

Information from the past: how elderly people orchestrate presences, memories and technologies at home

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Abstract This paper describes insights from an ethnographic study aimed at understanding the uses and meanings of objects and domestic spaces in the daily practices of older adults. This work was inspired from the awareness that designing suitable domestic technologies which “fit” into seniors’ home environments requires a deep understanding of how elders arrange and give meanings to their domestic spaces and objects. The final goal of this research is to provide insights into the ways older people make sense of products and services in relation to their individual and social well-being at home. Further studies will address applicative implications regarding how to use these insights to design as innovative and as effective products and services. This research involved two hundred and forty-one participants aged over 65 in Italy from different household situations (living alone, with others, in the family home) and in different social contexts (in rural and large urban areas). In-field observations were carried out at homes of the elderly, and data were collected through narrative interviews, home tours (audio and video recorded), photographs of objects and environments and ethnographic field notes. Results showed that several elements at home become a choreography of “fondness objects” which support the remembrance (e.g. mementos) and keep the elderly company (e.g. TV and radio). These

objects are often related to meaningful personal memories from past experiences and are “traces” of relationships which are no longer physically present were relevant in some periods of life. Ethnographic data return a clear picture of the elderly like people that actively organize their world starting from their strong need of relationships and selective remembering that supports their emotional lives. Implications and suggestions for designers are also discussed.

Keywords Older people · Active Ageing · Ethnography · Product design · User experience

1 Introduction

Population ageing is a growing social phenomenon threatening the sustainability of the welfare systems in the Western countries. Nevertheless, an increasing share of older adults shows the possibility to maintain independent living, social inclusion and active life for longer. Information and communications technology (ICT) is generally considered a promising domain that could lead innovation towards the development of new products and services promoting a more sustainable model of ageing that was defined as “Active Ageing”. In this perspective, many studies [20, 40] addressed issues related to the involvement of this peculiar group of end-users within the design process of ICT-based goods and services. The aim is to ensure usable and accessible technologies by taking into account the needs and requirements of the older people. Therefore, an exploratory work is necessary in the beginning of a design and development process in order to discover desires, expectations, values and daily practices of the elderly. The study described in the paper responds to this

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research scope by showing a comprehensive picture of domestic environments and meanings surrounding specific groups of objects and tools at homes of older adults.

1.1 Background

Recent estimations [21] have reported on a significant increase of the population aged 65 and over in the coming decades. Several aspects make this phenomenon a threat for national welfare and healthcare systems. The lower birth rate and the higher life expectancy represent critical aspects for the sustainability of the pension funding. Also, the proportion of people living with a delicate health situation will increase the demand for public care services with the risk of overburdening of the healthcare system. Nevertheless, other demographic reports [14] showed that only 20% of those aged over eighty have seriously limiting diseases like dementia, while the other 80% lives in more normal circumstances and can maintain independent and autonomous living. With regard to this latter socio-demographic scenario, “Active Ageing” (AA) has been identified as one of the most promising social phenomena for mitigating the impact of progressive population ageing on society and economy [15]. Active Ageing has been defined through the rights of independence, participation, care, self-fulfilment and dignity that should ensure a socially inclusive and healthy ageing [47]. The definition is often used to generally refer to all retired people with possibilities of good health conditions and independent living. In the coming decades, the purchasing power of these older people is expected to increase and the same is true for the demand for good quality of life, opportunities for activity and self-determination. In this socio-economic context, innovation of products and services is required to pay particular attention to the needs of the older share of the population. ICTs are broadly accepted as a valuable mean to make new services accessible to older adults, improving their quality of life and enabling independent living. However, despite the efforts of the research community and the industry to promote ICT advances, 40% of the people aged 55–64 never used the Internet and the percentage reaches 63% for the elderly aged between 65 and 74 [30]. The introduction of new products and services in the everyday practices of users is a critical issue, and some researchers have pointed that human aspects of interaction with new technologies and their acceptance in daily life are generally underexplored [16]. One of the causes of this phenomenon is related to the broadly discussed *bias* that anchors the innovation process to the technological advancement, uniquely.

Recently, several researchers and practitioners in ICT-related fields are embracing a new perspective by focusing the design process on the daily “journey” of the target user with the aim of leading the innovation towards a

transformation of the entire experience of use of products or services. In user experience design (UXD), the metaphor of the “user journey” is used to highlight the need to observe people’s behaviour in their daily life, identifying the key moments (i.e. touch points) that can be turned into “memorable experiences” by the use of a product or service. Prendergast and Roberts [40] outlined a similar approach in the design of healthcare services and goods for older people. The authors pointed out that ethnography should lead beyond the traditional question of design and technology innovation by identifying “designable moments” including spaces, times, objects, issues and practices. These elements should build the representative framework of people’s lives within which designers are asked to introduce effective innovations. Prendergast and Roberts stated that researchers should address implementation issues by shifting their attention towards a series of “user-oriented” research questions such as

What constellations of meanings surround certain objects and how does these affect their incorporation, or otherwise, into daily practices? (p. 60).

The study described in the present paper may also be considered an attempt to respond to that question through the description of home arrangements and meanings, which characterize elderly daily lives. Results could represent a suitable knowledge framework for inspiring designers to lead innovation towards the ideation of goods and services aimed at promoting the emotional, social and physical well-being of older adults.

Before describing the methods and results of this research, a literature review regarding the definition of ageing and the research methodology followed is reported in the following sections. A further paragraph is aimed at highlighting similarities and differences with related work in the ICT domain.

1.2 Psychological perspectives on ageing

The term ageing usually denotes the natural process through which an individual undergoes changes in several dimensions of his/her biological, psychological and social life by becoming aged. Ageing thus covers a range of phenomena, which are reflected in the population with wide individual differences. Over time, the representation of ageing processes in psychological theories shifted from a conception of ageing as decline to the empowerment of elderly people in their personal and social lives.

The study of ageing was long characterized by the metaphor of the hill [24]. In this conception, the lifespan is marked by two main processes: development and decline. Since this metaphor contrasts ageing with development, the changes that it involves are defined in terms of losses,

failures and inefficiencies. As often stated (e.g. [8, 43]), this conception has reinforced over time the representation of elderly people as a fragile and problematic group in society. Other psychological theories on ageing took a different view on the process of ageing. For example, the activity theory proposed by Havigurst [25, 26] contrasts with the traditional perspectives on ageing by suggesting that aged people should continue an active lifestyle. It also suggests that obstacles are to be resisted, and that problems involving declining health, loss of roles and responsibilities, reductions in income and a diminishing circle of friends can be overcome by continuing to engage in meaningful activities.

A step further in elaborating an active role in ageing was represented in the 1990s by the advent of Lifespan Developmental Psychology [5] whereby research on ageing was included in the study of how people develop throughout their lifetimes. This perspective introduced the concepts of selection, optimization and compensation as processes driving lifespan development by individuals [8]. A more specific focus on how these processes are enacted by elderly people was provided by Carstensen [10, 11], whose Theory of Socioemotional Selectivity describes how elderly people adapt their psychological functioning to their perception of having a limited amount of time left to live by developing a more intensive motivation towards relational and emotional life. Ageing is thus connected with the regulation of emotional functioning and with an orientation towards significant activities and relations. Carstensen identified selectivity as the mechanism by which elderly people restrict their social environment and the range of their meaningful relationships in order to maintain the most relevant ones. The development of socio-psychological theories of ageing prompted a reconsideration of the deep meaning of activities by elderly people in their everyday lives. As suggested by the theories just outlined, elderly people seem to be engaged in a continuous redefinition and selection of the meanings of the actions and relations in which they are involved. They do so in order to keep on living in a strong and positive emotional life. This process internally develops idiosyncratic personal projects concerning how to grow old, which spheres of life to develop further, which ones to preserve and which ones to abandon. The research described in this paper, for example, showed that elderly arrange their domestic environments in order to facilitate and benefit from the preservation of memory about past experiences and people which are no longer physically present.

1.3 Issues related to elderly people's access to ICT

In several studies on ICT for the elderly (e.g. [32, 35]), the home represents the preferential research context of the

design process because as age progresses as most of people's activities take place there.

For example, Leonardi et al. [32] suggested that the home is “the emotional centre of elders' life”; it is “more than a place where to live”. Home is a “territory of meaning” (p. 1703) where the aesthetic, functional and emotional dimensions are closely interconnected. Home is the first life space for elderly people because it supports their self-identity and self-expression [41].

At the same time, an overall increase of needs for cares, safety and social inclusion leads product and service innovation through the ideation of novel means and tools promoting and supporting self-fulfilment, autonomy and independent living. As outlined above, these topics are widely addressed by the General Assembly of the United Nations [47] adopting the expression “Active Ageing”. Following this approach to ageing, the European Commission supports the Ambient Assisted Living (AAL) funding programme that promotes projects improving autonomous living and self-fulfilment of elders through new services and products based on ICT. In this domain, experience from research and industry showed that augmenting the home environment of the elderly requires sensitivity to the daily life of the people inhabiting these spaces, with particular attention on the introduction of new products. For example, the “UTOPIA” (Usable Technology for Older People: Inclusive and Appropriate [20]) project focused on the methodological involvement of older people in the early stages of the design process in order to ideate effective IT-based products and services. The output of the UTOPIA project comprised a comprehensive framework of research methods and techniques (including interviews, questionnaires, workshops and focus groups) aimed to ensure a long-lasting partnership and relationship between researchers and older users in order to elicit and gather a considerable data corpus regarding elders' needs and requirements. In a similar perspective, Blythe and Dearden [9] stated that although design in human–computer interaction (HCI) is mostly informed by ethnographies and interviews, these methods are difficult to use when the scenario is represented by home rather than workspace. The authors showed the suitability of *pastiche* scenarios and personae for opening up a dialogue between users (i.e. older adults) and designers. *Pastiche* was described as a form of mime representing existing characters and situations to place in new contexts (p. 22). The study showed that this technique supported designers in collecting data from elders with the aim of better understanding issues related to deeply emotional aspects such as fear, loneliness, dependency and physical decline. The comprehension of needs, expectations, desires and practices of the elderly is a mandatory work for promoting their inclusion in information society.

This issue was also addressed by Goodman-Deane et al. [22] which suggested to lead further work towards the understanding of issues related to the development of more suitable and usable technology for older adults. As pointed out by the authors, design for universal access should support an effective use of new technologies by the elderly in order to allow them to benefit from leisure, social and health initiatives such as enjoying relational and entertainment possibilities offered by traditional media, Web 2.0 and smart technologies. Moreover, Diaz-Orueta et al. [18] pointed out that new complex technologies might exacerbate the digital divide problem, limiting the access to opportunities offered by technological tools and means. The authors reported on a study aimed at investigating the introduction of an innovative technology (a TV-based avatar) in the elderly's homes. Results showed that although cognitive impairments affect the elderly participants' interaction with the technological mean (i.e. the avatar), they naturally interact with it (as if they were answering to a real person) displayed by a classical user interface (TV set) with a classical way to interact with it (i.e. remote control). The introduction of new products and functionalities in daily contexts is also addressed by studies of technology acceptance and domestication. Walldén and Mäkinen [48], for example, investigated the individual and societal factors affecting the integration of smart environments (SEs) into people's everyday lives. Indeed, SE technologies (e.g. RFID) and applications (e.g. smart homes) are predicted to become widespread in the near future. However, a common issue in technology advancement is that only a small share of innovations turns into an actual usage of new products or services (see also [17]). The research approach of Walldén and Mäkinen [48] involved a set of interviews with experts aimed at understanding a wide range of aspects (at both individual and social levels) related to the reasons why a technology is taken in use. A peculiarity of their method consisted in shifting the exploration focus from the adoption phase to the conception phase where practitioners and researchers (i.e. experts) make their assumptions which drive the design and development of new products and services. Results showed that usefulness, ease of use, trust and social influence were declared by the experts as the most relevant factors affecting the technology acceptance at user level. Differently, issues related to legal, economic and cultural aspects were considered as influences at societal level.

The contributions described in this section highlight the need for researches aimed at increasing the overall knowledgebase concerning the elderly daily lives. This type of studies, indeed, should lead technological innovation towards the development of usable and acceptable products and services for elderly.

1.4 Methodological implications

The interaction design (ID) perspective [39, 42] considers ethnography as a method to study users' everyday activities in order to identify guidelines for ICT design connected with users' experiences, emotional and communication needs. The analysis of the user activity is only the first step in a more complex ID process, which involves users in two other phases of design: collaborative design sessions and evaluation of prototypes (the phases are reiterated to build technological tools and services close to users' needs). The first aim of this paper is to provide a clear picture of the lives of elderly at home in order to inspire future researches when ideating new products and services. Researchers [19] pointed out that home is a suitable research setting because the elder perceive to be in a familiar and safe environment. Moreover, during the interviews, objects and tools at home provide valuable suggestions and props of biographical narratives. This aspect is crucial in this specific research since participants were engaged in narrative interviews and they could use objects as *cues* to talk about their daily practices. With regard to technology, the domestic field allows researchers to observe how particular devices and goods were integrated into these particular spaces. Silverstone and Haddon [44] discussed the issue of the domestication of a technology pointing out that the purchasing of a product is a complex process that involves also what consumers do with the technologies in their homes. Therefore, designers need to understand which characteristics make an object acceptable and familiar. In this perspective, users are constructed within the design of the product since their behaviours complete the function of the artefact. Thus, research methods and techniques in this field should support designers and innovators to observe the actual usage of objects and goods with the aim of anticipating future actions and patterns of everyday life. Some studies [23, 27] dealt with practices of participatory design involving elders in the process of ideation, prototyping and evaluation of technology designs. Some authors [23] recognized that seniors mostly gave their contributions when asked to define requirements or validate solutions, for example by means of prototyping, while they were less involved in the direct design of solutions with experts. With the aim of facilitating communication between designers and end-users (i.e. seniors), they underlined the importance of *cultural mediators*. These participants were defined as “a ‘hybrid’ category of users that mediate the relationship between the design team and the final users” (p. 21). Mediators can consider the perspective of both final users and designers and can interpret the behaviour of elders according to the designers' perspective. Therefore, researchers explicitly recommended to acknowledge mediators' responsibilities and activities and to include

their role in the rationale of the co-design process. In respect of prototyping with elders, Howthorn [27] widely described the development of a tutorial, the FileTutor, for file management functions on PCs, by adopting a user-centred perspective. After some focus groups with elders about their use of personal computers, the researcher recognized the difficulties met by seniors when they tried to access this technology. The author carried out further investigation about this failure, and results showed that low-fidelity prototypes could not represent features as font size, positioning, mouse interaction, backgrounds, which matter for elderly users. Moreover, because of the lack of pre-knowledge and design vocabulary, participants could not easily follow the design process. In other words, the elderly had inadequate knowledge of that technology in order to figure out its functionality from a low-fidelity prototype. Furthermore, co-design practices were based on conventions (e.g. use of post-it representing listbox) unfamiliar for senior participants. These studies showed relevant issues encountered during the involvement of elderly in the design process. The research presented in the present paper used an ethnographic method with the aim of discovering the domestic spaces of elderly without focusing on a specific product or service. Further study could benefit from these research insights in order to ideate new goods for elderly in the domestic contexts of use.

In our opinion, the contribution of the ethnographic perspective to exploring natural settings is only partially investigated in the design literature. Ethnography is introduced into design practice as a method for tracking natural activity flows to be reproduced during the design process. Indeed, the outputs expected from ethnographic research are descriptions and models of activities useful to designers and engineers.

About the role of ethnography, Hughes et al. [28] thus stated: “its naturalistic stance requires that its analysis begin with what it is persons do within the natural settings of their ordinary lives” (p. 126). However, this widespread and still current definition neglects the sphere of the meanings behind activities. Understanding why people do something, for what purpose and what interpretation they ascribe to their practices, is not a secondary goal for ethnography applied to design.

Ethnography is particularly fruitful from this point of view because the ethnographer does not limit him/herself by observing only what happens in a specific context. She or he builds close relationships with participants eliciting reflection through dialogue; this practice is also useful to bring out beliefs and deep meanings in the participants’ discourses. The ethnographer’s questions about what is observed induce participants to reflect upon their routine actions; participants become more aware of their own daily practices.

In the field of design for human–computer interaction (HCI), Bannon [6] suggests a similar perspective. He claims that is inappropriate to define people who take part in information system design as “human factors”. People are “human actors” in situation, and it is crucial to understand the “underlying values of the people involved and their motivation” (p. 25) in the work setting, in that specific case. This change of terminology highlighted that persons are agents who have “a set of values, goals and beliefs about life and work” (p. 26). The involvement of users in the entire design process is the way, Bannon suggests, to integrate such a rich and complex set of information into a workable and wieldy system able effectively to support people in their everyday activities.

However, still problematic is how to translate the rich and complex findings yielded by qualitative research approaches into insights useful for the design process.

Kelder and Turner [29] recognized that the most usual consequence of the gap between the two kinds of representation is the marginalization of rich insights connected with personal, emotional and socio-cultural dimensions impossible to codify into synthetic and abstract requirements for technological solutions. The result of this “failure of translation” is the exclusion of the contextual practices from the information system design process.

The research presented in this paper took account of this issue that still seems overly complex for designers to explore. In our view, practices centred on everyday products or services at home cannot be understood only through functional or topographic analyses of objects or means in natural life contexts; rather, research should seek to gain deeper understanding of distinctive psychological functioning, motivations and interpretations, which for elders connect the presence of those items in the home to crucial activities characterizing their daily lives.

Coherently with the theoretical background of such research, the proposed method rested on an important assumption: language is not description; rather, it is action, and it is constitutive of contingent reality: “The discourse analyst searches for patterns in language in use, building and referring back to the assumptions she or he is making about the nature of language, interaction, society and the interrelationships between them” ([46] p. 39). According to this view, method is not a neutral technical research instrument; rather, it reflects theoretical assumptions about the nature of social processes. A central aspect of the discourse analysis (DA) method applied in our research concerned data validation. Far from collecting episodic events in the transcripts, we sought to identify recurrent practices which could provide evidence on how the participants described their own worlds. The nature of the analysis was therefore qualitatively based on an ecological perspective on the context studied. According to the

general recommendations of DA, the method should survey data relevant to the participants, looking for “indexicalities” rather than applying categories predefined by the researchers. Relevant descriptions are not defined in advance, because the aim is to select the relevant meanings by having participants “define” what is relevant and what is not to implementing their actions. For these reasons, in “Results” section of this paper participants’ voices are used to express the research findings.

2 Method

2.1 Participants

This research involved the study of 241 homes of Italian elderly persons (147 women; minimum age = 65 years; mean age = 74.43 years, SD = 6.76 years) in different social environments (61% in cities and 39% in small towns) with different types of household (e.g. living alone, with others, in the family home; see Table 1 for details).

More than half of the participants (55%) preferred to not declare their marital status; instead, 42% stated to be married and 3% widowed. The following two tables show the sample stratification per education level (Table 2) and current or past work experience (Table 3).

Participants were recruited for the study by searching about their own personal networks and ensuring that close familial relations were not involved (for example, grandparents or uncles). The reason for this choice was to ensure the necessary “sense of estrangement” of the researcher from the people and setting they were examining [36].

2.2 Procedure

The fieldwork was based on guided video-recorded home tours with 241 Italian older adults. The research was organized into two different phases:

1. A pilot ethnographic study on the everyday lives of three elderly persons living alone (two females and one male).
2. A specific ethnographic study with 238 elderly persons.

Each fieldwork was organized over three days. The first day was dedicated to the negotiation of access to the homes and to an explanation of the goals and activities of the research to the participants.

During the first visit, an informed consent form was discussed and signed by the participants, in order to safeguard their privacy and the anonymity of their data (all names used in the paper are pseudonyms).

Table 1 Respondents (absolute and relative value) for types of household

Type of household	No. of respondents	Relative value (%)
With wife/husband	98	40.66
Living alone	86	35.68
With son/daughter	21	8.71
With son’s or daughter’s family	14	5.81
With others (e.g. a friend)	20	8.3
Not declared	2	0.84
Total	241	100

Table 2 Respondents (absolute and relative value) per levels of education

Education level	No. of respondents	Relative value (%)
Primary school	84	35.29
Secondary school	58	24.18
Middle school	53	21.57
Degree	34	14.38
Not declared	12	4.58
Total	241	100

Table 3 Respondents (absolute and relative value) per current/past work experience

Work experience	No. of respondents	Relative value (%)
Employee	87	36.1
Housewife	69	28.63
Teacher	26	10.79
Dressmaker	19	7.88
Manager	12	4.98
Shopkeeper	12	4.98
Freelance	7	2.9
Entrepreneur	7	2.9
Housekeeper	2	0.83
Total	241	100

On the second visit, the researcher asked the participants for a guided video-recorded tour of their homes.

The third visit was dedicated to a video- or audio-recorded narrative interview [4] about the participants’ everyday life and daily activities. The researchers allowed the participants to choose how the interviews were recorded (audio or video recording). The opening question was: “Please describe for me a typical day of your week”. Specific questions arose from the narrations. The aim was

to understand the participants' routines and their activities on weekdays and weekends.

During the home video tours, researchers asked participants to show them around the home and describe their domestic spaces and objects from their personal point of view. In particular, they asked them to linger on the narration of the home spaces and objects to which they were most bound emotionally. Further questions were asked during the tour by the researcher to learn more about the objects being described and their meanings. Researchers also took detailed field notes while observing how participants interacted with their home spaces and objects. Data were organized in one folder *per* participant: each participant folder contained the transcription of the audio interview, field notes, pictures taken in the house or meaningful screenshots of the video recording. A first and overall inspection of the research documents allowed researchers to identify the macrocategories of the insights (e.g. mementos, workroom and technologies), while a more careful reading of the documentations was aimed at selecting quotations, field notes and pictures representing a relevant practice, feeling or behaviour.

2.3 Research goals

The research focus was on the elderly persons' homes, in particular on the uses and meanings of objects and domestic spaces as directly observed by the researcher in the field during three days of participant observation and narrated by the participants to the researcher through video-recorded home tours.

In order to collect a proper corpus of data, specific ethnographic techniques were used in the research, as follows:

- *narrative interviews*. Researchers guided participants through the telling of their life experiences while recording it on audio- or videotape ([3] p. 131). In this case, the interview was prepared in order to explore the elder's behaviours and habits in relationship with specific objects and home arrangements;
- *home tours* (audio or video recorded). During guided home tours, ethnographers followed the participants around their homes, often asking questions about concrete details or the narratives [7, 31, 37];
- *photographs* of objects and home spaces taken to document home arrangements;
- *ethnographic field notes*.

This research focused on the actual uses and interpretations made by elderly people regarding their domestic spaces and specific categories of objects in their homes, such as:

1. Mementos, i.e. heterogeneous artefacts to which people give personal meanings; objects that are important "witnesses" of a person's biography [37, 38]. Clemente and Rossi [12] used the expression "fondness objects" to denote a specific category of mementos as extraordinary objects and pertaining to particular biographies;
2. Objects for preserving personal memories (e.g. personal diaries, photograph albums, showcases, archives, boxes, trunks);
3. Technological items and tools (e.g. TV, stereos, radios, cell phones and various technical tools used by the elderly).

The aim of the study was to respond to the following research questions:

- Which objects become "fondness objects"? How are they exhibited and kept at home, and why?
- Which other objects keep an emotional value? What is the feeling about the introduction at home of technological and technical means and tools?
- Which psychological processes underlie the use and the spatial organization of objects at home?

These questions referred to problems of diverse nature and should be answered by exploring the connection among objects, meanings, daily practices and home arrangements in a complex way. An emphasis on some specific categories of objects (e.g. mementos) was also important for understanding which objects were repositories of personal stories, experiences and memories, and where they were arranged at home. A further focus was on the relationships between elderly people and technologies (i.e. specific uses and modes of interaction, meanings, arrangements in home spaces and how technologies enter elderly people's homes). The exploration of these aspects was aimed at yielding insights for the design of ICT-based products and services from the Active Ageing perspective.

3 Results

3.1 Homes as memory landscapes

In these research findings, memories represented a pervasive and constitutive aspect of the elderly people's home arrangements. Domestic scenarios were thick and stratified. They were populated by objects as "mementos", which belonged to heterogeneous categories. Some of them were recurrent and recognizable, such as photographs, holiday souvenirs, holy images and figurines, small gifts received as a remembrances of family rituals (i.e. weddings or baptisms), jewellery, artworks, sport or dance trophies.



Fig. 1 Living room; Gigi, aged 74, Gaeta (LT). A sample picture of a “landscape” where mementos are organized in visible displays

Other mementos were too idiosyncratic to put them in one sole category: collections (e.g. shells, stones, coins, dolls), sundry everyday objects (books, teacups, tables, chairs, television sets, radios); the meanings of the home itself were so private and invisible that they could be understood only when their owner told their stories.

Mementos had different shapes and features, although their function was similar: arranged in the house, they enabled memories to situate themselves in space. They served to construct a sort of spatial *mnemo-technique* [2, 23], a permanent and tangible “memory landscape” that resisted time and everyday life changes. Spaces—for example landscapes—might become cultural signs, topographies of collective memories. Our research explored how elderly people arranged their domestic spaces by building “monuments” and “landscapes” of their own memories (see for example Figs. 1 and 2). For this purpose the elderly participants were asked to show and describe their homes and mementos.

The homes of the elderly were naïve “museographies” where memories were carefully chosen and organized in visible displays or in hidden repositories and archives.

Nothing was random and superfluous in memory landscapes; every object in the house was linked to a specific individual memory or a certain use or need. This aspect was evident when one of the participants said:

I don’t like objects on display. I want to keep things with specific memories. So that when I look at them and observe them, I am at times happy or sad. I don’t know. it depends (Annamaria, aged 73, Rome, RM; interview).

In this case, Annamaria’s needs were twofold: on the one hand, she implicitly expressed the more abstract need to remember by looking at objects; on the other hand, she



Fig. 2 Kitchen; Amedeo, aged 72, Potenza (PO). A sample picture of a naïve “monument” as visible display of memories

explained her need to remember selectively in order to support her emotional life. The consequences of this remembrance, however, were not always the same. As Annamaria told us, they were uncertain: they might be positive or negative in an unpredictable way.

Furthermore, the data collected showed that remembering was a meaningful activity for elderly people. Memories were fundamental for defining their personal and social identity; most of their life and identity relied on remembering what they had done and the people with whom they had engaged in their previous lifespan. This aspect emerged strongly when the elderly participants presented their homes and memory landscapes to the researchers. Comments and glosses arose as they narrated the events, persons and significant episodes “embodied” by objects: «*they are memories, by now you live on memories*» (Antonio, aged 69, Morricone, RM; home video tour). The ethnographic encounter fostered Antonio’s reflexivity and awareness of his everyday life. He recognized that remembering was one of the meaningful activities in ageing; the objects that he had collected reflected this priority.

3.2 Memories for oneself: memory boxes

All mementos comprise two dimensions, private and public. The private one is specific to mementos because they are objects chosen simultaneously to “store” and to support memories. Objects become mementos because they are ascribed private meanings. Some mementos are more private and hermetic than others (i.e. collected shells or stones as opposed to pictures). However, this private meaning becomes public when it is narrated to someone, or when a staging is specifically constructed around it to aid its understanding. This latter case is represented by the naïve

museographies, more or less explicit, observed in the elderly participants' homes and described above. The category of mementos also includes objects that a person wants to keep completely private. They enclose memories only for that person who does not wish to share with others. They are hidden and stored in boxes preserved like precious treasures where “we collect ourselves” [13] and where we select and choose our intimate heritage.

Several participants, even those living alone, exhibited this twofold categorization of mementos: there were memories to be shared and others to be remembered for oneself. When the elderly participants were asked by the researchers about their memory boxes, some of them decided to take them out and show them. When this happened, the ritual of memory began: Mirella (aged 65, Lanuvio, LT) opened a pink chocolate box (Fig. 3), the first gift from her husband when they were engaged. The first memory that she put in the box was a letter from her husband. Her most cherished postcards and pictures followed the letter over time. The box represented Mirella's most important memories. As she put it: *«More and even more a box of memories»* (interview). She usually opened the box when she was depressed and wanted to remember *«good times lived in peace»*. Several dimensions were evoked by the object. The memory box contained Mirella's pictures when she was younger. On looking at them she was satisfied: her self-identity was supported and reassured, because now she could see her beauty that she had been unable to recognize previously. The memory box also enabled Mirella to include a space for transgression into the rules of her everyday life because it hid private memories that she did not share with others, such as the photograph of an old love that made her husband jealous. Finally, the object evoked fears that she had to overcome during her lifetime. The cover of the box depicted a quiet sea scenery.



Fig. 3 Memory box; Mirella, aged 65, Lanuvio (RM). A sample picture of a small casing enveloping private cards, pictures and diaries

Mirella had been afraid of the sea, even though it was a dream for her: *«Who would have thought that in old age I would go twice on a cruise»*, Mirella exclaimed.

Memory boxes perform many functions, as already shown. Often hidden in wardrobes, they could contain letters, greeting cards collected over the years, pictures, but also secret diaries written for someone else. This was the case of Ellis (aged 78, Formia, LT) whose children had been living in the USA for 22 years. She had collected greeting cards and letters from her children since her heart surgery. She understood the importance of keeping these physical and emotional memories for herself, so that she could feel close to her distant children, but also for her children because she wanted them to remember her. Close to the greeting cards were also some personal diaries. Her daughter had asked her to write them so that she could know about her mother's everyday life. Ellis began writing the diaries in private, without her husband ever knowing. This last example highlights another important aspect of these private memories. Ellis was collecting her own memories; she was building an intimate heritage to pass on to her children. Once again, meaningful others were central actors in the process of memory construction. Their presence gave meaning to the practice of selecting and preserving memories.

3.3 Technologies in elderly people's homes

This research showed that technologies may enter elderly people's homes in three main ways: (a) by supporting specific needs connected with ageing, primarily the need for safety; (b) by “building presence”, i.e. by providing sound landscapes that keep elderly people company; (c) as tools used for work practices carried out in specific spaces at home.

In the former case, we sometimes found advanced technologies in the elderly participants' homes: for instance, a helpline or a sort of pager, fixed in the house, which kept track of unanswered calls. Enrica (aged 82, Rome, RM) talked about this device as follows: *«it's the “who's there?”. If you call me, the number appears here, if I've not been at home [...] I can see who's called me and I can call them back»*. Enrica's nephew had mediated the entrance of the “who's there device” in her home. He installed it, he understood its functioning, and he later explained its use to Enrica. This last aspect was central to understand how elderly people started to use technology, above all the more advanced ones. Indeed, technology was often not self-evident to the elderly, who asked for help from their grandchildren or, generally, from younger and more experienced family members or friends. The strong need for help and support of elderly using technology was also demonstrated by the UTOPIA project [19] that focused

on eliciting requirements from the elderly regarding their lives at home. Other results showed that in many cases it was family members themselves who introduced technological tools, such as cell phones or helplines, without a specific request from the elderly. They did so because they wanted to monitor their parents living alone, often after, or during, a critical episode (such as the death of one of the parents or illness). These objects met the elderly person's need for safety and were accepted. However, the process of appropriation was slow and closely depended on who mediated implementation of the technology. In other words, the elderly person's trust in technology seemed to be built on his or her trust in the mediator.

When new digital technologies were introduced into the lives of the elderly, their use was restricted to certain functions. This aspect was more evident in relation to cell phone use. Usually, elderly people selected only a few functions: they called and received calls. Sometimes they stored the most important numbers in the phone book. Grazia (aged 70, Rome, RM) was also able to read the messages received because she only had to press the "read" button: «*I only use the mobile phone to make or receive calls. That's all. At most I read messages because it's written "read" so I read*» (field notes). Grazia's words stressed the importance of tool "affordances" [34] in suggesting functions and applications. The elderly seemed to use only those functionalities which were clearly displayed on digital tools and which were "familiar" from the point of view of known functionalities (i.e. making and receiving calls).

There were other common kinds of technologies in the homes visited during the research. Cell phones, TVs, DTT decoders and radio were the most frequent, but also computers and printers, mainly used for emails and to share photographs with friends and relatives. Technological tools were located in the most frequently used domestic spaces: kitchens and bedrooms. The kitchen was considered by Leonardi et al. as the most important space in the house as regards everyday activities, and in which technology is welcome to alleviate the workload. Indeed, the kitchen, because of its "dynamicity" linked to activities done in it, seems to be the domestic space most able to gradually transform itself and welcome new technological tools and functions. By contrast, according to Leonardi et al. [32], the bedroom is a conservative space populated by symbolic objects which resist changing their location to accommodate new artefacts (*ibidem*). However, our results contradict this finding. Indeed, the bedrooms explored were strategic "areas of control" for the elderly participants' everyday lives, where bedside tables were small "centres of physical and affective emergences": besides pictures of significant dead people, souvenirs and holy images, there were other relevant tools and daily items such as house



Fig. 4 Bedside table; Antonio, aged 69, Morricono (RM). A sample picture of a layout of souvenirs and remote controls in the bedroom

radios, cell phones, clocks, glasses, medicines and several remote controls (e.g. see Fig. 4). For example, Antonio (aged 69, Morricono, RM) talked about his bedside table as follows:

Here I have various... various... gadgets [the reference is to remote controls] for the cell phone, to use TV, this one is for the decoder, for the air conditioner, [...] these are... this is a souvenir of my mother [he picks up a little statue of an Italian saint which is near the remote controls] [...] these are friends of mine who've bought me gifts, I'm very attached to them (home video tour; see a freeze-frame in Fig. 4).

Antonio's bedside table bores everything that could help him feel safe: the sacred souvenir of his mother, the cell phone for rapid calls to members of his social network in case of need, the remote control for TV that filled the emptiness felt at sensitive times of the day.

This evidence showed that technological tools entered the homes of the elderly also in order to satisfy their need for company. Emptied of real presences and people, the homes of the elderly were populated by objects which reminded them and were "animated" by technologies that filled the emptiness of domestic spaces by providing constant soundscapes. Televisions and radios were "voices" for the elderly. They were often switched on even if the elderly person was not listening to or watching them.

As Giovanna (aged 65, Rome, RM) put it «*during the day, TV keeps me company*», also when she changed rooms and did not watch it.

These artefacts were sometimes chosen as fondness objects linked to biographies in a unique way. Besides sewing machines, telephones, cameras and typewriters, televisions and radios were endowed with specific meanings. They were gifts, or they had been purchased by their



Fig. 5 Chiara with her “voice”; Chiara, aged 80, Orvieto (TR). A freeze-frame while she recounts the story about her radio device

owners at specific life stages, for example after weddings, as symbols of a new life beginning (particularly televisions). When, over time, old technological tools broke and were replaced, the new ones carried with them memories of old objects.

The need of elderly people for company was particularly evident in their interactions with technology. These became real interlocutors with which the elderly related in a personalized manner, mostly when they were unable to sleep at night. As Chiara (aged 80, Orvieto, TR; see Fig. 5) recounted:

I’ve had the radio in the bedroom since my husband’s death, he talks [referring to the radio], I stay in bed, [...] I can’t stay there without the radio, [...] he talks to me and I fall asleep [...] I’m very fond of the radio (interview).

Chiara’s interview expressed a basic need. After her husband’s death she had been lonely. His loss was felt more at certain times, during which she filled the void with radio voices and contents. The radio had been a gift from her husband, and it now seemed to be his personification. Indeed, when Chiara talked about the radio, she used the third person singular masculine pronoun. Once again, an everyday object took the place of a lost relationship. The difference in this case was that features of a technological tool, above all sound, seemed to emphasize the dimension of presence—and its need—already ascribed to mementos.

Besides the radio, the TV was the most common object that served the need for keeping company with the senior. In the researchers’ field notes, indeed, the TV was always mentioned. Often, when researchers enter the seniors’ homes, the TV was switched on, and sometimes its volume was so high as to be heard also from the street, before entering the participants’ homes. “Switching on the TV”

was mentioned by participants as a routine, an activity that occurred every day at the same time. For example, Grazia explained that during the day, the TV kept her company even when she changed rooms and did not directly watch it. Quite similar was the case of Antonio who said *«I need it (TV) for company for any time of day or the night. I sleep with one eye, and with the other I watch the television, just [when] I return home I switch it on from here [he points towards the TV in front of us] or there [he points towards the bedroom]»*. In this example, Antonio underlined how his need for company was continuous during the day; it involved “anytime” including the night, often described as a very difficult time for older people, especially if they lived alone.

With regard to technologies and their appropriation by the elderly, another issue concerned the aesthetic dimension. When talking about this with the elderly participants, they expressed the need for objects to be appealing. For example, when Ennio (aged 73) explained to the researcher why he had chosen that specific radio, he stressed:

I chose it because I have a minor obsession with searching for things that are also attractive (.) I have to like the object. If I see it with a colour I don’t like, it’s possible that I’ll reject it immediately [...] the object has to attract me.

Ennio revealed how aesthetics (i.e. colour) was an important criterion when selecting one object rather than another. It was very important for accepting an object. But what kind of aesthetics is this? With regard to the homes of the elderly we could reason in terms of “age-related aesthetics”. Even though this concept was difficult to define unambiguously, some of the elderly participants’ answers suggested specific interpretations of it. Maria Pia (aged 72, Rome, RM) said about her clock: *«I like it because it is an object that matches my furniture»*. In light of Maria Pia’s statement, “appeal” could be interpreted as something in harmony with its context, and with similar features, like materials (i.e. the wood of furniture) or shapes. In this case, “attractive” was synonymous with “familiar”, “known”, “coherent”.

Otherwise, Grazia (aged 70, Rome, RM) emphasized home decoration. She said: *«I like the dressed home»*, referring to her handmade lace doilies placed on furniture to decorate and to protect objects considered of value. From Grazia’s point of view, “attractive” meant “decorated”, “embellished” and, at the same time, “protected” and “well preserved”.

The home arrangements observed in this study showed another typical place tagged as “workroom”: the latter was often a common room transformed in “domestic laboratory” that hosted creative activities of the seniors. For example, Luisa was 76 years old. During the video tour,

she described the room where she spent a lot of time sewing with her sewing machine, bought after the death of her husband. In the workroom, there were many different items: the small table behind the sewing machine held four albums of photographs; there was also the old wardrobe bought for her marriage, the bed used by her son in the past and a sofa. Luisa explained the activity she carried out there:

this is the workroom [pause] eh! Where I spend a lot of time [she laughs] because I love sewing, cutting, repairing, lengthen, tighten, shorten, it depends from what needs. I have all threads, the light here [she refers to the window]. I have all my memories [she points out her photo albums] since ... these are all souvenirs for me.

In the workroom Luisa told the researcher what she “loved” to do: “sewing, cutting, repairing”, in other words manual and practical activities that gratified her and contributed to her well-being. In the room she had all she needed: tools for her activity, the sunlight and her memories: some albums of photographs that recalled the main stages of her life. It was interesting to note that these specific rooms also contained photographs and memories, so they hosted a mix of functional and remembrance practices. This aspect is common among participants of this study.

4 Limitations

The aim of this study was to report on a broad ethnographic research exploring the daily practices of a large sample of older adults in their domestic environments. The focus of this investigation was on the meanings of objects and their arrangement in the different spaces of elders’ homes. Thus, at this step of the study, it is not possible present a complete framework useful for the design of new technologies. Further studies will be aimed at exploiting these insights turning them into design recommendations for products and services for the domestic environment of seniors. In other words, the current paper describes a necessary preliminary phase of research that should support future design strategies in the ideation of new goods for elderly.

For the specific purposes of the present research work, the ethnographic approach was considered the most appropriate for eliciting as much information as possible and discovering the distinctive traits of elderly behaviours and feelings at home. However, it would also be interesting to involve the same sample of end-users during further steps of co-design, such as concept definition and prototyping of new solutions, in order to obtain more specific

design suggestions and guidelines. Finally, the study involved elderly people from two different types of territory in the centre of Italy, i.e. small town and city. For future research, it is recommended to expand the research to other geographic areas (e.g. rural villages) including other countries for a more cross-cultural perspective.

5 Concluding remarks

The data gathered in our research sessions on house arrangements provided specific insights, most of them concerning psychological needs. In this section, results are discussed in order to respond to the research questions introduced in the beginning of the paper. Those issues were all focused on the understanding of uses and meanings of objects and domestic environments. First of all, we asked the question: “Which objects become ‘fondness objects’? How they are exhibited and kept at home, and why?”. Results showed that meaningful objects were “mementos”, i.e. repositories of personal stories and memories. The use and orchestration of this specific category of objects may be summed up as follows:

- *Virtual presences animate homes* Pictures and objects are narrated by elderly people as animating their homes by keeping virtually alive over the years people who have died (i.e. parents, partners or friends), or have left home (children), or who live elsewhere;
- *Tangible memories* Both common and idiosyncratic mementos support remembrance through their physical appearance; specific spaces are arranged in order to create or augment the perception of others’ presence as “being there” through objects;
- *public mementos vs. private memories* Both interviews and ethnographies showed that elderly people, even those living alone, preserve mementos in a twofold way which reflects the selection of objects for public sharing or for intimate use;

Secondly, we asked “Which psychological processes underlie the use and the spatial organization of objects at home?”. Two processes were observed in relation to the selection and function of mementos at home:

- *Selectivity of mementos* Elderly people select mementos to be preserved and selecting criteria change with time. This observation could help designers aiming at ideating products and services for preserving digital memories (e.g. pictures, audios and videos) at home. Stevens et al. [45], for example, showed an increasing trend in developing automated recording systems. However, from our results, a criticality could come out from that solution. The present study, indeed,

suggests that preference should be operated in terms of offering *selectivity* rather than automaticity;

- *Memory landscapes as peripheral displays* A distinctive function of mementos is to serve the remembrance need of the elderly while carrying out other activities. According to the definition of peripheral displays provided by Matthews et al. [33], memory landscapes convey remembrance primarily at an operational level rather than the action one and provide both peripheral awareness and primary activity (because remembering can be both a focal and a secondary activity in different moments and places);

thirdly, the research also focused on the following question: “What is the feeling about the introduction at home of technological and technical means and tools?”. Results described specific behaviour, attitudes and needs related to ways in which technological tools are placed and used in the homes of elderly people. These insights are listed as follows:

- *Sound technologies as filling emptiness* Radio and television are often switched on even if elderly people are not listening to or watching them. This aspect refers to a basic need for company expressed by the elderly. A design challenge here may be represented by the capacity of technologies to “animate” the home by providing either live “voices” and content or additional resources to let meaningful persons “enter the door”;
- *Familiarity as a success factor in the use of technologies* During home visits, the elderly respondents very often described technological tools as fondness objects. Cell phones, sewing machines, radios and televisions were introduced by and used together with people who had had strong relationships with the elderly participants at important moments in their lives. Once learned, the use of these technologies is maintained over time and sometimes orients the elderly in the use of new tools if their look and feel is similar to those technologies with which they are already familiar;
- *The heuristic of “visibility”* [1] In the case of new digital technologies introduced into the elderly participants’ lives, we observed the selective use of functions that were well represented in terms of affordances. By contrast, this target group tended not to use functions which were known to them but were not clearly displayed on digital tools. While affordances are always a crucial aspect in designing digital tools, this is an even more important issue for this target population;
- *The aesthetics of ageing* The appearance of digital artefacts is also important because it is often rather distant from an elderly person’s preferences; designers should begin to consider the “age-related aesthetic” even for the elderly. The issue of aesthetics was broadly

addressed by Silverstone and Haddon [44] as regards the design of early radio devices. The latter, indeed, represent one of the first mass technologies at home, and their design was initially aimed at integrating those unfamiliar machines into the harmony of the domestic furnishings.

Finally, with regard to the fourth research question: “Which other objects keep an emotional value?”, the results obtained showed that many elders furnish their domestic spaces with tools and machines suitable for pleasure (i.e. hobbies) and work activities. For several female participants, for example, the sewing machine represented the instrument that turned a room into a workspace where they spend much of their time during the day. This practice has an important value for elderly lives because they maintain an active life and a social inclusion through their skills and competences.

Overall, results from this ethnographic study showed that domestic environments in elderly people’s homes are strongly characterized by objects that promote the preservation and recall of past experiences and relationships. This kind of products and mainstream technologies (e.g. TV and radio) have the primary function of filling the void left by people that are no longer physically present. The physical absence, in turn, assigns to inanimate a deep emotional meaning to objects. If these products may only represent functional items for younger generations, they become “fondness objects” in the lives of the elderly with a relevant psychological function for their well-being in daily life.

Further studies will be useful to evaluate the generalizability of these suggestions. Moreover, cultural differences could be taken into account through the investigation and analysis of similarities and differences between countries.

Further studies in this research field should be aimed at yielding a knowledge framework suitable for the design of products and services to introduce in the daily lives of elderly people.

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