Voicing values: laying foundations for ageing people to participate in design

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ABSTRACT

This paper discusses Participatory Design workshops that sought to enable ageing people to articulate their core values in relation to their experiences of ageing. Our motivations were to better understand how ageing people decide whether or not to adopt and use particular technologies, and to gain insights into the kinds of technologies that might support their aspirations as they age. We contribute to current understandings of ageing people's values, including a range of values that were most important to our participants, insights into how these values are expressed and experienced in everyday lives, the inter-relatedness of values in action, and how the three social dimensions of *self*, *friends and family*, as well as *community* influence the expression of values. The workshops demonstrated how engaged ageing people are with others and the broader communities they inhabit. We reflect on the processes, methods and tools that were useful when supporting people to voice their values and how this approach can support the participation of ageing people in design.

CCS Concepts

Human-centered computing~Participatory design

Keywords

Values; Ageing; Participatory Design; Participatory Design Tools; Participatory Design Methods;

1. INTRODUCTION

Values are enduring beliefs that we hold concerning desirable modes of conduct or end-states of existence in different situations, societies and cultural contexts [1, 25]. For example, for an ageing person, desirable modes of conduct could be contributing to a community to improve it in different ways, while desirable end-states could be a preference for a loving home life or being valued by others. So values guide our actions, judgments and decisions, and are fundamental to what makes us human (e.g., [11,12, 25]).

Understanding people's values is important because, when people encounter new technologies, their values can affect their decisions whether or not to adopt and use particular technologies [18]. Halloran et al. [10] also argued for the use of values of those who will use the technology in a co-design process: "Since values embody ideas and qualities that people find important and worth

pursuing and attaining, it is now recognized that products that resonate with users' values will be more successful" (p. 245). Halloran et al. [10] identified some broad approaches in the literature concerned with values in design and the assumptions those approaches make regarding values. One approach is where the designer works with and selects from an assumed fixed set of universal values (e.g., [7, 8, 25]). Another is to elicit users' values based upon pre-existing taxonomies of values (e.g., [29]). A third is where designers discuss particular values with users in order to conceive new design solutions (e.g., [27]). In contrast, the approach Halloran et al. [10] adopt considers values "as a spontaneously emerging, dynamic resource for co-design when a bottom-up, data-driven approach is taken with specific groups of users." (p. 250). Their contribution was a clearer understanding on how user values can drive the co-design process and how values can be a central resource for co-design in different ways.

This paper discusses Participatory Design workshops that sought to enable ageing people to articulate their core values in relation to their own experiences of ageing. We begin by noting the ethical and political commitments of Participatory Design and more recent work that has specifically focused on values in Participatory Design projects. This is followed by a description of the workshops including their motivations and approaches. We then identify and describe five values our participants chose as most important to them. The Discussion section reflects on the contribution of the particular methods and tools employed in the workshop as well as the insights gained about the nature of our participants' values. We end by proposing ways to extend this work.

2. VALUES AND PARTICIPATORY DESIGN

There is an ethical stance underlying Participatory Design that acknowledges an accountability of design to the lives of those who will be affected by both the design process and its outcomes. At its heart is an unshakable commitment to ensuring that those who will use information and communication technologies play a critical role in their design. Designing in genuine partnership with those who will use the technologies we build is our way of taking a stand for our values both as designers and design researchers and within our wider communities [20].

The constitutive relations between ethics and Participatory Design are explored by Robertson and Wagner [21]. They explain how the major principles of Participatory Design share both pragmatic and ethical rationales. For example, the basic principle that people who do a particular activity know most about how it is done leads to the recognition that involving them in design means that the outcomes are likely to be more successful. At the same time, it expresses core values of Participatory Design that respect people's expertise and their right to represent their own activities to others

rather than having others speak for them. Similarly, the development and use of processes and tools that enable designers, users, and other stakeholders to learn from each other through understanding each other's perspectives leads to more robust communication and again leads to outcomes more likely to be successful. At the same time, it expresses other core values of Participatory Design that different voices need to be heard in a design process if it is to be genuinely participatory (p. 65). These values underlie the central epistemological claims of Participatory Design that genuine participation leads to more effective design knowledge and to more robust and sustainable design outcomes (e.g., [16, 28]).

Most importantly, the pragmatic and ethical rationales of Participatory Design underlie the centrality of mutual learning and mutual learning processes as both its motivation and outcome. Pragmatically, mutual learning can enable all participants to better envisage future technologies and the practices in which they might be used (e.g., [9, 28]). Ethically, mutual learning enables those who might otherwise lack the power and resources to genuinely participate in design to find and develop an effective voice in the shaping of their future activities and environments (e.g., [21, 28]).

More recently some Participatory Design practitioners have advocated that more specific attention be placed on values in Participatory Design projects [13, 14, 18] as this may help refocus how we conduct Participatory Design. First, Iversen et al. [13] argue that a reification of the tools, methods, and the notion of participation in the design process by some researchers has obscured what Participatory Design can truly offer as a design approach. They suggest that refocusing Participatory Design on core engagement with values would change how we view Participatory Design tools, methods and participation; that is, to see them as the means to work with participants' values during the design process. Second, working with participants' values explicitly, especially in more exploratory projects, can support participants to discover meaningful alternatives [18]. These 'alternatives' can include designed artefacts but can also have the potential to transform how people view technology, e.g., from seeing it as something that they had no influence over, to something that could be designed and shaped to fulfil their visions and values.

3. THE WORKSHOPS

In previous work, we learnt the importance of finding ways to support participants in design projects to articulate their values, and that these are more likely to be expressed through everyday practice rather than explicitly through thought or speech [13, 14, 18]. We had also learned that ageing people want to use the same technologies as everyone else does and are willing to invest time and effort into learning to use new technologies if they believe the investment will be worthwhile to them [23, 24]. These findings led to the questions of what would motivate ageing people to learn to use new technologies and what kinds of technologies ageing people would be interested in using and learning to use. Our previous work had also reminded us of the importance of mutual learning processes to identify and understand the changes, both good and bad, that emerging technologies might offer [22].

A one-day workshop was planned to investigate the values of ageing people and how these were expressed in relation to their willingness to learn to use various new ICTs. The aims of the workshop were to develop our understandings of how and why ageing people value information and communications technologies and the kinds of technologies they might value. We also wanted insights into the circumstances under which ageing people are prepared to learn new technologies and the kinds of benefits that are expected from new technologies, relative to the efforts put into learning and appropriating them into day-to-day activities. The workshop would be held at a community centre in one of the northern beaches of Sydney with participants from the seniors computer club that occupied one of the rooms in the centre. A notice was placed in the club's newsletter explaining the project and asking for volunteers.

The planning and preparation for the workshop at the community centre began with a series of iterative planning sessions by the authors. It was decided to include two distinct activities in the workshop. The first was aimed at supporting the emergence of values and trying to understand how participants expressed and experienced their values with regards to ageing. We used an activity that is a variation on 'show and tell'. Prior to the workshop we asked participants to bring with them an artefact that could help them tell us something about what really mattered to them in each of these three areas, such as an object, a story, a photo, a drawing, or whatever they deemed appropriate (see figure 2):

1. Where they lived (physical and lived environment)

2. Social engagement (family, friends and community)

3. Wellbeing

The second activity introduced several kinds of emerging ICTs that included ageing people as their proposed user demographic. The aim of the second activity was to see how our participants' values, which they articulated during the first 'show and tell' activity, shaped their views and preferences of these ICTs.

Prior to running the workshop at the community centre, we held two pilot workshops to try out both planned activities with participants already known to us. Seven septuagenarians participated, three women and four men. The pilot workshops were held over two afternoons. Each activity was piloted on a different day so that learnings/findings from the pilot of the first activity could help with the design of the second activity. At the end of each session, participants were asked to critique the activity itself and how it was designed and conducted. Piloting each activity separately enabled us to iterate the overall design of both as well as how data was generated and recorded in each. Most importantly, the pilot workshops highlighted issues with transitions between different phases of each activity and the feedback from our participants allowed us to fine tune the mutual learning processes involved in each.

Eight people participated in the actual community workshop, two men and six women. Ages ranged between 75 and 95. Computer literacy ranged from basic email and internet use to regular use of more complex applications. A variation of speed dating was used as a warm up activity (Figure 1). Pairs of participants, including the researchers, each had one minute to ask the other about something they had done recently, their favourite technology and their motivation to participate in the workshop. Then each moved on to another participant and this process continued until each had spoken to all the others.

Figure 1. Speed dating activity at the community workshop

The first activity began with each participant presenting their three items and explaining why they had chosen the individual items to speak about (i) where they lived, (ii) social engagement, and (iii) wellbeing (see figure 2). After each presentation, the others could to ask questions or seek clarification from the presenter. When the presentations were completed, we held a general discussion. After this, each participant was asked to reflect on the session so far and list examples of values, which they felt were important, on large sheets of paper. These were put up on the walls. In the pilot workshop, the group then worked together to identify some common values in the reflections, which were listed on a whiteboard (Figure 3). After this first pilot workshop, the authors used affinity diagramming to cluster the values, naming each of the eight resulting clusters with the term most frequently used by the participants. The clusters were shown to, and validated by the pilot workshop participants in the second pilot workshop.

The clusters were then incorporated into a 4x3 grid on an A4 sheet of paper. This grid had four empty squares and each of the twelve squares had room for comments. We used this grid in the actual community workshop. In this workshop, participants also presented the artefacts they brought with them, reflected and listed examples of the values they felt were important on large sheets of paper, which were again put up on the walls. Participants used the grid developed after the pilot workshop to identify values that were common to their own experiences and to add other values that were not yet included. The values articulated by the participants included choice, control, independence, competency, skills, value, purpose, contribution and belonging. When asked to rank these values in order importance to them, a clear group of five emerged. These are Purpose, Belonging, Competency, Contribution, and Independence.

Data gathered during the first activity of the pilot workshop and the community workshop included: recordings of participants presenting the three items they had brought to the workshop and recordings of the discussions that followed; a number of 'worksheets' such as the larges sheets of paper where participants' articulated and reflected on common values and the grid where they identified values that were most salient to their own well-being as they aged. After the workshop, the authors went through the various data, linking examples of values-in-action to the five most salient values chosen by the participants, and identifying inter-relationships between the five values.

Figure 2. Using artefacts to talk about personal experiences of ageing (at the pilot workshop).

Figure 3. Identifying common values (at the pilot workshop).

In the second workshop activity, the authors set out to 'sell' three emerging technologies to the workshop participants. The first relied on the use of various networked sensors within domestic spaces; the second was a 'social portal' combining a number of social technologies and other computer functionality into one application; and the third a robot pet. Participants were asked to respond to the potential contributions of the technologies to those things that really mattered to them. They were also asked to consider and articulate the circumstances, if any, in which they might be willing to make the effort of learning use these technologies and to make room for them in their everyday practices.

This paper reports only on the first activity of the workshop, where we supported participants to talk about their values with regards to their ageing.

4. VALUES IN ACTION
Our participants identified their five 'most important values' as Purpose, Belonging, Competency, Contribution, and Independence. While these are discussed individually in this section we emphasise that the inter-relatedness of the values is one of the major findings of the workshop. These values are mutually constitutive – affecting, shaping and influencing each other. As such, it is impossible to not refer to other values while

we discuss and illustrate how each value is expressed and experienced by particular individuals.

It was clear in our data that our participants' values were expressed and experienced relationally, i.e., from the self to another person or people or to something else, in the present or the future. We found that this relational sense making occurred consistently across three dimensions - the individual *self*, the individual's *friends and family*, and the *community* or *communities* that the individual is a part of and/or is invested in. Take for example one of the values – competency – which we will present in greater detail later. At first glance, we might think that this is solely about the self. People actively pursue activities that allow them to develop, maintain, or even to acquire new skills because being competent in something is important to them. However, we found that people also invested time and effort in developing various competencies because they want to feel useful, appreciated and of value to others. In some situations, it would be to particular family and friends, in others to particular communities the individual is involved in, or even to society in general.

The five values that our participants felt were more important to them are presented in the remainder of this section. We describe and illustrate how each of the values is experienced relationally and across the three social dimensions of self, friends and family, as well as community.

4.1 Purpose

To have a purpose or goal(s) appears to be a fundamental value. A person's sense of purpose shapes how the other values are expressed and experienced. From our participants' stories, having purpose gives people a sense of focus and the drive to engage with the world in their everyday lives. This translates to actions, such as having personal projects, having a particular health goal, contributing to community and so on. This doing of something purposeful gives people a sense of achievement or accomplishment and relates closely to people's desire for competency.

Full-time employment can be a major source of people's sense of achievement or accomplishment, as can responsibilities to dependents in a family. But as people age and move towards retirement from full-time employment, the demands and structures provided by full-time employment are opened for redefinition and refocus. However, it appears that finding, discovering and defining a new purpose is an ongoing effort. Besides retirement from work, major changes in a person's life circumstances can trigger the need to redefine their purpose. These include changes in their bodies, their states of health (for better or worse but obviously worsening over time), changes in their social circles, such as close friends dying, new friendships being made, or children and grandchildren moving further away, and ongoing changes in the community that one is involved in. There may also be changes to their financial situation.

Changes in purpose reflect the three important dimensions that shape values in action – self, family and friends, and community. The work in rediscovering and redefining one's purpose is accomplished relationally, and not just with regards to the self; it can also shape and be shaped by by family and friends, as well as the various communities in which people participate. Since purpose drives people into action, it is what they do and why they do it that we can begin to understand this value. So how does 'purpose' play out in some of our participants' lives?

Rose represents perhaps the most vivid example of someone who is very driven and displays a strong sense of purpose. Rose holds a voluntary but very senior role within an organisation that offers a wide range of education opportunities to seniors. Besides contributing greatly to the ageing community and to her sense of self and identity, this role engenders a strong sense of purpose for Rose. It keeps her engaged mentally, emotionally and physically while offering her a great deal of personal fulfilment.

Adam continues to work for himself from his home. He does not begrudge not being able to 'retire' because the work continues to give him a sense of purpose, self-satisfaction, and achievement. He is deeply passionate about his professional skills and is very good at his work. Adam has chosen not to 'retire' in part because he doesn't have extensive retirement savings and working is important for financial reasons.

Matthew moved with his wife to Sydney, from a smaller Australian city, after he retired. But his retirement has not slowed him down. In fact, he 'complains' about being busier than ever. Matthew told us that he is very interested in devoting his time and energy to exploring technologies to support the ageing. He also expressed a strong interest in seeking opportunities where he can help shape and influence the welfare of ageing people on a national level. Moving to Sydney, apart from other reasons, gets him closer to 'the action'.

David displays a strong sense of purpose that has fuelled his dedication to buy and renovate a series of houses over the years. Buying homes that need care and renovation, David adds his own aesthetics (which he is proud of) to the house that he then lives in for a while before selling and moving on to another home renovation project. On the 'self' level, this fuels his passion for creative activities while ensuring his financial independence. But this is also about others. David explained that one of the aims of the renovation is to create "a home environment which I share with my dog, Ivy, that is as beautiful as I can make it. I aim to make it restorative, restful, liberating to my spirits, and the enjoyment of visitors". David also sees his talent for aesthetics as a way to give back, "my family rely on me almost completely for matters of aesthetics. This enables me to pay back their seemingly unconditional love".

Although no longer in fulltime employment, many of our participants have redefined their purpose in part through volunteering and contributing to the community. Carla volunteers her administrative services at various classical music organisations. She is deeply passionate and knowledgeable about classical music. Although she 'complains' about the frustrations of dealing with various demanding people, it is clear that this job gives her a great sense of purpose, routine, and engagement. She values the opportunities to meet famous classical musicians that her position offers. At the same time, she feels that she is contributing something to the classical music community, as well as her friends.

David, Adam, Matthew and Dora all regularly walk their dogs as a way to keep active and fit. Yet, this purposeful 'self-centred' activity is deeply imbued with the social. For David, his morning walks with his dog to a nearby local park allow him to meet up with other dog walkers. This provides "the opportunity to gather and exchange news, views, and practical information about his local community, such as where to get the best coffee, or the latest shop that has opened up or closed, and so on". Cherishing his walks, he acknowledges they also "offer the same experiences and social activities to Ivy, my dog".

While our participants don't always talk explicitly about particular purposes they have in their lives, almost all of them would regularly preface their sentences with "When I get older…" This indicates that they are far from being done with life. From what they tell us about their everyday lives, they live and act with a sense that there is still so much to do. These are people with clear aspirations who are driven by a strong sense of purpose.

4.2 Belonging

For our participants, the value of belonging refers to the importance (and benefits) of being a part of family, groups of friends or various communities. Similarly, belonging is experienced and expressed across different social dimensions. This sense of belonging can apply to more than one social group. Belonging is important because it appears to fulfil different aspects of people's lives. This sense of belonging may provide someone with purpose, or something to focus on and cultivate; providing a sense of fulfilment and even security. Belonging may also provide companionship, which can help reduce the feeling of loneliness and improve wellbeing.

Family is one of the most important sources of belonging. Many participants speak with great pride about their now grown-up children, their children's respective spouses and grandchildren. Craig and Mary describe their sense of belonging not just with their immediate family - their children and grandchildren, but also their large extended family. Jim maintains his sense of belonging with his children through annual travels, going to various cities in the world to spend time with his children who are all settled with children of their own. But belonging is not simply about feeling a part of something. It needs nurturing and other work – reciprocal work, which can accompany desirable benefits. Jim's belonging gives him the opportunity to give, not just to receive, "Family gives you a chance to give and to receive – the affection and appreciation you get from the grandchildren and the good feeling you receive from helping them. It's a nice feeling. It satisfies your emotions and it is good for your health". For Craig, "Our family is our main interest and communication with our children and grandchildren keeps us young and interested". As people age, the value of belonging can afford other benefits too. Jim states, "maintaining your relationship with your family can provide you with a sense of security, an insurance, because they are the ones who will come to your aid when it's necessary".

For participants who don't have children or large families, friends can provide a sense of belonging and some companionship as well as people they could possibly rely on or turn to when and if they find themselves requiring assistance. For example, some of our participants are friends who have known each other for a long time. While all of them are engaged with and belong to various social groups, they share a friendship that has seen them travel together on various overseas trips and share many adventures and experiences.

Some are heavily involved in growing communities they choose belong to. For Rose, spending a great deal of her time enabling educational opportunities for seniors "is about giving back - as a way of saying thank you for the life I have enjoyed". Rose's engagement with, and sense of belonging to, allows her to "be creative, be socially interactive, be physically active and stimulated mentally" and this is beneficial because it helps her "avoid depression, loneliness, and aches and pains". This belonging is a big part to her identity and it seems to feed her passion to advocate for elderly people, giving her a great sense of purpose.

Craig belongs to a local community social club, is heavily involved in its organisation and responsible for its success and growth over the past eight years. Both Craig and his wife, Mary, are proud of their affiliation and contributions to the club. For Craig, belonging to this social club has also widened his social circle and allowed him to learn new skills. Diana proudly showed us the gold loyalty pin she received from Opera Australian to thank her for being a subscriber for fifty years. The pin was presented to the workshop participants as a sign of her long-standing and continuing engagement with that community; she still makes an effort to attend all the performances.

Belonging can also be about a person's connections to physical environments and places - be it a home, a particular suburb or a piece of land where a person spent a lot of time when younger. Connection and belonging may span time and space. For Kim, the suburb she lives in is particularly important to her not just the way she relates to the environment but also the general community and friends living there. She talks about being drawn to this suburb when she was young, and has since returned and bought a house there. She and her partner have lived in this suburb for thirty years because of "my wonderful experiences of living here in the 60s and what I wanted to find again". The architecture encourages a sense of community, "where we live, it's a very social environment, people know each other and we have street parties". She has also spent time and money renovating her home to make it "a place of refuge and a really pleasing place to be". To Kim, this belonging, and investing in it, contributes to her overall sense of comfort and wellbeing.

We can't discount the great affection some of our participants have for their animal companions. The way that Kim speaks about Rocco, her cat, shows how important he is in her life. Similarly, how David talks about his dog, Ivy, also shows how much she figures in his everyday routine and life in general. These pets are very much family members that contribute to strengthening people's relationships and sense of belonging to others in their own homes.

4.3 Competency

Competency is important to people's sense of self and identity because people want to still feel valued and that they have something to contribute despite their age. Competency can be about specific talents, such as David' talents for aesthetics and home renovation, or Adam's specific professional skillset. At the workshop, Adam proudly showed us the third gold medal he has received from his professional society, each in recognition of exemplary work in his field over the previous year. Meanwhile, Matthew is passionate about exploring emergent IT, especially learning about the Internet of Things (IoT) because he believes that such technologies could greatly benefit ageing people. Besides seeking out contacts and networks that he can be involved in and learn about the IoT, he also volunteers as a computer teacher at a senior citizen computer club. Matthew continues to update his skills through reading, participating in different ageing related research, attending workshops and talks, as well as being in contact with different IT organisations.

Rose exudes confidence when she speaks about her life: how she worked to regain her health after years of being reliant on medication; her current use of various technologies to maintain her fitness; her previous "successful career in law and accounting" and her current work with educational opportunities for seniors, all reinforce her sense of competency. She emphasizes the necessity of "using the talents I have, maintaining them and

growing them". Again, this ageing person is keen to learn about and participate in the latest initiatives in ageing related research.

Diana lives alone and is a keen gardener. She grows all of her own fruit and vegetables. She especially enjoys talking to others and offering them advice especially about growing vegetables. She also spoke proudly about her ability to put IKEA furniture together! For Diana, her competency – in being able to care of herself – signals to herself and her family that she is still capable of living independently in her own home.

David is developing his competency in piano playing. He learnt the piano when he was young but he never really persisted. He invests time and effort to play the piano, specifically to learn certain famous Brahms piano pieces well enough to perform them from memory. David sees this as a way to strengthen and train his mind and memory whilst pursuing his deep passion for music. Competency in piano playing adds to his sense of achievement and, at the same time, reinforces his standing as an aesthete amongst his family and friends.

Being competent as well as being valued by others are important to our workshop participants. A number of them spoke about becoming 'greyed out' - 'invisible' to the rest of the world as they age. Diana recounts increasingly frustrating situations at shops where others are being noticed and served before her, for example at the pharmacist that she visits regularly. On one occasion, two other customers were served before her. She decided that she just had to speak up, much to the surprise of the pharmacist who said, "Sorry, I just didn't see you". Diana said, "Sometimes it means that I just have to speak up. At a certain age, you just suddenly feel invisible. Maybe it's because I am an old lady that nobody wants to 'see'".

This 'societal blindness' is a condition that our participants felt they are subjected to. Being competent and valued was seen by some as a way to remain visible in society. Rose speaks about a different kind of competency that comes from self-confidence: "You need confidence to have a voice. That makes you feel valued when somebody takes notice of you. That is respect. On the other hand, if you don't have a voice, you are a victim, and we don't want to be victims!"

4.4 Contribution

Being able to to contribute to others is important because this signals a capacity or ability to give, which means that someone can be of value to others. As we saw earlier, Rose and Matthew contribute to empowering ageing people, especially with technology. And David contributes to his family and friends' experiences and pleasure. Contribution is strongly related to, and is to an extent dependent on, a person's competency, such as skills, talent and experience. However, people prioritise what they choose to contribute to, based on interests, sense of belonging, and what they can also receive from their contribution. Our participants talk about contributing to their friends and family as well as their community, but it is important to remember the reciprocal nature of contribution, that is, they also receive through giving. Through a capacity to contribute to others, and at the same time experience the appreciation of this contribution from others, people are able to strengthen their sense of self and foster their sense of belonging to a social group or community. Furthermore, a capacity to contribute demonstrates one's independence and can reinforce people's sense of purpose, wellbeing and happiness.

For the workshop, Diana brought in some lovely vegetables she had grown in her garden. Her delight in her garden is clear when she talks about it and by the amount of time she spends there.

Gardening is obviously a passion, but it also keeps her physically and mentally fit. Since she grows much more than she needs, she often gives away her vegetables to neighbours and enjoys their appreciation of her gardening skills and generosity.

Besides being longstanding members of a local social club, Craig and Mary are also deeply involved with their local parish where Mary volunteers on a few committees. Craig and Mary talk about the different important social circles in their lives – "They include family, different groups of friends, ex-colleagues, and different folks from the social club and of course the church. Keeps us very busy most days. No time for TV. By 10 pm most nights, if we are lucky, we are ready to go to bed". On top of that, Mary also told us about her long-term contributions to research. Mary has a twin sister, and together, they have been participating in quite a number of studies since they were young. Mary says that she feels good and it feels right to contribute to research, "for the good of everyone".

Jim, an ex-school principal is also a busy man. Besides his annual overseas travels to spend time with his children and grandchildren, he still volunteers as a teacher in a community college, serves as a treasurer in his local social club, as the president of his local political party that he has previously served as treasurer as well as various other roles. Jim helps organise a lawn bowls club and gets great pleasure from his busy life. He meets different people, contributes to and supports causes he is passionate about, and most of all, he said his activities "keep my mind active and engaged with different things that challenge me".

Carla is deeply passionate about classical music and is the Vice President of a local classical music society. She contributes her deep knowledge about music and strong administration skills to running this busy non-for-profit organisation. Carla also contributes to her friendship groups with her love for researching and planning interesting travel adventures. With her knowledge and connections, she has organised many successful overseas travel adventures with her close friends and her husband Matt, often to attend different music festivals around the world. On the other hand, Matt contributes by offering to care for his grandchildren when their parents are busy.

For Irene, participating in the world is important. She believes in having a positive attitude, telling everyone at the workshop that "You have to remember that you ARE a part of world. You are participating in life! This is important regardless of what community you belong to or participate in. I am 85 years old but I feel younger than my chronological age tells me simply because I am participating in life".

4.5 Independence

The desire for independence is one of the most pervasive values voiced by our participants. On a practical level, independence means not requiring assistance or care, and being able to look after yourself. This of course is predicated on things such as a person's state of health, finance, their partner's situation, etc. Taking steps to ensure their fitness and state of health are commonly what people do in order to maintain their independence. Everyone agreed that they do not want to be a burden to others as much as they can help it. On another level, independence also implies the ability to have choices; to be able to have a say about the current situation, and have control over changing situations. For many, independence is related to their choice or control over their lived environment – from their home, to their local and wider environment. Thus, independence is expressed differently for different individuals. For example, in

Jim's case, independence means being fit enough and able to travel to visit his children. Others are determined to live independently in their own homes for as long as possible. For them, the home, its memories, the area they live in, and what it affords are central to what they believe to be important.

Craig and Mary have been married for 53 years. They have been living in the home which Craig built 53 years ago. Given this, the house has great personal sentimental value to them. There are also years of memories associated with it, including the many family events and activities that have been held in it. This house is extremely dear to both of them. As Craig says, "Our home is our centrepiece and our extended family is always WELCOME! We love living in this area. It is so beautiful and we have seen so many changes for the years, so many people come and go". Mary wrote that she couldn't see herself living anywhere else, "being able to walk outside, look at the ocean and be thankful for where we live. We enjoy sitting, eating lunch on our back deck".

But Craig and Mary are also aware that as they age, and as their bodies and health change, they will need to make changes in order to maintain their independence and remain in their home. For example, they have a large garden, and while Craig enjoys gardening a lot, he says that it is getting much harder for him to manage all of it. So, he has recently hired someone to help him with some of the more physical chores. Craig and Mary are also aware that living on top of a steep hill may be an issue they will have to have to deal with in the future if they are to maintain their independence.

On the other hand, Irene moved into a retirement village precisely to maintain her independence. Irene's daughter and grandchild used to live with her in her house but they moved out some years ago. She decided that moving to a retirement village was more appropriate for her because she doesn't need to worry about too many things, such as the upkeep of the garden. The smaller place suits her needs, "my home is important as a place to rest and recover after a busy day". Living at the retirement village affords opportunities to keep her physical and mentally fit which contributes to her desire to maintain her independence: "Social interaction is very important. At the village, I made many friends, who also like to play cards and mahjong. We have organised many social outings together. I hope these activities will help lessen the possibility of dementia".

Meanwhile, Diana wants to stay away as long as possible from retirement villages. She is not particularly keen to move to a retirement village because she fears that such living arrangements might encourage the easy spread of illnesses and infections. Falling sick will definitely impact her independence. So she keeps fit through gardening, and she uses her iPad to research information about gardening. She also plays bridge, goes to the gym 3 times a week and attends the Opera. These are just some of the ways Diana ensures and enacts her independence. Similarly, Rose took charge of her own health and last year, gave up her low blood pressure medications which she had taken for 35 years. Now she says she is healthier than ever. She exercises regularly, uses her Fitbit to ensure that she walks over 16k steps a day or around 10kms. Matthew also exercises regularly and participates in a longitudinal medical research project that helps him improve his sense of balance and reduce likelihoods of falls.

Rose's idea of independence is not only about taking charge of her health. Like Irene, she is pragmatic and she moved into an apartment from a large house because she feels that she is able to cope better and not "waste time keeping extra rooms clean". Her

sense of independence is strengthened by having more time to contribute to others.

Dora says that "keeping well and active so that I can stay in my own home with garden is extremely important". She also values her mobility as this affords her independence. Dora is determined to try and keep her driver's licence and her car as long as possible so that "I don't have to rely on anyone and be a burden". The importance of being able to drive led her to highlight the work she puts in to care for her eyes. Besides walking her dog and exercising everyday, "I recommend enough sleep and good diet with greens to help with your eyes and having regular medical checks, especially for the eyes. A good sense of humour also helps!"

5. DISCUSSION

One of the challenges designers and researchers encounter when working with people's values is to find ways to support people to articulate their values [18]. Since values are always about 'something', they are not something that people can easily talk about in abstraction. For Dewey, the way to understand people's values, is to understand people's actions and practices [cited in 15] i.e., what people do. After all, values guide what people do and how they choose to act in particular circumstances and situations.

In this section we reflect firstly on how particular activities, tools, and processes we used were useful when working with people's values. Second, we reflect on how our participants' values are put into action in their everyday lives.

5.1 Reflections on methods

Standard Participatory Design methods and tools [2], allow us to ground our design discussions in everyday practice, to ensure that multiple voices are able to contribute to the design process, and to facilitate people's ability to envisage future situations. But contextualising and otherwise tweaking these methods/tools so that they work effectively in very specific situations is essential. In this section, we reflect on the importance of iteratively designing and refining the actual research tools and workshop activities to ensure that they they are focused on supporting people's articulation of values.

5.1.1 Speed Dating

When conducting workshops, especially with a group of participants who do not know each other, choosing an effective ice-breaker is crucial. This activity must suit the participants involved and the work that they are doing together. We decided to start the workshop with a 'speed dating' session, as this had proved effective in previous workshops [e.g. 22]. The advantage of this activity is that all participants had an opportunity to meet and chat briefly to every other participant. This was facilitated by a selection of potential pre-prepared questions that were relevant to our inquiries in participants' values.

This speed dating session was very successful as an ice-breaker as strangers were very quickly put at ease while, at the same time, they were attuned to the shared focus of the workshop. An advantage of speed dating is that the rules are simple and the activity is highly structured. Selecting questions, that are easy to answer but are related to the workshop, helped focus the participants. Strict time limits and rapid changeovers imposed some artificial, but playful pressure on people to get talking to each other very quickly, creating a sense of excitement, laughter and buzz in the room. Everyone relaxed and we noticed that some

even 'flirted' during the activity. It also provided a common experience that could seed further discussions during breaks.

5.1.2 Artefacts to support talking about values

Personally meaningful artefacts are very useful 'tools' that provide people with an immediate, accessible and effective means to talk about what is important to them; for example, Brandt and Grunnet's [3] use of props in design activities, and how personal artefacts can be triggers and placeholders for personal stories [4]. Asking people to think about and choose artefacts to bring to the workshop, that related to our suggested areas of (i) where they lived, (ii) social engagement, and (iii) wellbeing, encouraged them to begin reflecting on their values prior to attending the workshop. We also hoped that the act of curating the choice of artefacts for the workshop would focus our participants on currently salient issues within their ageing process.

Our participants brought a range of artefacts. Some brought photos (physical and digital) but we also saw books, a retirement village brochure, medication, a doll, a rug, an iPad, a toque (a Canadian knitted hat), pins, medals, dumbbells and even home-grown garden vegetables. When speaking to their artefacts, participants were able to share particular memories, important events, or other significant aspects of their lives. Having their own artefacts at hand eased people into sharing their personal experiences of ageing. Some used the artefacts to provide cues and prompts for their stories, especially when they were trying to remember what else they wanted to talk about, while others used them to emphasise or exemplify particular points they were trying to make.

Some of these artefacts elicited great admiration from fellow participants, for example Adam's medals from his Professional Society, Diana's gold pin from the Australia Opera, or David's picture of his pristine garden. This recognition from peers enabled the presenters to experience a sense of pride and pleasure, a reminder of their competency, their capacity to act and to contribute. Other more mundane artefacts such as Irene's dumbbells, Dora's packet of painkillers, and Diana's home-grown vegetables also speak about different individuals' lived and felt experiences of ageing. They reveal and remind us of the 'work' that ageing people actively do in order to stay healthy and independent.

Finally, the artefacts were useful because they triggered unexpected and additional stories from other participants. The use of artefacts in our workshops helped facilitate and enrich the sharing and discussions of people's stories and their values in relation to their ageing. This process made a significant contribution to mutual learning in the workshop, not just for us researchers to learn about our participants but also for our participants to learn about each other.

5.1.3 Piloting workshops

Piloting each of the activities of the workshop allowed us to evaluate and refine them before the workshop at the community centre. Refinements included the pacing of each activity, the focus of the data gathering methods and tools used, the clarity of instructions, and the usability and usefulness of the various artefacts, e.g., question sheets, grids with values, etc., that we used with the participants. One example of the value of piloting was our rethinking of how we facilitated the transition from one particular activity to another. This led in turn to the design of a guided worksheet to be used to facilitate the transition.

In the pilot workshop, after participants had spoken to the artefacts they had brought with them, they were asked to individually write down themes related to values that they felt were particularly relevant to themselves and to others. We noticed that they had some difficulty starting this process and we needed to provide prompts and explanations about possible themes that might be relevant.

When we reflected upon this after the pilot, we realised that it was difficult for participants to articulate their values without any support. It wasn't that they did not have anything to say, but rather, they had difficulty abstracting values, rather than providing a narrative example. To help ease the participants in the following workshop at the community centre into thinking about 'values', we created a grid where we wrote down various values that were generated by the participants from the pilot workshop. When the time came for us to use this grid at the community centre, we also first explained each of the values and gave real life examples through narratives of the values in the grid. Having the grid in front of them, and having heard these narratives, participants at the community centre found it easier to complete the activity. While much of what they wrote was similar to the values already presented on the grid, they expanded the list while adding more specific narratives of their own.

Besides providing opportunities to learn, iterate and refine the processes, the tools, the approach, and timing, piloting workshops with 'critical friends' increased the likelihood that the workshop at the community centre was more effective, productive, enjoyable, and respectful of our participants' time and efforts.

5.2 Reflections on values of ageing people

Supporting ageing people to voice their values, and facilitating discussions and reflections about their values have produced rich stories that reveal the felt and lived nature of people's experiences as they age. These rich stories contribute to developing accounts of ageing people that reveal them as individuals who are active participants in life (e.g., [19]). Such accounts stand in opposition to dominant stereotypes about the elderly, which view them as a homogenous group that is feeble, needy, lonely and incapable of learning or using digital technologies (e.g., [5, 19]). Hopefully, providing accounts informed by the values of ageing people will change how we design technologies for the elderly and the kinds of technologies we design. So what have we learnt about ageing people's values?

5.2.1 Inter-relatedness of values in action

What was immediately clear was the deeply intertwined and inter-related nature of people's values in practice in their everyday lives. While we have presented five of the values separately, it is clear that the different values shape and influence each other. For example, the importance of maintaining independence can be affected by competence, such as a person's ability to look after themselves or the mental and physical capacity to act in the world. This in turn can be shaped by an ability to recognise purposeful ways to maintain wellbeing. At the same time, we see that one of the ways whereby the person's mental, emotional and physical wellbeing can be sustained and nourished is through contributing to family, friends, or community. Contributing in turn can provide (or reinforce) a sense of belonging, which feeds back into a state of wellbeing, sense of purpose and competence, and so on.

For designers and researchers wishing to engage with people's values, this warns against limiting our focus to a particular value. The alternative is to try to ascertain what other values are at play, and during design, find ways to address people's values more holistically.

5.2.2 Influences from different social dimensions

Another learning is that values in action are strongly shaped and motivated, in a relational way, by different dimensions of people's social selves. The self, friends and family, as well as affiliated communities are important considerations for how an individual chooses to act and, in turn, can shape the individual's aspirations. What people choose to spend their time on, which aspects of their lives they want to focus on, where and to whom they wish to contribute, why they wish to remain healthy and fit, what contributes to their sense of purpose, why they choose to live in a particular place, and so on are influenced by these social dimensions.

We heard people talking about investing in family and saw how central the sense of connectedness and belonging to a family is for many of our participants, especially those with grandchildren. Much of what people find important, such as independence, competency, purpose, and so on can be linked to their desire to maintain their opportunities to spend time with family. For others, friends are important, not just as companions but also as companions who can stimulate a sense of purpose through shared interests, as well as being a point of call for assistance. When engaging with people's values during design, we can seek to understand and take into account how their values are enmeshed within different social dimensions, and how the social shapes the ways these values are expressed and experienced in individual lives.

5.2.3 Provisional and dynamic nature of values in action

When we listened to people talk about their lives, we understood how contingent, provisional and dynamic people's values are in action. This is yet another reminder that we should not treat people's values as fixed and unchanging over time. While an individual's values may not change much over the course of her life, how particular values are experienced and expressed are different in different stages. This means that particular values become more important, while others may become less important, at different stages of a person's life. These shifts occur when individuals' lives change, for example, employment, health, bodies, their friends and family, as well as the community they are involved in, and so on. People continually refocus, negotiate and realign particular values to best fit in with their new and changed circumstances. As people get older, different circumstances, such as health and their bodies, might change more rapidly or they are faced with losing more friends more frequently, and so on. We sensed that our participants are very much aware of such circumstances and are keenly attuned to such changes in their personal situations.

We saw earlier how Irene renegotiated her values with regards to her sense of belonging and independence. She decided that independence was more important to her at the current stage of her life, and in light of her circumstances, chose to move into a retirement village. Other participants, such as Diana, Craig and Mary were not so keen about the retirement village, at least not at this stage of their lives. However, they are not totally closed to the idea. Their situations are different to Irene's but they did indicate that they will need to "reassess one day, when the time comes". Amongst our participants it is the negotiations with the value of independence that we observe taking place most vividly. The big decision they face regarding independence is the kind of lifestyle they want, and in the longer run, figuring out what they can do to maintain it. For most who resist leaving their family homes, this involves thinking about strategies to scaffold their current situation in order to maintain and strengthen it so as to make their ability to stay home more resilient as their personal situations change.

6. CONCLUSION

The work described in this paper contributes on a number of levels to efforts that attempt to engage with people's values, especially in the early stages of designing digital technologies. Firstly, the rich and deeply contextualised data produced very valuable insights about ageing people's everyday lives. These include their concerns, motivations, aspirations and, in particular, the ways they make sense and realise their values in action. These values inform how people choose to act, relate to self and others, and live their lives. Secondly, our characterisation of ageing people's values demonstrates the complexity and messiness of values in action. Values can be shaped and influenced in various ways, and their expressions are provisional and contingent upon changes in individual situations and circumstances.

To our knowledge, these insights have not been previously reported in the domain of technology design. We hope that these insights will encourage technology designers to move away from dominant and erroneous stereotypes of ageing people, and instead to recognise the active, purposeful and deeply engaged lives of ageing people. These nuanced understandings of ageing people's values can shed light on why people are willing to adopt particular types of technologies or are willing to invest time, effort and money on learning particular technologies. Recognising the dynamic nature of values in action can broaden our understandings of how values shape our entire lives, not just when we are old.

The work we present reflects contributions from a cohort of elderly participants who are urban dwellers, relatively well educated and reasonably financially independent. We recognise the need to include a more diverse range of participants. We look forward to working with a broader and more diverse group of participants, examining the influence of other personal situations, such as people of different socioeconomic backgrounds, cultural backgrounds, education levels, those without children, and participants who live in rural areas. By developing ways to support ageing people to voice their values, we can lay the foundations for their participation in co-designing technologies that fit meaningfully with their everyday lives and what matters most to them.

7. ACKNOWLEDGMENT

8. REFERENCES

[1] Almond, B., & Wilson, B. (Eds.). (1988). Values: A symposium. Atlantic Highlands, NJ: Humanities Press International Inc.

[2] Brandt, E., Binder, T. & Sanders, E. (2013). Tools and techniques: Ways to engage telling, making and enacting in Simonsen, J. and Robertson, T. (eds) (2013) *Routledge International Handbook of Participatory Design*. New York: Routledge, pp. 145-181

[3] Brandt, E & Grunnet, C. (2000) Evoking the future: drama and props in user centered design, In Proceedings of Participatory Conference (PDC 2000), New York, USA, pp 11-20

[4] Clandinin D.J. & Connelly, F.M. (2004) *Narrative Inquiry: Experience and story in qualitative research*. San Francisco, CA: Jossey-Bass

[5] Durick, J., Robertson, T., Brereton, M., Vetere, F. and Nansen, B. (2013) Dispelling Ageing Myths in Technology Design, In *Proceedings of the 25th Australian Computer-Human Interaction Conference* (OZCHI 2013*),* Adelaide, pp. 467-476. DOI= http://doi.acm.org/10.1145/2541016.2541040

[6] Frauenberger, C., Fitzpatrick, G., Good, J. and Iversen, O.S. 2015. In pursuit of rigour and accountability in participatory design, *Journal of Human-Computer Studies*, 74, p.93-106.

[7] Friedman, B., & Kahn Jr, P. (2008). Human values, ethics and design. In A. Sears & J. Jacko (Eds.), *The human-computer interaction handbook: fundamentals, evolving technologies* (pp. 1241-1266). New York: Lawrence Erlbaum Associates.

[8] Friedman, B., 2004. Value sensitive design. *Encyclopedia of human-computer interaction*. Great Barrington: Berkshire Publishing Group, 769–774

[9] Greenbaum, J. and Kyng, M., 1991. *Design at work: Cooperative design of computer systems.* Hillsdale, NJ: Lawrence Erlbaum Associates.

[10] Halloran, J., Hornecker, E., & Stringer, M. (2009). The value of values: Resourcing co-design of ubiquitous computing. *Co-Design*, 4 (5), 245-273.

[11] Halstead, J.M. & Taylor, M.J. (2000) Learning and Teaching about values: a review of recent research, *Cambridge Journal of Education*. 30 (2), 169-202.

[12] Harper, R., Rodden, T., Rogers, Y., & Sellen, A. (Eds.). (2008). *Being human: Human-computer interaction in the year 2020*. Cambridge, UK: Microsoft Research Ltd.

[13] Iversen, O.S. and Leong, T.W. (2012). Values-led participatory design: mediating the emergence of values. In *Proceedings of the 7th Nordic Conference on Human-Computer Interaction: Making Sense Through Design* (NordiCHI '12). ACM, New York, NY, USA, 468-477. DOI= http://doi.acm.org/10.1145/2399016.2399087

[14] Iversen, O.S., Halskov, K., & Leong, T.W. (2012) Values-led Participatory Design, *Journal of CoDesign*, 8 (2-3), 87-103

[15] Joas, H (2000) *The genesis of values*, Polity Press, UK

[16] Kensing, F and Blomberg, J (1998) Participatory Design: issues and concerns, *Computer Supported Cooperative Work* (CSCW), 7 (3-4); 167-85

[17] Le Dantec, C.A. and Do, E. Y-I (2009) The mechanisms of value transfer in design meetings, *Design Studies*, 30(2), 119-137

[18] Leong, T.W. and Iversen, O.I. (2015) Values-led Participatory Design as a pursuit of meaningful alternatives. In *Proceedings of the Annual Meeting of the Australian Special Interest Group for Computer Human Interaction* (OZCHI) ACM, New York, NY, USA, 314-323. DOI= http://doi.acm.org/10.1145/2838739.2838784

[19] Light, A., Leong, T. W., and Robertson, T. (2015). Ageing Well with CSCW. In *ECSCW 2015: Proceedings of the 14th European Conference on Computer Supported Cooperative Work* (ECSCW), 19-23 September 2015, Oslo, Norway, pp. 295-304. Springer International Publishing.

[20] Robertson, T. and Simonsen, J. (2013) Participatory Design – an Introduction, in Simonsen, J. and Robertson, T. (eds) (2013) *Routledge International Handbook of Participatory Design*. New York: Routledge, pp. 1-17.

[21] Robertson, T. and Wagner, I. (2013) Ethics. Engagement, representation and politics-in-action, in Simonsen, J. and Robertson, T. (eds) (2013) *Routledge International Handbook of Participatory Design*. New York: Routledge, pp. 64-85

[22] Robertson, T., Leong, T., Durick, J. and Koreshoff, T. (2014) Mutual Learning as a resource for design research, *Proceedings of the 13th Participatory Design Conference* (PDC 2014), Vol. 2 pp 25-28. DOI= http://doi.acm.org/10.1145/2662155.2662181

[23] Robertson, T., Durick, J., Brereton, M., Vaisutis, K., Vetere, F., Howard, S. and Nansen, B. (2013) Emerging Technologies and the Contextual and Contingent Experiences of Ageing Well, *Proceedings of Interact 2013*, pp. 582-589.

[24] Robertson, T., Durick, J., Brereton, M., Vetere, F., Howard, S. and Nansen, B. (2012) Knowing Our Users: Scoping Interviews in Design Research with Ageing Participants. In *Proceedings of the 24th Australian Computer-Human Interaction Conference* (OZCHI'12) Melbourne. ACM, New York, NY USA, 517-520. DOI= http://doi.acm.org/10.1145/2414536.2414616

[25] Rokeach, M. (1973). *The nature of human values*. NewYork: Free Press.

[26] Ross, P. R., Overbeeke, C. J., Wensveen, S. A., and Hummels, C. M. (2008). A designerly critique on enchantment. *Personal and ubiquitous computing*,*12*(5), 359-371.

[27] Sanders, E.B.-N. and Stappers, P.J., 2008. Co-creation and the new landscapes of design. *CoDesign*, 4 (1), 5–18.

[28] Simonsen, J. and Robertson, T. (eds) (2013) Routledge *International Handbook of Participatory Design*. New York: Routledge.

[29] Voida, A., and Mynatt, E. D. (2005, April). Conveying user values between families and designers. In *CHI'05 extended abstracts on Human factors in computing systems*, ACM, NY, USA, 2013-16. DOI= http://doi.acm.org/10.1145/1056808.10570