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In Search for Design Elements: A New Perspective for Employing Ethnography in Human-Computer Interaction Design Research

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Abstract: Design ethnography has been widely used in Human-Computer Interaction (HCI) to understand people's everyday behaviors, in order to build technologies capable of meeting users' needs. Building on top of the recent debate on ethnography within HCI, this article proposes to employ reflexivity and theoretical pluralism to ground a new way of using design ethnography in HCI, directly envisioning novel designs during the fieldwork. Inspired by design practices like biomimicry, I describe the figure of the ethno-designer, a digital design ethnographer who dives into 'successful' virtual environments in search for insightful design patterns, with the purpose of creating new designs in other, even distant, contexts. In this perspective, the fieldwork becomes an incessant source of inspiration for identifying effective 'design elements', understanding how they work and their 'experiential effects', and producing design implications to create novel technologies across multiple application domains.

Keywords: ethnography; design research; design ethnography; World of Warcraft; gamification; Massively Multiplayer Online Role-Playing Games; HCI.

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1. INTRODUCTION

Ethnography has a long tradition in many different disciplines, ranging from anthropology and sociology, to ethnology and psychology. Within HCI, ethnography plays a major role in design research, meant as the upfront research practitioners do to ground, inform, and inspire their product development process (Zimmerman et al., 2007). The term ‘design ethnography’ precisely unites design research and ethnography, referring to ‘a set of data collection and analysis techniques, assumptions and skills that can be used to understand a particular environment, or domain, of people for the express purposes of designing new technology products’ (Salvador & Mateas, 1997, p. 166). Ethnography can provide rich data on actual human practices describing a social setting as it is perceived by those involved in the setting, matters that may not normally be captured by other methods (Randall & Rouncefield, 2017). Data collected through ethnographic techniques may then be used to generate ‘implications for design’, namely a specific type of design knowledge that is employed to create novel technologies or improve existing ones (Sas et al., 2014).

However, design research often focuses on design implications solely for a product or service, which commonly pertains to the same domain in which the upfront research has been conducted. Therefore, it comes as no surprise that design ethnography in HCI has commonly investigated a particular social context and then generated implications for designing in the very same context (e.g., Pink et al., 2019; Strengers et al., 2019; Shin et al., 2019). The main goal of this article is to outline opportunities for innovating design research and, more specifically, design ethnography, by suggesting that ethnographic techniques may be used to extract insights that can be theorized and implemented in different contexts, even far removed from the setting in which the ethnographic data have been originally collected. Drawing inspiration from practices like ‘biomimicry’, a design practice that studies nature and organisms to create products that mimic biological designs and processes but do not pertain to the natural domain (Lurie-Luke, 2014), I propose that design research can be conducted to

explore a particular context to generate design implications for other, different, even multiple, application domains. To this aim, ethnographic techniques like digital ethnography are especially useful, because the digital ethnographer may focus on how specific ‘design elements’ i.e., the building blocks of a digital environment, work and then directly envision how they could be employed in contexts that present analogies with the setting of the research. In other words, through the identification of the design elements that represent the ‘best practices’ in a given digital space e.g., in terms of their effectiveness in impacting users’ retention, engagement, and behavior, and the study of their experiential effects, the fieldworker can inspire new designs addressed to other domains directly in the course of the fieldwork. From this point of view, the design ethnographer becomes a researcher in search for inspiration, a detective that sounds successful virtual worlds to discover and define new design elements.

Taking into account the debate on ethnographic methods that has recently spread within HCI, which highlighted the roles of ‘subjectivity’ in the ethnographic account (Rode, 2011) and of theory in the interpretation of data (Van Maanen, 2011), in this article I propose a new perspective on the use of design ethnography in HCI, defining the figure of the *ethno-designer*.

This new kind of design ethnography will be illustrated in the next sections by recounting my ethnographic work in World of Warcraft. However, before starting to explain how this method can be put into practice, I will introduce the theoretical tools that I used during the fieldwork emphasizing the importance of reflexive description to ground the results of the ethnographic work, as well as the importance to adopt multiple theoretical approaches in order to explain the observed phenomena and generalize the results from the field.

The main contribution of this work to HCI lies in a new perspective for using design ethnography in design research, by outlining the figure of the ethno-designer, a design researcher who is in search for effective designs to be reproduced, reimagined and adapted to different contexts.

2. BACKGROUND

In the design research community, the term design research implies an inquiry focused on producing a contribution of knowledge. However, in the HCI community and in the design practice community, the term design research “is generally used to refer to the upfront research practitioners do to ground, inform, and inspire their product development process” (Zimmerman et al., 2007, p. 2). In this article, I precisely refer to this latter sense with the term design research. In this perspective, design research encompasses a huge array of methods such as surveys, interviews, and focus groups. Among these, ethnography gained importance over the years for its capability of developing rich understandings of settings that have some relevance to design choices (Randall & Rouncefield, 2017).

2.1 Design ethnography

The term design ethnography identifies a design research method that originally stems from corporate settings to look in depth into what people do, what tools they use, and how they think in order to understand how to better make and sell products (Salvador, Bell, & Anderson, 1999). To do so, it relies on fieldwork and participant observation as ethnography in social and anthropological sciences. Design ethnography may find its use in the early phases of User-Centered Design focusing on the broad patterns of everyday life that are important and relevant specifically for the conception, design and development of new technology products and services (Salvador et al., 1997, 1999); it is also related to the Empathize step of the Design Thinking Methodology, a non-linear, iterative process for problem solving, where designers have to gain an empathetic understanding of the problem they aim to solve through empirical research (Dam & Siang, 2012). In HCI, design ethnography has often been used as a technique to generate implications for the design of novel technologies (Sas et al., 2014). Traditionally, the generation of implications for design was carried out through requirements gathering, but it has been critiqued for its failure to capture the richness of social settings (Crabtree et al, 2000).

Ethnographic methods emerged to address this limitation (Sas et al., 2014) and are now widely employed especially in the initial stages of the design process, when design research is needed to understand people in particular contexts in order to inspire, ground, or inform novel technologies (Zimmerman et al., 2007).

For instance, Dew and Rosner (2018) conducted an eighteen-month ethnography of timber framing at a tiny house construction program, where people learn to imagine, create, and maintain living materials. The collected data have been then used to identify opportunities for designing with living, finite materials. Pink et al. (2017) studied how screens are used in everyday morning routines showing that mobile screen technology use is shaped by the creative improvisations these routines involve: the authors use the implications of this research for the design of future screen interaction styles in everyday life contexts. Foley et al. (2019) present findings from a long-term ethnographic study aimed at gaining an understanding of people's with dementia lived experience in order to inform design practices for and with people with advanced dementia in residential care.

In the same line, Shin et al. (2019) carried out a design ethnography of three collective homes identifying the values, practices, and everyday interactions implied in the ongoing making of these domestic settings. The study findings led to design implications for creating more flexible systems to support shared domestic living arrangements. Desjardins et al. (2020), instead, combine a design ethnography with a research-through-design (RtD) approach to investigate how people currently live with Internet of Things (IoT) domestic data and to create five speculative concepts which point out new modes of engagement with IoT data in the home. Likewise, Strengers et al. (2019) present findings from an ethnographic study with 31 Australian smart home early adopters, which are then used to identify design challenges for the smart home, like increased 'digital housekeeping'.

As we may notice, all these works use the data collected during the ethnographic research to inspire or inform designs specifically addressed to the domain (and the users) investigated during the

fieldwork. In other word, design ethnography is domain-specific, in the sense that it studies a certain context and then generates design implications for the very same context. This happens even when the ethnography is conducted in digital environments. For instance, Feuston and Pieper (2019) carried out a digital ethnography of public Instagram accounts to examine how Instagram users express mental illness. Study findings were then used to discuss implications for incorporating ‘the everyday’ into the design of technological solutions for marginalized communities and avoid that designers may perpetuate and instantiate stigma related to mental illness. Encinas et al. (2019) studied a Tumblr community of teen shoplifters who post on how to steal from stores and discussed the findings against different design approaches, Design Against Crime, Critical Design, and Value Sensitive Design, highlighting how interpretations of the same data can lead to radically different design responses. All the envisioned design solutions, nonetheless, are addressed to the context of shoplifting.

It seems therefore that findings collected through design ethnographies have a sort of ‘local’ validity, that is, they can be used to generate design implications for the particular context, domain, or type of users that have been originally investigated. Obviously, HCI design researchers feel strongly that an important aspect of design implications is their generality when applied to settings beyond the fieldwork (Sas et al., 2014). However, they promote generalization of findings from the situated fieldwork to other similar settings (Sas et al., 2014). Therefore, even though design implications may speak to multiple contexts and be valid for different users, such contexts and users are very similar and pertain to extremely adjacent domains (Sas et al., 2014).

2.2 Mimicry approaches

I argue, instead, that design ethnography can be used to generate implications that may work as a source of inspiration for contexts and people even far removed from the context and people investigated during the fieldwork, which apparently may share very few characteristics with the setting

in which ethnographic data were collected. This method, which I called ethno-design in order to emphasize that the gaze of the ethnographer is primarily directed at specific designs, draws inspiration from other fields of research where knowledge about one thing is used to inform something completely different. Biomimicry, for instance, is a design practice that looks at how biological organisms are ‘designed’ to design artifacts and buildings. The practice is not new, as Leonardo da Vinci looked at birds to design flight machines. More recently, Velcro was modeled by the burdock plant by George de Mestral. Likewise, the tubercles of leading edge of humpback whale flippers have been used to inspire the development of more efficient wind turbines and fan blades (Fish et al., 2011). In the same line, autonomous robots use inspiration from biology to develop systems capable of operating in unconstrained or partially constrained environments (e.g., Zhang et al., 2020). To a certain extent, even artificial intelligence research draws inspiration from self-organizing biological processes and structures (Floreano & Mattiussi, 2018). Moreover, there are many research projects in interaction design that mimic biological and natural features, such as garments imitating seasonal behavior of defoliation (Ozkan, 2015), prosthetic tails to expand human body functions (Nabeshima et al., 2019), and even design tools specifically conceived to elicit designs inspired by nature (Qamar et al., 2020).

Another line of research that shares communalities with the ethno-design method is the investigation of ‘peripheral practices’, niche, unusual, marginalized and/or highly specialized communities of practice, which may result in implications for HCI outside of that community (Tanenbaum and Tanenbaum, 2018). Rosner and Taylor (2011), for instance, studied antiquarian book restoration practices not to make book binding better or more technologically augmented. Rather, their exploration seeks to take knowledge from these practices and apply them to the understanding of software and technology design, in order to find answers to questions like: ‘How might HCI foster more longstanding relationships with digital technologies as they have developed with some traditional media – such as manuscripts, photographs or books?’. Similarly, Tanenbaum and Wakkary (2012)

studied Steampunk subculture to challenge assumptions on e.g., ‘modular design’, which typically operate at the user level and relies on explicit interoperable infrastructure and standards. Steampunk designers use glue and other adhesives to join and attach irregular and heterogeneous parts, working around the necessity of the standard interface of modular design that joins and connects predesigned components. However, peripheral practice research is more interested in generating new knowledge that may provide a critical perspective on current designs or HCI ideologies than in inspiring novel designs.

Finally, gamification i.e., the use of game design elements in non-game contexts (Deterding et al., 2011), aims to transfer designs belonging to a specific domain to other, different, domains. It is based on the presupposition that it is possible to extract specific elements of design from games, in order to implant them in non-game environments: the purpose is to somehow enhance ‘serious’ applications and services with the enjoyment and involvement that characterize the game experience. As it is presently implemented, gamification uses mainly points, badges and leaderboards, typical of the videogame world, to improve the user’s engagement (Morschheuser et al., 2017), foster her motivations to participate (Rapp et al., 2016) and change her behaviors towards more sustainable or healthy lifestyles (Rapp et al., 2017). However, current gamification techniques still rely on taken-for-granted design practices, aimed at employing the most common elements of games, such as points, badges and leaderboards (Rapp et al., 2019) drawing them from design textbooks or crystallized design habits, rather than being directly inspired from games.

In sum, differently from biomimicry approaches, the ethno-designer draws inspiration from other man-made designs. Unlike the study of peripheral practices, it is interested in generating novel designs across multiple contexts. In contrast to gamification techniques, the ethno-designer does not rely on “standards” or established design practices, but actively explore existing designs and their way of functioning to envision novel designs for diverse application domains.

In other words, the ethno-designer uses the fieldwork to directly produce implications for design, installing ‘designerly ways of doing’, such as envisioning, creation, and ‘imagination’ (Halse, 2013) in the ethnographic fieldwork along with research questions. This figure attempts to innovate design ethnography in line with works conducted by EPIC (Ethnographic Praxis in Industry Community), renewing technology focused ethnographic research. Haines (2017), for instance, proposed a multi-dimensional design ethnography, emphasizing the assemblages that constitute our lives and interweaving digital, embodied, and internal experiences over different temporalities, within different spaces, and between different agents.

The ethno-designer proceeds toward her goal by carefully considering methodological and theoretical issues, such as validity and generalization (Cross, 2006; Halse, 2013). In the following, I will draw from two well-established concepts in anthropology, i.e., *reflexivity* and *theoretical pluralism*, to outline how the ethno-designer’s work can gain reliability: as these two theoretical tools are rarely employed within HCI design ethnography, despite their popularity in contemporary anthropology, I will extensively discuss them in the next sub-sections.

2.3 Reflexivity

The way ethnographies are written implies a stance on the reality that has been observed. The awareness of this ‘textwork’, involving choices concerned with ‘voice, authorial presence (or absence), analogies and metaphors, allusions, professional dialect and jargon, imagery, interpretative moves, tone, empirical or theoretical emphasis, truth claims (or lack thereof), figures of speech, and so on’ (Van Maanen, 2011 p. 159), has spread for quite a long time among anthropologies, while only recently it has been brought to light in HCI community (Lucero, 2018; Rode, 2011). Within HCI, the ethnographer has been represented mostly as a ‘realist teller’, whose voice is removed from the text ‘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 et al., 2012, p. 1136). While other ways of representing the world, commonly employed in anthropology, hardly found a place in HCI. For example, confessional or impressionistic styles, which engage the fieldworker in a discussion around the doubts that characterize her research and paint reality from a unique and subjective point of view (Van Maanen. 2011), were rarely used in HCI ethnographic research. Recently, these ways of writing started to be discussed even within the HCI community (Lucero, 2018; Taylor et al., 2018; Rode, 2011), showing an emergent awareness that the 'realist teller' is only a particular writing strategy among the others, and the 'realistic' way of representing the world is nothing but the attempt of making the ethnographic work 'objective' by concealing the ethnographer's subjective point of view.

Actually, the debate about the writing styles in ethnography is strictly connected to the problem of accountability of the ethnographer's findings. If the realistic recount is no longer the unique way for founding the ethnographic narration, the epistemic authority of ethnography can also be established on bases that differ from those that rely on the 'objectivity' of the realist teller. Reflexivity found a place in the anthropological discourse as a means for retrieving the objectivity of the fieldwork in the ethnographer's reflexive recount. The reflexive approach, through the description of the rapport between the observer and what is observed, and its evolution in time, finds the objectivity of the ethnographic writing in providing the reader with the instruments needed to evaluate the reliability of the ethnographer's claims (Altheide and Johnson, 1994). Reflexivity can then function as the operational definition used in the quantitative sciences, telling how the ethnographer 'measured' what she encountered during the fieldwork: by accounting the theoretical presuppositions that moved the observation, the methods she used, the sampling techniques she adopted, the procedures she employed to gather the data and the reading strategies that guided their interpretation, the ethnographer grounds the ethnographic narration, giving it more validity, reliability and credibility (Cardano, 2009).

Reflexivity may represent the main way to scientifically legitimize the ethnographic writing in HCI, without the need to chase the ideal standard of objectivity. As the ethnographic work is always carried on from a specific point of view, that of the ethnographer, it cannot use the tools of the hard sciences to ground its findings. Instead, reflexivity provides the fieldworker with means for making her work accountable, without constraining her to hide her voice under the cover of a realist narration.

Reflexivity can be usefully paired with the practice of autoethnography, in which the ethnographer's subjective experience is studied along with those of other participants and reported in the ethnographic narration (Tedlock, 1991). Autoethnography is 'an autobiographical genre of writing and research that displays multiple layers of consciousness, connecting the personal to the cultural' (Ellis and Bochner, 2000 p. 740). It goes beyond the confessional or impressionistic styles of writing ethnographies, as autoethnographers start from their own experience and self-observation, looking back and forth, first inward by exposing a vulnerable self; then through an ethnographic wide-angle lens (Ellis and Bochner, 2000).

Autoethnography provides the ethno-designer with a privileged point of view for understanding the observed phenomena, as she can exploit the introspective access to her conscious mental and emotional states: actors have predictive advantages over observers and the verbal reporting of these states can convey privileged information about the causes of the behavior under investigation (Newell and Shanks, 2014). As we will see in the next Sections, through autoethnography, the ethno-designer can formulate hypotheses about how specific design elements work 'from the inside', gaining empathy with the user's point of view. Reflexivity, then, might ground the autoethnographic work, by making all the fieldworker's choices transparent.

2.4 Theoretical pluralism

Along with the ‘textwork’, the ‘headwork’, i.e., the conceptual work that informs the ethnographic fieldwork, does not play a minor role in anthropology. However, HCI design ethnographies often engage with theory only frugally, appearing to embrace the idea that it is needed to look at what happens in social settings ‘in a theoretically unmediated fashion’, in order to produce concrete insights for designs based on what people say and do in there (Crabtree et al., 2009). When they are engaged in headwork, this commonly refers to a single theory or construct in charge of shedding light on the data: for instance, Feuston & Piper (2019) use social control theory (Barkan, 2011) as a way of understanding how people and the Instagram platform participate in narration of mental illness; while Shin et al. (2019) build the interpretation of the collected data on Gruning and Lindley’s (2018) ownership spectrum.

Conversely, ethnography in anthropology seems to prefer to deeply engage with theories drawing on a variety of theoretical approaches at the same time, according to the specific research questions it aims to answer. In this context, pragmatism allowed ethnographers to favor theoretical pluralism, by highlighting that some theories work better than others, depending on the particular problems addressed, and the situations and times in which they are used. Pragmatism suggests that we should allow our questions to determine our theories and avoid theoretical monism, by claiming that it is better to have ‘different coats to clothe the children well than a single, splendid tent in which they all shiver’ (Goffman, 1961 p. xiv). The risk is that this approach may lead to a ‘shameless eclecticism as various theories are drawn on to explain and perhaps generalize certain matters and as the specific nuts and bolts of various theorists are selectively put to use’ (Van Maanen, 2011. p. 156). However, most of ethnographic works in anthropology convincingly tie together diverse theories in order to explain the complex aspects of the reality they are exploring. For instance, Jakob Krause-Jensen’s *Flexible Firm* (2010) is an ethnographic account of several ‘cultural projects’ undertaken inside Bang and Olufsen,

which offers reflections on theories of ritual, magic, identity, power, control, resistance, and ideology coming from a wide array of social theorists including Turner, Foucault, Bourdieu, Weber, Geertz, Giddens and Barth. Likewise, Michel Anteby's *Moral Gray Zones* (2008) explores officially prohibited, yet tolerated practices, that are performed by both workers and supervisors in a French aeronautic plant, mixing various theories that on the surface may appear even incompatible (e.g., functional, symbolic, structural) to account for his field materials.

What I want to emphasize is the opportunity, for the ethno-designer, to multiply the theories employed in the fieldwork rather than opting for theoretical frugality. Theory might support the generalization of how 'the things work', allowing for the de-contextualization of the designs' effects from the here and now and easing their transfer to other specific domains. For the ethno-designer, theories are not addressed to establish general laws: their use resembles what the designers make of their concepts, to suggest courses of action that must ultimately work, focusing on what could be altered and proposing novel and untested paths into alternative futures (Krippendorff, 2007). Theories can be pragmatically employed to connect different domains, grounding analogies between diverse worlds: by theoretically explaining why specific designs might work in certain conditions, even far removed from those in which they were studied, theories consolidate the ethno-designer's design implications. In this perspective, multiple theories and constructs may be used, as many as the contexts targeted by the ethno-designer, widening the applicability of the investigated designs.

3. IN SEARCH FOR DESIGN ELEMENTS

To outline the way through which I elaborated the theoretical tools described above and how they can be enacted on the field, I will now illustrate how I employed design ethnography in the last years going in this direction. I've been inspired in my research mainly by gamification practices, which attempt to

“enhance” serious context with design elements coming from games. However, rather than looking at well-established gamified practices that use points, leaderboards and badges, I attempted to identify new game design elements suitable to be transferred to other contexts for their experiential, behavioral, social and organizational effects on users. In this perspective, the ethnographic work appears essential: there is no other method than observation, personal participation, rapport with people, that can bring to light how experiences, behaviors and their related social practices are interwoven with the designs that constitute the immaterial stage in which they are performed. This work gave me the opportunity to rethink the role of the ethnographer in design research, ending up with the figure of the ethno-designer.

Conducting an ethnographic research in a digital game was a way to experiment a new approach to inspire the design of interactive systems. Virtual (or digital) ethnography has been widely used as anthropological investigation of the individual experiences, social interactions and social practices of digital worlds (Lysloff, 2003; Boellstorff, 2008), or in the cracks that separate and connect the digital life with the real one (Miller and Slater, 2000; Kozinets, 2001). The digital ethnographer is immersed in technology, and actually can study designs from inside. Although Geertz (1973) correctly noted how the locus of study is commonly not the object of study, and anthropologists usually don't study villages, but study in villages, it is certainly true that the configuration of space and its materiality, where the ethnographic work takes place, have a great influence on the behaviors, interactions and practices that are performed in there (Mum, 1996; Richardson, 1982). From this point of view, designs can be seen as virtual spaces that allow, limit and shape their inhabitants. Such immaterial structures directly affect the users' experiences and are worth to be studied in their working principles, outlining how they impact on their behaviors, emotions, and interactions.

Therefore, virtual ethnography appears the election method to discover ‘design elements’ that can be used as a source of inspiration for designing applications across multiple domains even far removed from the context of the fieldwork. Design elements may be defined as *a set of building blocks or*

features shared by digital applications, comparable to Wittgensteinian family resemblances, following Deterding et al.'s (2011) definition of “game design elements”. They may be a reward system based on experiential points, or a set of “digital objects”, like pieces of gear or weapons, used to reward the player for her effort, or an “organizational structure” that may favor the intimacy among users. The virtual ethnographer, therefore, may focus her attention not only on the practices performed by users in digital environments, but especially on the design elements that constitute the *locus* in which such practices take place. The ethno-designer is thus a digital design ethnographer primarily interested in studying design elements that are suitable, with opportune transformations and adaptations, to be transferred to other domains, generating design implications that can be used to create novel systems across multiple contexts.

3.1 The ethno-design method

I now briefly introduce the conceptual steps that I have outlined above to describe how the ethno-design method works, referring the reader to the examples from the field Section for a deeper explanation. Figure 1 sketches how the method unfolds.

First, the ethno-designer chooses a digital environment that seems to embed a series of ‘best practices’ in terms of how they positively engage, motivate, support its users. After an exploratory phase in which her endeavors are addressed to understand the individual, social and cultural dynamics that take place in there, she preliminarily hypothesizes that specific design elements could be usefully applied to other contexts due to the similarities she notes on the basis of her previous knowledge. In this way, she identifies a preliminary list of design elements suitable to be transferred to other domains.

Here, the focus becomes narrower than in ‘anthropological ethnographies’ where the fieldwork tends to aim for giving a holistic perspective of meanings within participants’ worlds, and even than in

traditional design ethnographies where often the goal is to explore people's practices to identify their unmet needs, which could be then satisfied by the design work. As long as her knowledge of the field increases, the ethno-designer may become aware that the investigated phenomena can be of inspiration for other contexts as well, as she may find further correspondences between what is happening in there and the features of the other domains she knows.

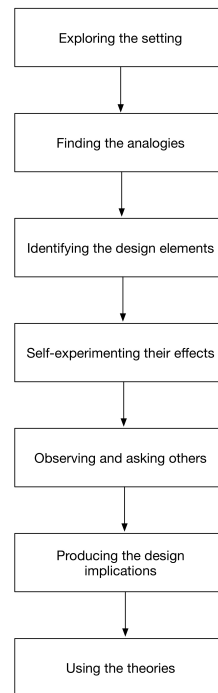


Figure 1. A diagram of the ethno-design process

Second, the ethno-designer attempts to explain how the design elements work, experimenting on herself their effects through autoethnography: in this way, she outlines a hypothetical catalogue of successful design choices to be applied to the target domain. Then, she tests her hypotheses in the fieldwork, by observing the design elements in the practices in which they are embedded, and by asking to other social actors: this may lead to generate a series of ‘design implications’. Here the idea of producing ‘implications for design’ is installed in the research questions and in the fieldwork: the

ethno-designer starts from an interest in specific designs, aims to understand them in their working principles, and strives for reimagining and adapting them to different contexts.

Third, the ethno-designer uses multiple theories to further validate her hypotheses and inform her findings with more general principles. Theories might help the ethno-designer move her knowledge from the ‘here and now’ of her subjective experience (although corroborated through observation and inquiry) to other ‘places’, where similar conditions may apply and thus similar phenomena may occur. In other words, the particular experiences she experimented, with reference to specific design elements, are retraced to their underlying theoretical mechanisms, e.g., behavioral, psychological, social, enabling and grounding, through generalization, the transfer (and reinvention) of the original design pattern.

In this perspective, fieldwork and inspiring design are a unique activity: as long as the ethno-designer is engaged in individuating and studying successful designs and their ways of functioning, she is, at the same time, involved in the activity of envisioning and defining how they could be employed in other domains. In doing so, the reflexive recounting grants accountability to her work, grounding all her theoretical, methodological and practical choices. I will illustrate in the following sections how this fusion can be reached in practice.

3.2 Setting

My fieldwork was conducted in World of Warcraft (WoW) from October 2012 to September 2016 in three main phases to discover what kinds of design elements could be translated, with appropriate transformations, in other non-game contexts. In the first phase (from October 2012 to March 2014), I focused on those design elements that could intrinsically motivate players (Rapp, 2017a). In the second phase (from June 2014 to May 2015), I directed my attention to those design patterns capable of being applied to behavior change technologies, given their ability to modify players’ behaviors (Rapp, 2017b; 2017c). The last months of my research (from October 2015 to September 2016) were employed to

figure out how WoW's design elements could support reflection on players' personal identity and involve them in social and organizational structures (Rapp, 2018).

The selection of the Massively Multi Player Online Role-Playing Games (MMORPGs) genre was not casual: these digital environments might embody the best practices in terms of capability of engaging and retaining their users, deeply affecting habits and behaviors of players that literally live in there. MMORPGs' players spend more than half a working week in such environments (Yee, 2006), so much that these games were identified as the leading culprit of video game addiction (Council on Science and Public Health, 2007; Lee et al., 2007).

WoW is the empirical case closest to the 'ideal type' (Weber, 1949) of a MMORPG capable to create an enduring loyalty, as it has become synonymous with MMORPGs for players (Calleja, 2007) and set the MMORPGs 'genre standards' for game designers (Debeauvais et al., 2011). These peculiarities were confirmed to me by seven hardcore gamers, interviewed in the exploratory phase of my research. Selecting a typical/emblematic case as the subject of this ethnographic study was essential to make possible a generalization of my results (Gobo, 2008): by representing a typical case of MMORPGs, WoW could better ground what I intended to extract from the research results, giving them a more general validity.

It is in need to say that both the idea and the practice of the ethno-design method did not come to me as a monolith, painstakingly planned in advance and then enacted on the field. It has rather bloomed slowly during the course of four years of research: I progressively became aware that what I was doing could be framed in a different perspective, reconfiguring the role of the design ethnographer.

Before describing how the ethno-design work can be put into action, some clarifications on the object of study and the ethnographic setting are in need. In WoW, players advance through different levels of play, exploring the world of Azeroth, facing quests and killing monsters. Players create their avatars, which have different abilities depending on their 'race' (e.g. Dwarf, Night Elf), class (e.g.

Death Knight, Mage) and role (dps, offensive role; tank, defensive role; and healer, helping role). They need to join in groups, either temporary or permanent, in order to complete the hardest instances and raids. While instances are five-player dungeons, raids are from-ten-to-forty player dungeons, representing the most difficult contents to be faced in the game. During the fieldwork, I reached the level cap (100) with my main character, a night elf mage, participated in a variety of game activities, and became responsible for the social life of my in-game companions in a variety of organized groups through which WoW is structured (guilds). I fully played two different WoW's expansions, Mists of Pandaria and Warlords of Draenor.

I collected a huge quantity of materials, in the form of documents, interviews, informal conversations, and personal experiences. Observation was carried out in Italian servers. It has been conducted mainly in a PvE server (Player vs Environment), where players can't fight each other with the exception of certain areas. However, to consider also the game dynamics of the PvP servers (Player vs Player), where players can fight each other everywhere, I played for 150 hours in an Italian PvP server.

I formally interviewed 36 players selected through a purposeful sampling method (Marshall, 1996), taking into account their different in-game engagement and their social role. I divided interviewees in: i) *novices* (character level 30-80 in Pandaria and 40-90 in Draenor), who have no more than six months of experience and play less than ten hours per week (9 interviewees); ii) *normal players* (character level 80-90 in Pandaria and 90-100 in Draenor), who have more than six month of experience and play between ten and twenty hours per week (9 interviewees); iii) *hardcore gamers*, who have at least one character developed at the maximum level, and have been playing for more than two years with a frequency of more than twenty hours per week (16 interviewees). I further divided hardcore gamers in *leaders*, i.e., 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. Ten

participants played mainly in a PvP server, whereas the remaining ones played in a PvE server. Among *hardcore gamers* (females=6; average age=29,6; min age=18; max age= 44), two participants held a Ph.D., three a master's degree, four a bachelor's degree, five a high school diploma, and two a middle school diploma; among *normal players* (females=4; average age=27,3; min age=19; max age=38), one interviewee had a Ph.D., two a master's degree, three a bachelor's degree, and three a high school diploma; finally, among *novices* (females=5; average age=24,3; min age=18; max age=35), two held a master's degree, four a bachelor's one, two a high school diploma and one a middle school diploma. Two hardcore gamers, who stopped playing WoW before the interview, were added as outliers, to consider processes of disengagement. I stopped interviewing when I became aware that additional data would not have produced substantial new results for the goals of my research, following a data saturation criterion (Bowen, 2008).

I relied on my in-game connections to approach the majority of the interviewees, asking my guild companions to identify the players that most fitted my selection criteria (23 out of 36). Others were directly recruited by myself during instances or raids, or through casual encounters in the world of Azeroth after a brief screening interview (13 out of 36). While relying on my expert companions' knowledge ensured the recruiting of 'typical players' and 'critical cases' (Marshall, 1996) (e.g., a player belonging to one of the most powerful guild in WoW), the second method widened the sample heterogeneity to profiles that I did not think of before.

The interviews were carried out both in the game world (18) and in the 'real world' (18), in the former registering the answers through the chat log, and in the latter audio recording the outcomes. Interviews lasted almost three hours each (average=157 min; min=130 min; max=188 min), exploring the players' subjective experiences and their connections with WoW's design elements. Questions were formulated on the basis of my personal game experience and the many discussions I had with other

players during the fieldwork. Players' names (included mine as a player) have been changed due to privacy reasons.

I also conducted hundreds of informal conversations, examined a variety of game related documents (forum posts, WoW guides, etc.), and carefully self-analyzed my personal in-game experience resulting in a huge amount of diary pages, screenshots, chat logs. Observations of players' behaviors were carefully recorded through written notes, which were reviewed immediately after the end of the game sessions, while the informal conversations were registered through the chat log.

The interviewees were always aware of being recorded. Members of my guilds were also informed of the nature of my research and they were thus aware that even our informal conversations would be traced, even if I did not always remember it to them. On the contrary, brief conversations and stand-alone in-game actions with unknown players casually met during the game were registered without their awareness of being recorded: however, all the personal details were omitted in the reporting of the findings to ensure their privacy.

Data were analyzed through a thematic analysis (Braun and Clarke, 2006) through multiple cycles. Initial codes were generated by identifying data features that I considered interesting. In this analysis, data were broken down by taking apart observations and sentences and by labeling them with a name. These codes were grouped together in overarching themes, by using affinity diagrams. Finally, I reviewed and labeled the individuated themes.

However, a complete exposition of the setting and the findings of the whole research goes beyond the purpose of this article, where instead I want to focus on the modalities of work of the ethno-designer, and the methodological tools that she needs to achieve her goals.

4. EXAMPLES FROM THE FIELD

In the following, I will focus on methodological points relevant to the ethno-designer's work. In the first sub-section I will outline the preliminary steps that the ethno-designer needs to carry out in order to acquire a familiarity with the field. Then, I will describe how the ethno-designer connects two different domains, defines research questions and focuses on specific design elements to be transferred to other contexts. In this sub-section, I will also briefly expose in a separate paragraph, for the commodity of the reader, some design suggestions that may be useful for designing Personal Informatics systems: such suggestions are only meant as exemplificative supports to explain how the ethno-design method can be put into practice and won't be deepened in all their details. The main contribution of this article, in fact, remains theoretical and methodological, not empirical. In the last two sub-sections, I will focus on the importance of the subjective experiences for the ethno-designer's research and the role of theory in the explanation and generalization of her findings.

4.1 Acquiring familiarity with the field

Data from the field. In the last four months I completely immersed myself in WoW playing almost 10 hours a day to progress as fast as I could and understand what happened in there. Despite my previous experience with videogames, it was my first time in a MMORPG, so I had to learn almost everything: my idea was to draw inspiration from WoW to motivate users to participate in 'serious' online communities. However, I soon became aware that this goal was impossible to be accomplished without a deep understanding of the playing dynamics and the WoW's embedded culture. The game is difficult to be mastered and interacting with others is not simple as well: hardcore gamers rarely open up to novices like me, so I need to gain strength and abilities before starting my interviews and discovering aspects of the game that are not immediately visible. It ended up that I almost left my initial objective apart: my priority now is to experiment as many game experiences as I can, perfect my way of playing,

confront with other novices. In the meanwhile, I am shifting my focus to other phenomena: the WoW's reward system is extremely interesting since it could enhance users' performance in many different contexts. However, only now, I start seeing the complexity that lies behind WoW's designs and their experiential effects on players: I think that acquiring a preliminary knowledge about how the game works as a whole is essential for my research. (*Notes of February 3rd, 2013*).

Methodological considerations. As we might see from my notes reported above, the ethno-designer's research starts with the definition of goals addressed to find interesting design patterns to be used in specific application domains. However, once she accessed the field, she needs to acquire knowledge about the observed phenomena. This is the phase that most resembles the 'traditional' ethnographic work, where the fieldworker has to gain familiarity with the field, learn the jargon of the 'natives', understand their practices and culture. At this stage, the ethno-designer has to face the common problems of the ethnographer, such as individuating reliable key informants (e.g., the hardcore gamers), gaining access to 'closed' environments (e.g., the guilds), interiorizing social practices through participation (e.g., the guild's life). Without this initial fine-grained work her gaze would not be able to deepen the design elements she is interested to, identifying their side-effects and wider implications, as well as to formulate precise hypotheses and individuate design details that could be insightful for her goals.

Nevertheless, whereas for ethnographers in anthropology giving a holistic perspective of meanings within participants' worlds represents the final aim of the fieldwork, for the ethno-designer this understanding has only a utilitarian purpose: it is a preliminary, though necessary, step before narrowing her focus on specific design elements. The ethno-designer does not ignore the 'big picture' in which designs are inserted, but is not interested in outlining an exhaustive account of the world she is studying. The wider knowledge she develops about that world is not but a 'tool' for better

understanding the design patterns she aims to transfer to other domains: her premises, research questions, goals, and ‘research outputs’ remain designerly oriented.

4.2 Finding similarities and seeking design elements

Data from the field. During my last year and a half in Azeroth, my interest in Personal Informatics (PI) systems, defined as those that ‘help people collect personally relevant information for the purpose of self-reflection and gaining self-knowledge’ (Li, Dey, and Forlizzi, 2010), progressively led to focus my research on those WoW’s aspects that could be connected with PI. PI circumscribes a field that, at first glance, appears far removed from the world of MMORPGs. However, upon closer examination, many commercial PI tools, as well as prototype research applications, use game features to motivate people in the tracking activity, for example through cooperative game mechanics (Chen and Pu, 2014). Nevertheless, all these attempts leverage a limited number of ‘game elements’: points, leaderboards, challenges, and badges represent the most common used mechanics in this kind of instrument, undermining the impact that games could have on PI design. It seemed to me that having a wider variety of effective design elements targeted to PI could enrich the user experience of self-tracking technologies, lightening many of the burdens that currently affect their daily usage. Barriers include insufficient motivation, lack of utility and engagement, unsuitable visualizations and scarce support provided by the analytics tools, as well as difficulties in understanding numbers and in reflecting upon them (Li et al., 2010, 2011; Rooksby et al., 2014; Choe et al., 2014; Bentley et al., 2013; Rapp and Cena, 2016).

I hypothesized that many problems users encounter in accounting for their personal data in PI applications, as well as procedures to deal with them, were similar to those faced by WoW’s players to master the game. My personal experience made me first aware of the importance of numbers in WoW,

in order to develop a character at its maximum potentialities. Interviews and observation, then, confirmed my initial hypothesis.

Noein, one of the most experienced players I met in WoW, is proud to recount how he perfected his mage: *'It took me years to find the perfect equipment that maximizes all its skills. The guides that you find on the WoW websites are a good starting point, but then you have to find your way to play... I searched for the optimal combination of gear, how to distribute the stats... Well, it's not simple at all, it's like an enigma that you have to solve, and there is not a unique solution. I experimented so many combinations of items... I analyzed tons of data'*. Players like Noein continuously generate and test hypotheses, in order to identify correlations and causation among factors that may affect their characters' performance. These strategies closely resemble those of the Quantified Selfers, who diligently collect many kinds of information about themselves and enact self-experiments, systematically varying specific aspects of their life to find correlations among data and solve a specific problem (e.g. a chronic headache) (Choe et al., 2014).

Conversely, WoW novices share characteristics with inexperienced self-trackers, who find it difficult to understand their own data. Ludos, for example, explains *'For me it's really difficult to understand how to distribute weights among the different skills of my rogue and decide what kind of gear I have to wear. I proceed more or less randomly because I can't figure out what all these numbers mean... I hope to learn how to better myself in the future, but for now I only want to level up and discover the next dungeon'*. Novices and normal players are keener on finding ready-to-use solutions, than on striving for developing knowledge on their own. I personally searched for help when I encountered difficulties, trusting in other, more expert, players: *'Strength should be your primary concern and you should up it as much as possible. You also have to stack haste way up to the 11% breakpoint, and then try to focus on Critical Strike until you have 25%. After meeting this condition its value considerably drops'*, said Niren, explaining to me how he maximized the stats of a warrior. This

attitude is similar to that of the inexperienced self-trackers in PI domain, who do not have the willingness and expertise to interpret and account for huge amount of quantitative data. They often lack time, compliance and determination to extract knowledge from a bunch of stats and graphs and do not want to invest much effort in managing their data (Rapp & Cena, 2016).

The similarities I found between WoW players and PI users constituted a ‘bridge’ to connect the two domains. Then, I enlisted a preliminary series of design elements to be explored (or re-explored) in depth (characters, items, battle stats, add-ons, etc.) through personal experience, observation and interviews. At that time, I was already familiar with World of Warcraft, and thus I was able to define specific research questions: Does WoW visualize numbers in ways that might help players see value in them? How does the game motivate its players to acquire the knowledge needed to develop their characters? Do social interactions and guild organization play a role in learning processes?

I discovered that WoW’s players enact different strategies to manage their ‘numbers’, and WoW supports them either directly or indirectly. Novices and normal players look for quick answers that might suggest the optimal gear for their avatar, being keen on inquiring other players; WoW, in turn, makes available enclosed communities and private communication spaces where players can find a proper guide to solve their problems and answer their questions. Guilds are places where inexperienced players can disclose their doubts without feeling ashamed: members of a guild are driven by a common aim, e.g., to face the most difficult raids of the game, and they help each other to empower the group as a whole.

Hardcore gamers, instead, strive for a self-made knowledge because it strengthens their sense of competence and self-efficacy. WoW sustains such endeavors by providing a variety of specialized analytical tools, which, although developed by third parties (often the players themselves), can be easily connected to the game interface. Pawn, for example, helps players select the best gear choices among those available, after carefully setting up the character’s stat weights; whereas SimCraft, a

program that shows how much damage can be done in optimal conditions and with perfect timing rotation, provides a sort of baseline that hardcore gamers try to surpass by experimenting different item combinations.

However, I asked myself many times which were the drives of their perseverance in acquiring the knowledge needed to better their avatars. After having interviewed more than fifteen hardcore gamers and informally talked with tens of them, I could affirm that a more or less pronounced social reason is always present. Creating a sort of ‘ultimate character’ not only allows them to excel in the game and ‘solve a problem’ by counting only on their own strengths, but also provides reputation, social desirability and in some cases a sort of fame. This is also the reason why most of them become a guide in the guild they belong to, influencing other players seeking recommendations and mentorships. Eloin, for example, started to invest a huge amount of time in ‘studying’ her priest when she became aware that her knowledge could make her gain social centrality: *‘What really drag me into WoW was the opportunity of being recognized by someone else as competent. When everyone is asking for you for matters related to your class you become important... I don’t know, more important than what I am in real life’*. WoW favors the development of an ‘implicit reputation system’, whereby hierarchies and mentorship provide players with a status based on competence, whereas the character’s equipment immediately makes visible the player’s expertise.

The equipment, nevertheless, not only exposes the players’ competence, but also represents and tells a story about their in-game experiences, supporting them in making sense of their data. Each piece of gear is connected with threads of histories made of ‘legends’, missions, characters and other items. As a result, data are inserted into a narrative frame that ascribes to them a deeper meaning and value. The importance of finding and balancing the right items does not only lie in the quantitative outcome that they may produce on the battleground, in terms of heightened damages, aggro, and capability of healing. All these objects are tied together into meaningful stories, which can be lived, and then

recounted in a later time. Casdan explains: *‘This dagger, the fangs of the Father, is a legendary item, it means that it is extremely rare, but this is not the reason why I’ve been guarding it for so many years, even if it’s quite useless now... Every time I looked at this weapon I saw that golden age... my friends, those battles, how much fun we had’*. By inserting data into identifiable ‘objects’, which are part of wider narratives concerning the player’s character and its ‘life’ in the game world, WoW allows her to manipulate not abstract numbers, but ‘concrete’ meaningful entities that embed experiences, anecdotes, memories: these can be further recollected and re-lived with others, as well as exchanged, modified, and ‘thrown away’.

Design suggestions. WoW supports a fruitful mechanism where the more expert players are fostered to mentor less experienced ones because they can gain visibility and recognition, by showing their competence and attracting social relationships. Social structures like the WoW’s guilds can be imagined even in the PI context, by designing closed groups, where people know each other, and some users are socially recognized with a role based on their competence. Hierarchies, reputational mechanisms, possibility of having groups of followers could be means for motivating the most experienced individuals to share their knowledge, provide suggestions, and guide who is still novice in tracking. In turn, opportunities of obtaining useful and tailored recommendations may motivate inexperienced self-trackers to expose their doubts and seek help in expert users, who may help them in interpreting their data.

WoW also promotes the idea that PI systems could make available more complex functionalities and settings as the user’s experience in interacting with her data increases, offering more specific analytical tools as her capabilities of formulating precise research questions develop. In other words, WoW exemplifies a development model that may be inspiring for PI, where diverse analyzing features could be easily connected with a main, flexible and expandable application, offering supplementary

possibility of action and visualization on the same data, depending on the user's level of experience and needs: this model supports the proliferation of instruments addressed at satisfying idiosyncratic desires, instead of the creation of a ultimate application capable of meeting all the diverse users' expectations.

Finally, WoW shows that data can be incorporated into visible entities, each one with its own meanings: these are inextricably tied to quests, bosses, dungeons, and the wider world of Azeroth, allowing players to make sense of their own numbers within a narrative frame. Raising the intellect of a mage of 10% is not only a matter of increasing performance: it is a story, symbolized by a concrete entity with its own unique aesthetics and 'possibilities for actions' (i.e., a weapon enables the character to face more powerful monsters and can be modified, donated, or 'destroyed'), which, in turn, might trigger memories, emotions, and reflections. For PI, this would mean to favor the creation of 'plots' from data, whereby the user might represent the 'main character', with 'means' to be exploited and a 'mission' to be accomplished: users could be supported in building such stories by the tool (e.g. by using procedural content generation techniques for games). In this perspective, users would manipulate 'data-objects' inserted in a 'fictional' context: for example, increasing the number of slept hours would become a specific item to be conquered; otherwise, they could experiment 'alternative lives', where they would explore the consequences of change in their daily living, also interacting with the 'plot' (e.g. by manipulating the 'numbers', they would see a change in the story). In this way, data would also become something that is worth to be told to others.

Methodological considerations. Once the ethno-designer has acquired a certain familiarity with the reality to be studied, we can better note her different attitude in setting up the research with respect to the traditional design ethnographer: the goals become clearer and more precise, the focus is narrower, and the gaze is primarily directed toward designs, their ways of functioning and impacting on individuals' experiences. As a first step, the ethno-designer explores the fieldwork in search for hints

that will allow him to connect the environment she is studying with another domain. Such exploration is inspired by the knowledge she has of the target context, gained e.g., through literature review or empirical research. In the case reported above, I reviewed literature about lifelogging and PI and interviewed a variety of PI users, from quantified selfers to inexperienced self-trackers.

The ethno-designer's work, at this point, is to turn the similarities into opportunities for design. The researcher's mind is driven by the critical points of the context that she wants to improve, orienting her attention and shaping her research questions: she continuously swings between two domains, the one she is observing and the one she aims to enhance, extracting design elements from the former, and adapting them to the needs of the latter. Instead of starting from data collection of how people live and behave, saving for later the work of drawing implications for design, the ethno-designer immediately orients her attention towards specific design patterns, asking herself: why they are so effective? What kinds of impacts they have on individuals? Are there side-effects that are not immediately visible? How would they affect the target domain? What kind of adaptations are needed to preserve their original experiential effect?

While I was collecting data about how WoW's digital objects are capable of eliciting emotions and memories in players, I was already envisioning how similar designs would be inserted into PI domain. I was imagining how such data-objects would be preserved, modified, donated, sold and even destroyed by the user herself, similarly to what happens to gear in WoW. This, for example, would allow to design for forgetting (Sas & Whittaker, 2013) in PI, rather than for a total recall, as it is commonly affirmed in the PI discourse.

To summarize, the ethno-designer is in continuous search for analogies between different worlds. She turns the peculiarities of a specific context into opportunities for designing in other, apparently distant, domains. Her work is made of constant comparisons, formulating hypotheses that specific

design elements would work even in other contexts, getting inspired by specific designs to imagine how they could be adapted to other users and to other purposes.

4.3 ‘Living’ designs and documenting the ethno-designer’s subjective experiences

Data from the field. Despite it wasn’t my first raid in a pick-up group, I was still a novice in this kind of dungeon. After a very bad experience in the Mogu’shan Vaults, where all my raid companions blamed me for my inexperience, I was really afraid of being incapable of meeting the expectations of this new group. Fear was my dominant emotion at that time, so that also my in-game performances were inevitably affected by it. As long as the raid proceeded, I became aware that my attacks were completely ineffective. The stats of my damages were incredibly low in comparison with those of the other dps, but the worst thing was that everyone could see how much bad I was playing my role. I felt ashamed. I felt like when I was playing my first instances six months before. My mage had never been very powerful (I had a lot of problems in upping its strength at that moment), but this time it seemed ridiculous. I was trying to set up its equipment, but suddenly I fell behind. Again, as in Mogu’shan Vaults, I was in panic because I knew that losing the group meant showing my ineptitude in playing. After a while, a rogue came back and guided me to the others, where they were all waiting me. There was a great disappointment. They were discussing whether to kick me out the raid. I decided to immediately leave the dungeon, because I couldn’t bear that sense of pressure anymore. (*notes of June 25th, 2013*).

The episode above represents one of the steps within the path that led me to understand how WoW’s pick-up groups are designed as a training arena to better the players’ performances on the one side, and as a stage for exhibiting their skills, on the other one (Rapp, 2017a). Players can enter in them by using the instance finder or the raid finder, two features that build temporary aggregations of players to face a specific dungeon of the game. Initially, given my repeated personal experience of fear and shame, I

was inclined to think that they were primarily shaped to exploit negative emotional states to foster players' continuous training. I hypothesized that players are so exposed to the public judgments in there, that they are literally constrained to put their best efforts in accomplishing their duties. As the game supports the employment of add-ons (e.g., Omen) that make visible how they are playing (e.g., by showing how much damage they are producing), all the group members are constantly scrutinized by the others, producing a state of mutual surveillance that pushes everyone to increasingly better her performances.

However, I soon started to doubt my initial interpretation: by talking with other hardcore gamers, in fact, I discovered that most of them were actively searching for such arenas, willing to show their performances in public. So, I began to see how my perspective was incomplete. Novices are, indeed, pushed to enhance their performances by the anxiety of making a bad impression in front of their peers and by the constant attempts of avoiding shame for their mistakes. Tyran, for example, said: *'It's hard to play in groups... you make a little error or are not fast enough to heal and you get instantly blamed and threatened to be kicked out... Sure, I think that all this pressure is pushing me to better my character and know more my class'*. But hardcore gamers see these groups under a completely different light.

Some months after my raid in the Heart of Fear, I entered in a new guild. There, I got close especially with Kairos and Neon, two players of great experience, who represented a constant point of reference for the remainder of my permanence in WoW. They gave me a hint for finding an answer to my question: why do hardcore gamers still play in pick-up groups, even when they are part of a strong guild that could face every raid of the game? They said to me that the pleasure for joining these battles came mainly from the sense of power and vanity that they could experience. A long time passed, and finally I became strong enough to find out for myself what they really meant with their words. I discovered pick-up groups as a place where I could exhibit my abilities, as I were acting on a stage.

The first time, it happened in the Downfall. My party was wiped out for the fourth time by the boss, because the other dps were not up to controlling the adds. I decided then to show to others what I really could do. The sense of omnipotence I felt in that moment was incomparable; and the subsequent attempts of reliving such excitement kept my abilities at a certain level for the rest of my permanence in WoW.

I have to emphasize how it would have been hard to believe that a game like WoW could elicit such strong emotional states without experiencing them on myself. My first-person involvement was crucial to understand ‘from the inside’ the role of emotions in WoW, how they could be triggered by design, and how they could support the players’ engagement for such a long time. Reflecting on the relationship between emotions, exposure, and social ties, I became gradually aware that their effects go far beyond the increasing of players’ performances, so that they contribute to build the sense of players’ identity within the game.

In four years of play, I could observe great transformations in myself as a player: from a worried, hesitant, insecure novice, to a conscious, responsible, mature hardcore gamer. In this path, the major turning points were represented by those emotionally significant episodes, be they positive or negative, that made me stop for a while, think about myself, reflecting on who I was and who I was becoming in the game. In each of these moments, the presence of others was a constant: WoW is a place where emotions continuously bloom because of the social interactions that happen in there. It is through the design of different social spaces characterized by different levels of visibility, from private chats where to exchange intimate experiences, to raids where friends can cooperate to reach a common aim, to pick-up groups in which strangers meet temporarily searching for approval or to gain admiration, that WoW creates the ground where emotions can grow. By ‘constraining’ players to a continuous confrontation with others and for a variety of purposes, WoW allows them to live impactful emotional experiences, that provoke transformations in their in-game selves.

One day, in *The Gates of Retribution*, Kairos publicly blamed me for not having, in his words, ‘done my job’ within the group. I took these critics personally, he was my friend, and I felt somehow betrayed by him: he could talk to me privately without exposing me to such a humiliation. After an initial profound delusion and sadness (it is difficult to believe how a trivial in-game episode might so strongly impact on the player’s inner life without subjectively experiencing it), nevertheless, I took my time to reflect on his words. Maybe he was not wrong. Actually, in that period I was too arrogant, I was thinking that I had almost reached the perfection with my mage, but, obviously, that was not the case.

This episode seems to suggest that ‘others’ can be exploited to provide fresh perspectives on the individual’s identity, as interpretative tools that can make her rethink about herself. This suggestion goes along with an idea of PI that focuses more on meanings and subjective interpretations than numbers and objective knowledge. It recommends, for the PI domain, to design for connectedness and emotional experiences rather than for rational examination and abstract analysis: e.g., by creating social spaces with different levels of visibility and sense of intimacy, where users might publicly expose their data and performances, or find friends who may give them a different perspective on their ‘quantified self’. In this manner, PI systems would foster a long-standing engagement, based on strong social and emotional ties, as well as promote reflections on the individual’s self, meeting the PI’s greater ambition of providing self-knowledge, rather than merely numbers and stats (Rapp & Tirassa, 2017)

Methodological considerations. The autoethnographic approach is essential to understand how certain design elements work. Without experiencing on myself shame, fear, vanity, sadness, delusion, arrogance, friendship, gratitude, I would not have been able to really understand the emotional levers that *WoW* exploits to influence players’ behavior. Therefore, I would have not been capable of ‘correctly’ transferring those elements to other domains: the ethno-designer, in fact, strives for recreating the experiential effects that particular design patterns elicit in their users, rather than to

replicate their external structures. To really understand whether a design element might have an impact on the ‘internal world’ of the user, it is essential for the ethno-designer to experience ‘in first person’ how it is ‘lived’. This produces a subjective take on reality that, apart from the designers’ intentions, makes evident what the researcher, which put herself in the user’s shoes, ‘sees’ in the design elements she interacts with. This focus on subjectivity and on how reality is subjectively constructed might be called ‘phenomenological’: phenomenology precisely conceives the mind as subjectivity and our take on the world as subjective (e.g. Heidegger, 1982; Husserl, 1968). Understanding what kind of experience designs are able to provoke and at what conditions may suggest how and when it is appropriate to reproduce such experience in other contexts. The ethno-designer is initiated into practice and gives value to her own experiences for explaining the working principles of the designs she is exploring.

The reflexive narration, which is particularly explicit in the recounting reported above, exposing my initial explanations and the subsequent hesitations and revisions, might ground the ethno-designer’s subjective perspective. Instead of conveying a ‘certainty over a correct interpretation of behavior thereby guaranteeing reproducibility’ (Rode, 2013), as it happens in realist HCI ethnographies (Crabtree, Hemmings, & Rodden, 2003; Park et al., 2006), reflexivity focuses on self-reflection and doubt, making evident to the reader how the researcher came to the conclusions reported. This answers to the accusation of arbitrariness, often made with reference to the subjective accounts, since every ethno-designer’s choice becomes accountable in the reflexive narration.

Moreover, the ethno-designer’s work is not a “solipsistic” practice. Her subjective experiences and emotions are constantly compared with those of the other social actors that she is studying in the fieldwork. The ethno-designer seeks communalities among the individuals’ experiences, in order to identify the “typical” experiential effects of specific design elements. In other words, her subjectivity and what she feels and live on the field are just the starting point for an inquiry that is always inter-

subjective. To this aim, she may employ a “participant researchers” strategy (Van Maanen, 1978), by seeking the aid of her informants to confirm/disconfirm that the data was viewed and understood consistently by both herself and the participants.

4.4 Employing multiple theories

Data from the field. Time is one of the main mechanisms through which WoW fosters players to develop new behaviors and habits. I became aware of the importance of the WoW’s temporal structure only after two years of play, when I realized that my whole day schedule was almost completely shaped by that of my guild. The rhythms of my days, sequences of meals, sleep, study, were progressively substituted by the pace of my guild’s life, with its farming, questing and raiding times (Rapp, 2017b).

Understanding why and how WoW’s ‘temporal design’ is so effective in shaping players’ habits, and how it could be transferred to other domains, required me a great theoretical effort. Time in WoW entails multiple impacts on the players’ in-game life, so that it is difficult to bring it back to a unique perspective. Specific theoretical approaches, here, can enlighten only a single facet of a phenomenon that remains irreducible to a univocal interpretation. In this case, much of my work as an ethno-designer was to find and use those theories capable of reading WoW’s time design at multiple levels.

One of the modalities through which WoW affects players’ time, and through it their behavior, is by designing the reward time schedules. Such schedules have a variety of consequences, which, nonetheless, are hard to be distinguished and fully clarified without a theoretical support. Applied Behavioral Analysis (ABA) is a theory that builds upon the principles of behavior discovered by the Skinnerian behaviorism (Cooper et al., 2007). This perspective sees behavior as controlled by variables primary located in the environment and offers theoretical tools to explain how reinforces like rewards affect individual’s behavior.

For instance, certain rewards push players to remain in the WoW's world for a huge amount of time, completely capturing their attention until their moment of delivery: Kershan, for example, a highly experienced player who has been playing WoW for five years, remembers how she spent innumerable hours waiting for the apparition of Ban'thalos, an extremely rare spirit beast, stating that in those moments she was completely glued to the screen. These kinds of rewards, in fact, are completely uncertain: if on the one hand they generate a continue state of arousal due to the impossibility of knowing exactly when they will be delivered, on the other hand they constrain players to long waits often characterized by frustration. Through the lens of ABA theory, they are reinforces delivered through variable interval schedules, resulting in a univocally directed temporality toward an end, which tends to produce a constant, stable rate of response (e.g., maintaining a high level of engagement waiting for the pet appearance). Similarly, rewards distributed through variable ratio schedules increase player's engagement: nonetheless, as a side effect, they enforce players to replay the game. These schedules typically do not produce any postreinforcement pause, due to the absence of information about when the next response will produce reinforcement, making the responding remain steady (Cooper et al., 2007). To obtain the most powerful gear, for example, players are encouraged to redo the same dungeon even tens of times in the hope that a certain boss will finally drop what they crave for. This framework, therefore, explains why specific rewards work in a particular way, and such explanation might be useful to reproduce their effects in other specific environments that can exploit such effects.

Although ABA represented an indispensable tool to inform part of my results, it could not produce an exhaustive understanding of all the different ways in which WoW exploits time design to drive players' behavior. Individualistic accounts alone are not able to situate the players' actions in the wider bundle of activities and rules that regulate many aspects of the WoW's time. I found then in the social practices approach an effective means for understanding temporality in WoW. Connecting to the work

of Wittgenstein, Bourdieu, Latour and Giddens, Reckwitz (2002) and Schatzki (2001) have proposed a conceptual framework for the analysis of everyday social practices. A social practice is a routinized type of behavior 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). Social practices theory allowed me to study and observe designs embedded in the practices in which they were situated, accounting for phenomena like the guild temporality that would have been hard to explain otherwise.

For example, raids require the co-presence of multiple players at the same time, so that they have to group themselves in organized groups, i.e., the guilds, and synchronize the rhythms of their daily activities. Players are free to select the group that best matches with their expectations, and this freedom makes them believe that they retain the power of setting their time of play. Nevertheless, when entering into a guild, players find an already established nexus of practices that set the pace of the daily living and prescribe the sequence of the activities that have to be performed within the group. Each guild has its own rules, which prescribe, through mutual expectations and social constraints, when and for how long its members have to guarantee their presence in the game. This results in a collective temporality that shapes players’ everyday actions and produces rituals and recurrent protocols that give order to the daily life (Southerton, 2009), yielding a commitment to the guild daily living and a long-standing engagement that may ‘*last for years*’, as Mytral emphasized. By understanding how and why the diverse forms of WoW’s temporality impacted on its players, I became able to envision new kinds of online communities, where the development of synchronized activities, requiring the co-presence of multiple users in certain moments, shapes habitual behaviors and gives them a regular rhythm (e.g., an application that makes the physical activity data of the user’s companions visible only from 6pm to

9pm can push them to regularly meet in the evening, when they can share insights related to their attempts to change behavior).

Methodological considerations. From the ethno-designer's perspective, theory represents not only a pragmatic tool for interpreting and grounding the considerations that she is going to make during the fieldwork. It is also a primary means for abstracting results coming from one domain and making them suitable to another one. Theories might help the ethno-designer discover regularities among different phenomena, generalizing findings coming from her personal experiences and participant observation: they provide concepts that have a wider applicability, as well as support her in identifying the most suitable context for certain design elements. As the examples above show, theories allowed me to distinguish phenomena apparently similar: the engagement resulting from rewards delivered through variable interval and ratio schedules differs from that elicited by rituals and mutual expectations, which is actually characterized by a personal dedication. This distinction allowed me to find the most suitable domains of applicability for specific design elements, strengthening the link between the original setting and the target domain. For instance, in a health behavior change context aimed at producing long-lasting changes in people's habits, a design capable of establishing collective routines is preferable to one addressed to individually reward users, since the dedication resulting from the former might better support the compliance needed for making the intervention successful. Therefore, designs exploiting co-presence and relying on collective endeavors might be more effective in producing the desired change than reinforcements delivered through variable interval schedules.

Instead, when the primary need is to change specific, and perhaps dysfunctional behaviors, intervening by designing different reward time schedules may be more effective. In this case, ABA theory provides a stronger theoretical scaffolding to distinguish and analyze different ways of prize delivering and define how the rewards should be designed to fit the target context. While the ethno-

designer's subjective experience provides insights 'from the inside' with respect to how schedules contribute to shape experience in different ways, ABA theory helps her formalize them in intervention programs and apply them to other domains.

To summarize, by adopting multiple theories, depending on the practical needs coming from the fieldwork, the ethno-designer is able to preserve the complexity of the designs she is studying and to firmly connect them to other domains.

5. DISCUSSION

The method I outlined above contributes to HCI and design process by showing how design research, and more specifically design ethnography, can produce implications for design that can be applicable to multiple domains, far removed from the setting in which the fieldwork took place. Design solutions have a tendency to be mimicked across products, designs, and domains. It is not uncommon that in the early phases of a design project a design competitive analysis is conducted, which is a standard practice within industry: the design features of competitor systems are analyzed and researched through various techniques and innovated on in order to elicit engagement and draw users from other platforms.

The ethno-design method somehow reminds this practice and uses ethnography to sound "rich" digital environments for discovering successful design elements that can inspire the design of novel features across other applications. This method allows to see the ethnographic fieldwork as a rich design resource for other designs, rather than a place where to study people's needs and practices to be satisfied and addressed in the subsequent design phases. The ethno-designer strives for understanding how specific design elements are experienced and emotionally lived in order to reproduce such experiences in other domains, to mimic great design solutions and adapt them to other contexts. In the

following, I will discuss some points that seem to be crucial when carrying out the ethno-design method.

5.1 Focusing on design elements

At a first sight, the ethno-design practice appears quite removed from both (virtual) ethnography in anthropology and design ethnography. Ethnographers in social sciences are commonly tied to a retrospective commitment to descriptive accuracy, in which lessons learned through observation and participation are recast as empirical material for subsequent analysis to expunge a form of scientific knowledge (Ingold, 2013): in other words their main goal is to generate and disseminate knowledge explaining the complexities of reality. On the other hand, traditional design ethnography aims to generate insights useful for design, but the attention of the design ethnographer is mainly focused on the study of social practices and people. The ethno-design method, instead, embraces fully the process of generating implications for design, which becomes a core component of the ethno-design practice, and is mostly interested in identifying and studying specific design elements, rather than exploring social and cultural matters.

Therefore, in what sense the ethno-designer is still a (design) ethnographer? The ethno-designer's vision is narrower with reference to ethnographers, since her gaze leaves apart the ambition of outlining a deep, holistic understanding of human social activity and culture in a given context. The ethno-design method is primarily interested in design elements and how they relate with humans, rather than in humans and how they relate with their environment (be either physical, social, cultural, or technological). Its end is not to develop a deeper understanding of human nature or contribute to human transformation of social relations (Tunstall, 2013), but to inspire novel designs. In other words, it starts from designs and ends in designs.

Nonetheless, the ethno-designer uses the theoretical and methodological tools of ethnography and fully immerses herself in a certain reality. In her perspective, the ‘design elements’ are nonhuman actors having a ‘material agency’ (Latour, 1993), at par with people that interact with them. As Haines (2017, p. 128) points out: ‘what would an ethnography focused on an AI perspective look like, as opposed to taking a human user perspective? It is not hard to imagine that in the future, we could reformulate the subjects and objects of study in ethnographic praxis in the technology industry to conduct research not just on the experiences of people interacting with systems, but on the experiences of intelligent systems interacting with people.’ The ethno-designer represents a step toward this direction where “systems” gain a central importance in the ethnographic practice. The ethnographic focus of the ethno-designer revolves around ‘digital objects’ that have a sort of ‘material agency’ (Latour, 1993) on their own and produce specific effects on users. Nonetheless, the ethno-designer is still interested in exploring how users experience the interaction with such elements because this knowledge is fundamental for envisioning novel designs that aim to reproduce the same (or similar) experiences in other environments.

The renunciation to outline a complete picture of the embedded culture and society of the world the ethno-designer is exploring may prevent her from being significantly surprised by what participants care about, missing to tie their practices and discourses to more general concepts like identity, life, and value. However, this issue might be mitigated by the long-term engagement in the field as well as by the development of long-term informant relationships. Even if the ethno-designer’s attention is directed to specific elements, the way of the fieldwork is carried out respects the rigor and the ‘rhythms’ of ‘traditional’ ethnography, requiring months, even years, to be conducted properly. During this period, she continuously develops her knowledge of the ‘world’, bumping into aspects that are not directly related to the design elements she wants to explore. This allows her to remain open to the unexpected,

to move her research questions in novel directions, to revise her previous results, and to go beyond the explicit words, as well as the apparent behavior, of the social actors she is observing.

Therefore, the ethno-designer is still an ethnographer in the sense that her gaze and way of conduct are fully ethnographic: she participates to the reality she is studying by experimenting on herself what happens in a certain digital environment; she establishes long-term rapports with people to understand what is happening in there; and she looks at design elements as they were social actors, attempting to identify the practices in which they are involved, “what they do”, and how they relate to the users that interact with them.

5.2 Transferring design elements to other domains

As a second point, the method proposed raises questions about the applicability and validity of the design elements found when transferred to other contexts. Will they maintain the same kinds of effects they had in their original framework? What kind of relationship exists between a given system and its parts? The ethno-designer somehow decomposes the wholeness of a design searching for specific aspects that could be applicable to other contexts. In doing so, she needs to individuate the elements that are more suitable to preserve their impact after the transferring. This suitability is connected with the relative independence of the elements found from the entire frame in which they are inserted: the more they can claim a circumscribed impact despite the relationships they have with other features of the system, as well as the system as a whole, the more is likely that their effects are due to their own functioning, apart from the role of the wider environment.

To assess such independence the ethno-designer can rely on a variety of techniques, differentially comparing the different effects that specific elements may have on different users, or at different times. For example, singular design elements may have been added later and have produced incremental and/or delimited effects which could strengthen the hypothesis of their relative self-sufficiency. In over

ten years of patches and expansions, for instance, WoW has introduced many changes in the game. Eklund and Johansson (2013) highlighted that the introduction of functionalities like the raid finder profoundly altered the ways players collaborate in pick-up groups. This change, nevertheless, had impacts only on those game parts aimed at supporting players in finding companions for raiding, by speeding up the recruiting process, while having minor or no effects on players belonging to stable guilds, who are used to play with their guild's friends.

Alternatively, the ethno-designer can explore whether specific design elements are effective only on specific kinds of users. In WoW, many players show to be motivated and influenced only by certain aspects of the game, and not by others. Such diverse attitudes toward singular elements may be a cue that their effectiveness is related to the user's characteristics, rather than to the peculiarity of the framework in which they are inserted. For example, all the interviewed leaders (hardcore gamers) reported that the guild life was their main reason to remain in the game. However, many emphasized how the opportunity of entering in a guild, with its hierarchical structure and its reputation mechanisms, motivated them to play here as in other games, like Guild Wars 2. This can strengthen the hypothesis that such game elements could maintain their efficacy in different environments, if well implemented and addressed to those users that are sensitive to them.

Despite these cues, the ethno-designer cannot be certain that the elements she will find in the field will produce the same kind of experience when transplanted in other contexts: the possibility that their efficacy might be strictly tied to the frame in which they were originally inserted still remains. For this, the ethno-designer can produce only design hypotheses that need further empirical assessments to prove their validity. The inspirations she could derive from the fieldwork may lead to the formulation of design guidelines for other designers, or the creation of new systems, which nevertheless should be evaluated on the field to account for their efficacy, through e.g. prototype design, participatory design sessions, and user tests.

5.3 Relying on subjectivity

My emphasis on reflexivity and autoethnography comes from the need of changing the dominant form of ethnographic text within HCI, namely the realist ethnography (Rode, 2011). I claim that subjectivity plays a primarily role in the whole ethno-designer's work. In this perspective, a question arises: how is it avoided that ethno-design becomes a new kind of 'I'-design, where designs are made from the perspective of the design researcher, rather than from the perspective of future users, the latter being the reason for introducing ethnography into HCI design research?

On the one hand, valuing the researcher's subjectivity, as I have already noticed, does not mean that her work aims to produce a solipsistic account of reality: her 'phenomenological' recount of the observed phenomena is intrinsically inter-subjective, since her interpretations are made of the constant confrontations with the other social actors and represent a consequence of being embedded in the social practices she is studying. The ethno-designer's lived experience is constantly compared against the information collected through the fieldwork. In other words, the ethno-designer seeks to find correspondences between her private experiences and those of the other players (captured through observation and interviews), identifying "typical ways" of experiencing certain game design elements, across the individual differences that are inevitably influenced by the particular background of both the ethnographer and the users she recruits. This method allows her to point out the 'typical effects' of the design elements she is studying, also emphasizing exceptions and variances from the 'trends'. To this aim, the role of theory is fundamental, as it enables the ethnographer to further generalize beyond the single experiences and explain the non-typical cases, identifying those contextual and individual factors that may impact on how certain design elements are experienced by specific users.

On the other hand, autoethnography might lead to a deeper empathic understanding for the users' practices (Ljungblad, 2009), since the fieldworker primarily considers what she 'lives' in the field,

gaining a knowledge ‘from the inside’ of the *erlebnisse* experienced by those who share her same reality. In this perspective, envisioning and suggesting new designs can be grounded in what individuals ‘see’ and value in the design elements they engage with, as well as in the impacts that such designs produce on their subjectivity.

The ethno-designer, therefore, builds her designs not on her individual perspective as a designer, but on the inter-subjective ‘I’ constructed during the fieldwork, assuming that it will be similar to that of the future users she aims to affect. As we have seen, this assumption is informed by the knowledge she has of the target domain. Nonetheless, she cannot exclude that her research is exempt from biases. Ethnographic research is fundamentally subjective and, therefore, is inevitably self-biased and self-fulfilling due in part to confirmation bias. As the ethno-designer figure somehow reunites different roles that are often separate in the design practice, that of the ethnographer who creates knowledge about human behavior and needs and that of those who are in charge to seek design implications, these biases may be even more pronounced. To address this issue, a phase of “confrontation” with other design researchers and designers, who may be in charge to put into practice the design implications formulated in the fieldwork, might be needed. Moreover, the ethno-designer may seek the help of the ‘participants’ that are engaged both during the fieldwork and in the research in the target domains: the participant researchers strategy represents an important means to ‘disconfirm’ what the ethno-designer has found, theorized and envisioned, by sharing with participants preliminary hypotheses, theories and design implications and receiving feedback about the interpretations and solutions she has developed.

This said, the ethno-designer does not aim to produce an ‘objective’ account of the reality she studies in line with the Evidence Based research movement (Goldthorpe, 2000; Runciman, 1983), which sustains the need of evaluating the ethnographic work with the same criteria adopted by the scientific research in the quantitative and hard sciences. Rather, she acknowledges the fundamental bias of every ethnographic research, which remains fundamentally subjective, and accounts for it through

the transparent exposition of all her theoretical choices, presuppositions, procedures and interpretations that drove her work on the field using the reflexive recounting (Cardano, 2009).

5.4 Choosing diverse theories

The ethno-designer might employ different theoretical approaches, which could appear even opposite at first sight. By being driven by the goal of understanding how specific designs work, and not of producing a coherent account of human social activity, the ethno-designer can use heterogeneous theories depending on the phenomenon she has to explain. When I had to account for time in WoW, for example, I decided to draw on ABA and social practices. In a certain way, practice theory actively aims to debunk behaviorism, and employing them together may give the impression of being contradictory: how are the insights each suggests to be integrated or weighed against each other? It is duty of the ethno-designer, through the reflexive recounting, to provide an explanation and convince the reader that her choices are valid. In the example reported above, the two theories do not clash each other because they refer to different levels of analysis: ABA focuses on individuals, whereas social practice theory deals with impersonal and longer-term phenomena like practices. So, even if they are used separately to account for two different design elements, rewards and guilds, taken together they can provide a multifaceted explanation of the wider aspect of time design in WoW.

Another point is worthy to be explored. How does the ethno-designer decide which of the theories leads to the greatest insight? The answer lies in the knowledge of the observed phenomenon she actively constructed during the fieldwork. There are no absolute criteria for choosing a specific theory rather than another. The ethno-designer develops an empirical and subjective understanding of the designs she is studying, and such knowledge is the main driver for selecting a specific theory. Again, the reflexive recounting will be in charge of defending this choice by providing convincing arguments and anticipating possible objections. For example, most ethnographers would consider behaviorism to

be essentially anti-ethnographic (because it creates explanations based solely on external views of actors and without taking into account social meanings and interactions), and thus the use of ABA as a theoretical lens for ethnography problematic. During the fieldwork, I became aware that ‘internalistic’ theories, such as the expectancy-value theory (Wigfield et al., 2009), could explain why players were motivated to pursue specific rewards, but they were less useful to account for how the temporal modulation of reward delivery impacted on players. Nevertheless, in my personal experience as a player I found ‘time’ as a fundamental aspect to be clarified for understanding the high effectiveness of WoW’s rewards; and ABA was the unique approach capable of accounting for its role, providing a fine-grained description of different temporal mechanisms and their effects on individuals’ actions.

5.5 Ethics

A final point worthy to be discussed is related to the ethics of the ethno-design work. By transferring design elements from one environment to another, the ethno-designer cannot avoid asking herself not only whether it could be done, but also whether it should be done. Actually, the employment of certain design elements may be licit and justifiable in certain contexts, but questionable in others. For example, exploring the changing technological configuration of gambling activities in Las Vegas, Dow Schüll (2012) emphasizes how certain designs may be deliberately created for engendering an extreme involvement in their users, so as to support the development of states of addiction. This is also the case of many entertainment games, such as the MMORPGs that I investigated in my fieldwork, which have been reported to be the leading culprit of video game addiction (Council on Science and Public Health, 2007; Lee et al., 2007). If the employment of such design techniques may be ethically questionable even in their original contexts, where players deliberately choose to and actually search for being deeply engaged, they may raise much more moral concerns when applied to other situations. Despite

McGonigal's (McGonigal, 2011) utopian vision of how games could change reality to the better when transferred into everyday behaviors, dystopian developments can also be foreseen (Schell, 2010).

Highly effective design elements, such as those findable in games, may be used, for example, to induce unnecessary 'needs', and lock users in a somehow self-perpetuating cycle of work and consumption. They may also make the individuals less aware of the reasons and responsibilities of their own behaviors, dragging them into a spiral of engagement and entertainment that may obscure their real goals. In this case the ethno-designer should ask herself: Are there fields in which they should not be employed? Is making an experience more enjoyable, an intervention more effective, and a task more engaging always a desirable outcome? What are the unexpected impacts that they could produce on users (e.g. addiction, isolation, escapism, hedonism)? Are they implicitly reinforcing some aspects of our society (e.g. consumerism, individualism)?

Transferring elements from one field to another may induce unpredictable side-effects, long-term and systemic consequences on individuals and society that the ethno-designer should try to take into account. Linehan et al. (2014) emphasized that HCI researchers do not commonly produce critical reflections on the potential future consequences of their designs. But technology and design do have long-term impacts, which are emergent, complex, ambiguous and connected to other changes (Nathan et al., 2008; Rapp, 2019). And the ethno-designer cannot uncritically accept the assumptions underlying her work, such as that making an experience more enjoyable, effective and engaging is always and per se a valuable outcome; or, in the example that I reported here, that a game frame is suitable to every domains and that it will turn the experience to the better. To explore such issues, the ethno-designer can look at design techniques that refer to the critical and speculative design approach (Dunne and Raby, 2013; Bardzell et al., 2012; Baumer et al., 2014). For example, critical designs (e.g. Purpura et al., 2011) may represent a useful tool to envision how specific design elements may impact on the long term on society, and how ethical concerns could develop from the transferring of a 'best

design practice’ from one field to another. The ethno-designer could then usefully employ them to explore the future consequences of her work and envision whether the design elements she is finding and adapting are ethically suitable or not to another context.

6. CONCLUSION

The main contribution of this article to HCI is to outline a novel role for design research and, more specifically, for design ethnography: instead of producing design implications with a ‘local applicability’, thus being valid for the particular context, domain, or type of users that have been originally investigated through the ethnographic work, design ethnography may aim to use the fieldwork for creating implications across multiple domains, even far removed from the original setting of the ethnographic research. The ethno-designer, introduced in this article, connects different realities with the aim of transferring, after adequate adaptations, successful design elements from one field to another. Autoethnography and reflexivity can help the ethno-designer understand the designs she is investigating from the inside, clarifying how specific design elements impact on the users’ subjectivity. While theories can ground her findings, supporting her in generalizing them and making them suitable for other domains.

In this perspective, the fieldwork is not only a setting where to understand the values, needs and practices of social actors and potential users; but it is an incessant source of inspiration for identifying specific designs, understanding how they work and their effects, and producing design implications that mimic best design practices. From a method usually employed in the early phases of a project for grounding the design work in that specific project, design ethnography becomes a means for continuously inspiring novel designs across multiple design projects. I hope that the methodological

tools outlined in this article will stimulate others to extend this line of research further, identifying “rich contexts” where to find design elements that could be usefully employed in other domains.

REFERENCES

- Abu-Lughod, L. (1991). Writing against culture. In R.G. Fox (ed.): *Recapturing Anthropology: Working in the Present*. Santa Fe, New Mexico: School of American Research Press, pp. 137-62.
- Ackerman, M. (2000). The Intellectual Challenge of CSCW: The Gap Between Social Requirements and Technical Feasibility. *Human-Computer Interaction*, vol. 15, pp. 179-203.
- Altheide, D. L., & Johnson, J. (1994). Criteria for Assessing Interpretive Validity in Qualitative Research. In N.K. Denzin and Y.S. Lincoln (eds.): *Handbook of Qualitative Research*. London: Sage, pp. 485–99.
- Andersen, T. (2013). Medication management in the making: On ethnography-design relations. CSCW'13. Proceedings of the Computer-Supported Cooperative Work Conference, San Antonio, Texas, USA, 23-27 February 2013. New York: ACM, pp. 1103-1112.
- Anteby, M. (2008). *Moral gray zones: Side productions, identity, and regulation in an aeronautic plant*. Princeton, NJ: Princeton University Press.
- Bardzell, S., Bardzell, J., Forlizzi, J., Zimmerman, J., & Antanitis, J. (2012). Critical design and critical theory: the challenge of designing for provocation. DIS'12. Proceedings of the Designing Interactive Systems Conference, Newcastle Upon Tyne, United Kingdom, 11-15 June 2012. New York: ACM, pp. 288-297.
- Barkan, S. (2011). *Sociology: Understanding and Changing the Social World*. (2011)
- Baumer, E., Khovanskaya, V., Matthews, M., Reynolds, L., Schwanda Sosik, V., & Gay, G. (2014). Reviewing reflection: on the use of reflection in interactive system design. DIS'14. Proceedings of the Designing Interactive Systems Conference, Vancouver, Canada, 21-25 June 2014. New York:

ACM, pp. 93-102.

- Bentley F., Tollmar, K., Stephenson, P., Levy, L., Jones, B., Robertson, S., Price, E., Catrambone, R., & Wilson, J. (2013). Health mashups: presenting statistical patterns between wellbeing data and context in natural language to promote behavior change. *ACM Transactions on Computer-Human Interaction*, vol. 20, no. 5, pp. 30:1-30:27.
- Berengueres, J., Alsuwairi, F., Zaki, N., & Ng, T. (2013). Gamification of a recycle bin with emoticons. *HRI '13. Proceedings of the ACM/IEEE international conference on Human-robot interaction 2013*. Piscataway, New Jersey: IEEE Press, pp. 83-84.
- Boellstorff, T. (2008). *Coming of Age in Second Life: an Anthropologist Explores the Virtual Human*. Princeton, New Jersey: Princeton University Press.
- Boellstorff, T., Nardi, B., Pearce, C., Taylor, T. L. (2012). *Ethnography and Virtual Worlds: A Handbook of Method*. Princeton, New Jersey: Princeton University Press.
- Bowen, G. (2008). Naturalistic inquiry and the saturation concept: A research note. *Qualitative Research*, vol. 8, no. 1, pp. 137-152.
- Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, vol. 3, pp. 77-101.
- Calleja, G. (2007). *Digital games as designed experience: Reframing the concept of immersion*. Ph.D. dissertation, Victoria University of Wellington, Wellington, New Zealand.
- Cardano, M. (2009). *Ethnography and Reflexivity. Notes on the Construction of Objectivity*. *Ethnographic Research, NetPaper del Dipartimento di scienze sociali*, vol. 1/2009.
- Choe, E. K., Lee, N. B., Lee, B., Pratt, W., and Kientz, J. A. (2014). Understanding quantified-selfers' practices in collecting and exploring personal data. *CHI'14. Proceedings of the SIGCHI Conference on Human Factors in Computing Systems*, Toronto, Canada, 26 April – 1 May 2014. New York: ACM, pp. 703-712.

- Cooper, J. O., Heron, T., & Heward, W. L. (2007). *Applied behavior analysis* (2nd ed.). Upper Saddle River, New Jersey: Prentice Hall.
- Cooper, K. (2010). Go with the flow: engagement factors for learning in Second Life. SpringSim'10. Proceedings of the 2010 Spring Simulation Multiconference, Orlando, Florida, 11-15 April, 2010. San Diego, California: Society for Computer Simulation International.
- Council on Science and Public Health. (2007). Emotional and behavioral effects, including addictive potential, of video games (No. CSAPH Report 12-A-07). <http://psychcentral.com/blog/images/csaph12a07.pdf>. Accessed 16 November 2016.
- Crabtree, A., O'Brien, J., Nichols, D., Rouncefield, M., and Twidale, M. Ethnomethodologically informed ethnography and information systems design. *JASIST*, 51, 7, (2000), 666-6.
- Crabtree, A., Hemmings, T. & Rodden, T. (2003). The Social Construction of Displays. *Coordinate Displays and Ecologically Distributed Networks*. In K. O'Hara, et al (Eds.) In *Public and situated displays: social and interactional aspects of shared*. Netherlands: Kluwer, pp. 170-190.
- Crabtree, A., Rodden, T., Tolmie, P., & Button, G. (2009). Ethnography considered harmful. CHI'09. Proceedings of the SIGCHI Conference on Human Factors in Computing Systems, Boston, Massachusetts, 4-9 April 2009. New York: ACM, pp. 879-888.
- Cross, N. (2006). *Designerly Ways of Knowing*. London: Springer.
- Cunningham, S. J., and Jones, M. (2005). Autoethnography: a tool for practice and education. CHINZ'05. Proceedings of the 6th ACM SIGCHI New Zealand chapter's international conference on Computer-human interaction: making CHI natural, Auckland, New Zealand, 7-8 July 2005. New York: ACM, pp. 1-8.
- Dam, R. F. & Siang, T. Y. (2020). 5 Stages in the Design Thinking Process. Interaction Design Foundation. Available at <https://www.interaction-design.org/literature/article/5-stages-in-the-design-thinking-process> (Last access 20/09/2020).

- Debeauvais, T., Nardi, B., Schiano, D. J., Ducheneaut, N., and Yee, N. (2011). If you build it they might stay: retention mechanisms in World of Warcraft. FDG'11. Proceedings of the 6th International Conference on Foundations of Digital Games, Bordeaux, France, 29 June - 1 July, 2011. New York: ACM, pp. 180-187.
- Deci, E. L. & Ryan, R. M. (2000). The 'what' and 'why' of goal pursuit: Human needs and the self-determination of behavior. *Psychological Inquiry*, vol. 11, pp. 227-268.
- Audrey Desjardins, Heidi R. Biggs, Cayla Key, and Jeremy E. Viny. 2020. IoT Data in the Home: Observing Entanglements and Drawing New Encounters. In Proceedings of the 2020 CHI Conference on Human Factors in Computing Systems (CHI '20). Association for Computing Machinery, New York, NY, USA, 1–13. DOI:<https://doi.org/10.1145/3313831.3376342>
- Deterding, S., Dixon, D., Khaled, R. and Nacke, L. (2011). From game design elements to gamefulness: defining 'gamification'. MindTrek'11. Proceedings of the 15th International Academic MindTrek Conference: Envisioning Future Media Environments, Tampere, Finland, 28-30 September 2011. New York: ACM, pp. 9-15.
- Dew; K., W. and Rosner, D. K. (2018). Lessons from the Woodshop: Cultivating Design with Living Materials. In Proceedings of the 2018 CHI Conference on Human Factors in Computing Systems (CHI '18). Association for Computing Machinery, New York, NY, USA, Paper 585, 1–12.
- Dunne & Raby (2013). *Speculative Everything: Design, Fiction, and Social Dreaming*. Cambridge, Massachusetts: MIT Press.
- Ellis, C., & Bochner, A. (2000). Autoethnography, personal narrative, and personal reflexivity. In N.K. Denzin and Y.S. Lincoln (eds.): *Handbook of Qualitative Research* 2nd ed.. Thousand Oaks, California: Sage, pp. 733-768.
- Enrique Encinas, Mark Blythe, Shaun Lawson, John Vines, Jayne Wallace, and Pam Briggs. 2018. Making Problems in Design Research: The Case of Teen Shoplifters on Tumblr. In Proceedings of

- the 2018 CHI Conference on Human Factors in Computing Systems (CHI '18). Association for Computing Machinery, New York, NY, USA, Paper 72, 1–12.
DOI:<https://doi.org/10.1145/3173574.3173646>
- Feuston; J. L. & Piper, A. M. (2019). Everyday Experiences: Small Stories and Mental Illness on Instagram. In Proceedings of the 2019 CHI Conference on Human Factors in Computing Systems (CHI '19). Association for Computing Machinery, New York, NY, USA, Paper 265, 1–14.
DOI:<https://doi.org/10.1145/3290605.3300495>
- Fish, F. E., Weber, P. W., Murray, M. M., & Howle, L. E. (2011). The Tubercles on Humpback Whales' Flippers: Application of Bio-Inspired Technology, Integrative and Comparative Biology, Volume 51, Issue 1, July 2011, Pages 203–213.
- Floreano, D. & Mattiussi, C. (2008). Bio-Inspired Artificial Intelligence: Theories, Methods, and Technologies. The MIT Press.
- Foley, S., Pantidi, N., and McCarthy, J. (2019). Care and Design: An Ethnography of Mutual Recognition in the Context of Advanced Dementia. In Proceedings of the 2019 CHI Conference on Human Factors in Computing Systems (CHI '19). Association for Computing Machinery, New York, NY, USA, Paper 610, 1–15.
- Geertz, Clifford (1973). The Interpretation Of Cultures. New York: Basic.
- Gobo, G. (2008). Re-conceptualizing generalization. Old issues in a new frame. In P. Alasuutari; J. Brannen; and L. Bickman (eds.): The SAGE Handbook of Social Research Methods. London: Sage, pp. 193-213.
- Goffman, Erving (1961). Asylums. New York: Anchor.
- Goldthorpe, J. H. (2000). On Sociology. Numbers, narratives and the integration of research and theory. Oxford: Oxford University Press.

- Gruning, J. & Lindley, S. (2016). Things We Own Together: Sharing Possessions at Home. ACM Press, 1176–118
- Halse, J.. (2008). Design Anthropology: Borderline Experiments with Participation, Performance and Situated Intervention. PhD dissertation, IT University Copenhagen
- Halse, J. (2013). Ethnographies of the Possible. In W. Gunn; T. Otto; and R. C. Smith (Eds.) Design Anthropology: Theory and Practice. London and New York: Bloomsbury Academic, pp. 180-196.
- Haynes, S. R., Carroll, J. M., Kannampallil, T., Xiao, L., & Bach, P. M. (2009). Design research as explanation: perceptions in the field. In Proceedings of the SIGCHI Conference on Human Factors in Computing Systems (CHI '09). Association for Computing Machinery, New York, NY, USA, 1121–1130. DOI:<https://doi.org/10.1145/1518701.1518873>
- Heidegger, Martin. (1982). The Basic Problems of Phenomenology. Bloomington: Indiana University Press.
- Hine, C. (2000). Virtual Ethnography. Thousand Oaks, California: Sage Publications Ltd.
- Hine, C. (2008). Overview: Virtual ethnography: modes, varieties, affordances. In N. Fielding; R.M. Lee; and G. Blank (eds.): The SAGE Handbook of Online Research Methods. London: Sage.
- Husserl, E.. (1976). The crisis of European sciences and transcendental phenomenology. An introduction to phenomenology. Evanston: Northwestern University Press.
- Ingold, T. (2013). Making. Anthropology, Archeology, Art and Architecture. New York: Routledge.
- Johnson, R., Rogers, Y, der Linden, J., & Bianchi-Berthouze, N. (2012). Being in the thick of in-the-wild studies: the challenges and insights of researcher participation. CHI'14. Proceedings of the SIGCHI Conference on Human Factors in Computing Systems, New York: ACM, pp. 1135-1144.
- Khovanskaya, V., Sengers, P., Mazmanian, M., & Darrah, C. (2017). Reworking the Gaps between Design and Ethnography. CHI'17. Proceedings of the 2017 CHI Conference on Human Factors in Computing Systems. Denver, CO, USA, 6-11 May, 2017. New York: ACM, pp. 5373-5385.

- Kozinets, R. V. (2001). Utopian enterprise: articulating the meanings of Star Trek's culture of consumption. *Journal of Consumer Research*, vol. 28, pp. 67-88.
- Krause-Jensen, J. (2010). *Flexible firm: The design of culture at Bang & Olufsen*. New York: Berghahn Books
- Krippendorff, K. (2007). Design research, an oxymoron?. 67-80. In Ralf Michel (Ed.). *Design Research; Essays and Selected Projects*. Zürich: Birkhäuser Verlag, 2007.
- Latour, B. (1992). Where are the Missing Masses? The Sociology of a Few Mundane Artifacts. In W.E. Bijker; and J. Law, (eds.): *Shaping Technology/Building Society: Studies in Sociotechnical Change*. Cambridge, Massachusetts: MIT Press, pp. 225-258.
- Lee, M.-S., et al. (2007). Characteristics of Internet use in relation to game genre in Korean adolescents. *CyberPsychology and Behavior*, vol. 10, no. 2, pp. 278–285.
- Li, I., Dey, A., & Forlizzi, J. (2010). A stage-based model of personal informatics systems. CHI'10. *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems*, Atlanta, Georgia, 10-15 April 2010. New York: ACM, pp. 557-566.
- Li, I., Dey, A., & Forlizzi, J. (2011). Understanding my data myself: Supporting self-reflection with Ubicomp technologies. *UbiComp '11: Proceedings of the 13th international conference on Ubiquitous computing*, Beijing, China, 17-21 September 2011. New York: ACM, pp. 405-414.
- Ljungblad S. (2009). Passive photography from a creative perspective: 'if I would just shoot the same thing for seven days, it's like... What's the point?'. CHI'09. *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems*, Boston, MA, USA, 4-9 April 2009. New York: ACM, pp. 829–838.
- Ljungblad S. & Holmquist, L. (2007). Transfer scenarios: grounding innovation with marginal practices. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems (CHI '07)*. Association for Computing Machinery, New York, NY, USA, 737–746.

DOI:<https://doi.org/10.1145/1240624.1240738>

- Linehan, C., et al. (2014). Alternate endings: using fiction to explore design futures. CHI'14 Extended Abstracts on Human Factors in Computing Systems, Toronto, Canada, 26 April – 1 May 2014. New York: ACM, pp. 45-48.
- Lucero, A. (2018). Living Without a Mobile Phone: An Autoethnography. In Proceedings of the 2018 Designing Interactive Systems Conference (DIS '18). Association for Computing Machinery, New York, NY, USA, 765–776.
- Lurie-Luke, E. (2014). Product and technology innovation: What can biomimicry inspire?, *Biotechnology Advances*, 32(8), 1494-1505.
- McGonigal, J. (2011). *Reality is Broken: Why Games Make Us Better and How They Can Change the World*. New York: Penguin.
- Lysloff, R. T. A. (2003). Musical community on the Internet: An on-line ethnography. *Cultural Anthropology*, vol. 18, no. 2, pp. 233-63.
- Marshall, M. N. (1996). Sampling for qualitative research. *Family Practice*, vol. 13, no. 6, pp. 522-525.
- Morschheuser, B., Riar, M., Hamari, J., & Maedche, A. (2017). How games induce cooperation? A study on the relationship between game features and we-intentions in an augmented reality game. *Computers in Human Behavior*, 77, 169-183.
- Millen, D. R. (2000). Rapid Ethnography: Time Deepening Strategies for HCI Field Research. DIS'00. Proceedings of the 3rd conference on Designing interactive systems: processes, practices, methods, and techniques, Brooklyn, New York, USA, 17-19 August 2000. New York: ACM, pp. 280-286.
- Miller, D. & Slater, D. (2000). *The Internet: An ethnographic approach*. Oxford & New York: Berg.
- Nabeshima, J., Saraiji, Y, & Minamizawa, K. (2019). Prosthetic Tail: Artificial Anthropomorphic Tail for Extending Innate Body Functions. In Proceedings of the 10th Augmented Human International Conference 2019 (AH2019). Association for Computing Machinery, New York, NY, USA, Article

36, 1–4.

Nardi, Bonnie A.; Diane J. Schiano; and Michelle Gumbrecht (2004). Blogging as social activity, or, would you let 900 million people read your diary?. CSCW '04. Proceedings of the 2004 ACM conference on Computer supported cooperative work, Chicago, Illinois, 6-10 November 2004. New York: ACM, pp. 222-231.

Nardi, B. A., & Harris, J. (2006). Strangers and friends: collaborative play in world of warcraft. CSCW '06. Proceedings of the 2006 ACM conference on Computer supported cooperative work, Banff, Canada, 4-8 November 2006. New York: ACM, pp. 149-158.

Nathan, L. P., Friedman, B., Klasnja, P., Kane, S. K., & Miller, J. K. (2008). Envisioning systemic effects on persons and society throughout interactive system design. DIS'08. Proceedings of the 7th ACM conference on Designing interactive systems, Cape Town, South Africa, 25-27 February 2008. New York: ACM, pp. 1-10.

Newell, B. R. & Shanks, D. R. (2014). Unconscious influences on decision making. Behavioral and Brain Sciences, vol. 37, no. 1, pp. 1-61.

Orgad, S. (2005). From Online to Offline and Back: Moving from Online to Offline Relationships with Research Informants. In C. Hine (ed.): Virtual Methods: Issues in Social Research on the Internet. Oxford: Berg, pp. 51-66.

Ozkan, B.. (2015). Fall: an interactive garment that mimics nature's responsive system of defoliation through an embedded electronic mechanism. In Adjunct Proceedings of the 2015 ACM International Joint Conference on Pervasive and Ubiquitous Computing and Proceedings of the 2015 ACM International Symposium on Wearable Computers (UbiComp/ISWC'15 Adjunct). Association for Computing Machinery, New York, NY, USA, 617–621.

Park, J., Blythe, M., Monk, A., & Grayson, D. (2006). Sharable digital TV: relating ethnography to design through un-useless product suggestions. CHI'06. Proceedings of the SIGCHI Conference on

- Human Factors in Computing Systems, Montréal, Canada, 24-27 April 2006. New York: ACM, pp. 1199-1204.
- Pierce, J., Strengers, Y., Sengers, P. & Bødker, S. (2008). Introduction to the special issue on practice-oriented approaches to sustainable HCI. *ACM Transactions on Computer-Human Interaction*, vol. 20 no. 4, Article 20, September 2008, 8 pages.
- Pink, S., Mackley, K. L., Mitchell, V., Hanratty, M., Escobar-Tello, C., Bhamra, T., and Morosanu, R. (2008). Applying the lens of sensory ethnography to sustainable HCI. *ACM Transactions on Computer-Human Interaction*, vol. 20, no. 4, Article 25, September 2008, 18 pages.
- Pink, S., Caminha C. S., de Souza, A. P., Zilse, R., & Gomes, A. S. (2017). Design Ethnography for Screenless Interaction Style: hands-on and no-hands in early morning routines. In *Proceedings of the XVI Brazilian Symposium on Human Factors in Computing Systems (IHC 2017)*. Association for Computing Machinery, New York, NY, USA, Article 20, 1–10.
- Purpura, S., Schwanda, V., Williams, K., Stubler, W., and Sengers, P. (2011). Fit4life: the design of a persuasive technology promoting healthy behavior and ideal weight. *CHI'11. Proceedings of the SIGCHI Conference on Human Factors in Computing Systems*, Vancouver, Canada, 7-12 May 2011. New York: ACM, pp. 423-432.
- Qamar, I. P. S., Stawarz, K., Robinson, S., Goguey, A., Coutrix, C. & Roudaut, A. (2020). Morphino: A Nature-Inspired Tool for the Design of Shape-Changing Interfaces. In *Proceedings of the 2020 ACM Designing Interactive Systems Conference (DIS '20)*. Association for Computing Machinery, New York, NY, USA, 1943–1958. DOI:<https://doi.org/10.1145/3357236.3395453>
- Rapp, A. (2017a). Designing interactive systems through a game lens: An ethnographic approach. *Computers in human behavior*, 71, 455-468
- Rapp, A. (2017b). Drawing Inspiration from World of Warcraft: Gamification Design Elements for Behavior Change Technologies. *Interacting with computers*, 29(5), 648-678

- Rapp, A. (2017c). From games to gamification: A classification of rewards in World of Warcraft for the design of gamified systems. *Simulation & Gaming*, 48(3), 381-401
- Rapp, A., Hopfgartner, F., Hamari, J., Linehan, C., Cena, F. (2019). Strengthening gamification studies: Current trends and future opportunities of gamification research. *International Journal of Human-Computer Studies*, 127, 1-6.
- Rapp, A., Cena, F. (2016). Personal Informatics for Everyday Life: How Users without Prior Self-Tracking Experience Engage with Personal Data. *International Journal of Human-Computer Studies*, 94, 1–17.
- Rapp, A., Cena, F., Gena, C., Marcengo, A., Console, L. (2016). Using game mechanics for field evaluation of prototype social applications: a novel methodology. *Behaviour & Information Technology*, 35(3), 184-195.
- Rapp, A. (2018). Social game elements in World of Warcraft: Interpersonal relations, groups and organizations for gamification design. *International Journal of Human-Computer Interaction*, 34(8), 759-773.
- Rapp, A. (2019). Design fictions for behaviour change: exploring the long-term impacts of technology through the creation of fictional future prototypes. *Behaviour & Information Technology*, 38(3), 244-272.
- Rapp, A., Tirassa, M. (2017). Know Thyself: A theory of the self for Personal Informatics. *Human-Computer Interaction*, 32 (5-6), 335-380.
- Randall, D., & Rouncefield, M. (2017). Ethnographic Approach to Design. *The Wiley Handbook of Human Computer Interaction*, 125-141.
- Reckwitz, A. (2002). Toward a theory of social practices. A development in culturalist theorizing. *European Journal of Social Theory*, vol. 5, pp. 243-63.
- Richardson, M. (1982). Being-in-the-Plaza versus Being-in-the-Market: Material Culture and the

- Construction of Social Reality. *American Ethnologist*, vol. 9, no. 2, pp. 421-436.
- Rode, J. A. (2011). Reflexivity in digital anthropology. CHI'11. Proceedings of the SIGCHI Conference on Human Factors in Computing Systems, Vancouver, Canada, 7-12 May 2011. New York: ACM, pp. 123-132.
- Rooksby, J., Rost, M., Morrison, A., & Chalmers; M. (2014). Personal tracking as lived informatics. CHI'14. Proceedings of the SIGCHI Conference on Human Factors in Computing Systems, Toronto, Canada, 26 April – 1 May 2014. New York: ACM, pp. 1163-1172.
- Rosner, D. K., Taylor, A. S. (2011) Antiquarian answers: book restoration as a resource for design. In: Proceedings of the SIGCHI conference on human factors in computing systems. ACM, New York, pp 2665–2668
- Runciman, W. G. (1983). *A Treatise on Social Theory*. Cambridge: Cambridge University Press.
- Salvador T., & Mateas, M. (1997). Introduction to design ethnography. In CHI '97 Extended Abstracts on Human Factors in Computing Systems (CHI EA '97). Association for Computing Machinery, New York, NY, USA, 166–167.
- Salvador, T., Bell, G., & Anderson, K. (1999). Design Ethnography. *Design Management Journal*. 10(4), 35-41.
- Sas, C., & Whittaker, S. (2013). Design for forgetting: disposing of digital possessions after a breakup. CHI'13. Proceedings of the SIGCHI Conference on Human Factors in Computing Systems, Paris, France, 27 April – 2 May 2013. New York: ACM, pp. 1823-1832.
- Sas, C., Whittaker, S., Dow, S., Forlizzi, J., and Zimmerman, J. 2014. Generating implications for design through design research. In Proceedings of the SIGCHI Conference on Human Factors in Computing Systems (CHI '14). Association for Computing Machinery, New York, NY, USA, 1971–1980.
- Schatzki, T. R. (2001). Introduction: Practice Theory. In T.R. Schatzki; K.K. Cetina; and E. von

- Savigny (eds.): *The Practice Turn in Contemporary Theory*. London: Routledge, pp. 1-14.
- Shin, J., Sepúlveda, G. A., & Odom, W. (2019). "Collective Wisdom": Inquiring into Collective Homes as a Site for HCI Design. In *Proceedings of the 2019 CHI Conference on Human Factors in Computing Systems (CHI '19)*. Association for Computing Machinery, New York, NY, USA, Paper 316, 1–14.
- Dow Schüll, N. (2012). *Addiction by Design: Machine Gambling in Las Vegas*. Princeton, New Jersey: Princeton University Press.
- Shove, E. (2003). *Comfort, Cleanliness and Convenience: The Social Organization of Normality*. Oxford: Berg.
- Shove, E. (2004). Changing human behaviour and lifestyle: A challenge for sustainable consumption. In L.A. Reisch; and I. Røpke (eds.): *The Ecological Economics of Consumption*. Cheltenham: Edward Elgar, pp. 111-31.
- Southerton, D. (2009). Temporal rhythms: comparing daily lives of 1937 with those of 2000 in the UK. In E. Shove; F. Trentmann; and R. Wilk (eds.): *Time, Consumption and Everyday Life: Practice, Materiality and Culture*. Oxford: Berg, pp. 49–63.
- Southerton, D., Diaz-Mendex, C., & Warde, A. (2012). Behavioural Change and the Temporal Ordering of Eating Practices: A UK–Spain Comparison. *International Journal of Sociology of Agriculture & Food*, vol. 19, no. 1, pp. 19–36.
- Stolterman, E. (2008). The nature of design practice and implications for interaction design research. *International Journal of Design*, vol. 2, no. 1, 55-65.
- Strengers, Y., Kennedy, J., Arcari, P., Nicholls, L., & Gregg, M. (2019). Protection, Productivity and Pleasure in the Smart Home: Emerging Expectations and Gendered Insights from Australian Early Adopters. In *Proceedings of the 2019 CHI Conference on Human Factors in Computing Systems (CHI '19)*. Association for Computing Machinery, New York, NY, USA, Paper 645, 1–13.

DOI:<https://doi.org/10.1145/3290605.3300875>

- Sundén, J. (2012). Desires at Play: On Closeness and Epistemological Uncertainty. *Games and Culture*, vol. 7, no. 2, pp. 164-184.
- Tanenbaum, J., Tanenbaum, K., Wakkary, R. (2012) Steampunk as design fiction. In: CHI 2012. ACM Press, Austin, pp 1583–1592
- Tanenbaum, J., Tanenbaum, K., 2018. Steampunk, Survivalism and Sex Toys: An Exploration of How and Why HCI Studies Peripheral Practices, in: Filimowicz, M., Tzankova, V. (Eds.), *New Directions in Third Wave Human-Computer Interaction: Volume 2 - Methodologies*. Springer, Cham, pp. 11–24.
- Taylor, J. L., Soro, A., Roe, P., Hong, A. L., & Brereton, M. (2018). “Debrief O’Clock”: Planning, Recording, and Making Sense of a Day in the Field in Design Research. In *Proceedings of the 2018 CHI Conference on Human Factors in Computing Systems (CHI '18)*. Association for Computing Machinery, New York, NY, USA, Paper 308, 1–14.
- Tedlock, B. (1991). From participant observation to the observation of participation: The emergence of narrative ethnography. *Journal of Anthropological Research*, vol. 47, no. 1, pp. 69-94.
- Tunstall, E. (2008). Design and Anthropological Theory: Trans-disciplinary Intersections in Ethical Design Praxis. *Proceedings of the 96th Annual Conference of the College Arts Association*, Dallas, TX, USA, 20-26 February, 2008. College Arts Association.
- Tunstall, E. (2013). Decolonizing Design Innovation: Design Anthropology, Critical Anthropology, and Indigenous Knowledge. In W. Gunn; T. Otto; and R. C. Smith (Eds.) *Design Anthropology: Theory and Practice*. London and New York: Bloomsbury Academic, pp. 232-250.
- Van Maanen, J. (1978). People processing: Strategies of organizational socialization. *Organizational Dynamics* 7, 1 (1978), 19 – 36.
- Van Maanen, J. (2011). *Tales from the field. On writing ethnography* (2nd. ed.). Chicago, Illinois: The

University of Chicago Press.

- Weber, M. (1904/1949). Objectivity in Social Science and Social Policy. In E.A. Shils; and H.A. Finch (eds. and trans.): *The Methodology of the Social Sciences*. New York: Free Press.
- Werbach, K. & Hunter, D. (2012). *For the Win: How Game Thinking Can Revolutionize Your Business*. Philadelphia, Pennsylvania: Wharton Digital Press.
- Wigfield, A., Tonks, S. & Klauda, S. (2009). Expectancy-value theory. In K.R. Wentzel; and A. Wigfield (eds): *Handbook of Motivation at School*. New York: Routledge, pp. 55-76.
- Yee, N. (2006). The demographics, motivations, and derived experiences of users of massively multi-user online graphical environments. *Presence: Teleoperators and Virtual Environments*, vol. 15, no. 3, June 2006, pp. 309-329.
- Zhang, C., Zou, W., Ma, L., Wangì, Z. (2020). Biologically inspired jumping robots: A comprehensive review, *Robotics and Autonomous Systems*, 124.
- Zimmerman, J., Forlizzi, J., & Evenson S. (2007). Research through design as a method for interaction design research in HCI. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems (CHI '07)*. Association for Computing Machinery, New York, NY, USA, 493–502. DOI:<https://doi.org/10.1145/1240624.1240704>

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