

Rethinking Age in HCI Through Anti-Ageist Playful Interactions

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ABSTRACT

Abundant HCI research exists on the many assistive technologies that provide help with everyday physical and cognitive tasks. However, while a purely assistive approach often casts aging people in passive roles, recent studies suggest that adults may be ‘flourishing’ way into advanced age, even though implicit ageist prejudices are difficult to eradicate. Negative age-related stereotypes are the hidden and yet urgent issue we address in this study. There is a clear opportunity for an anti-ageist perspective in HCI, an approach that we propose as complementary to assistive technologies: in addition to providing solutions *for* the aging population, we urgently call for designs *about* aging, to spark a conversation on age, raise awareness and ultimately contrast ageist stereotypes. We point at empathy as a key element to reconceptualize, at least in part, HCI’s contribution to research on aging. We present a design critique of two interactive pieces that, although not without flaws, suggest how future empathy-raising artifacts might be. Our analysis combines pragmatist aesthetics, interaction criticism and ludology, and yields four design tactics

(recurring configurations of significant elements) that are generative in bringing about broader design implications towards a different, empathy-based concept of aging in HCI.

1. INTRODUCTION

The increasing average life expectancy worldwide has urged researchers and policymakers to consider the opportunities and needs of an aging society (Kinsella *et al.*, 2001), and Human–Computer Interaction (HCI) has a long history of contributing to the quality of life of aging people¹. Although abundant age-related HCI research exists (Bouma, 1998; Durick *et al.*, 2013; Gerling *et al.*, 2010; Gregor *et al.*, 2002; Newell *et al.*, 2006; Pedell *et al.*, 2010; Worden *et al.*, 1997), much of it focuses on supporting aging adults in physical and social tasks. The development of accessibility guidelines and assistive technologies may be the best-known example (Bouma, 1998; Gajos *et al.*, 2008; Gregor *et al.*, 2002; Worden *et al.*, 1997), but many others exist². Whereas much age-related HCI research so far has foregrounded assistive objectives (Gerling *et al.*, 2010; Khosravi and Ghapanchi, 2016; Lancioni *et al.*, 2013; Lee *et al.*, 2012; Uzor and Baillie, 2014), here we will call for a different perspective.

While a purely assistive approach often casts aging people in passive roles, recent studies suggest that adults may be ‘flourishing’ way into advanced age (Blythe *et al.*, 2015; Rogers *et al.*, 2014), even though ageist prejudices are difficult to eradicate. Indeed, negative age-related stereotypes are the hidden and yet urgent issue we address here. Design is not culturally or politically neutral, and may serve a social agenda: in this case, we advocate for inclusion and understanding. Medical specialists (Beard and Bloom, 2014) and gerontologists (Walker, 2000) have denounced ageist prejudices as marginalizing for specific age-groups. HCI already serves aging people by providing assistance and should take a step further. There are a clear opportunity and an urgent need for an anti-ageist perspective in HCI, an approach that we propose as complementary to assistive technologies: in addition to solutions *for* the aging population, we urgently call for designs *about* aging, to spark a conversation on age, raise awareness and ultimately contrast ageist stereotypes.

¹ The negative connotations of ageist language, even in scientific papers, are well-known (Nuessel, 1982). Here, we consciously make an effort to use neutral expressions such as ‘aging population’ to minimize the bias that may be implicit in other terms.

² Among others, from preventive activities (Nacke *et al.*, 2009; Uzor and Baillie, 2014), to technologically-supported rehabilitation and physical therapy (Krichevets *et al.*, 1995; Villaverde *et al.*, 2013), and to the promotion of emotional wellbeing and sociality (Jung *et al.*, 2009; Pedell *et al.*, 2010; Tsai *et al.*, 2015).

This different kind of age-related HCI could make the natural process of aging more understandable and relatable for the general population, thus reducing ageist preconceptions and social exclusion. To do so, we turn to empathy, a well-known notion in HCI (Bardzell and Bardzell, 2011; Bickmore and Picard, 2005; Mattelmäki and Battarbee, 2002; McCarthy and Wright, 2004; Suri, 2001; Wright and McCarthy, 2008).

To advance our inclusive agenda, here we specifically examine play, although other kinds of age-positive interactions may be possible. Playfulness is already a familiar concept in physical and occupational therapy for aging adults (Gerling *et al.*, 2010; Krichevets *et al.*, 1995; Uzor and Baillie, 2014; Villaverde *et al.*, 2013). We see, however, the opportunity for another complementary approach, like we just proposed for assistive technologies: in addition to serious games *for* aging adults, empathy-raising games *about* the experience of aging are much needed. Indeed, very few playful artifacts that address the 'felt life' of aging people exist to-date: the scarcity of such artifacts confirms the timeliness and urgency of our proposal. Here, we select two of the few available ones, *The Graveyard* (Tale of Tales, 2008) and *Alz* (Carter, 2014), that address age outside the assistive paradigm and that aim at creating an empathic, unjudgmental understanding of the aging process. Our examples – even though not developed for research, as anti-ageist game design is still in its infancy – were highly regarded by the game press for their ability to foster empathic connections (Kohler, 2008; Meier, 2014; Priestman, 2014; Short, 2010).

To analyze them, we turn to ludology (Aarseth, 2014; Järvinen, 2007) and HCI-oriented pragmatist aesthetics (Fiore *et al.*, 2005; Wright and McCarthy, 2008; Wright *et al.*, 2008). The former provides us with categories to identify the formal components of gameplay, whereas the latter enables us to describe experiences of play and empathy vis-à-vis aging avatars³. Our analysis is also informed by interaction criticism, that we leverage for its effectiveness in unpacking culturally dense artifacts (Bardzell and Bardzell, 2015; Bardzell *et al.*, 2014; Bardzell, 2009, 2011). We produce a design critique of *The Graveyard* and *Alz*, examining how they frame the concept of age and teasing out different configurations of significant elements (or 'design tactics'). We provide these tactics as inspiration towards new designs for age-positive empathic experiences.

³ Originally a term from Hindu mythology, here 'avatar' refers to the virtual character controlled ('inhabited', in a sense) by a player.

To be clear once again, we call for complementing the assistive paradigm, and we neither want nor can downplay it. Assistive solutions are certainly fundamental in specific circumstances. However, we argue that a narrow focus on assistance may lead to conceptualize age as a loss of physical, social, and cognitive abilities. This is exactly why we need a complementary approach that brings empathy to the forefront. Anti-ageist empathic design is yet to come, and carefully unpacking *The Graveyard* and *Alz* provides a two-fold contribution in that direction. First, it teases an age-positive HCI, still in becoming but already promising, that presents aging adults as people to empathize with, rather than patients to assist. Secondly, it suggests a broader reconceptualization of age in HCI, expanding its scope to include empathy-raising designs. All said, we offer our insights to HCI researchers and designers to spur new empathy-based contributions to the 'aging well' agenda.

2. PRIOR WORK IN HCI ON EMPATHY AND AGING

To contextualize our work, we begin with a survey of research literature related to HCI, empathy and aging. First, we will offer an outline of empathy research in HCI, and then we will curate an overview of assistive technologies for aging people. Finally, we will draw a connection with the urgent call to contrast ageist stereotypes, advocated not only by HCI researchers but also by health policy experts and social gerontologists.

2.1. Empathy research in HCI

Differently from sympathy, 'awareness of the suffering of another person as something to be alleviated' (Wispé, 1986), empathy has been defined as a cognitive and emotional attempt to 'comprehend un-judgmentally the positive and negative experiences of another self' (Wispé, 1986). In the past years, two general approaches to empathy in HCI have been explored – as a support for a deeper understanding, and as a desired outcome for design – and both are relevant to our current proposal. In what follows, we will first outline empathy as way towards an intimate comprehension of users and their contexts: although the artifacts we will analyze are not meant to support a design process, the concepts derived from this first approach will be useful for our design critiques. Secondly, we will present empathy as a desired outcome to be fostered through design: *Alz* and *The Graveyard* are part of this second group, and we situate them in their broader context.

The first perspective has its roots in qualitative user studies, and frames empathy as a fundamental requirement for intimate, deep understanding. The call for a more empathic way of ‘knowing the user’ emerged as a complement to efficiency-driven and performance-oriented user studies: as Suri argued, ‘we can broaden our understanding of people and situations, learning ‘why’ as well as ‘how and what’ people do’ (Suri, 2001). Indeed, the importance of supporting empathy between researchers, designers, stakeholders, and users has been widely accepted in the past 15 years. For instance, Wright and McCarthy argue that ‘knowing the user [...] involves understanding what it feels like to be that person [...] In short, it involves empathy’ (Wright and McCarthy, 2008). This clearly resonates with the ‘third wave’ of HCI, foregrounding the necessity to understand users not only in terms of needs and abilities, but also of desires, emotions and experiences (Bødker, 2006; Kaye *et al.*, 2007; McCarthy and Wright, 2004; Wright and McCarthy, 2008). The increasing attention to empathy has contributed to a shift in how user studies are framed and conducted. For instance, Wright and McCarthy (2008) point at three general kinds of empathy-oriented user research. First, they mention ethnography-inspired field studies, such as technology biographies (Blythe *et al.*, 2002), cultural probes (Gaver *et al.*, 1999) or empathy probes (Mattelmäki and Battarbee, 2002). Secondly, they discuss empathy through narrative, for example narrative vignettes (Weiser, 1991) or design documentaries (Raijmakers *et al.*, 2006). Finally, Wright and McCarthy point at empathy through the imagined other, for example role-playing applied to experience prototyping (Buchenau and Suri, 2000), or physical suits simulating age, such as Age Explorer (2003). Furthermore, empathic comprehension is not only a way for designing compelling interactions, but also for pursuing progressive agendas vis-à-vis (among others) social justice, inclusion and empowerment. As HCI addresses increasingly sensitive themes, other positions drawing on empathy – from feminist HCI (Bardzell and Bardzell, 2011) to care ethics (Toombs *et al.*, 2016) – have been brought forward for a more nuanced and respectful understanding of stakeholders and their social, political, ideological relationships. The specific attention to the ‘felt life’ of empathy will be a key component of our methodology, and our objective here is two-fold: we point not only at the general interest in HCI towards empathy, but also at some specific perspectives we will adopt in our design critique.

The second point of view frames empathy as an outcome of effective design: for example, an experience to be fostered (Conati *et al.*, 2005; Leite *et al.*, 2012) or an affect to be computationally

represented (Bickmore and Picard, 2005). For the former point, the design of computer-based exercises for people at various levels of the autistic spectrum is well known in HCI. SIDES (Piper *et al.*, 2006) is a fitting example of this: a digital playful activity for adolescents with Asperger's syndrome to practice group-work skills and empathy. Current research in HCI, education, and game design (Boltz *et al.*, 2015; Gotsis *et al.*, 2010; Kors *et al.*, 2016; Smethurst and Craps, 2015) explores how playful interactions stimulate the cognitive and affective aspects of empathy, empowering players to experience other points of view. In this case, the objective is to foster a sense of shared similarity and empathic concern for people with whom players may not have had direct contact. Let us now briefly proceed to the second point, empathy as a simulated affect. Here, artificial intelligence and human–robot interaction are research areas where creating a satisfying empathic relationship – ideally similar to those taking place with human – is a desirable outcome. For example, relational agents are computational artifacts designed to establish and maintain social–emotional relationships through a variety of empathy-inducing strategies (Bickmore and Cassell, 2001; Bickmore *et al.*, 2005). From this second perspective, we tease out a parallel between the growing interest in playful interactions that support empathy (Boltz *et al.*, 2015; Gotsis *et al.*, 2010; Kors *et al.*, 2016; Smethurst and Craps, 2015), and our proposed agenda of fostering a deeper understanding of the aging process.

In sum, both perspectives presented here suggest the overall relevance of empathy for the design of technological artifacts. However, the assistive approach now constitutes the principal way of framing age in HCI. In what follows, we will explore it before moving on to our proposed empathy-oriented age-positive perspective.

2.2. Beyond assistive HCI

Before addressing The Graveyard and Alz, we will consider some examples of the assistive paradigm. Our objective is two-fold: first, we will show how Alz and The Graveyard are different from assistive artifacts, and then we will tease out the conceptualization of age implicit in the assistive paradigm. This will enable us, in the rest of the paper, to turn our attention to a complementary and more empathic way of thinking.

Assistive products aim at improving everyday activities: 'they are used to maintain or enhance functioning [...] of the person using them, rather than to cure a disease or condition' (World Health Organization, 2010). Medical assistance through digital services is also called telemedicine, defined by the World Health Organization as 'the delivery of healthcare services, where distance is a critical factor, [...] using ICTs for [...] diagnosis, treatment, and prevention [...], all in the interests of advancing the health of individuals and their communities' (World Health Organization, 1997). Gerontechnology, another related category, refers to an interdisciplinary research field working 'towards the aspirations and opportunities for the elderly person' (Bouma, 1998). Examples of assistive technologies and gerontechnologies include, among others, sensors to detect whether a person falls, faints, or is otherwise incapacitated (Hawley-Hague *et al.*, 2014; Uzor and Baillie, 2014). Remote monitoring is not the only possible assistive approach: others aim at maintaining the mobility of aging adults through, among others, powered wheelchairs, functional electrical stimulation, and wearable devices (Cowan *et al.*, 2012). Other kinds of assistive interventions deal with social isolation (Pedell *et al.*, 2010; Tsai *et al.*, 2015), often addressed by providing specific devices (e.g. tablet computers), or by customizing interfaces (e.g. voice-activated menus). Certain assistive products meet the needs brought forwards by specific age-related conditions, such as Parkinson's (Cunningham *et al.*, 2009) or Alzheimer's diseases (Lancioni *et al.*, 2013). As we will demonstrate in our design critique, the age-positive artifacts we call for do not belong to the categories discussed so far, as they *refer to* aging people and their human experience, rather than *assisting* them.

Some technological supports for physiotherapy, occupational therapy and assisted socialization may also be categorized as assistive in a broader sense when offered to aging patients to preserve their abilities. Play sessions with computer games have shown benefits for perceptual or physical abilities, such as manual dexterity, hand–eye coordination and verbal or spatial reasoning (Gerling *et al.*, 2010; Uzor and Baillie, 2014). In physiotherapy, the benefits of regular game-based exercise have been documented (Krichevets *et al.*, 1995; Villaverde *et al.*, 2013). Brain trainers are recent additions to the preventive/assistive field and claim to slow (the so-called) mental aging (Nacke *et al.*, 2009). 'Their theoretical assumption [...] seems to be that one needs only to train some memory strategies in order to produce relatively comprehensive positive outcomes for older adults' memory' (McDaniel and Bugg, 2012), but their medical efficacy is still under evaluation

(Nouchi *et al.*, 2012). Again, the age-positive approach we advocate for does not belong to these popular and commercially successful genres, as it does not aim to provide physical or cognitive benefits (e.g. 'brain training') but to offer an empathy-raising experience.

We may also include in the assistive approach some interactive experiences developed to train nurses and doctors in empathizing with older patients (Seaberg *et al.*, 2000). Not all medical training simulations share this assistive perspective, and we point at those teaching relational skills instead of diagnostic and therapeutic ones. The Anatomy of Care (WILL Interactive, 2004) is a fitting case, a web-based digital experience to teach better human-relation skills to healthcare providers. Users go through different scenarios as various characters (doctor, nurse, unit clerk, patient transporter, or environmental service worker) at a fictional metropolitan hospital. They are prompted to make decisions at different branching points, and explore the consequences those actions: for example, a nurse must decide whether to take the time to address a patient's seemingly minor concern or be on time for an important meeting (Libin *et al.*, 2010). Again, the artifacts we will consider in our design critique are not training simulations, and do not target a professional audience of nurses or doctors, but are games that are publicly available and free.

If we tie back together all these strands, three main conceptualizations of aging adults emerge: people needing stimulation to maintain physical/cognitive abilities, people with whom professionals need to be trained to relate and people 'affected' by an undesirable condition (i.e. 'age') to be contrasted with occupational or cognitive training (i.e. 'brain training'). There are both room and need for a complementary approach, one that is oriented towards the empathic understanding of aging people, that foregrounds unjudgmental comprehension instead of just assistance, and that engages the general public instead of a specialized one. Building upon numerous recent HCI contributions, we will construct such approach in the second part.

2.3. An opportunity space: promoting empathy towards an aging population

We have outlined how empathy has gained relevance in HCI research and how different approaches vis-à-vis aging are currently being experimented with: this is where we situate our empathy-based reframing of age in HCI. Furthermore, the reconceptualization we propose is also

in a strategic position for dialoguing productively with health experts and policymakers. Here, we will briefly contextualize such dialog by presenting some key perspectives against ageism from inside and outside HCI.

In recent years, a more age-positive type of design, with less emphasis on diminishing abilities, has emerged as a new opportunity space. We follow Vines and colleagues as they point at the implicitly negative connotations of age in many assistive HCI artifacts so far (Vines *et al.*, 2015). Through an extensive review and discourse analysis, their recent study shows how 'older users are often portrayed as people with a set of specific characteristics: they have a range of health concerns, they experience physical and cognitive decline, they are slow at performing with technology, and experience social isolation and a loss of independence' (Vines *et al.*, 2015). In line with their proposed 'new research agenda for future HCI research that takes the diversity of lived experience in later life into account' (Vines *et al.*, 2015), our call for promoting empathy towards an aging population resonates with a research sensibility that has become more accepted in recent HCI. For example, Blythe *et al.* focus on 'flourishing' people over 80 years of age, expressly aiming to 'overturn the notion of old age as pathology' (Blythe *et al.*, 2015), and Nassir *et al.* invite to 'redress the deficit-driven approach to technology design' (Nassir *et al.*, 2015). In the same vein, we agree with Light and colleagues when they argue: 'We can dignify ageing [...] by acknowledging ageing as a physical, mental, emotional and structural process that people work to learn to manage as part of that process, even as their capacities change' (Light *et al.*, 2015). Furthermore, our argument for complementing assistive technologies echoes a recent study by Rogers and colleagues that, through the use of DIY toolkits, examined 'how retired people can contribute to future technological design [...] rather than being, themselves, the subject of technologically assisted living' (Rogers *et al.*, 2014). Finally, the call for rethinking the relation between technology and age beyond purely assistive objectives is also shared by new studies on specific aging populations, such as people with dementia⁴.

Not only HCI but also other fields have advocated for the decoupling of age and illness. The World Health Organization expresses disapproval for the 'negative stereotypes and barriers to

⁴ For instance, designing with and for people with dementia (Hendriks *et al.*, 2014; Lindsay *et al.*, 2012; Wallace *et al.*, 2012) aims at 'empowering them through engagement in design has the potential to alter the ways in which we think about the role of technology in their lives' (Lindsay *et al.*, 2012).

participation [that] currently marginalize older people, undermine their contribution to society and increase the costs of population aging' (World Health Organization, 2012). Renowned medical journal *The Lancet* acknowledges that 'social roles – typically student, working age and retirement – that have little physiological basis [prevent] the flexible types of participation older people are increasingly seeking and [are] exacerbated by ageist stereotypes of frailty and mental diminution' (Beard and Bloom, 2014). This is not only a problem of social inclusion but also of policy. Some recent tendencies in healthcare frame assistive solutions also in terms of economic savings⁵, an approach that seems indeed problematic⁶. Walker, a specialist in social policy and gerontology, has warned against framing age as a cost for society: 'ageing would be constructed, in policy terms, as an economic burden, and national governments would attempt to reduce its economic cost in the form of [...] health and social services' (Walker, 2000). Our argument for an empathy-based perspective indeed resonates with this call, advocated by health policy specialists (Phillipson and Walker, 1986; Walker, 2000), for the continued inclusion and empowerment of aging adults, and against a healthcare strategy based on cost-cutting.

So far, we have proposed that age-positive HCI should complement assistive technologies with a more holistic and empathic approach. In the following section, we will select and analyze two anti-ageist examples that – while still perfectible – enable us to explore an empathic experience towards some aging populations.

3. ANTI-AGEIST DESIGN: TWO EXAMPLES

Let us now turn to two promising artifacts, of which we will present a design critique. In concrete, our objective here is to spark a conversation on the role of empathy, moving towards a different approach that complements the assistive paradigm described so far.

We choose for our analysis *Alz* (Carter, 2014) (Figs 1 and 2), featuring a main character who suffers from Alzheimer's disease, and *The Graveyard* (Tale of Tales, 2008) (Figs 3 and 4), casting

⁵ For example: 'to monitor the elderly with chronic conditions in their own residence can be used as a cost-effective way to reduce hospitalization' (Khosravi and Ghapanchi, 2016) and 'for many older people [assistive technologies] can be cost effective [and] pay-back periods from investment in adaptations and [assistive technologies] can be quite short' (Lansley *et al.*, 2004).

⁶ Vines *et al.* (2015) also address this issue ('the discourse of health economics').

users in the role of an aging woman. As we call ‘promising’ these two objects, we do not imply they are perfect: on the contrary, they are early precursors pointing at a direction for further work. Our decision to focus on playable artifacts is informed by the works of Flanagan and Nissenbaum (2014), Ensslin (2014), Isbister (2016), Sicart (2014) and Antonelli (2011), all suggesting that games are mature enough for engaging with deeply existential topics. We leverage *The Graveyard* and *Alz* as ‘objects to think with’, to illuminate some possible characteristics of an empathic and age-positive HCI. They represent aging in realistic, holistic ways (e.g. without fantastic and sci-fi characters); they articulate a coherent and well-formed experience in which the avatar's age is relevant; and finally they are aimed at a general public and are not specialized educational products. We select them for the variety of conditions represented, for their relative popular success, and for their innovative reinterpretation of game-like interactions. At the same time, we are aware that they are early works in this field and we do not espouse them unconditionally, pointing in our analysis also at shortcomings to be perfected. In the following two paragraphs, we will present a more articulated description, followed by a deeper examination of their strong and weak points.



Figure 1. Alz, gameplay image.



Figure 2. Alz, gameplay image



Figure 3. The Graveyard, gameplay image.



Figure 4. *The Graveyard*, gameplay image.

3.1. The Graveyard and Alz

Following the conventions of third-person shooter games, *The Graveyard* shows a black and white tridimensional representation of a European churchyard, with a single walkway near tombstones and lots, leading to a bench outside a chapel. The player controls a female avatar in her eighties. The game space is small, limited to the walkway and the little yard in front of the church. No other actions are possible except for treading on the path, reaching the bench and, finally, sitting on it with some difficulties. There are no interactive objects in the virtual world, foregrounding the avatar's memories and emotions over her physical performance. As she reaches her destination at the bench, the camera gets closer to her face while a song plays in the background – with lyrics in French and English subtitles – telling the story of the protagonist's friends and family. As the music ends, the player regains control and may lead the avatar out of the graveyard, or just leave her sitting on the bench.

Alz casts the player in the role of a man who suffers from a severe form of Alzheimer's disease and has troubles recognizing objects and people. It is composed of bidimensional spaces without horizontal scrolling and, at specific times, users can press a button to react to the environment:

when this happens, lines of text representing thoughts or words appear on the screen. The graphic representation is stylized, simplified, with unrealistic colors that contrast gray tones with vibrant reds and pinks: visual glitches, flickering figures, changing colors and missing elements are a distinctive aesthetic feature of Alz. The text presented during gameplay tells the protagonist's thoughts as he explores his surroundings and the tone is calm, even serene, although the avatar is aware he is forgetting. As the graphical glitches get more frequent, the protagonist encounters his daughter and briefly recognizes her, before continuing his stroll across the visual noise.

3.2. Objects to think with

The Graveyard and Alz provide us with a fresh perspective on technologies for and about aging people. At the same time, they are just promising (but, in a sense, primitive) examples we bring forward to point at a future direction, something that does not yet exist but that we offer as an urgent topic for further study. The kind of empathy-raising design we are pointing at is still in its early days, and we cannot present other more satisfying exemplars for the simple reason they have not yet been produced⁷. In this spirit, we will use Alz and The Graveyard as 'objects to think with', to envision the alternative empathy-based conceptualization of age we are proposing and, ultimately, to design similar but better artifacts in the future. To do so, a first overview is necessary to shed their problematic components from the ones we will use in our argument.

Alz and The Graveyard are open to a plurality of interpretations and, indeed, our first judgment on them is complex. To illustrate better their potentialities, but also their shortcomings vis-à-vis age-related stereotypes, here we juxtapose quotes from the game press praising the empathic connections they create, with our own criticism for their potentially reductive depiction of aging. Although the two selected pieces were not conceived as scholarly work, and there is little academic research on both to-date (De Schutter and Vanden Abeele, 2015; Rughiniş *et al.*, 2015), they nonetheless resonated among game designers for their effectiveness in making users empathize

⁷ Between the first writing of this study and its revision, other similar artifacts have been published. Among them, *We Are Alfred* (Embodied Labs, 2016) is particularly noteworthy for its use of virtual reality to cast users in the body of an aging person with sensory impairments. Indeed, this confirms a growing interest in the design of empathy-raising solutions, thus supporting our call for further research in this space of opportunity. However, the nuanced approach we adopt for *The Graveyard* and *Alz* remains valid: is *We Are Alfred* perpetuating a stereotype of sensory/cognitive diminishment, is it opening up new possibilities for empathic design, or – more likely – both at the same time?

with avatars that are clearly different from those usually present in escapist computer games. As no critical analyses of the two artifacts are available in scholarly venues, we turn to signed articles (e.g. opinion pieces) published by the game press. The Graveyard prompted comments such as ‘the very limited interaction you have with the [main] character instantly makes the connection deeper and more powerful than it would have been if you were simply watching’ (Kohler, 2008) and ‘[this piece is] exploring what can be done to express emotions and states not commonly found in games’ (Short, 2010). Likewise, Alz was regarded as ‘a poem-length immersion in the world of someone caught in the confusion of memory loss’ (Meier, 2014) and because ‘its glitch art and fragmented narrative offers a window of understanding’ (Priestman, 2014).

As we mentioned, however, Alz and The Graveyard are far from perfect. Let us briefly leverage Vines *et al.*'s (2015) discourse analysis to tease out some issues. The two protagonists are mostly alone, and are engaged in activities (wandering, reminiscing...) usually considered unproductive, passive and solitary. No opportunities are depicted for the protagonists, who appear resigned to their social roles. These characteristics risk of perpetuating what Vines *et al.* call the ‘discourse of socialization,’ the pervasive assumption of aging adults being dependent, and without initiative. The characters are, among other traits, defined by what they cannot do: one is not able to remember and recognize, whereas the other is painfully slow in her movements. Indeed, they are not given a choice to do something else than the one action that characterizes them. Again, this may perpetuate the ‘discourse of deficits’ (Vines *et al.*, 2015), the tendency to categorize aging people as being ‘unable to do something’ rather than the other way around. As we call for further works in this area, we suggest that more refined artifacts should instead foreground the different ways in which aging people may be ‘flourishing’ (Blythe *et al.*, 2015): for example, dynamic social relationships, creative endeavors, participation in co-design activities...

These are the reasons why our preliminary judgment on Alz and The Graveyard as empathy-raising artifacts is nuanced and needs to be put into context. Should they be praised for creating ‘a deep connection’ (Short, 2010) and ‘a window of understanding’ (Priestman, 2014), or should they be critiqued for potentially perpetuating stereotypes of physical and mental decline? We find it significant that less problematic exemplars could not be easily identified, and we interpret it as a strong symptom that a more conscious approach to empathy and anti-ageism in HCI is urgently

needed. As we acknowledge that they are just a first step in a very promising direction, we clearly call for future artifacts that consciously avoid negative preconceptions on aging, and transmit only age-positive values. Having teased out and shed away the problematic characterizations in the two designs, we will now focus on the rest, as a step towards future age-positive and empathy-raising technological artifacts.

4. ANALYTICAL METHODOLOGY

In what follows, we will outline our analytical methodology and its theoretical bases. Before, we presented a general overview of many empathy-oriented HCI perspectives, but here we will focus specifically on the operational concepts we will leverage in our analysis. After presenting our methodological approach, we will delve deeper into three specific points: we will address the categories for analyzing the game-like parts of the artifacts (Järvinen, 2007), those for describing the experience of interacting with them (Wright and McCarthy, 2008), and finally how we address some users' expectations (Peirce, 1982).

Our analytical strategy combines interaction criticism (Bardzell, 2009, 2011) and pragmatist aesthetics (Fiore *et al.*, 2005; Wright and McCarthy, 2008). We turn to interaction criticism for its effectiveness in producing close readings of artifacts, teasing out their significant components and offering them for discussion to scholars and designers. We complement it with pragmatist aesthetics for its capacity of producing and comparing rich experiential accounts. By combining these two approaches, we can foreground how certain characteristics of the two artifacts support empathic experiences. The analysis is further informed by ludology (Aarseth, 2014), an interdisciplinary point of view close to game design and game studies. Our critique of *Alz* and *The Graveyard* takes into consideration their visual elements, as well as the rules and procedures governing their gameplay (Järvinen, 2007). We foreground the processes of experience (Wright *et al.*, 2008) and the concept of habit (Peirce, 1982) to explore how *Alz* and *The Graveyard* address the process of aging in a way that is complementary to assistive technologies. After this general overview, we now delve deeper in three key points of our methodology.

First, we turn to ludological categories (Aarseth, 2014; Järvinen, 2007) as effective tools to subdivide the gameplay of our two examples into more analyzable elements, a method that is

particularly useful to isolate and evaluate game elements and their relationships. Our choice of ludological categories is based on some similarities and some other outstanding differences between Alz and The Graveyard and entertainment video games: as we will show, these artifacts raise empathy also because they transgress some game-related expectations. Among other categories⁸, Järvinen considers *Components* ('what is being moved or modified in the game'), *Environment* (the spaces where play takes place), *Rulesets* ('the procedures with which the game system constrains and moderates play, with *Goal Hierarchy* as an especially important subset'), *Game Mechanics* ('what actions the players take as means to attain goals when playing'), and *Themes* (the cultural and narrative context of the game). Ludological categories will be used to subdivide Alz and The Graveyard into discrete, tractable parts, highlighting some unusual structural characteristics (e.g. the lack of an opponent) in comparison to conventional video games.

Secondly, our analysis is also informed by the Deweyan pragmatist account of aesthetic experiences (Dewey, 1934), as well as by McCarthy and Wright's (McCarthy and Wright, 2004) more recent reformulations. We choose these concepts for their effectiveness in describing 'felt life,' which is clearly central for communicating 'what it feels like' to inhabit an aging body – as opposed to the more functionalistic approach of assistive technologies. We understand experience as a situated and continuous process with which subjects perceive, interpret and make sense of the world. Following Wright and colleagues, we may subdivide it in different constitutive processes⁹: here, we will focus specifically on *Anticipating*, *Connecting* and *Interpreting*¹⁰. When *Anticipating* a situation, the experience is already shaped by a network of prior knowledge, expectations and competencies. With *Connection*, we point to the 'pre-linguistic feeling' of a situation, informed by its embodied, somatic, and kinesthetic components. Finally, *Interpretation* refers to the process of 'finding a narrative in the encounter, the agents and action possibilities' (Wright *et al.*, 2008). These three strands will be particularly useful in our analysis to describe the initial encounter between a player and the two artifacts. We will leverage them to understand the tentative process

⁸ Additional categories, less relevant for our specific design critiques, are *Information*, *Interfaces*, *Players* and *Context*.

⁹ For the purpose of analysis, even if experience is inherently holistic.

¹⁰ Wright *et al.* (2008) also mention the processes of *Reflecting*, *Recounting* and *Appropriating*, which are less central in our design critiques.

of meaning-making at work in *Alz* and *The Graveyard*, laying the foundation for the more general design tactics we will extrapolate.

Finally, we complement Wright *et al.*'s process of anticipation with the notion of *habit* from pragmatist semiotics¹¹ (Peirce, 1982). Habits indicate general dispositions to act, perceive or interpret in a certain way in similar situations; they are tendencies that can be broken, modified or reinforced and can help to formalize and understand how certain artifacts may prime expectations to produce specific effects. This will be central in our analysis: by systematically disregarding many of the assumptions taken for granted in mainstream entertainment, the two artifacts surprise players, thus setting the stage for their objective of raising empathy. In practice, we will turn to habits to model the game-related expectations subverted by *Alz* and *The Graveyard*. We will focus on two in specific¹²: (1) computer games represent extraordinary events, and let players control avatars that are in some way exceptional; (2) computer games challenge players through various types of competition, evaluating their performance with victory conditions, scores or similar mechanics and reward good performances. *The Graveyard* and *Alz* are especially significant if examined in comparison to ordinary computer games, and we will use habits to express some plausible expectations from competent players.

We have described our analytical methodology, integrating pragmatist phenomenology and ludology in an approach informed by interaction criticism. In the next paragraph, we will begin our design critique by outlining the unusual experience of *Alz* and *The Graveyard* in contrast to the visual and procedural characteristics of conventional video games.

5. FOUR DESIGN TACTICS TO FOSTER EMPATHY

We presented the objective of our study (bring to the forefront a design approach that complements the widespread assistive paradigm vis-à-vis age and aging) and the main concept we point at as a

¹¹ An analysis based on habits is not only theoretically compatible with the above-mentioned pragmatist approaches to experience (McCarthy and Wright, 2004; Wright and McCarthy, 2008), but has been successfully adopted in previous studies to analyze the role of expectations in shaping how computer games are interpreted (Ferri and Fusaroli, 2009).

¹² In Peirce's pragmatist semiotics, habits are not deduced from user studies but are arguments deriving from a critical interpretation. For our purposes, we isolated two of them from the many possible. However, the number of potential dispositions and expectations is clearly much higher.

possible alternative (empathy), and we laid out our analytical methodology (interaction criticism, ludology, pragmatist aesthetics and pragmatist semiotics). We will now finally produce our design critique of Alz and The Graveyard.

Our analysis teases out four recurring configurations of significant elements in the artifacts, or 'design tactics,' that we carefully consider to reveal an empathy-based conceptualization of age and aging. Here, we leverage design tactics as descriptive tools, as lenses that enable us to focus on significant elements in the artifacts, but, on other occasions, they might be used generatively. The tactic of *erasing the competition* changes the agonistic structure of the ludic activity: players do not compete against an antagonist, but un-judgmentally explore a variety of situations. *Different agency* proposes alternative ways of affecting (or not) the virtual world and is at odds with the expected hyper-ability depicted in video games. While escapist gameplay experiences offer challenges that may be solved somehow, *unchanging circumstances* frustrate this expectation (in the same way one cannot 'win' or 'solve' a novel or a movie). *Mundane difficulty* makes everyday activities the focus of the ludic simulation, as opposed to the usual extraordinary feats required in escapist games. For each one, we will also provide practical considerations towards more refined future designs. We leverage the four tactics as supports to further thinking, and we use them to envision a different approach to age in HCI. They provide opportunities for users to engage in meaning-making in ways that only interactive artifacts can offer, and they suggest a broader focus that includes the promotion of empathic understanding of aging people, instead of a narrower one centered principally on assistance. In teasing out these design tactics, we not only point at them to support our proposed empathic reconceptualization of age in HCI, but we also offer them to designers and researchers as generative ideas towards more refined age-positive artifacts.

5.1. Erasing the competition

We begin our analysis of The Graveyard and Alz from their components (Järvinen, 2007), what acts or is acted upon during gameplay. Opponents are crucial components in common video games, creating competition between player and system. In other words, video games actively 'play against' their user by instantiating competitors that make victory conditions harder to reach. Together with one of the habits we identified ('Computer games expressly challenge players'), they support the reasonable expectation of a competitive activity. In other words, players usually

play to win. However, *Alz* and *The Graveyard* foreground openness to interpretation while other games reward agonistic behavior through points, achievements, and similar mechanics. This is likely to surprise competent players as they interpret (Wright and McCarthy, 2008) what happens during gameplay. To provide more nuance, we will borrow some terms from narratology¹³, such as *protagonist* (the main character) and *antagonist* (the principal opponent). At a formal level, all narratives tell the story of at least a protagonist and of an antagonist¹⁴ (Bertrand, 2000), a structure reflected in many single-player computer games casting players as protagonists and computer-controlled characters¹⁵ as antagonists. Yet, in *The Graveyard* and *Alz*, there is no one to play against, there seems to be no antagonist except for the protagonists themselves: the two positions blur and overlap and competition is diluted. Gameplay, indeed, foregrounds a complex relationship between the protagonists, their abilities and the surrounding context: walking in the graveyard, in the case of our first example, is slow and tiresome but leads to a deeper connection to the past. Also, making sense of *Alz*' confusing world is complicated but possible, as the protagonist's brief recognition of his daughter shows. The two artifacts neither evaluate players' performance nor assign any score, but empower users to assign meaning to their own experience: as a design tactic, erasing the competition moves the focus away from the struggle against an antagonist and foregrounds other types of deeply personal situations.

As we offer this tactic for further design, we point at the lack of winning/losing conditions, scores, explicit rewards and antagonists not as an anomaly but as a generative feature promoting undirected interaction, exploration and ultimately empathy. By expressly removing objectives, players are free to focus and bond with the virtual characters. In relation to empathy with aging adults, the lack of competition eliminates the need for comparison, which may, in turn, lead to a less judgmental view of others' abilities. We may envision future similar artifacts exchanging competition for adaptation and flexibility. A different conceptualization of age could be less about comparison, and more about experiencing a broad spectrum of possible actions – some easier than

¹³ Narratology and narrative semiotics are disciplines focusing expressly on stories, their interpretation, and how humans understand their context in narrative terms. As *Alz* and *The Graveyard* background purely ludic elements and bring forward other narrative ones, we turn to the narratological vocabulary for a more precise analysis.

¹⁴ In concrete, narratives may have multiple antagonists, or only abstract ones, or antagonists may be inanimate objects, or they may fail to oppose the protagonist... Narratology and narrative semiotics (Bertrand, 2000) may provide a more detailed account of this structural approach.

¹⁵ Or, in alternative, abstract elements such as a timer.

others. This design tactic does not cast one's own body in the antagonist's position, as brain-trainers and fitness apps might sometimes do, but rather shows a nuanced range of possibilities with varying degrees of accessibility. Possible future designs along these lines might include intelligent agents to empathize with, and immersive 'open simulations' that cast players in everyday situations in a variety of age-related conditions. This would resonate not only with the already-mentioned physical devices for experiencing the effects of old age such as the AGNES suit (2010) or We Are Alfred (Embodied Labs, 2016), but also with recent interactive pieces that attempt to metaphorically represent the sensory perceptions caused by some autistic conditions (Kadayifcioglu *et al.*, 2013).

5.2. Different agency

The second design tactic further differentiates between empathy-raising pieces such as *The Graveyard* and *Alz* and escapist video games. Related to the previous one, different agency focuses specifically on the diversity of physical and cognitive abilities, rather than on the competitive situation. To discuss it, we address how the process of anticipation (Wright *et al.*, 2008) and part of the first habit ('computer games let players control avatars that are in some way exceptional') prime specific expectations about the ludological category of rulesets (Järvinen, 2007), defined as the procedures encoded in the system to regulate interaction. Let us return to our comparison with regular games: *The Graveyard* adopts the typical visual style and interface of third-person shooters, canonically characterized by fast-paced action. The range of available actions is of particular significance, as third-person video games usually center their mechanics on running, jumping and avoiding enemies – often at superhuman speed. Competent players might expect in *The Graveyard* the same set of possible actions, but at the first encounter¹⁶ with the actual gameplay, such anticipations are broken. The avatar has limited possibilities to act on objects, and players can guide her only in a walk towards the bench. The protagonist's realistic and relatable human traits emerge by the opposition with the unrealistic ones often evoked by escapist games. This supports interpretations (Wright *et al.*, 2008) quite different from the performance-oriented ones typical of regular games: the cemetery is a place for thinking and remembering rather than for physical prowess. *The Graveyard* does not feature an outright passive protagonist, but one who is peacefully

¹⁶ Activating the process of connection (Wright *et al.*, 2008).

reminiscing instead of acting: at the end of the walkway, she does not interact with her surroundings but evokes other characters from her past. Alz offers us a complementary situation, with a protagonist that walks but has troubles in some cognitive activities: to partially compensate for this, it also briefly shows a second character – the daughter – acting together with the protagonist and temporarily enhancing his agency.

As anticipated, this tactic is complementary to the previous one, erasing the competition, but addresses a different theme. It contrasts the emphasis on fitness and personal/bodily efficiency, adopted by several brain-trainers and other assistive or therapeutic interventions. Instead, by foregrounding how age is neither a temporary illness nor a defect, this tactic represents it as a normal condition that we need to relate to. Alz and The Graveyard do not depict aging characters as outright passive, but as engaging in different emotional and mnemonic activities. Echoing the calls against the reification of age (Katz, 1996; Phillipson and Walker, 1986; Vines *et al.*, 2015), future empathic artifacts should include avatars with a broad range of conditions, reminding users that aging is a unique experience that can be standardized only up to a point. This is the contribution that this design tactic proposes to designers: a more nuanced set of different abilities would allow players to experiment and empathize with people of various ages and conditions. In a similar sense, some toy makers are beginning to produce dolls representing a variety of physical disabilities in a positive way (Makies.com, 2015): along the same lines, more open empathic artifacts could include systems for personalizing and modifying avatars to invite users to experiment with characters with different physical, cognitive and perceptual abilities.

5.3. Unchanging circumstances

Here, we concentrate on the ludological category of goal (Järvinen, 2007). The second habit we assumed ('good performances are rewarded, and games can be won') supports the reasonable disposition that conventional video games have a specific goal that players try to reach. Put another way, if one assumes that a game is 'winnable,' it follows that there must be one or more goals to reach. From this, we derive a corollary: games are frequently generous in allowing a reasonable chance at reaching their goal. Players can often improve their avatars: injured ones can heal with the right power-up, weak characters can *level up*, and lost games can be replayed. The tactic adopted by Alz and The Graveyard violates this convention, as the conditions of both avatars do

not change as gameplay progresses, and there are no 'winning conditions.' To further unpack this design tactic, we turn to Wright *et al.*'s process of interpretation (Wright *et al.*, 2008), which refers to a subject's ability to recall and reconstruct in narrative terms a previous experience. Wright *et al.*'s emphasis on narrative reminds us the narratological concept of 'canonical narrative schema' (Bertrand, 2000), a sequence of events constant across several narratives. Many narrative schemas require stories to begin with a 'lack' – the protagonist might be in danger, or poor, or in search of knowledge, or simply bored – and develop towards its resolution. However, *The Graveyard* and *Alz* transgress this very common configuration and present an experience where the initial lack is neither resolved nor improved. There is no need (and there would be no reason as well) to speed up the old woman walking towards the bench in the churchyard, as she does not visit the graveyard to collect anything tangible. Likewise, players cannot fix the glitching graphics in *Alz*, simulating the cognitive impairment of the protagonist: also in that piece, gameplay does not lead to any improvement in the avatar's condition, and still it produces a coherent, satisfying experience.

We present this tactic as a resource for future designs, casting the audience in an interesting and yet contradictory situation, especially in the case of experienced video game players. In our examples, the humanity of the two avatars – and, consequently, their relatability – emerges in contrast to the hyper-efficiency of most protagonists in regular video games. By casting users in avatars that are opposite to the superhuman characters of the entertainment discourse, empathy-supporting artifacts distance themselves not only from common video games but also from some negative conceptualizations brought forwards by 'brain training' products (Nouchi *et al.*, 2012). The same also holds for some – clearly not all – products for professional training, which often conceptualize professional caregivers as the main category in charge of empathizing with aging people. Conversely, focusing on a broad range of different types of agency rejects the rhetoric of assistance and efficiency. As a speculative proposal for future designs leveraging this same tactic, 'age-positive brain-trainers' may focus on a much broader spectrum of cognitive and social skills, prompting users – for example – to connect with family and friends and to cultivate an effective support network. By not framing any of the avatars' traits as disadvantages, empathic interactions may help accepting others' (or one's own) conditions: in specific, this underlines the naturalness of physical and cognitive changes.

5.4. Mundane difficulties

For this last design tactic, we consider the category of theme (Järvinen, 2007), exemplified by casting users in the virtual bodies of avatars that show some verisimilar physical or cognitive consequences of age and putting them in relatively common everyday situations. This is another design choice that sets *The Graveyard* and *Alz* apart from regular games, which often represent powerful, perfect and often superhuman characters. Here, we consider the first habit ('Computer games represent extraordinary events'), together with the processes of anticipation and connection (Wright *et al.*, 2008). Competent players may reasonably assume that games present exceptional situations. In other words, superheroes or athletes have specific traits that make them narratively interesting. *The Graveyard* and *Alz* break this habit, and represent their main characters in everyday settings, attending ordinary activities, and managing common difficulties. Indeed, these pieces adopt 'the mundane' as thematic and figurative repertory from which they draw gameplay elements. Secondly, referring to the process of connection (Wright *et al.*, 2008), players' expectations are subverted. As the two artifacts break the implicit assumptions about exceptionality, players may search the systems for other challenges: 'is there anything hidden in these spaces?' or 'is this character really what it appears to be'? In other words, these artifacts invite their exploration, the search for outstanding elements, but offer none. These experiences are particularly meaningful in comparison with other games where 'the extraordinary' – in terms of top athletic performances, magical abilities and extreme situations – is the dominant theme.

This design tactic sets the experience in a mundane, plausible and verisimilar setting, and complements the previous tactic of unchanging circumstances. Whereas the previous one addressed the protagonists' characteristics (human vs. super-efficient), this grounds an experience in ordinary circumstances. Compared to escapist games, *The Graveyard* and *Alz* are on the opposite end of the spectrum and draw from everyday circumstances to simulate characters to empathize with. Walking slowly to the end of a walkway to go sit on a bench, or wandering through a city trying to collect one's own thoughts are clearly not escapist activities – but they are indeed significant elements of a touching human experience.

6. RECONCEPTUALIZING AGE THROUGH EMPATHY

Whereas the 'aging well' agenda calls for a holistic approach to age research, a sizable number of HCI artifacts for aging people are grounded in an assistive paradigm (Bouma, 1998; Cunningham *et al.*, 2009; Gregor *et al.*, 2002; Khosravi and Ghapanchi, 2016; Lancioni *et al.*, 2013; Uzor and Baillie, 2014; Worden *et al.*, 1997). There are both the opportunity and urgent need for a complementary approach: with this paper, we explored how empathy-raising designs may expand the conceptualization of age in HCI. In specific, we call for more artifacts *about* aging (in addition to the many *for* aging people) to promote empathy, spark conversations, raise awareness and, ultimately, contrast prejudices. Clearly, evoking the felt experience of aging differs from assisting aging people in practical matters, and nonetheless may have an impact. As shown by our design critique, the two approaches ('designing *for*...' and 'designing *about*...') speak to different audiences, address different needs, and frame their users in a variety of ways. Foregrounding one or the other not only affects research and design in HCI but also has broader socio-cultural repercussions. If the assistive approach remains by large the predominant way to conceptualize age, it entails a representation of aging people having diminished abilities and needing care. In addition, an assistive perspective speaks mostly to people who indeed 'need assistance,' thus strengthening the divide between the general population and an aging minority. Vice versa, a more empathic conceptualization foregrounds aging as a universal human process. Consequently, age-related empathic designs address a broader public, prompting to experience 'how does it feel like' to live temporarily in an older body. By enabling a more general understanding of the experience of aging, HCI has a concrete opportunity to contrast ageist stereotypes, ultimately advancing the agenda of 'aging well' by addressing widespread prejudices.

As we conclude, let us finally synthesize the empathic approach emerging from our design critique. In our analyses, we 'thought through' Alz and The Graveyard, teasing out how they articulate the concepts of age and aging. We unpack them in four main points. First, aging is not an antagonist to be defeated or a competition that one can win. Second, the changes in physical and cognitive functions deriving from age are inherently part of the human condition. As a third point, age is not a defect, a lack to be 'resolved' or warded off. Finally, aging is a normal, ordinary process that any

living being undergoes. As a contrast, the selection of assistive solutions we curated in the beginning yielded the following very different concepts: aging adults need stimulation to maintain physical/cognitive abilities; professionals need to be trained to relate to aging adults; age is an undesirable condition to warded off through assistance or 'brain-training.' By carefully considering the design tactics we isolated, we made a case for the conceptualization of age in *Alz* and *The Graveyard* fostering an empathic and unjudgmental perspective, whereas the assistive solutions conceptualize it through efficiency, performance and ability.

Identifying a selection of design tactics (recurring configurations of significant elements) enabled us to present more systematically how *Alz* and *The Graveyard* frame age differently from assistive solutions. The 'aging well' agenda may benefit from other empathy-raising designs, in addition to more conventional solutions, and we call for rethinking age in HCI including empathy for aging people. Indeed, we already see other recently published artifacts (Embodied Labs, 2016) proceeding in the same direction: we point at a growing interest, still in its early stages but already quite promising, towards exploring the 'felt life' experience of aging. We also clarify once again that we do not consider *Alz* and *The Graveyard* as perfect exemplars of the reconceptualization of aging we call for, but rather as promising (and yet primitive) precursors. Taken a-critically, these two artifacts might end up reaffirming the very stereotypes that some HCI researchers are opposing (Blythe *et al.*, 2015; Durick *et al.*, 2013; Light *et al.*, 2015; Nassir *et al.*, 2015; Rogers *et al.*, 2014; Vines *et al.*, 2015). However, as we examine them with a thorough design critique, they reveal an urgently needed space of opportunities: raising empathy for aging people through technological interactions, without falling into the trap of perpetuating negative ageist stereotypes. Clearly, we cannot (and do not wish to) downplay the crucial contributions of assistive technologies for aging people and their caretakers, yet we make a case for complementing them with an empathy-raising perspective. As the importance of 'aging well' becomes more broadly recognized, and as the discussion on aging moves past a purely assistive framing, our analyses support a kind of HCI that also considers empathy for aging people in addition to more medical considerations. By reconceptualizing how HCI approaches aging research, we call for designs that present age as a facet of the human condition rather than as an antagonist to fight. We also call for designs that foreground an unjudgmental understanding of the aging process, and that cast a light on the challenges (and the opportunities) in the everyday lives of people of all ages. Far from exhausting

the potentialities of an empathic perspective on age-related HCI research, our analyses have shed light on a much-needed opportunity space, on which we urgently call for more attention.

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