 7 million of active subscribers as of May 2015 (Wikipedia, 2015) is still the most popular and most-subscribed MMORPG on the market. Players proceed through 100 levels of play, wandering in the world of Azeroth, killing enemies, gaining powers and taking up professions. Game activities are mainly in the form of quests, i.e. tasks that should be accomplished to obtain experience points or equipment. Players create characters selecting their “race” (e.g. Dwarf, Night Elf) and class (e.g. Death Knight, Mage), which will influence their way of play. Players are further split in dps (i.e. damage per second), which has the role of attacking enemies, tank, addressed to defend its companions, and healer, aimed at healing other players.

Players have to join their forces and their different skills in order to complete the hardest instances and raids. Instances are five-players dungeons that can be accomplished either with a group of well-known companions, or using the dungeon finder, a feature that allows players to join a pick-up group, i.e. a group where members do not know each other. Raids are from-ten-to-thirty players dungeons that are the most difficult contents in WoW and can be faced by being part of a guild (i.e. a permanent structured group), or by using the raid finder, a feature that allows players to form large pick-up groups. Nevertheless, the hardest raids, in which players can obtain the most rare objects and gear, can be only tackled if part of a guild.

Through the years, WoW has become the virtual world par excellence (Calleja, 2007), entering “the offline culture’s everyday speech to a greater extent than have most other computer games” (Corneliussen & Rettberg, 2008) and fascinating players also outside the circle of hardcore gamers. For game designers it set the MMORPGs “genre standards” (Debeauvais, Nardi, Schiano, Yee, & Ducheneaut, 2011: 181), while researchers found in WoW the perfect prototype of a game that creates an enduring loyalty in its players, by hitting “on all cylinders motivationally” (Rigby & Ryan, 2011). All these features make WoW the case study closest to the “ideal type” (Weber, 1949) of a MMORPG. As it is fundamental in a qualitative investigation to select a typical case for generalizing its results (Gobo, 2008), we selected WoW as the observational object of our ethnographic work to better ground the recommendations and strategies that we intended to outline on the basis of our research results, providing them with a more general validity.

In years, HCI researchers have explored WoW to investigate topics connected to players’ motivations (Yee, Ducheneaut, & Nelson 2012), personality (Yee, Ducheneaut, Nelson, & Likarish 2011), demographics (Yee, 2006), learning (Nardi, Ly, & Harris, 2007), characters’ value (Livingston, Gutwin, Mandryk, & Birk, 2014) and names (Thurau & Drachen, 2011). Furthermore, different studies have been carried out to explore the factors behind the success of a guild (Ducheneaut, Yee, Nickell, & Moore, 2007), players’ intimate experiences (Pace, Bardzell, & Bardzell, 2010), social dynamics during raids (Bardzell, Nichols, Pace, & Bardzell, 2012) and friendship among players (Nardi & Harris, 2006), how the act of playing can improve real-life relationships (Snodgrass, Lacy, Dengah, & Fagan, 2011) and the negotiations between players and Blizzard to exert control over the game (Glas, 2013). Moreover, a number of research adopted an ethnographic lens (e.g. Nardi, 2010; Golub, 2010) to outline the features of WoW culture.

However, the majority of these studies did not relate players’ experiences to those design elements that seem to influence their behaviors and give a form to their social relationships. What shapes players’ emotions, relationships and objectives? How do game elements drive players’ behaviors and make them change their habits? How are these elements subjectively experienced by players? To give an answer to these questions, we suggest to look through the players’ eyes, searching for game elements that push and shape behaviors in a specific manner, and might be employed in the design of behavior change technologies. To this aim, we conducted an ethnographic research in World of Warcraft.

**3 METHOD**

We conducted an ethnographic study in WoW for two and a half years. We followed a reflexive approach, moving away from the “realist” tradition of ethnography within HCI (Rode, 2011), which removes from the ethnographic narration the ethnographer’s voice, “preventing discussion of how the researcher’s presence in the field, their interactions with participants and their own background and experiences, have shaped the ethnography” (Johnson, Rogers, van der Linden, & Bianchi-Berthouze, 2012). Reflexivity, instead, allows reader to understand the process of data gathering and the ethnographer’s place within it, by accounting the ethnographer’s firsthand experience (Rode, 2011), which gains importance mainly in how it clarifies the investigated reality (Ellis & Bochner, 2000). In this research, then, we took into account the ethnographer’s personal experience in WoW and incorporated it into the ethnographic narration (Tedlock, 1991). For this, the style of our writing is closer to confessional tales, which van Maanen (2011) identifies as one of the three major traditions of ethnographic writing in anthropology, than to realistic tales, which represent the dominant form of ethnographic text within HCI (Rode, 2011). In confessional tales, the subjectivity of the ethnographer regains its voice, by presenting to the reader the fieldworker’s personal experience. Therefore, we reported in our result section also some of the ethnographer’s notes, written in first person, gathered during the fieldwork.

Our ethnographic research was carried out in two phases: in the first phase, a participant observation was conducted by the ethnographer, along with 16 contextual interviews, from October 2012 to March 2014 to individuate which game elements can motivate, nudge, engage and retain players in the world of Warcraft. Starting from those findings, we proposed a series of recommendations for gamification design, which aimed to go beyond the current gamification techniques based on extrinsic rewards, by leveraging users’ intrinsic motivations (Rapp, 2015b).

Then, in the second phase, we focused our attention on how game elements could influence and shape players’ behaviors, by continuing the participant observation in WoW from June 2014 to May 2015 and conducting 12 further interviews. This phase of the research, which we will outline in the following, is also based on the re-examination of all the materials gathered during the first phase. The final aim of this study is to understand how WoW impacts on players’ behavior through its game elements and, drawing on the review of such elements, to define a series of design strategies that could be employed in behavior change technology designs.

Findings of the fieldwork were interpreted in the light of behavior change theories, which were employed to further support the strategies defined. The objective was doing an “outdoor psychology” (Geertz, 1983), where behavior dynamics were studied “in practice” (Lave, 1983).

It is important to highlight that the fieldwork was conducted in the last two expansions of WoW, called Mists of Pandaria (from October 2012 to October 2014) and Warlord of Draenors (from November 2014), and the related patches, as a game like WoW is under a continuous evolution: along the years, WoW has changed many game elements, strongly impacting on players’ behaviors (e.g. Eklund & Johansson, 2013). Although we did not find significant differences between Pandaria and Draenor for the purposes of our research, the results exposed in this work would not necessarily find confirmation if referred to previous or future expansions of WoW. Moreover, the fieldwork mainly took place in a PvE server (Player vs Environment), where players cannot fight each other in the shared world. However, we took into account also the game mechanics of the PvP servers (Player vs Player), where players can be engaged in a duel everywhere, by creating two of the five secondary characters in a PvP server.

The ethnographer immersed himself in the world of Azeroth for more than two years, formally interviewing 28 players and being engaged in hundreds of informal conversations and game activities. His main character, a Night Elf Mage, Evyer, reached the level cap (100), participating in seven different guilds, and becoming an officer in two of them; he also completed almost all the dungeons available in the game, being involved in a plethora of game activities, from farming, to learning professions, nurturing pets and trading items. To widen his knowledge of the game and the heterogeneity of the phenomena observed, he created 5 secondary characters (a death knight, a warrior, a priest, a hunter and a druid) and evolved one of them to the 95 level (a Blood Elf hunter).

The fieldworker took accurate field notes throughout all his game experience, collecting his personal thoughts, hypotheses, reflections and feelings, along with others’ behaviors, habits and practices. Together with tens of informal interviews with the members of his guilds, he conducted the 28 formal interviews both in Azeroth during in-game actions, registering the conversations via chat logs, and in “real” world, meeting participants face to face and audio recording the outcomes. The whole study cohort was composed of 28 participants (16=male, age range=18-46 years, age average=30.2 years; SD=7.9 years). Participants were selected through a purposeful sampling technique (Marshall, 1996) and differentiated along the dimension of engagement, taking into consideration four different factors: i) degree of player’s experience, defined by her character’s level; ii) age of WoW account, iii) hours of week play, iv) social centrality, by which we mean the social role covered by the more engaged players. Age of the WoW account, hours of week play, and elements for assessing the participants’ social centrality were asked during a preliminary interview.

We aligned the study cohort size to the common practices in qualitative research[[3]](#footnote-3) (Marshall et al., 2013) and to those employed in other studies which investigated WoW throughout ethnographic observation: Prax (2010) interviewed 12 players to explore leadership in WoW; Livingston et al. (2014) involved 20 participants in exploring characters’ value for the players of MMORPGs; Nardi and Harris (2006) recruited 26 participants to analyze collaborative play in WoW. However, we decided to stop at 28 participants when we became aware that further interviews would not have provided remarkable new insights for the aim of our investigation, following a data saturation criterion (Bowen, 2008).

Participants can be divided in: hardcore gamers, players with a character at level cap, with more than 2 years experience in WoW and an average play per week of more than 20 hours; normal players, which have a character at level 80-90 (Pandaria) or 90-100 (Draenor), with more than 6 months of experience in WoW and a frequency of play of 10-20 hours per week; novices, which have a character at level 30-80 (Pandaria) or 40-90 (Draenor), with less than 6 months of experience in WoW and less than 10 hours of per week. Hardcore gamers were considered key informants and thus are the most consistent part of the study cohort: they were further split in leaders, officers or masters of a guild having a central role in their social groups, and followers, players with no key responsibilities in their guilds and with a less important role in their groups. Two further players, who stopped playing WoW before they were interviewed, were recruited as outliers, to investigate the reasons behind their disengagement.

Fourteen participants played other MMORPGs, allowing us to widen the field of investigation to other contexts during the interviews. The interviews were semi-structured and they lasted about three hours. The questions of the interviews were defined on the basis of the ethnographer’s personal experience on the field, as well as the informal conversations he made during the fieldwork. Questions were focused on exploring how the game influenced the participants habits and behavior. Participants were free to talk of the game elements they considered more important and to divert from the track of the interview.

Participants were recruited mainly in a PvE server (19 out of 28), leveraging the ethnographer’s social network of game companions (16 out of 28), or randomly engaged during an instance or raid in a pick-up group (12 out of 28). All the characters’ and guilds’ names were changed due to privacy reasons.

Following a multisite-based approach (Marcus, 1995), we also gathered and analyzed a plethora of WoW related documents, constantly visiting the WoW’s official forum and those of the guilds in which the ethnographer was involved. The results exposed in the next section are grounded not only in the participants’ words, but also in all these documents, in the observations and in the informal conversations carried out with other players during the fieldwork. We analyzed the data through a thematic analysis (Braun & Clarke, 2006). We generated initial codes identifying features of the data that appeared interesting to us. During this analysis, data were first broken down by taking apart observations, sentences, paragraphs and by labeling them with a name. Such codes were then grouped in categories, i.e. overarching themes. To this aim we used affinity diagrams. Then we collated the relevant data extracts within such themes. We finally reviewed and labeled the themes identified.

**4 RESULTS**

**Persistence**

New routines blossom easily within WoW. Players are thrown in a world that has its own norms, shared social practices and sedimented meanings, which they have soon to adapt to. The persistence of the WoW’s world favors the adaptation of players to the game practices, instead of promoting the inverse process: “When you enter for the first time - Mina recounts - there is a world full of life that goes on and on autonomously. I mean, you arrive in something that is already there and you have to adapt to it… You can’t decide everything by your own… Thus, there’re other people, they’re there before than you, they have organized things and you have to adjust to them”. In highlighting the permanent nature of the world of Azeroth, Neyr adds that “[WoW] is an enormous world, full of living things. It seems that you have arrived on an alien planet, where there is another civilization in which you have to enter on tiptoe”. In such an environment things happen and go on regardless the presence of the single individuals, while players soon develop the feeling that they have to abandon themselves to its rules, if they want to keep playing effectively.

The preexistence of social relationships and stabilized groups, in a world that lives and evolves independently from those who are “hosted” by it, pushes players to adopt new behaviors. Individuals gradually incorporate the social practices already shared by their community, in a process of assimilation that goes beyond the learning of some game mechanics, but which can be characterized as the acquisition of new habits. Guilds are the main agent of this process, fostering the development of routines that are previously established through social prescriptions and collective expectations: “in our group the only thing that counts is to meet the expectations of the group, to satisfy its needs… thus, if you are supposed to be crafting items for the raid, and you aren’t, you can’t participate to the next raid. You have to respect others… No matter how, it is a society and you have obligations”, says Vania.

Social norms are perceived as unchangeable by the majority of players, even by those with an high in-game experience, unless they become guild masters and thus decide the rules of their own group. Herik, for example, when he left the role of master and moved to another guild, had to adapt to new social practices, as if he were a novice: “After completing TBC (i.e. the expansion The Burning Crusade), I wanted to test my limits. So I applied for The Unknown… I had to pass a test phase before becoming a member in effect and I felt like returning to my first days in WoW. I was constantly under examination, for weeks I had to play perfectly, matching the expectations of my officers… there, all the players were devoted to the in game progress… I found it difficult to respect such a vertical hierarchy”.

However, what makes the difference in WoW is that all these rules are deliberately adopted. New behaviors are acquired voluntarily, as players do not feel to be coerced by someone or something: the existence of a variety of guilds, characterized by different prescriptions, social relationships and structures, makes for players possible to select the one that fills most their needs and desires. Neyr changed four guilds before reaching stability: “I found a place where I can relax. The hierarchy is almost flat… we exchange what we have, there is a kind of generosity and availability to others that I can hardly find in the real world”; while Daemon highlights how his group is simply addressed at playing together for fun’s sake: “When I started to work, I couldn’t really keep up with the rhythms of The Archans anymore. So I changed, joining The Night Crawlers… here I can play when I want”.

WoW is characterized by the persistence of its world: this gives players the sensation of entering in an environment which they have to adapt to. By favoring the formation of permanent groups, with their own lives, norms, prescriptions and expectations, WoW enhances the impression that the world of Azeroth is populated by independent entities by which the players have to make themselves accepted. The incorporation of already established social practices is one of the main ways through which players acquire new habits, conforming to the rules of the groups they belong to. However, by allowing each individual to choose the social group that best fits their needs and desires, WoW does not make the players feel to be compelled, but leaves them the impression that they are deliberately acquiring new behaviors.

**Memories**

Notes of 24th July 2014. *“I returned in WoW after almost three months of pause, and it was incredible how much this “place” has meant to me. I spent the last two weeks wandering around in Azeroth, walking through the Mage Quarters of Stormwind, flying above the Un’Goro Crater, climbing the paths of the Mount Hyal. During this journey, I was continuously amazed by discovering how this world was packed with my memories. Each place I visited embodied episodes of my in-game life, and I could remember them by simply moving through these places. The tavern in which we used to meet, my guild companions and me, every evening; the lake where I encountered one of my actual best friend in WoW; the dungeon where I got my first epic item. Even the objects that I put in my bag did more or less the same to me. In there, I treasured all the main boss drops that I gained when raiding with my last guild: each one of them stood for a difficult battle, a number of failed attempts, a moment of enormous satisfaction. All these elements made me reflect on my whole adventure in WoW and how I changed over time in there: how at the beginning I was completely driven by progressing in the game, while in the last weeks I was so into the management of my guild that I almost lost the pleasure of playing. For the months to come I then promised to myself to restart with a new attitude, letting myself go to the WoW guild life, without pretending of guiding it”*.

As the episode reported above highlights, and interviews and informal conversations we made confirm, WoW is packed of elements that favor the players’ remembering of the stories they lived and the goals they achieved during their in-game experiences. The lands that compose the world of Azeroth are places that host a variety of personal memories, which can be recollected by simply moving around and observing their details, retracing all the battles faced, the encounters made and the episodes shared with other players. This strict tie between WoW’s spaces and personal experiences is testified also by the deep meaning that closed and well characterized areas of the game, the dungeons, assume for the players: “I shared so many experiences in those places – said Tera – that sometimes I go with my old friends in the old raids only just to relive those challenges... it’s the atmosphere that counts”.

Figure 1. Personal items and pets that can trigger reminiscence processes (World of Warcraft, Blizzard Entertainment Inc., 2004).

However, WoW players can also recollect their in-game memories almost at any time, by simply looking at their characters, which embody all the events happened to them in the equipment they own, in the achievements they completed and in the skills they learnt. Feilyn highlights how the gear worn by her shaman can trigger the reminiscence of a variety of episodes related to the past stories in which she was one of the leading actors: “You know, everything I wear, it comes from somewhere. You see its name and level and you immediately remember that it was dropped in that dungeon by that boss… Each one of these objects represents a story of mine, in which I achieved something, with other people”. These digital objects represent much more than mere rewards for completing a dungeon, as they are guarded by players as precious mementos from their past. Kairo, for example, illustrates how and why they are preserved: “This crown, I won it at Molten Core, almost ten years ago... I keep it with me, even if it isn’t useful anymore… it’s too weak now but it’s like a souvenir through which I can look at that moment... It reminds me of all the days we strived and the miles we ran in that dungeon… It was a long time ago but it’s still so vivid”.

These personal items are somehow precious for players, as they materialize positive memories: they refer to the results of the players’ efforts in pursuing their objectives, as Abraxas stresses when he says “The ring means that I played well in my group, that I tried again and again to win it... It testifies my specific abilities in that raid. I mean… it’s like scars when you fight… you survived and won”. In the same way, the characters’ skill levels and their achievements can provide players with the reassuring feeling of being able to face the challenges ahead, as they emphasize and make them remember the episodes in the past where they were successful. Ganes says: “All my character’s attributes remind me a variety of episodes… how much effort I put into trying to raise his intellect, improving the chances of his critical strikes… it makes me think to all the attempts I made, how he was and how he is now. And it’s strange to say but this reassures me. I’m aware that I can do everything in this game if I’ve already achieved all this”.

In WoW, spaces, characters and items provide players with a variety of memory cues that allow them not only to retrieve a specific episode of their past, but actually to relive it through a reminiscence process, which brings back to light details, emotions and thoughts. As long as they evoke positive experiences, which are connected with positive feelings, they show to have a self-enhancement function, reinforcing the effort and persistence that players can put into achieving their current goals and facing their future challenges.

**Incentives and penalties**

In WoW, incentives, like points, gold, items, gear and achievements, reward players’ behaviors, pushing them to better their in-game performances and making them engage in different activities, even in those that can appear repetitive and burdensome at a first sight. Players are in search for rewards because they need them to advance in the game, gain an higher reputation among their peers, or simply satisfy their narcissism by beautifying their characters. For Tera they are the only means “to face harder challenges in the game by enhancing the skills and powers of my character”; for Abraxas they represent “a mirror of my reputation as the others can see what I wear, my mounts and my achievements… they ask where did you take this? Eheh to have this it’s quite impossible”; while Mina says “I want all the mounts, they are so cute and make my character so cool”.

However, what seems to make them really effective in driving players’ behaviors is not only the high and differentiate value that they embody, but also the modalities through which they are provided and how they can be used within the game. Uldar explains how in WoW “you can always obtain something that you expect, and something you don’t. I mean, I know how much experience points and gold I can gain when I’m completing a quest. But drops are given randomly… A friend of mine did the same raid thousands of times and he never had what he wanted. But he’s still hoping to get it”. By giving a quote of secure incentives, and another one through random schedules, players feel always rewarded and, at the same time, are pushed in performing specific behaviors in the hope of obtaining what they most desire.

At the same time, rewards in WoW can be used in different ways. While those that are needed by the player are employed to enhance her character, or to improve her reputation, other ones can be traded for different objects or gold, putting them up for an auction, giving them to others, or simply selling them to a merchant[[4]](#footnote-4). Kairo reports that “I often gather a lot of items that I can’t use on my warrior because they are too weak for my level… But I can sell them and I can make gold". This mechanism guarantees that all the incentives that players gain can be exchange for other goods, without leaving them with the unpleasant feeling of having obtained something that is completely useless. Nevertheless, if everything can be sold, not everything can be bought, as Tera highlights: “Obviously the high-level items can’t be bought, but are dropped only when you defeat a boss in a raid. But without gold I wouldn’t even be able to face the raid”.

Figure 2. An incentive distributed through a variable ratio schedule after completing a raid (World of Warcraft, Blizzard Entertainment Inc., 2004).

These words also outline how in WoW some rewards are needed for obtaining, maintaining, or enhancing other ones: “you need a lot of consumable for raiding, potions, flasks, food are indispensable and the only way to obtain them is buying them or farming a lot”, says Uldar; and if Feilyn illustrates how the equipment that players gather has always to be kept in maintenance by using gold, Ganes adds that “to face the hardest raids you must have your gear at maximum level, by modifying it through the professions... And you must farm to obtain the materials for crafting”.

WoW has a multi-level reward system set in, in which “minor” rewards are used to obtain, repair and enhance the “major” ones. Each reward is, then, calibrated to the abilities requested in obtaining it. The most precious incentives are tied to the completion of the hardest contents in the game, while the other ones can be obtained through repetitive and low-skill demanding tasks: “having gear for farming doesn’t make sense… farming is repetitive, you need only patience not skills… it’s only a means. To have powerful objects you have to excel in raids”, says Pyros. As long as different activities are linked to different types of incentives, and all are needed to advance in the game, players have to engage also in tedious and laborious assignments to have access to the more enjoyable and satisfying experiences, and obtain the most valuable prizes: this results in a “virtuous” circle, where players are driven toward different behaviors depending on the rewards they are looking for, feeling at the same time to be receiving the right compensation for their competences.

If incentives are essential in addressing players’ behaviors, also penalties can have a great influence. Novices like Ludos well explain how they work in WoW: “when I go off the tracks the game makes me continuously die, forcing me to return in a zone that is appropriate for my level. I become powerless for some minutes and my gear suffers some damages, but it’s not something irreparable. I only have to spend more gold to repair it”. Tyran, instead, highlights that the greatest punishments in WoW come from other players: “It is hard to play in groups, when you go in instances where you don’t know the other players [i.e. using the dungeon finder]… you make a little error or aren’t fast enough to heal and you get instantly blamed and threatened to be kicked out… Thanks God they don’t know me, otherwise the shame would be too much. But I think that all this pressure is pushing me to better my character”.

If Tyran stresses how social blame is important in driving novices’ behavior within the pick-up groups, Pyros illustrates how more complex mechanisms of social exclusion function as punishments in some guilds’ life. This happens especially in those oriented to progress in the game, where players that do not belong to the “core”, made up by the officers, are constantly under scrutiny: “Usually - says Pyros - during a raid I control who is doing what, and then the better you played, the more probabilities you have to obtain what you wanted… For each boss, the last dps is excluded from the raid and we take another one. The same for the healer. Then, you must let your light shine, always, or you are out. But this pushes you to play better and better”. Not playing at the level required by the guild, not following its rules, or causing quarrels among companions can lead players not only to be excluded from the next raid, but also to be marginalized, and in extreme cases expelled by the guild itself: “in my guild - explains Crane - if you are the only one that doesn’t play well, we have a lot of patience… But after that, if you don’t show the willingness to improve we won’t be calling you anymore for raiding… Far cry from this, it’s being troublesome or not respecting our rules. We give only one notice, then you’re free to find another guild that matches more your way of behaving”.

WoW provides valuable rewards which are needed by the player to advance in the game, improve her reputation and dress up her character. By distributing them through foreseeable and unpredictable patterns, WoW makes players feel of being always rewarded; by letting them free to trade the prizes they obtain, it establishes an internal economy where everyone can exchange the goods she doesn’t need, avoiding the frustration of hoarding a bunch of useless rewards; by building a mechanism in which some incentives have to be used to obtain other ones, WoW pushes the player to engage in a variety of activities, depending on what she desires to obtain.

On the other side, WoW is able to influence players by providing penalties for their inappropriate behaviors. However, none of these punishments seem irreparable. Dying is always a reversible process, which only constrains players to repair the suffered damages; social blame and expulsions in pick-up groups can be mitigated by the fact that members do not know each other; marginalization and banning in the guild life can be fixed by finding another group, which can better fit the skills and the temperament of the player excluded. All these aspects highlight that WoW always offers the player a possibility of redemption, fostering her willingness to amend her faults and improve her way of behaving, or allowing the search for an alternative more suitable to her habits.

**Time**

Notes of 11th May 2015. *“In the last few days I became aware that the most fascinating aspect of WoW is its capability of modifying the schedule of my daily living. When I started to play, I was used to enter in WoW when I had some-free time, to grant myself an interruption from the flux of my working activities. Now, after more than two years, I can see how my whole day is shaped along its times. It’s hard to explain how my time is now the WoW time, and the habits related to my “real life”, like eating, sleeping and even working, are adjusted to fit the events that happen in Azeroth. The fact is that I can’t miss to be there at 5pm to prepare myself for the raid. It’s like I have developed completely new habits: I go there and I know what will happen, the order, the duration, the pace of the activities that will be carried out. All is enveloped in a rituality that I share with my guild companions. And this order, this predictability, is somehow reassuring”*.

Time, with its cycles, accelerations and breakings, seems fundamental in WoW for conducting players to develop new habits, even in contrast with those that characterized their “real” lives. For example, as the game most difficult contents require the cooperation among players, they have to synchronize the pace of their activities, giving form to a shared temporality that favors the development of common routines. Kairo highlights how being present in WoW at the same time is essential in the guild life, talking about the management of raids: “Knowing that 19 people can’t begin because you are away… They are all there at 8 o’ clock, and you are not, and they are waiting for you… if you are in our guild you must play almost 5 times a week. Because if you play, say, once in three weeks, you can do that for goodness’ sake, but then clearly we don’t have people for raiding”. Tera, on the other hand, remembers how WoW moved her to other rhythms, pushing her to reset her daily habits: “I came out of the University at four, I logged into the forum, I read the new posts and enrolled in the raid. And then every night at 9, whether it was raining or snowing, every night I met my companions to raid… Friends said to me: Don’t you come out anymore? No I must raid… on Easter, on Christmas, always”. By playing together regularly, players seem also to develop new behaviors in the form of rituals, where a series of activities is shaped in a prescribed order, aligning individuals’ behaviors to a common protocol. Herik outlines how: “When 9pm is coming, you enter in the server and there is all the ritual of meeting your friends to do something together. You first go into the tavern, buy your fucking things, and then craft your items. You arrive in front of the dungeon as you were going to take a beer. And then the leader calls the roll, goes through the tactics and the roles, checks that everything is in place. Ok, are we ready? Let’s go, let’s begin. And we start to move together”.

Although at a first glance it could appear that players are free to set their own time of play, its progression and articulation is actually manipulated by the game itself, which favors a cyclical and pressing acting. Players are somehow pushed by the game to adopt a new temporality. For example, raids in WoW are designed to reset every 7 days, vaporizing the objectives achieved by players: if, on one hand, this mechanic slows down the progression, on the other, it enhances the pressure on players, who are “invited” to be constantly present, in the attempt to finish the dungeons before the deadline. As Crane highlights, this mechanism prescribes not only the order of the in-game activities, but also the pace, the frequency and the duration through which they have to be performed: “Thus, basically on Wednesday and Thursday you go to farm the dungeon one as some of us has to keep the items… On Friday you do the first three bosses of the dungeon, which you know how to deal with… and then there are the other evenings in which you have to throw down the last boss, where you die 15 or 20 times and the pressure raises and you play more and more and faster ‘cause the raid is going to reset”.

Manipulation of time is reflected in many other game elements. Pyros, for example, outlines how farming contributes to shape a recurrent temporality that supports the development of a sedimented habit: “We are a small group of friends who stay up late. We farm during the night… And farming is repetitive, you always harvest the shoot, making your route and waiting for it to reappear. Things grow again after a while, everything has its spawn time. And this takes hours and hours, every evening… The first times you do that because you need it for raiding. But now it’s like an habit and I do it without thinking too much”. Tera, instead, points how the waiting enhances the retention in the WoW’s world, making her do things that she would never imagine: “I am an hunter and I wanted to tame that black lion. And it spawned every one million hours of Jupiter. I had to stay under that tree, maybe there for three hours waiting. And in those moments I didn’t go even to pee, I didn’t eat. I did that. I’m telling you because I’m attached to that period but I feel quite embarrassed. It’s incredible that I’ve done those things”. Waiting is also materialized under the form of the announcement, the promise that something will happen in the near future: the event, such as the imminent availability of a new expansion or raid, or the creation of a in-game happening, has the power to orient players’ efforts, mobilizing them collectively. Casdan still remembers: “It was an event for the launch of Ahn’Qiraj raid. Before the launch, there was a faction level gathering, the horde and the alliance collected resources to open the gates of this raid, and there was a strong collaboration between guilds to do that... it was memorable”.

WoW manipulates the time of the game by modulating the order, the rhythm, the duration and the velocity of the in-game behaviors, supporting the development of new habits. Cooperative play favors the establishment of a shared temporality, in which all the members of a group have to uniform their time of access, promoting the consolidation of common routines and rituals. Distribution of temporized rewards pushes players to wait or perform certain behaviors in specific moments, keeping them in the game world for a long time. Resetting the players’ progresses cyclically, instead, accelerates and slows down the pace of the game activities influencing the rhythms of the players’ behaviors and enhancing the frequency of play. Finally, events intern to the game set institutionalized moments that regulate players behaviors, by offering common objectives which players can direct they efforts to.

**Mutual help and mentoring**

Notes of 4th March 2015. *“The first raid I participated in together with my new companions was a complete disaster. I had joined this new guild only one month before that. I wanted to try the experience of building up a group from scratch again. Even if we were together from so little time, there was already a familiar mood between us. Then in two hours we failed almost ten times. We were completely uncoordinated, even if we were not afraid of making mistakes. We wanted to cooperate and understand where we were wrong. Lete: please, can someone tell me what I have to do? :D; Derkes: we get to the first boss and we check the tactics; Derkes: you and Ariess tank and then change when you gain too much damage; Evyer: Ready?; Derkes: Move from that puddle; [we all die]. Axial: who goes aggro?; Kernel: Sorry, I did; Ariess: never mind let’s try again, tank follow me; [we all die again]. Axial; mmh some of us don’t have the gear; Evyer: Yes, I think I missed a couple of pieces but I don’t know where to get them; Derkes: we should check the pieces we all need and search them together before trying again; Lete: Evyer don’t worry I can show u where to find what u need!!!. That raid was the first episode of a collective experience, where, as long as our intimacy was growing, we also became better players. By feeling free of sharing our mistakes, by dividing the burden of learning new tactics and disclosing our weaknesses and strengths we perfected our in-game behaviors, understood how to solve the difficulties and mastered those activities that we have never expected to manage”.*

Players in WoW “learn to play” by confronting each other within their guilds, which function as mutual help groups to collectively overcome their difficulties. Learning “how to behave” in the game is essential for the success of a raid, as a single error of an individual can wipe all the group members. However, as highlighted in the episode above, and confirmed by the interviews and informal conversations we made in WoW, guilds constitute a place where it is possible to share both successes and failures, as players cooperate for a common aim. Pyros, for example, recounts: “It was when we faced the last boss of Naxxramas… Everyone of us tried for weeks to find a solution, suggesting possible tactics, discussing them in the forum, but without success… That was a moment of crisis in my guild… Even in the despair, in those days we felt very close, because we were somehow grouped by a common problem that we were struggling to solve... I think that we finally succeeded only thanks to our mutual support”.

Becoming friends increases the opportunities of helping each other, as personal relationships reduce the embarrassment of asking for help: the development of a familiar environment strengthens then the cooperation among the group members, actually resulting in better performances during the game. The problems of the individuals gradually become the problems of the group, and this mutual exchange eases the acquisition of the “right” behaviors to face the game challenges. Erwin, for example, remembers how he met those that now are some of his best friends even in real life: “I started to whisper to other players during an instance… then, I began to chat privately a lot and follow their progresses in the game like they were mine”. This friendliness usually blooms in small guilds, or in a sub-group within a larger group, where the intimacy of the environment favors the development of deep bonds: Crane explains that “In large guilds there are few persons that become friends, which chat, do things together, and then become the best players in the guild. They are usually the officers, which look at the guild as a small group of friends. This is a strong core that sees the others only as necessary for facing the raids”. Then, as Uldar highlights, it is not rare that these ties can lead to share also the problems related to their real lives: “At the beginning you talk about the game, but then you start to talk about your life… and this transforms the game, as you can meet there even only to talk and share all your struggles”.

Acquiring the correct skills for the in-game goals is a process that also passes through the enduring activity of “mentors”: they play the role of teaching the correct actions to be performed during the battles or, by and large, to achieve some kind of objectives. Mentors can be observed throughout their actions in instances and raids, or can be asked about how to behave correctly in the game. Novices consider them as more experienced peers: Mina, for example, stresses that “For many things I have to ask someone… here the officers are willing to answer me and make me stronger. It’s probably because they want me to play with them in the future”; while Kya states how mentors are essential for “learning how to play properly and understanding how to exploit the potentialities of my class… it is sufficient to observe how they fight in instances to learn a lot”.

From the mentor’s point of view, guiding others is a way for expressing an altruistic attitude in a way that can produce visible results: “I spend so many hours helping others, even only explaining how the game works – Mytral says - Why do I do it? Why do people help others in the real world? What pushes people to candidate themselves? It is the same. Here there is a community and maybe someone is in difficulty, and then you say ok I can give him an hand… Maybe here it’s simpler than in the real world, I help another player and I can see his progress in the game”. Moreover, mentoring provides the mentor with tangible rewards, as Halo highlights when says that “When I help the noobs [novice players] by guiding them in the instances, I actually collect a lot of items that I can sell for gold. I help them and in the meanwhile I help myself”.

However, the most important thing is that helping others also represents a badge of honor, an action that can provide players with reputation: “there is the fact that in my guild we are more than 150, and for the shaman, the druid and the dk [death knight] everyone asks me… It is a satisfaction”, Pyros claims. This common recognized esteem among the members of a group is the main reason that fosters high-level players to leverage their services, for example when they have to quickly evolve an “instrumental” character: Kairo explains that “My shaman, which is a healer, is developed in the slightest particulars and statistics… But I have other characters, because they are necessary to the guild. If you want a mage and you have never used it, you can ask the reference mage of your guild, how can I use it? Which kind of gear is needed? And you can make a copy of it, by imitating its rotations and skills, asking and observing”.

WoW allows players to build intimate spaces where to share their achievements, expose their difficulties and find solutions for their problems, and this actually results in a change of their behaviors toward better performances and proper execution of in-game actions. Although these environments can become larger and dispersive, WoW gives players the opportunity to group among friends, supporting the development of a sense of intimacy (e.g. allowing users to whisper each other or to talk in private chats), exposing them to other individuals’ achievements (e.g. showing their progresses in the guild window), favoring the exchange of reciprocal perspectives (e.g. through forums).

Moreover, mentors in WoW function as guides to instruct and drive players’ behaviors, by giving them a reference for their questions and doubts. Mentors actively influence novices’ actions, by illustrating how to develop their skills and by indicating them the correct conduct to be kept during the in-game activities. However, they can also be useful for more expert players, by giving them, for example, practical hints to speed up the evolution of their secondary characters. As mentorship is often rewarded by goods or by an enhanced reputation, mentors’ activity is guaranteed by what they can earn, or by the admiration that they can gain from their followers.

**Stories**

WoW is a conglomerate of stories that players can read and live through their characters. Quests, the basic game mechanic through which players are addressed to achieve specific goals, guide their behaviors in specific directions, by leveraging a narrative framework that fosters their sense of projection in another reality.

Through narration, players are pushed to perform tasks that can appear repetitive at a first sight. Ganes stresses that “most of the quests are substantially the same, you have to kill some mobs, harvest some herbs, things like that… but behind each quest there is a story that you can follow… I don’t know how to say it, but it’s like being in that world and live in these stories… it doesn’t matter that these missions are fundamentally boring…their stories are not”. All these tales guide players through the world of Warcraft, chaining different tasks in a unique narrative frame, but, at the same time, they do not prescribe a unique path in it. Instead, their variety and overabundance let the players free to follow those that best match with their desires, while the behaviors that they address can remain substantially the same.

In this world, made up of a myriad of different stories that tell the lives of Azeroth’s characters, races and factions, players can feel to be the leading actors. Halo, for example, explains how in WoW “you are a hero that makes epic things. You are the main character of epic stories that you can tell others. Actually they aren’t epic, because it’s a game, but when you are doing them you say wooow what I’ve done!”. Through this point of view, little things done, minor goals achieved and small progresses made can appear, to the player, somehow “bigger than life”, motivating her to reach further goals and grow her alter ego in the game world.

Figure 3. A quest representing the beginning of a new story (World of Warcraft, Blizzard Entertainment Inc., 2004).

Along with the stories provided by the game itself, strong players can become narrators of their own tales, functioning as ideal examples to follow for their exceptional achievements. High level characters, with a gear expanded at its maximum level, are admired for their strength and their unreachable abilities, functioning as magnets that can address players’ efforts. Their deeds can spread as myths, representing a possible evolution of players’ selves concretized in another avatar, which “normal” players aim to become. Mina explains clearly how “In this world I don’t want to be a human. I’m already a human in real life… You know, I’ve always loved fantasy books and here I can imagine to be a character of my books… When I first saw Eka [a night elf druid in her guild], she had such strong healing skills that she could make our group invulnerable… I thought that I wanted to become like her. I want a character that allows me to do that, to behave like her”. This attitude is also shared by Macross, who, although a beginner, wants to become like the character he encountered during an instance three days before “an epic warrior able to tear down enemies at the first strike… dreadful and merciless. I miss everything to be like it. But I think that it’s not impossible to be like him… if he has done it maybe I can do it too”. By showing their skills and exposing their achievements and gear, these “heroes” are then able to motivate the other players’ endeavors.

WoW gives life to a plethora of different stories in which players can project themselves, becoming the protagonists of the deeds told in the game. Thanks to their variety and overabundance, players can choose the tales that are closer to their desires; while the tasks that these stories address can remain laborious and repetitive, the burden of their accomplishment is lightened by the narrative frame in which they are inserted. As we have also seen, strong players themselves can become the source of further stories that can spread in Azeroth as myths: their avatars can drive other players’ behaviors as magnets, representing exemplar paths of evolution for their characters; they are models, ideal images of the “perfect self” to achieve.

**5 DESIGN STRATEGIES**

In this section, we want to move from the empirical results exposed above to the definition of a series of strategies addressed to the design of behavior change technologies. Empirical works, in fact, can yield concrete and contextually-specific findings, which can be applied to create design guidelines (Hekler et al., 2013): for example, Consolvo et al. (2006) exploited the evaluation of Houston application to ground a number of requirements for behavior change technologies; while Balaam et al. (2011), starting from the results gathered during participatory design sessions with stroke patients, defined a set of guidelines for motivating regular performance in rehabilitation programs. This kind of studies, thanks to their high level of applicability to design, are an essential component of HCI research (Hekler et al., 2013).

Each of the strategies that we will illustrate below is grounded on the results described above: to give them more general validity and provide reasons to believe that they could be effective, we further informed them with evidences found in behavior change literature. We favored theoretical pluralism, following a well-established practice in ethnography, which is inclined to use the theories that fit better to the particular problems addressed and the particular situations in which they are used, without relying on a unique overarching theory (van Maanen, 2011). However, most of the arguments that ground these strategies can be retraced in the specific result sections which they refer to: findings from the fieldwork, then, represent the fil rouge that ties them together.

All the strategies are meant to change behavior in a desired direction, by leveraging those factors that are stressed in those approaches to behavior change newly explored within HCI: some of them are aimed at modifying users’ habits by taking advantage of the social norms in force in a given system; others exploit the role of the others in pushing and shaping individuals’ behaviors; others then focus on the importance of the environmental and unconscious factors in influencing people’s actions.

Nevertheless, all these strategies are left on purpose at a high level of abstraction so as to be adapted to different contexts and applications. At times they overlap or are designed to be employed in combination, at times are thought to be mutually exclusive.

Following Hekler (2013), we consider them as “design hypotheses”, which will require further testing to prove their validity. However, as long as they are based on an empirical case chosen for its typicality and are further informed by literature, they can claim for a certain strength.

For concreteness sake, we will provide an example of a simplified feature for each proposed strategy. Such examples will then be enacted in usage scenarios. We start describing a Persona, Philip, which will represent the main character of the scenarios outlined below.

*Philip is 45 years old, married, with two children. He is a lawyer and has a sedentary lifestyle. After having experienced some health issues related to high blood pressure and cholesterol levels, he decided to do more physical activity. However, for lack of time and laziness he found it difficult to exercise regularly. Therefore, he decided to join a system that allows him to log his activity levels through a wearable device, set his own goals and ask for advice, in the hope of finding support to his willingness to change.*

**Design Strategy 1. Persistence.** Encourage the development of new habits by creating a system that shows persistence and seems to live and evolve autonomously. Give the user the impression of entering in a world of already established social practices to elicit a process of adaptation toward new behaviors. However, leave the users free to choose the habits that better reflect their needs to avoid them feeling any external coercion.

*Rationale.* Social practices are a type of habitual behavior consisting of different interconnected elements, such as a shared knowledge, collective norms and meanings, mutual expectations (Reckwitz, 2002). Within them, different ways of repetitive acting are carried out by individuals, which contribute to the perpetuation of the practices themselves (Giddens, 1984). Individuals are enrolled in a social practice and they have to adapt to them, by accepting a role and incorporating their shared norms and sedimented meanings (Schatzki, 2001).

This design strategy aims at highlighting the opportunity of triggering processes of behavior change by fostering users to adopt practices already established. As WoW shows by presenting itself as a permanent world, in which things happen and evolve regardless of the presence of the individual, it is possible to promote the development of new habits by highlighting the sense of persistence of a given system.

WoW showed that the main mechanism through which the idea of “world” is enacted is the presence of stable groups: as players in WoW are committed to assume the norms of the guild which they belong to, slowly replacing their old routines with the new ones of their community, users can be stimulated to interiorize new habits, by making them find preexisting practices shared among other individuals. By designing different social groups, each characterized by a set of rules, roles and expectations, it is possible to support the development of different practices that can be then adopted by the newcomers through a process of assimilation.

However, this strategy also suggests to give the user the possibility of deliberately choosing among the groups and the practices available, to leave her the sensation that she is freely adopting a new habit. As in WoW the overabundance of different guilds allows players to find the routines that better fit their needs, providing users with alternative opportunities is a way for supporting the change without instilling the impression of being constrained by an external force.

*Example.* Sub-communities that require to all their members to perform certain tasks. If the group meets the goals all together, through the participation of all its members, it is rewarded by the system. Users are free to choose the group they want, depending on the specific needs they have.

*Scenario.* Philip has just joined the community of the system. He has discovered that such community is split in different groups, each one with a different common goal to reach. Each group has its own rules: for example, one group requires its members to run almost thirty kilometers per week, another one wants users to share their own data every evening and participate weekly in the forum, providing suggestions and commenting the members’ achievements or failures. Each group has also its own organization, hierarchy, and rewards, where the “administrators” are in charge of setting the goals and managing its daily functioning. Philip, then, decides to join a group that focuses on regular exercise, without requiring excessive efforts (only four kilometers twice a week), thinking that such rules better match with his desire to change without feeling forced into a constraining training program. By adhering to the group aims and norms, Philip progressively feels to be part of a larger community and to contribute to its development. Each week, in fact, the system rewards all the groups that have met their achievements.

**Design Strategy 2. Memories.** Give the user the opportunity to recollect and reflect on her past experiences related to her attempts of change, anchoring them to meaningful cues that can elicit a reminiscence process. Support remembering of positive memories that can enhance the user’s view of her personal past, therefore improving the efforts she will put in future attempts to change.

*Rationale.* Episodic memory is a personal recording of the past, which registers information positioned in particular places at particular times (Tulving, 1972). These information can be retrieved through a reminiscence process, which permits individuals relive what happened in their past (Tulving, 2002). In this process, the spatial-temporal context is a fundamental component: memories are encoded according to a temporary situation, which have to be included in the retrieval cue to have an optimal recollection (Tulving, 1983). Recollection of an event as experienced allows the rememberer to make use of past experiences, and it makes possible the awareness of facts and events that are personal and fused to the individual’s past and that provide guidance to her future (Wheeler, Stuss, & Tulving, 1997).

This design strategy proposes to favor the recollection of the past experiences related to the user’s behavioral data (such as behavior measurements, attempts to change, goals achieved), by providing meaningful contextual cues which can trigger a reminiscence process. As WoW highlights, spaces and digital mementos are fundamental in enabling the reliving of personal episodes. This strategy suggests to enhance the recalling of memories, by connecting them to the places in which the facts occurred and by designing meaningful cues that can functions as “souvenirs” from the past, digital objects that embody the details related to a significant event. By favoring the recalling of enriched memories, it is possible to stimulate the user’s reflection on the choices she made, the behavior she performed and the objectives she reached. Reflection may be then useful when the user has not yet the intention to modify her behavior, by increasing her awareness about the behavior to be changed, as stated by the consciousness raising strategy in the TTM (Prochaska & Velicer, 1997).

Moreover, this strategy recommends to constantly support the reminiscence of positive episodes of the user’s past, such as those related to the goals she reached and the improvement she achieved. Bryant, Smart and King (2005) showed that positive reminiscence increases the frequency of happy feelings and serves as a coping strategy for subjective distress reduction. On this point, WoW highlights how the recollection of positive in-game experiences is not only related with positive emotions, but can also improve the endeavors that players might put into pursuing future objectives, strengthening the confidence in their ability. Thus, by making the user remember the experiences related to her past behavior successes or progresses toward a specific goal, her master expectations can also be raised, fuelling her beliefs in her abilities and thus determining an enhancement of her self-efficacy (Bandura, 1977). This can enhance her perseverance in maintaining a desired behavior or in engaging in more difficult objectives of change.

*Example*. A “data-package” that makes the user remember how she felt when she accomplished the goal she had set for herself.

*Scenario.* Philip has recently stopped to regularly exercise, because his job has become more demanding, leaving him less spare time. However, one day his device sends him a message inviting him to access the system and visualize the gift it set aside for him. The system shows him a “digital memory” represented by a pair of shoes named “Slim Down Shoes” gained at the Park Central on 23th of June. Philip suddenly remembers how he achieved such “object”. By opening it he discovers that, on an evening six months before, he first reached the goal of losing two kilograms, thanks to the efforts he put in the three weeks prior. The system visualizes the place where he was, a photo related to that day, how he slept well that night, and how his mood was good the next day. Philip clearly recollects that episode, how he was satisfied and proud of himself: in that period, he was drowning in work, nevertheless he was running almost twice a week. The system further feeds back the notes he left to comment this achievement, along with his friends’ praises, and Philip also remembers the good feelings he experienced in running and seeing that his efforts were rewarded by such a concrete result. As a consequence, he begins to reflect on how he could find the time to run every week again, despite the difficulties coming from his job.

**Design Strategy 3a. Incentives.** Provide users with valuable incentives along different schedules, both predictable and random, letting them free of exchanging what they do not need or desire, in order to enhance the perceived usefulness of every gained rewards. Also foresee an incentive system in which some rewards are used to obtain, maintain or enhance other ones: by tying different activities to diverse types of incentives and by making them dependent on one another it is possible to engage users in tasks that can at first appear burdensome and tedious.

*Rationale.* WoW incentives embody different values, such as instrumental (they give player more power), social (they provide her with reputation) and aesthetic (they ornament player’s character), which make them of great importance in the players’ eyes. These are provided combining fixed and variable ratio schedules: a fixed ratio schedule of reinforcement requires the completion of a number of responses to produces a reward, while a variable ratio schedule requires the completion of a variable number of responses to produce a reward (Cooper et al., 2007). By superimposing these two types of ratio, individuals can foresee which kind of incentives they will receive for a certain task and, at the same time, keep hoping to gain further rewards, more valuable and rare, without knowing their time of delivery: as WoW shows, uncertain rewards generate positive experience (such as excitement) and hence increase motivation and investment in the process of reward pursuit (Shen, Fishbach & Hsee, 2015); a secure quote of incentives, instead, avoids the sense of frustration that may rise when rewards are not delivered as frequently as expected (Wang & Sun, 2011).

As long as WoW allows players to exchange the goods they earned with gold, it establishes a token economy, where a series of backup reinforcers can be obtained by paying for them with tokens (Miltenberger, 2007). In this manner, WoW leaves players free of converting all the incentives they obtained in an universal currency, making everything they gather a source of possible value.

This design strategy highlights the importance of providing incentives that are perceived as valuable by players, as they incorporate instrumental, social and aesthetic meanings, and combining different schedules of delivery: while certain rewards guarantee users of a secure gratification for the tasks they carried out, uncertain rewards induce positive feelings and increase investment of effort in pursuing them. Adding the possibility of exchanging the delivered incentives in tokens that can be used to gain other prizes, more fitted to the user’s desires, is another way to enhance the perceived value of what is obtained.

Furthermore, this strategy stresses the importance of tying different type of incentives to different activities, where some of the rewards provided are needed to obtain, maintain or improve more valuable ones. As WoW shows, individuals are pushed in performing certain types of behavior, even if burdensome, repetitive and tedious, when their outcomes can be used to be engaged in more enjoyable activities and get more valuable prizes, or improve what they have already gained through their efforts and endeavors. The important thing is to connect the incentives delivered with the difficulty and the abilities required to perform a certain task, in order to avoid the feeling of being unjustly rewarded for competences users have yet to acquire.

*Example*. Personalized rewards that provide useful suggestions on how to improve behavior. Rare and valuable incentives delivered through random ratio schedules, for example additional functionalities to make the experience with the system more enjoyable.

*Scenario.* Philip has been using the system for three months. It rewards him every time he does some physical activity by suggesting new paths to run, tailored on his habits and tastes, as well as training programs and customized goals built on his current physical condition and his past performances. Philip is immediately gratified by such recommendations: by following them he has access to further rewards, entering in a virtuous circle that keeps up his motivation in maintaining an active lifestyle from day to day. However, the system also distributes rarer rewards that progressively unlock new system’s functionalities. Today, he has just had access to a social feature that allows him to cooperate with other users to face challenging collective goals (e.g. running almost one thousand kilometers by the end of the week). These rewards are delivered randomly after an undisclosed number of goal accomplishments. Such uncertainty keeps Philip tied to the system even in the long term, in the hope of obtaining unexpected prizes that could make his experience more diversified and fun.

**Design Strategy 3b. Penalties.** Leverage the power of penalties in driving the user’s behavior, by subtracting what she owns, by exposing her to the blame of the others, or by devising mechanisms of social exclusion, when she does not behave in the desired direction. However, always allow the user that incurred in a penalty to find a way for repairing or escaping, by engaging her in offsetting activities or permitting her to find alternative solutions.

*Rationale.* Loss aversion poses that changes that make things worse (losses) loom larger than improvements or gains (Tversky & Kahneman, 1991): this means that individuals prefer avoiding losses to acquiring gains and that the fear of losing what they own can be used to nudge individuals’ behavior (Thaler & Sustein, 2008), like increasing their productivity (Hossain & List, 2012). On the other hand, peer pressure can positively affect individual’s efforts especially when is enacted in small groups, where the sensation of being constantly under examination can push individuals to improve their performance in order to avoid the shame of their peers (Kandel & Lazear, 1992). Moreover, the emotional reaction to social exclusion known as social pain, which is the same unpleasantness that is experienced in response to physical pain (MacDonald & Leary, 2005), highlights the importance of thinking, feeling, and behaving in ways that may reduce one's chances of being excluded from desired relationships or groups. Fear of exclusion from a group can make individuals strive to make themselves more attractive as group members: to secure group relationships which are valuable to them, people may be willing to make substantial efforts (Brekke, Nyborg & Rege, 2006), conforming to the group’s behavior (Williams, Cheung & Choi, 2000), or working harder (Williams & Sommer, 1997), which presumably indicates greater attempts at reestablishing some kind of social acceptance (Molden, Lucas, Gardner, Dean, & Knowles, 2009).

By making players lose their abilities and the efficiency of their equipment when they die, by exposing them to the constant judgments and shame of others within pick-up groups, by leaving guilds the possibility of excluding some of their members if they don’t act as it may be expected, WoW leverages different mechanisms for penalizing the players that somehow do not behave “properly” in the game. This fosters players to better their in-game performances and to put more efforts in group activities.

This recommendation suggests how to employ penalties when designing for behavior change, by exploiting both the aversive reactions when individuals are afraid of losing something, and the negative emotions that arise when they suffer the negative judgments of their peers, or the marginalization that they may encounter within the group which they belong to. By providing users with rewards, and then taking them away when they fail, by allowing them to join small groups, in which their performances are constantly exposed to others’ judgments, or by letting groups free to ask their members some efforts and excluding those that don’t meet their expectations, it is possible to positively affect individuals’ efforts in improving or changing their behavior.

However, as WoW highlights, users should always have the opportunity to remedy to their faults without asking them too much, or by providing them an alternative way of escape: losses should be mitigated by the possibility to regain the misplaced rewards; blame should be reduced by giving users the control of the identity visible to others, letting them free to hide themselves or to control the kind of data they want exposed; group exclusion should be lightened by providing different groups with different requirements in which users can find another place to belong to. Otherwise, penalties may lead to negative side effects, such as aggressive reactions and the abandon of the system (Cooper et al., 2007).

*Example*. A time-out procedure that prevents the user to gain rewards for a specified time. The user is left out by the group because she has not accomplished her weekly task and she cannot gain incentives for the next week.

*Scenario.* Philip has missed his goal this week due to a momentary lack of motivation. He started thinking that he does not have the patience to continue his training program, and that he could run occasionally in the future. However, by accessing the system, Philip is made aware that he has been somehow “ostracized” by his companions. His failure has been exposed in the public wall of his group and he discovers that he won’t be able to participate to any challenge in the next week, preventing him to get any further rewards. Also other social features are inhibited and he cannot contact his friends in there anymore. After an initial bewilderment, Philip reflects on how his performance is tied to the group’s goals, and this punishment could help him adhere to his initial intention of regularly doing physical activity.

**Design Strategy 4. Time.** Create a temporality of the system, with its rhythms, durations and velocities to drive users’ behaviors by means of its manipulation. Support the development of synchronized activities, which require the co-presence of multiple users in certain moments, to shape habitual behaviors and give them a regular pace.

*Rationale.* Time in human societies is socially constructed (Elias, 1992). Temporal structures are regulated by institutional events, social constrictions and collective expectations, which provide regularity to people’s behaviors, giving the pace of daily living (Southerton, 2009). On the other hand, the temporality of a social practice deeply influence relationships and behaviors carried out within that practice, as acting on the modalities of its temporal organization can be essential in changing crystallized behaviors or in promoting the adoption of new habits (Southerton, Diaz-Mendez, & Warde, 2012).

This strategy proposes to act on different dimensions of time, such as duration, sequence, tempo, periodicity and synchronization (Fine, 1990) to influence users’ behaviors. Creating an inner temporality in a given system is a way to promote the development of new habits, or the modification of old ones, through the manipulation of their rhythms, their periodicity and their order, as WoW points out when modulating the time of the in-game activities.

Designing the waits, prescribing the acceleration or deceleration of specific tasks, increasing the time pressure and providing temporized rewards in specific moments of the day are all means through which time can be exploited for driving certain behaviors along specific directions, increasing their frequency or duration, and enhancing, at the same time, the user retention.

Furthermore, as WoW points out, favoring the co-presence of different users in specific moments in time can be a way to support the development of shared habits and rituals: by requesting the users to synchronize their activities to reach a common objective, embracing them in mutual expectations and social prescriptions, or by organizing collective events that can magnetize their efforts, it is possible to give regularity to certain behaviors, or influencing the sequence and the modalities in which they are performed.

*Example*. Temporized rewards that are delivered only in specific days at specific times if the user accomplishes her task. Time slots in which sharing and exchanging insights on the gathered daily data.

*Scenario.* It is Tuesday, 7pm and Philip has just finished his first run of the week. His tracker lets him know that he has just received a prize. The system, in fact, rewards him every time he runs from 6pm to 7pm on Tuesday and Thursday. This simple mechanism pushed Philip to comply to his running program, transforming it into a new habit. Initially, he run in those time slots to gain the reward, but now it seems natural for him to exercise at that time of the day. After returning home at around 9 pm, Philip accesses the system to visualize his daily data. From 9 pm to 12 pm the application makes the data of his group’s members visible, and Philip can discuss them with his companions. The limited time-availability of this information has pushed users to regularly meet in the evening, when they can share insights and suggestions related to their attempts to change.

**Design Strategy 5a. Mutual help.** Make users join social groups in which they can share their experience of change, by giving them the opportunity to set common goals and compare their progresses and failures. At the same time sustain users in the development of personal relationships, as close bonds among group members can positively favor the process of behavior change.

*Rationale.* In self-help groups, people with a shared problem congregate and attempt to support each other, through the process of problem resolution (Weisner, Greenfield, & Room, 1995). Self-help groups showed efficacy in chancing behaviors related to the addiction of psychotropic substances or in alcoholism, acting through an increase of the individual’s self-efficacy, motivation and ability of active coping[[5]](#footnote-5) (Kelly, Magill, & Stout, 2009). Nealon-Woods, Ferrari, and Jason (1995) highlighted that the process of change is also favored by the social support and by the improvement of personal relations, which can help reduce the factors that impede the change.

In WoW players can associate themselves with a guild, in which they can share common objectives and develop friendships. This closeness favors the mutual exchange and help in solving the in-game problems, resulting in better performances and in change towards more effective behaviors.

This design strategy wants to highlight the possibility of promoting behavior change processes by leveraging the social support of groups, in order to trigger changes through an enhanced self-efficacy and motivation. In ”guilds” addressed to solve a common problem, users can share suggestions, helping each other in finding new solutions. By providing chats and spaces of confrontation and by exposing each user to the individual progress of her peers, it is possible to support the development of personal bonds, which can further support behavior change processes.

*Example*. Small “guilds” targeted to the solution of a common problem, where each individual can expose her difficulties in changing behavior and provide suggestions to others.

*Scenario.* Philip has finally decided that he needs not only to maintain a regular level of physical activity, but also to lose weight. So, he decides to join the Alpha group, a “guild” of ten users that have a similar problem to manage. The guild is characterized by a public “plaza” where members publicly expose their problems, and a series of private rooms, where members can communicate privately. Every week, one of the group’s members posts on the “plaza” her problem, and describes what she has done to solve it, highlighting her achievements and fails. For a week, the other members can ask for more information, suggest interpretations and provide recommendations. After one month, it is Philip’s turn to verbalize his problem. He tells his difficulties in stopping eating certain kinds of food. The others ask him more details, and discover that he eats much more in the evening, especially when he has had a hard day at work. Basing on their personal experiences, they suggest that this behavior could be triggered by stressful situations, and that the solution should be searched in his emotional life. As time goes by, Philip develops an emotional attachment with his group’s members: he starts chatting privately with three of them. As the rapport with them develops and they become friends, he finds himself more inclined to seek help and accept recommendations on how to proceed to produce and maintain the change.

**Design Strategy 5b. Mentoring.** Allow certain users to become mentors, giving them the possibility of suggesting, instructing and modeling users who experience difficulties in changing their behaviors. Anchor mentorship to an incentive system or reputation mechanisms, through which expert users can be rewarded for their active role in helping others.

*Rationale.* Mentoring has been used to change health behaviors and promote sustainable lifestyle patterns: peer mentors can help mentees develop decision-making and problem-solving skills that facilitate success in behavioral change efforts, acting through training and supervision, and by providing guidance, social support, and assistance (Petosa & Smith, 2014). In fact, social cognitive theory suggests that peers strongly influence each other because people are more likely to imitate the behavior of individuals they see as similar to themselves (McAlister, Perry, & Parcel, 2008).

This design strategy suggests to support mentorship when designing for behavior change technologies. As WoW highlights, mentors can drive individuals toward a desired path by becoming reference points for their questions and doubts, by teaching the correct route for reaching certain aims and by showing the proper behaviors to be kept. In this manner it is possible to promote a change triggered by peers, where certain users, acknowledged as expert or virtuous by the larger community, can help the others achieve their objectives of change. Using mentors is also possible to leverage mechanisms of modeling, through which new behaviors can be learned by imitation (Miltenberger, 2007).

Mentorship can be sustained, as WoW shows, by providing mentors with some rewards, or even more important, with reputation, which can feed their altruistic actions with admiration and respect. By becoming a recognized reference point in the community which they belong to, mentors can also be trusted by more “expert” users, which can have already achieved some kind of results, but are struggling to better other aspects of the behavior that they have not yet mastered.

*Example*. Reputation mechanisms that allow mentors to gain followers and make their specific competence visible. Reward systems that reward the mentors, every time a follower succeeds in her efforts.

*Scenario.* After three years Philip has become an expert in dealing with sedentary and overweight related problems. He learnt a lot from his personal experience, attempts to change and his friends’ personal stories. Gradually he started helping people outside his group. The system increases his reputation every time a new user found his recommendations useful and starts following him. At the same time, it provides a quota of the rewards gained by his mentees every time they achieve the goals they set for themselves. In the last six months, Philip has gained quite a popularity in his community. The system has established a virtuous circle and as long as Philip gains more reputation and rewards, he remains favorably disposed to help others, despite the burden of giving an increasing number of advices.

**Design Strategy 6. Stories.** Envelop objectives and assignments in a narrative framework, to exploit the engagement that tales can provide to individuals. Foresee a variety of narrative lines to satisfy different tastes. Furthermore, by making visible exemplar users’ stories, their results and how they achieved them, it is possible to leverage the attraction they exert in order to canalize and foster users’ endeavors in changing their own behaviors.

*Rationale.* Narratives lead to persuasion as individuals become so absorbed in the story that they are less likely to counter-argue, coming thus to believe what the story states, and as they may identify with or develop emotions for the characters of the tale told, making their perspectives have bigger influence on their beliefs (Green, 2004; Green, Garst, & Brock, 2004). Stories could also act on behaviors through behavioral modeling and observational learning, changes in cognitive readiness, and perceived social norms (Hinyard & Kreuter, 2007). As WoW shows, stories are a powerful means to drive individuals’ behaviors toward specific directions, as they frame tasks in a narrative form that can relieve of their monotony and heaviness. By providing a variety of stories that players can choose freely from, WoW appeals different players, not constraining them to follow a preconceived route, even if the goals that it wants them to achieve remain substantially the same.

This design strategy proposes to exploit a narrative framework to present objectives and tasks, fostering user’s projection in a different universe of meanings, which can lighten the activities to be carried out when she desires to modify her own behavior. By proposing diverse and overabundant stories, which can differently dress the same type of assignments, it is also possible to make users feel free of determining their own experience of change. By allowing users to combine, chain, or even write their personal stories, they could also benefit of the improvements in mental and physical health that writing about an important personal experience can bring about (Pennebaker & Seagal, 1999).

At the same time, this strategy proposes also to exploit the passive attraction that “important” individuals and their stories can exert on others. WoW shows how powerful characters function as models for other players, who are pushed in persevering in their efforts to imitate such ideal projection of themselves. These exemplar points of arrival for the players’ endeavors can be interpreted as the materialization of desired states manifesting personal goals and providing incentives for behavior change. By providing examples of virtuous users in specific domains, making visible the evolutionary paths of their behaviors, the actions they have undertaken and their final achievements, it is possible to orient the other users endeavors in reaching such ideal results. One of the sources of self-efficacy, in fact, is the vicarious experience: seeing that others can reach difficult objectives can persuade the observers that they too will improve if they intensify and persist in their efforts (Bandura, 1977).

*Example*. Goals framed in different narratives that the user can chain together in a own personal story.

*Scenario.* It is evening and Philip, after finishing his work, logs into the system to set his next goal. He wants to increase his weekly kilometers run from 15 to 20, and find a better balance between his physical activity and quality of sleep. The system allows him to frame the goal in a narrative, by choosing a fictional context and characters among a variety of possibilities. The main character of the story is Philip himself, while the goal set is reframed as a distant fortress on a mountain. The next day, Philips runs a lot, but during the night he cannot sleep well, because he is too tired and stressed. By the end of the week the system shows him that his character, despite the distance covered, could not reach the fortress, because it did not have enough strength (due to the poor sleep) to make the final step. Philip enjoys this way of reading his data and achievements. The system further allows him to chain his different stories in an overarching narrative by providing some authoring tools: Philip is trying to reach a hidden treasure by overcoming a variety of challenges in a science-fiction style world.

**6 COMPARISON WITH OTHER MMORPGs**

In this section we outline how the diverse design elements that inspired the design strategies described above can be found in other MMORPGs by building on top of our personal knowledge, participants’ interviews, and related literature, and paying specific attention to Guild Wars 2 (ArenaNet, 2012) (GW2). This game has been considered a worthy successor of WoW, and was a recurrent touchstone in the participants’ words. Furthermore, it has been selected because the ethnographer played the game for a brief period (3 months) after his fieldwork in WoW. However, being fully involved in more than one MMORPG requires a huge investment of time (months, if not years), which we could not afford to dedicate. Trying to engage with two (or more) MMMORPGs simultaneously risks also to make the ethnographer feel a sense of social dissociation from one when the other becomes more socially demanding (Calleja, 2007). Therefore, the comparison reported below will be limited to the way of functioning of the similar elements found, and to a preliminary analysis of the subjective effects they may have on their players. Going deep in the investigation of their subjective impacts, instead, would have required another (or more than one) ethnographic study. For richer insights on how these kinds of elements affect players’ behaviors, then, we suggest to return to the description of our ethnographic work in WoW, which, addressing a “typical’ MMORPG, can reasonably be generalized to other games of this genre.

Strategy 1 “Persistence” exploits group formation to make users develop new habits. Such groups are very common in MMORPGs. EverQuest (Sony/Verant’s, 1999), one of the first MMORPGs on the market capable of appealing a large user base, allowed players to group in guilds, sophisticated social networks where reputation, trust, and responsibility were the predominant modes of organization (Jakobsson & Taylor, 2003). They can also be encountered in EVE Online (CCP Games, 2003), a space-themed MMORPG, where players can gather into corporations, which in turn can band together to create huge alliance in order to engage in epic battles. Guild Wars 2 further shows how players have to assimilate norms and values when they enter in a new guild: especially the “hardcore guilds” ask their members to regularly contribute to the accomplishment of the guilds’ goals, such as building War Room upgrades, or set to Player versus Environment, depending on their specific focus.

Strategy 2 “Memories” supports reminiscence by allowing players to collect gear, mounts and items. Even Final Fantasy XIV (Square/Enix, 2010), as stressed by one of our interviewees (Halo), employs similar mechanics, allowing players to recollect their in-game history by displaying their characters’ skills, equipments, and achievements, as well as the mounts collected while playing. Similarly, Guild Wars 2 provides an inventory that may be used to preserve the valuable items gained by the player during her game experience.

Strategy 3a “Incentives” focuses on the different modalities that can be used for distributing rewards. Certain and uncertain modalities of delivery mechanisms are quite common in MMORPGs. The Anima Weapon quest chain in Final Fantasy XIV, for example, drops the yearned rare items on a variable ratio schedule, about 25% of the time, as described by Halo. Even in Guild Wars 2 the most valuable objects are delivered through a similar schedule. In this game, players can also increase their chance to get valuable items, by improving the Magic Find, a character’s attribute that boosts the probability of receiving higher-quality loot from killed enemies.

On the other side, strategy 3b “Penalties” highlights the importance of punishments in games. Penalties, in fact, are widely employed in MMORPGs, where one of the most common mechanism to punish players is death (Klastrup, 2007). In EVE online, for example, when a spaceship is destroyed by an enemy, players also lose the ship’s cargo, including PLEXs, in-game items that represent subscription time for playing the game. Dying, therefore, means to lose abilities, valuable goods, and skills as it happens in WoW. In Guild Wars 2, punishments are also represented by exclusion from the guild the player belongs to: although the game is less demanding than WoW and can also be managed without a strong attachment to a specific guild (at least until the recent introduction of raids), not contributing to the guild life could may come down to being kicked out.

Strategy 4 describes the role of “temporal design” to shape players’ behavior. In MMORPGs, time design is a crucial factor, as these games are addressed to retain players within their world as much as possible. In EVE Online, for example, players’ characters do not evolve by accomplishing quests: they can acquire new skill points only over time. As long as the player’s account is active, the character’s skills can increase. Players need to regularly enter into the game to set a new training program every time their character finishes the queued skill training. However, the most common way to manipulate time in MMORPGS is through farming. In Guild Wars 2, players are pushed to spend long time in farming materials for crafting: one of our participants, Mytral, for example, who played GW2 for some months before returning in WoW, stressed how he was used to wait for herbs to respawn, exactly as he was currently doing in WoW.

Strategy 5a “Mutual help” recommends to create design spaces where friendship can bloom. In MMORPGs establishing relations of friendship is essential to overcome the game difficulties (Eklund & Ask, 2013). Therefore, most of MMORPGs allow players to gather in small circles, supporting the flourishing of friendship bonds. In 2002, for example, EverQuest’s players were given the capability of setting up their own self-defined chat channels, allowing groups of friends to create private back channels for themselves (Taylor, 2006). In Guild Wars 2, it is common that in-game cooperation turns into deeper relationships too, and that such ties ease the game challenges, as reported by one of our interviewees, Nika, who joined the Guild Wars 2’s community after leaving WoW.

Strategy 5b “Mentoring”, on the other hand, recommends to employ mentoring and reputation. These are common mechanisms in MMORPGs, where the task of teaching new players is often transferred to mentors. EVE Online, for example, has been traditionally considered an incredibly difficult game for new players, with a horrifically steep learning curve (Bergstrom, Carter, Woodford, & Paul, 2013). In this game players can find a help by joining a corporation. Bergstrom et al. (2013) investigated how TEST, one of the game’s corporation, offers new players a bargain: they can be fast-tracked into a social community where guides can answer their question, but this help is provided in exchange for them be willing to fly a disposable ship and to die on the front lines of the battlefield. In Guild Wars 2, even if a mentoring system that rewards mentors for their help is not currently implemented in the game, players show the willingness to be rewarded for their efforts, as it emerges from players’ posts on the GW2’s official forum[[6]](#footnote-6), and as confirmed by our interviewees who played the game. However, “informal” forms of retribution, such an increased reputation spread through word of mouth, are common in this game too.

Finally, in strategy 6 “Stories” WoW shows that the overabundance of quests is a crucial factor for making the players feel free of living their own personal experience in a fantasy world. Quests are the most common mechanism to frame goals in MMORPGs and are employed in all the games we cited above (EverQuest, Final Fantasy XIV, EVE online). Although GW2 does not have a common quest system (i.e. proposed by Non-Playable Characters), it provides dynamic events happening in the game world, which embody a mission that can be chosen and followed by the player. Moreover, players have the possibility of defining the biography of their character, which will impact on the future development of the game. The choices made while playing will further have effects on the evolution of their in-game experience, allowing them to be somehow the co-author of their in-game story.

**7 DISCUSSION AND CONCLUSION**

Findings of this ethnographic study outlined a series of design elements of MMORPGs that drive many of the players’ in-game behaviors. Building on top of these results, we identified 8 strategies aimed at the design of behavior change technologies, which suggest how to employ the elements found in non-game contexts. Table 1 summarizes the strategies proposed, highlighting the differences from and the relations to the current gamification techniques.

Table I. Design Strategies

Instead of providing lists of game elements (e.g. Malone & Lepper, 1987; Hunicke, LeBlanc, & Zubek, 2004) suitable to be employed in gamification designs (Robinson & Bellotti, 2013) from the designers’ point of view, these strategies are grounded in players’ subjective experiences and are explained in their functioning and impact on behavior. In doing this, we tried to ground them in behavior change theories, as the current gamification designs seem not to be informed by a strong theoretical background (Seaborn & Fels, 2015). In current literature there is often no mapping of the behavioral determinants from human behavior theories to specific game elements (Orji, Mandryk, Vassileva, & Gerling, 2013). Tying our design strategies to behavioral and psychological theories, thus, can be seen as a further contribution of our work, making clearer how the various theoretical determinants can be translated into specific game elements.

As a result, the defined strategies leverage a variety of elements that games employ in influencing individuals’ actions: along with attitudes and beliefs, we focused our attention on the social and environmental aspects that can guide people’s behavior in games. Players are not only consciously “persuaded” during their play, but their behaviors are shaped by incentives and penalties, by the presence of other players, and by the gradual assimilation of norms and routines. To explain these dynamics and give them a more general validity, we informed them with a variety of theoretical approaches that seem to be very promising in the future designs of behavior change systems. These strategies can then address not only some of the critiques advanced toward the current gamification practices, but also some of the shortcomings that characterize the “persuasive” approaches to behavior change.

Before moving to the discussion of the game elements/strategies identified, we have to analyze the relationship between the single game elements and the whole game. In this work we investigated WoW starting from the tacit hypothesis that a game can be broken down into different aspects, each one with its own value and effects on players’ behavior. In formulating our design strategies, we also hypothesized that such impacts will be maintained outside the frame of the game, where the single mechanics could be also employed alone.

During the fieldwork, we found some clues that seem to strengthen such a supposition, suggesting that particular aspects of the game may retain specific effects on users even when considered alone. First of all, players show to be fascinated and affected by some game elements and not by others. Some players, like Herik and Pyros, find in the possibility of establishing social relationships their main reason for playing, while others, like Abraxas and Kylian, are lone wolves only moved by rewards and reputation. These varied attitudes reflect the diverse motivations for playing MMORPGs found by Lee (2006), who describes how different players are motivated by different game mechanics, somehow ignoring all the others. Some of our participants, for example, showed to be affected only by the possibility of collecting rare rewards: however, they explained how this was their main reason for remaining not only in WoW, but also in all the other games they played in their life, such as EverQuest or Guild Wars 2. This may support the hypothesis that such game elements are effective in different contexts, even if only for specific kinds of users, independently from the frame in which they are inserted.

Another factor is related to the intrinsic mutable nature of WoW. In over ten years of its history, WoW has altered many of its elements through expansions and patches, having strong repercussions on players’ behavior. Eklund & Johansson (2013), for example, noted that the introduction of the dungeon finder has deeply modified the premises for collaborating in pick-up groups. This change, however, had consequences only for those parts of the game addressed at making players encounter for the raids, by speeding up the recruiting process previously made through the world chat. On the other hand, it had minor or no effects on players belonging to stable guilds, who are used to facing raids with their guild’s companions, as emphasized by Mytral, one of our participants. Other interviewees, like Aion, further highlighted the local effect that novel features had on players’ behavior, referring to the opportunity, introduced by Mists of Pandaria, of buying mounts with real money at the in-game shop. Some months later, Aion brought this matter up again highlighting how such possibility pushed novices, and only them, to search for shortcuts, weakening the efforts they put in the game, and consequently lowering the average skill level of the newcomers. This suggests that singular game mechanics may have circumscribed effects on specific players without affecting the game as a whole.

However, it is still possible that the elements we reviewed above might not impact users/players (or some of them) in the same way if employed alone in another context, as their effectiveness could be strictly tied to the frame of the entire game. This can be truer for those players that claim to play WoW especially for its unique and fantasy world where they can escape (escapism motivation in the Lee’s classification (2006)): Mina’s attachment to WoW, for example, is due to the particular mix of imaginary, aesthetic, atmosphere that the game provides, and it is likely that many of the elements that actually influences her would have a minor impact if framed in another way. Most of our interviewees stressed that WoW is unique and that the reasons behind its success are quite unknown: many other games employ similar game mechanics in similar combinations, but they are not even comparable to WoW. For Herik, WoW appealed a huge user base made up of casual and hardcore gamers, creating an enduring loyalty, commitment and dedication in them, because “in WoW it’s not true that if you don’t do or know certain things you can’t advance or play… This is why it had a great success... WoW is a game that you can play at different level of complexity. Its free and open and everyone lives the game as she likes and plays it as she wants”.

Whatever its “magic formula” may be, it is clear that the whole subjective experience that a complex game can engender in its players is hardly reproducible not only in other contexts, but even in other games. However, the main goal of gamification does not rely in the attempt to exactly reproduce the multiple feelings that players experience while playing. Rather, it aims at affecting users’ performances, motivations in doing a task, and disposition in changing a target behavior, by getting close as much as possible to the enjoyable and fun experience found in games.

In doing so, it employs design techniques that extract single design elements, such as points, badges and leaderboards, from their original gaming context to implant them in other environments, assuming that their effects on players will be kept after such a transfer. This is the same hypothesis that guided our research. Jacobs (2013) criticized this view claiming that gamification should move from the addition of stand-alone game mechanics, to the creation of new systems resulting from the combination of multiple mechanics and the existing environments. However, research has shown that the gamification approach has positive psychological and behavioral outcomes, even if such effects are dependent on the context in which the gamification is implemented, as well as on the users using it (Hamari et al., 2014; Seaborn & Fels, 2015). These evidences suggest that game elements somehow maintain their effectiveness in impacting on individuals’ behaviors, despite their solitariness and decontextualization.

However, it is true that the more gamification focuses on single, particular, low-level elements, the more it risks impoverishing the experience provided, distancing from the original one that gamification aims to at least partially replicate. As a consequence, our suggestions for design look at more systemic design strategies than those employed in most of the current gamified applications: they recommend, for example, to design reward systems, considering the values that they embody and their schedules of delivery, instead of simply proposing the usage of specific rewards, like points and badges. Moreover, most of them are designed to be used in combination: for example, penalties would be more effective if used together with incentives, balancing positive and negative reinforces.

Nevertheless, if such strategies would be capable of generating effects close to those produced by the elements from which they were drawn can only be confirmed in the field. This is the reason why we considered them as design hypotheses in need of further empirical evaluations to prove their efficacy. However, by grounding them in psychological and behavioral theories we tried to give them a more general validity: by leveraging the same behavioral principles on which they are built, designers would be likely able to produce similar effects on behavior.

In the following, we compare each design strategy with related work highlighting similarities and differences with other research in HCI. Some of the strategies explore design elements still scarcely employed in previous literature, while others stress the importance of continuing along strands of research already investigated within some behavior change systems: nevertheless, they emphasize the need to improve the elements employed in previous work, or to focus on specific aspects that are not widely examined yet.

Strategy 1 “Persistence” proposes to focus on habit formation, instead of momentary modifications of punctual behaviors. Despite habits and their change have often been considered in HCI as automatic responses to contextual cues, which can be formed through reminders (Stawartz, Cox, & Blandford, 2014), or event-based cues (Stawartz, Cox, & Blandford, 2015), this strategy recommends to look at them from the social practices perspective. By following what has been called the “turn to practice” in HCI (Kuuti & Bannon, 2014), this strategy suggests a way for establishing social practices through the creation of stable groups with their norms, roles and expectations. In fact, WoW shows that establishing a persistent world by supporting the aggregation of players in permanent groups is a fundamental factor to shape new habits. From this perspective, the social norms that users have to assimilate in such groups play a fundamental role. Within HCI social norm effects have been investigated especially in relation to how users align their behavior with their peers in Social Network Sites (Foster & Lawson, 2013). HCI researchers, for example, designed behavior change energy systems by providing comparative feedback against other households (Froelich et al., 2010; Petkov, Köbler, Foth, & Krcmar, 2011). Here, instead of focusing on the impact that may derive from the pressure of the users’ peers, we want to emphasize how established groups’ rules, values and priorities slowly affect individuals’ habits, fostering the adoption of routines through a process of assimilation. A key aspect of this strategy is also related to the promotion of different kinds of groups: if the user can select those that match best with her expectation, she will less likely feel compelled to adopt new practices.

Strategy 2 “Memories” aims at eliciting reminiscence, which can make users self-reflect on episodes related to their attempts of change. In a persuasive perspective, user’s data are commonly employed to feed information back about a certain behavior, in order to aid conscious decision making and in the hope that raising awareness could lead to a change in behavior (e.g. Kappel & Grechenig, 2009; Kim & Paulos, 2010; Kim, Hong & Magerko, 2009). This strategy, instead, suggests to exploit them to make the user remember her past, pointing the role of positive memories in behavior change dynamics, elicited by digital objects that can be preserved by the user. All these elements can, at first sight, be related to the badges commonly used in gamification. Similarly, they embody a memory: they help people visualize tasks and goals which could disappear otherwise (Laschke & Hassenzahl, 2011). However, the richness of the memories they are capable of eliciting is greater, by making players relive past episodes connected to their in-game experience. This happens because they are strictly tied to the digital projection of the player in the game, i.e. her character, they represent meaningful moments of the player’s history, and they are connected to contextual cues that are able to trigger processes of reminiscence. In other words, they embody *meaning*, which Laschke and Hassenzahl (2011) considered essential in gamification design, i.e. a valuable personal story that can be recollected. Then, this strategy suggests to design digital mementos that incorporate meaningful information of important episodes and achievements connected with the user’s past history. However, as memories of past experience can also be counterproductive, because an individual may be discouraged from the remembering of her past failures, this strategy proposes to elicit mainly positive episodes and successes.

Strategy 3a and Strategy 3b stress the importance of environmental factors in driving people’s behavior, going beyond the employment of points widely used in the actual gamified systems, to foresee more complex mechanisms of punishment and reward.

Specifically, strategy 3a “Incentives” suggests that the exploration of ratios and modalities through which incentives are provided and exchanged is essential for behavior change, as well as the study of the nature of rewards itself. While research in HCI mainly focused on understanding which kinds of incentives may be most appealing to drive users’ behavior (e.g. Scekic, Truong & Dustar, 2013; Ganesh, Marshall, Rogers, O’Hara, 2014; Consolvo et al., 2008), much less work has been done in investigating different delivery modalities, which may go beyond immediate feedback (Nakajima, Lehdonvirta, Tokunaga, & Kimura, 2008), or fixed-ratio schedules (Villamarín-Salomón & Brustoloni, 2010). Instead, this strategy emphasizes the need of combining different schedules, while allowing users to exchange what they gained, in order to maximize their satisfaction and the effectiveness of rewards in influencing behavior. WoW, in fact, highlights that the combination of certain and uncertain rewards increases the players’ investment in the process of reward pursuit, avoiding, at the same time, the frustration of not gaining what they were expecting. However, when transferred to other environments, all such incentives risk to fall into the issue described by Robertson (2012), i.e. as *pointification*: obtaining points for doing check-ins, as it was in Foursquare, does not seem to provide long-standing gratifications, as the prizes delivered are perceived as meaningless by most of the users (Rapp, 2015a). To be meaningful, instead, they have to embody aesthetic, instrumental and social values, as it happens in many other MMORPGs (Wang & Sun, 2011). For this, this strategy suggests to design multi-level incentive systems, without forgetting that the distributed rewards need to incorporate different values (Rapp, 2015b).

On the other side, strategy 3b “Penalties” focuses on punishments: while it is rare to find behavior change systems and gamified applications that take advantage of the employment of negative reinforcers (Kirman, Linehan, Laeson, Foster, & Doughty, 2010), games are a perfect example of how technology can exploit them for shaping behavior. This strategy highlights how penalties can take different forms, leveraging aversive reactions and negative emotional states that are stronger than the disappointed and dissatisfied emotions that can be evoked by displaying negative feedback through sympathetic agents (Midden & Ham, 2009; Nakajima & Lehdonvirta, 2011). Foster, Linehan, Lawson, and Kirman (2011) designed Power Ballads, an application that automatically posts a public message to the user’s Facebook profile, together with an aversive stimulus (e.g. a link to a music disliked by her), every time she engages in an excessive energy consumption behavior. In a similar way, BinCam (Comber & Thieme, 2013) makes visible on the user’s Facebook profile the images of the waste thrown away in a sensorized bin: this way, the system aims at making users aware of their recycling habits, by punishing misbehaviors with the evocation of feelings of guilt and shame, and by requiring them to adjust their behavior to avoid public disapproval. This strategy suggests to continue along this line of research, exploring games for finding and experimenting different mechanics to produce aversive stimuli. Highly penalizing mechanisms, such as social exclusion, loss of abilities, goods, and privileges, as well as shame and blame, can be employed to support change provided that users have the possibility to remedy to their faults, or to find alternative ways of escape.

Strategy 4 outlines the role of time when the aim is to establish new habits. It highlights how it is necessary to look at systemic design strategies when designing for behavior change, instead of employing atomic game elements as done in current gamification practices (Jacobs, 2013). Time in HCI has been considered for slowing down certain practices within the slow technology perspective (Hallnäs & Redström, 2001; Odom, Banks, Durrant, Kirk, Pierce, 2012): this slowness has been used to ensure that users have enough time to think about their choices in order to enhance learning and reflection, and, through that, impact behavior (Orji, Vassileva, & Mandryk, 2013). However, the possibilities of designing waits, rhythms, accelerations, temporized rewards, and shared temporalities to effect behavior change, which this design strategy proposes to exploit, has not been widely explored in HCI. As WoW further shows that time can also be manipulated by establishing rhythms and schedule within groups, this strategy recommends to explore the multiple modalities through which MMORPGs exploit time design to drive individuals’ behavior.

Strategy 5a and Strategy 5b suggest that social relationships can be used not only in a competitive direction, as most gamification techniques prescribe (e.g. Sepher & Head, 2013; Costa, Wehbe, Robb, & Nacke, 2013; Eveleigh, Jennett, Lynn, & Cox, 2013 ), but also to exploit the altruistic predisposition of the individuals, by eliciting processes of change through mutual help and mentoring.

More in detail, strategy 5a “Mutual help” recommends to leverage the sense of closeness that can arise in small groups in order to foster processes of mutual help. Instead of simply requiring users to cooperate (work together) to achieve shared objectives, rewarding them for reaching these goals collectively (e.g. Chen & Pu, 2014; Rooksby, Rost, Morrison, & Chalmers, 2015), this strategy proposes to design private spaces in which users can solve a shared behavioral problem. Within HCI community, social support has been explored in order to promote behavior change (Adams, Baumer, & Gay, 2014; Agapie, Colusso, Munson, & Hsieh, 2016; Rapp & Cena, 2016). Maitland and Chalmers outlined different ways of peer involvement to support weight loss: obstructive, inductive, proactive, supportive, and co-operative. In VivoSpace (Kamal, Fels, McGrenere, & Nance, 2013) users have the ability to log their meals, physical activity and weight and to share them with their social network: they can also invite their social connections to participate in their goals with them, gaining experience points for completing their goals. In this design strategy we want to reaffirm the importance of social support, focusing on the opportunities that may rise from confrontation enacted in small circles of users addressed to solve a specific behavioral problem.

Strategy 5b “Mentoring”, on the other hand, suggests to exploit reputation for supporting users’ altruism, and through that improving others’ positive behaviors, instead of employing reputation scores to increase user’s performances. HCI community focused on mentorship mainly in relation to design of online health communities (Meier, Lyons, Frydman, Forlenza, Rimer, 2009; Hartzler, McDonald, Pratt, Park, & Huh, 2012). CareMentors (Chapman, Mankoff, Ishizaki, & Marcu, 2012), for example, is a service framework for an online peer mentor community, which was evaluated in the form of role-playing scenarios: results suggested that mentor relationships are most beneficial to users when they are initially diagnosed or feel they are losing control. However, how to reward mentors for their efforts has not received a similar attention. Reputation rewards has been mainly used to push users to increase their performances in a given community (e.g. Farzan et al., 2008; Davis & Klein, 2015). This strategy confirms the importance of exploiting mentorship for behavior change purposes, and proposes to explore modalities, such as reputation mechanisms and shared incentives among mentors and mentees, to reward users for their endeavors in helping others.

Finally, Strategy 6 suggests that persuasive approaches, instead of solely feeding information back to the users (e.g. Kunetsov & Paulos, 2010; Lee, Lee, & Lim, 2010), could be enhanced by employing narrative frames, which can act on users’ behaviors by favoring their projection in another reality and by providing a series of models to follow. It confirms the power of narrative in lightening burdensome and annoying tasks, as well as providing psychological and physical benefits when users are allowed to write their own stories (Pennebaker & Seagal, 1999). At the same time, it emphasizes the importance of ideal models to shape behavior. Moving to HCI field, Travel Q (Kim et al., 2015) is a community platform that allows users to share their micro activities through photos by using a quest metaphor, in order to enhance travel experience: however, the potentialities of narratives for behavior change purposes are not examined here. Hilviu & Rapp (2015) suggested to use stories to make Quantified Self data more meaningful, while in the context of Alternate Reality Games, narratives have been used to lighten burdensome tasks (McGonigal, 2011). In this strategy, instead, we want to focus on the opportunities offered by the freedom of building our own personal story for behavior change purposes, by selecting it among a variety of choices, or by creating it from scratch.

In conclusion, through this work we attempted to make a threefold contribution. First, we showed how games like MMORPGs are able to drive players’ behaviors by leveraging a variety of game design elements, which rely on different psychological and social mechanisms. Second, we defined a series of design strategies addressed to employ those design elements in the context of behavior change technologies with the aim of improving them, grounding such strategies in psychological and behavioral theories. Third, we suggested how the ethnographic study of games can be an optimal source to find inspirations for the gamification discourse.

The same results of our ethnographic research, we are aware, could give birth to different strategies and we hope to inspire future investigations in this direction: new, varied and further refined reflections along this path may also provide significant advancements to the gamification field.

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**List of Figures and Tables**

Table 1. Design strategies.

Figure 1. Personal items and pets that can trigger reminiscence processes (World of Warcraft, Blizzard Entertainment Inc., 2004).

Figure 2. An incentive distributed through a variable ratio schedule after completing a raid (World of Warcraft, Blizzard Entertainment Inc., 2004).

Figure 3. A quest representing the beginning of a new story (World of Warcraft, Blizzard Entertainment Inc., 2004).

1. Although it is common to talk of *persuasive technologies* within HCI, we prefer, following Hekler et al., to use the term *behavior change technologies*, as the first one risks to evoke the Fogg behavioral model (Fogg, 1998), underlying all the other approaches that have informed the design of systems aimed at changing behaviors during the last years. [↑](#footnote-ref-1)
2. Due to its wider use in HCI literature, we decided to follow the Deterding et al.’s definition of gamification, although other authors (e.g. Huotari & Hamari, 2012) went in different directions. [↑](#footnote-ref-2)
3. Marshall, Cardon, Poddar, and Fontenot (2013) suggest to conduct 15 to 30 interviews for a single case study. [↑](#footnote-ref-3)
4. Some objects in WoW are bound to the character when equipped, which means that the object can be exchanged, auctioned or given, only if it has not been equipped by the player’s character before. After that, it can only be sold to the merchants. Other ones are bound to the character on pickup, and they can be only sold to the merchants. [↑](#footnote-ref-4)
5. With active *coping* responses we mean methods to manage stressors, such as unpleasant emotions. [↑](#footnote-ref-5)
6. https://forum-en.guildwars2.com/forum/game/gw2/Suggestion-Make-mentoring-a-real-thing (last access 17/06/2016) [↑](#footnote-ref-6)