

The leisure time canvas

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The Leisure Time Canvas: Elicit Empathy for Older Adults through Activities and Hobbies

Understanding your user's daily life and interests is essential in providing insights that can be leveraged to define new design opportunities. However, when designing for older adults, this is challenging because, older adults may find it complicated to express themselves; designers may have difficulties to take their perspective and empathize with them. This paper introduces the Leisure Time Canvas, an empathy toolkit designed to facilitate older users to share stories about their activities and hobbies, to elicit their perspectives, desires and needs, and thereby inspire the design process. We report on the design of the canvas and its explorative use with six older adults and reflect on the resulting stories and design implications. This canvas aims to facilitate interaction between designers and user groups that may be difficult to empathize with or experience challenges in verbalizing their needs. The results show that activities and hobbies are meaningful input for design.

Keywords: design empathy, older adults, activities and hobbies, storytelling tool.



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Introduction

An increasing number of older adults want and need to live longer independently at home (Ahlqvist, Nyfors, and Suhonen 2015). The global population of 60 years and older is expected to reach nearly 2.1 billion by 2050, which is double from the population in 2017, leading to an ageing society (The Department of Economic and Social Affairs 2017). Design is one of the ways to contribute to this challenge of an ageing society, by providing concrete solutions and services (Pericu 2017). The needs and interests of older adults should be addressed to achieve the goal that ‘no one will be left behind’ (The Department of Economic and Social Affairs 2017). We aim to support design for prolonging healthy years, which is in line with trends identified by Stein et al. (2017) on extending well-being.

User-involvement is acknowledged to be essential in design. In research and design activities it can mainly show positive effects on 1) quality and speed of the research and design process, 2) better match between solution and user, and 3) an increased user satisfaction (Kujala 2003). Involving users in the early stages of a project facilitates exploration and articulation of problems, opportunities, ideas, and concepts (Steen, Kuijt-Evers, and Klok 2007).

However, there are some challenges when involving users. Van Kleef et al. (2005) describe three reasons to be taken into account when gathering user’s input as they: 1) may not be aware of their needs, 2) may not be able to formulate their needs and 3) may not be eager to speak about their needs. Hence users need adequate facilitation when involved in the design process. Also, users may express their preferences based on familiar products, rather than the opportunity at hand, resulting in design process outcomes which are similar to existing ones, and possibly not optimal for the challenges at hand (van der Panne, van Beers, and Kleinknecht 2003).

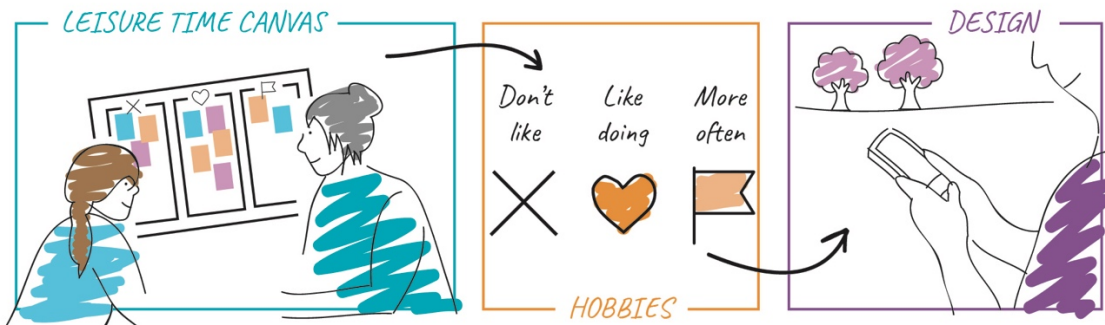
It is essential to overcome these challenges because users, and especially older adults, have knowledge that designers or other experts lack (van Doorn and Klapwijk 2013). Users are experts in their own lives, but not necessarily experts in design. To bridge this gap, designers create formulations that encompass the users’ goals and needs, to translate into concrete design proposals (Kujala 2003).

To understand users and address their needs with design, we need to find out about their desires, wishes, priorities, and attitudes to improve the potential benefits of a design solution (Chapman, Hampson, and Clarkin 2014). This is more effective if designers do so at an early stage in the design process.

Designers and researchers can provide tools to assist the user in the position of ‘expert of their own experience’ (Sanders and Stappers 2008). People’s hobbies and leisure time activities present an opportunity to contribute to successful ageing (Kahlbaugh and Huffman 2017) and connect to older adults on a personal level. However, there are no concrete tools to facilitate this. Therefore, we developed the Leisure Time Canvas (LTC): an empathy tool designed to enable users to share stories about their current and future hobbies and activities, to elicit their perspective, desires and needs, and thereby gain empathy for the user and inspire the design process. In this paper, leisure activities are seen as ‘preferred and enjoyable activities participated in during one’s free time’ (Chang, Wray, and Lin 2014). With this tool, designers can understand the drivers behind the users’ hobbies and leisure activities, to learn about their values and daily lives. Also, when we better understand people’s emotions and personality, we can design more personalized interventions that create potential to benefit well-being and stimulate successful ageing (Chapman, Hampson, and Clarkin 2014).

We present the LTC and explore how it supports designers to empathize with challenging user groups and their context. More specifically we provide evidence on how the LTC allows older adults to express themselves. We report on the use of the LTC together with six older adults, in one-on-one sessions with a design researcher (first author). We describe the needs and insights that were found in these sessions, through which we aim to learn about the current perspectives, daily life and engagement with the hobbies of older adults. With this contextualized information we can create more focused, personalized and meaningful designs (see Figure 1).

Figure 1: From hobbies and personal interests to design opportunities, through The Leisure Time Canvas (LTC).



Related work

Design empathy means seeing and understanding people from where they stand, as persons with full lives, social networks and feelings instead of test subjects, as unfortunately is still often the case in research (Mattelmäki and Battarbee 2002). Creating meaningful concepts as designers or researchers largely depends on the level of understanding and empathy designers can gain for the target group (Smeenk et al. 2018).

Co-design refers to the involvement of people who are not trained in design in the design process, to creatively work together (Sanders and Stappers 2008). To be able to facilitate designers to get a better understanding of the users, researchers and designers can create tools to let users express themselves, as we draw upon Sanders' vision (2002) that all users can bring inspiration to the design process. This vision extends the perspective from Visser et al. (2005) who issues that users are 'experts on their experience'. These type of tools facilitate empathy by getting a deeper understanding of people's feelings, dreams and imaginations (Sanders 2002).

There are several empathic methods where participants reflect on their personal experiences (Kouprie and Visser 2009), such as context mapping to understand people's interaction with products (Visser et al. 2005), generative techniques to facilitate users in making artefacts to generate a personal perspective (Stappers, Visser, and Keller 2017) and probing techniques to trigger inspirational response by maps, postcards, cameras and/or booklets (Gaver, Dunne, and Pacenti 1999). Context mapping is outside our scope as it focusses on product use, we will elaborate upon generative techniques and probes.

Generative techniques are useful for collaborative thinking, mapping, dreaming, storytelling and envisioning (Sanders 1999). It is a participatory design language which can be used together with users early in the design process to imagine and express their ideas about living, working and/or playing in the future (Sanders 1999). However, some considerations have to be made. Lazar et al. (2018) address the importance of the materiality of the used tools, by having art therapists selecting materials to intentionally guide participants to engage with difficult emotions. By enabling people to create artefacts and explain them to peers, participants take the initiative in driving the direction of the study and as such prevent blind spots for the designer (Stappers, Visser, and Keller 2017).

Probes as a user engagement concept, originated by Gaver et al. (1999) are used to explore the design space. A probe offers boundaries to let the user creatively contribute to research in an open and sharing way (Wallace et al. 2013). With probes, the participants are given the initiative, as instead of answering a precisely framed question, it is about generating them (Stappers, Visser, and Keller 2017). Users may have different levels of creativity, and through probe theory, these can be approached in four ways: doing, adapting, making and creating (Burrows, Mitchell, and Nicolle 2015). Especially, empathy probes can provide insights into users' experience in their daily life (Mattelmäki and Battarbee 2002). An interesting example is the use of cultural probes to co-create a digital neighbourhood guide for and with older adults, important aspects such as mobility and personal limitations were found (Jarke et al. 2017).

The most significant difference between generative techniques and probes is the mindset. Probes are evoking inspiring responses which designers use, while generative techniques are used in a more steered process, making understanding explicit (Sanders and Stappers 2014).

With the LTC we differentiate ourselves from probes by positioning the tool between the design and the user in a session, instead of the user executing the probe independently (alone). Furthermore, exploring a specific technology in context is not our main scope. Instead, we steer the discussion as with generative techniques, focusing on what characterizes a person via their leisure activities, hobbies and activities to inform the design

space for a particular user group. This can lead to new questions, insights, opportunities or perspectives on existing problems.

Leisure Time Canvas

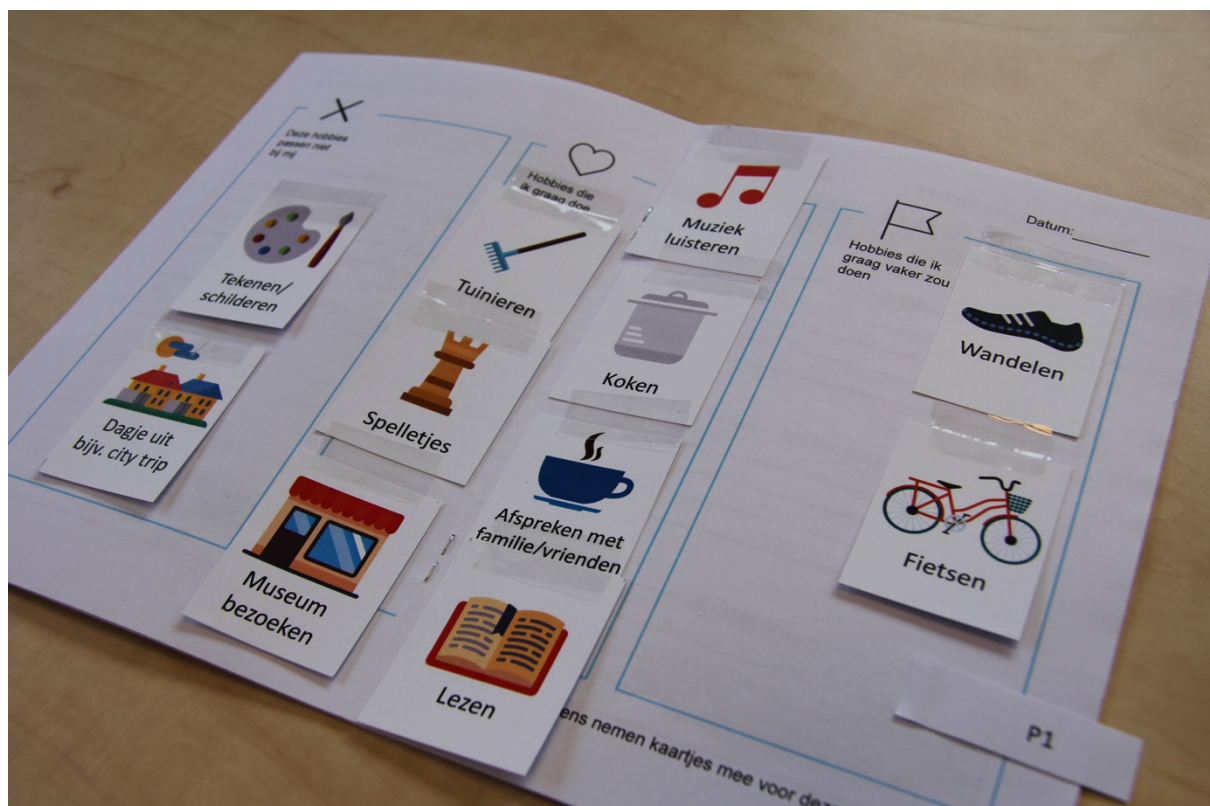
In this section, we will elaborate on the canvas design and protocol, and the participants, context and method. Our LTC is inspired partly by probes literature, as it embraces the spatial and doing approach (Burrows, Mitchell, and Nicolle 2015), to gain design empathy for the users. Through triggering storytelling, we get to know their interests and know the user better.

Canvas design

Hendriks et al. (2015) pointed out that it is necessary to provide the rationale behind a tool for purposeful implementation. Thereby we aim to enable other researchers and designers to adapt and expand this tool.

The LTC is a template consisting of three columns to sort hobbies and other leisure activities on (see Figure 2), the columns state from left to right: 'does not suit me', 'I like doing this' and 'I would like to do more often'. The participants were given a pile of cards with common activities and hobbies for older adults, displayed by an icon and corresponding name of the activity. Then they had to sort these activity cards according to their preference onto the canvas. The purpose of dividing the cards into three different places is to make the users aware of their perspective on these activities, and reflect on how they engage with them in the past, now and possibly in the future. Besides the pre-made cards, several blank cards were given to the participant to write down missing hobbies or activities that they might engage in. Afterwards, the researcher discussed the resulting 'palette' with the participants, with a primary focus on the barriers they experienced with the category 'I would like to do more often'. This conversation resulted in rich contextual stories about people's drivers, barriers, and routines regarding their hobbies.

Figure 2: The Leisure Time Canvas to facilitate the user's storytelling about their hobbies



The hobby and leisure activity cards were chosen based on the Pleasant Activity List (Roozen et al. 2008) including social activities, domestic activities, culture/science/travelling, intimacy/personal attention and diverse activities resulting in the following eleven cards: reading, walking, visiting a museum, playing games, cooking, listening to music, drawing/painting, cycling, gardening, meeting with family/friends, making a city trip. Corresponding icons were chosen to make it playful and provide concrete visual examples, inspired by the enthusiastically received probe packages created by Gaver et al. (1999) also targeted at older adults. For other target groups, the set of cards can be adjusted.

The card sorting interaction was chosen based on the redesigned semantic differential (Branco, Quental, and Ribeiro 2017) on which the users provided positive and negative adjectives which should be placed on a scale of intensity, to evaluate how the user characterizes their experience while playing a game. As it proved to be an understandable task for older adults with dementia, we used a similar interaction and mapping style for the LTC but instead used it to facilitate a conversation rather than evaluation.

LTC is a social tool that is used in the interaction between designer and user to stimulate sense-making and facilitate a meaningful conversation. Older adults may experience barriers when explaining their needs (van Kleef, van Trijp, and Luning 2005), and some of this stress could be relieved by talking about something they like or are passionate about. In this way, we facilitate the users to choose and steer the conversation through the LTC, as they have the freedom to elaborate on specific activities they resonate with. The tool thereby allows the designer to get a deeper understanding of the particular motivators and values of individual users.

Participants, context and method

The toolkit was used together with six (1 male, 5 female) independently living older adults, aged 61-78 years (one participant was unwilling to provide this info), in a session between user and researcher. All participants (Table 1) were recruited via a smartphone training class and signed a consent form. All sessions were held in April 2017, in a community building, and lasted between 20 and 30 minutes. These sessions were audio recorded, and a thematic analysis was done following the steps defined by Braun and Clarke (2006). We transcribed the interviews to familiarize ourselves with the data. Then we generated initial codes across the six interviews. We found themes by connecting and comparing codes.

Table 1: Demographics of our six participants who used the Leisure Time Canvas

<i>Participant</i>	<i>Gender</i>	<i>Age</i>	<i>Living situation</i>
Amy	Female	61	Living together with partner
Dorothy	Female	73	Living alone
Ella	Female	71	Living alone
Frederick	Male	76	Living together with partner (Tamara)
Patty	Female	-	Living together with partner
Tamara	Female	78	Living together with partner (Frederick)

Result and analysis

Here we report on our findings applying the LTC in practice to elicit new insights from older adults based on leisure activities and hobbies. We analysed six sessions and report on those by 1) describing three common themes identified from the data, 2) addressing the diversity within these themes through discussion and 3) reflect on the resulting insights for design.

Common themes

Lack of people to engage with in activities while having an existing social network.

Amy, Ella and Dorothy expressed they each had individual hobby ambitions, but did not feel like going alone. For example, Dorothy goes cycling every 2 weeks with an elderly association, but she feels insecure to attend activities alone, such as walking through the forest. Interestingly, they are all part of several social communities, but may not perceive them as an option to go together with for a walk. Yet, it could be they indeed do not have similar interests in a particular hobby, as one participant mentions having different hobbies from his partner: 'the dog is more my wife's hobby'. Potentially older adults need facilitation in finding people with similar interests to engage in activities with. Perhaps, older adults experience barriers to step outside their comfort zone and join new activity groups.

Impactful experiences limiting or promoting engagement with an activity.

What impressed us is the dedication with which some participants execute a hobby or certain activity for several decades already. Although this depends per person, most people may not have had one hobby as long as an older adult. Then how does this influence the design process? If an older adult builds up a routine over a long time, he or she may not be very likely to change this, unless certain factors cause this change. By being aware of these triggers in context, we can bring these into a design as well. For example, by making inviting others an essential part in the design. Next to stimulating these triggers for change, it can also be interesting to design to enrich current routines. Secondly, serious life events might influence one's engagement in hobbies and activities. For example, Frederick's wife recommended him to start playing bridge after he could not play soccer and tennis anymore due to his knee surgery.

Reflections on stereotypical hobbies and activities for older adults.

We have found an interesting contradiction in perspective on 'elderly hobbies': Frederick said 'I have old people's hobbies' while Ella mentioned that she moved away from 'the grey-headed hobbies'. This shows there is particular perception of one's own hobbies, and hobbies that are common in the community. This might lead to transfer between hobbies or make different decisions based on the community. Potentially people need support in making these decisions, or inspiration for what is on offer in a community. This is knowledge and experience which indeed only older adults have, as designers cannot predict this view for every individual.

Diversity within themes

Yet within these common findings, there certainly are different specific and individual reasons and contexts for making decisions. For example, in terms of not wanting to walk alone. For Amy, this comes from her husband not being interested in visiting a museum, while for Dorothy and Ella it comes from anxiety to not go to the forest or sea. This illustrates that people have very individual needs and perspectives (see Table 2), and need to be respected as such when we aim to design for this target group.

Table 2: The commonalities and diversity of our participants

<i>Participant</i>	<i>Commonality</i>	<i>Diversity</i>
Amy	Cycling, knee injury	Cycling instead of walking, because of her knee injury.

	Alone	Her husband is not that interested in a museum card and she does not want to go by herself.
Dorothy	Cycling	Cycling every 2 weeks (routine)
	Alone	Because she got lost in a forest once, she does not dare to walk there alone anymore.
Ella	Cycling	Cycling with good weather
	Alone	Because of a severe nose bleed, she got anxious and won't go by herself anymore into the forest
Frederick	Cycling	Cycling instead of soccer and tennis
	Knee surgery, playing bridge	Dropped previous hobbies and his wife motivated him to start playing bridge after he came out of the hospital
Patty	Cycling	Cycling yearly with family, monthly with sisters and ever 2 weeks with elderly association, on Sundays with her husband. Strong drive to stay active
	Knee surgery	The recovery went really well and her drive to stay active was high
Tamara	Cycling	Cycling as summer activity
	Alone, health	No more travelling such as going to Brazil, because you have to be healthy and have somebody who joins.

Design for personalization

Now that we have identified the diversity and commonalities for the perspectives of the older adults, we want to address how this potentially influences the design space. We will use an example quote or statement from each of the six participants, and translate these towards a possible design opportunity. This illustrates how designers could elicit new design opportunities by using the LTC.

Amy desires to go to a museum more often: 'I once said I would love to have a museum card, but my husband is not that interested in it. And to do it by yourself... you don't do it that often. At least, not me. But it would be very nice!'. She also addressed having a busy schedule: 'We are quite busy these days. I babysit the grandchildren, that's already two days a week. And you also have to do your house and garden.'. Thus, perhaps we can design a service to make Amy aware of the cultural possibilities in her neighbourhood (decreasing travel time), so she can merge it into her current life. Also, we might design a tool to find a match with someone else in her community to visit the museum together. This might add to address issues of loneliness in elderly communities.

Dorothy feels insecure to go somewhere alone since her husband deceased, and this decreases the number of places where she still goes: 'I really do not drive to the big city, it is because since the moment I was alone, I became much more insecure.' She even got lost once while walking, increasing this insecurity: 'I chose for a less crowded road but then went this way and that way... and I completely got lost... no one came by... I did not know where I was. After a while luckily, a mountain biker came by and showed me how to get back. Since that moment I do not walk in the forest alone anymore.' Thus, perhaps we can use design to give Dorothy a feeling of security/safety in the forest by connecting her to someone, or facilitating easy access to others through technology.

Ella desires to go to the sea more often, but feels scared as well to go alone: 'I would like to walk more next to the sea, but it is so far away. And you have to take someone.' and '1 ½ years ago I had a severe nose bleed and it took so long to get back to the car... like... really long. And I am a bit stressed out, scared. I even did not dare to get out of the house for a while, so to speak. I used to go into the forest with my dog, walking or cycling, but my psychologist said better not to do it by yourself, so I only choose routes where many people are.' Thus, perhaps we can provide her with a feeling of comfort to start feeling at ease to go by herself, or we use technology to emulate the experience of going to the forest or sea by virtual means. Or trigger to find a match with younger people to go to the beach together, in return for teaching them something she learned over the years.

Frederick enjoys the freedom of choosing his activities: 'I never have difficulties in planning things, because I can simply cancel an afternoon or evening. You are your own boss eh.' and 'I learned to play bridge when I came out of the hospital [knee surgery]. At the start really limiting... damn I could not do anything anymore. But my wife motivated me to do so.' Thus, perhaps Frederick would have liked a service which gives potential hobby suggestions to him, if his wife did not come up with the idea. On the other hand, it is still important to stay physically active for Frederick, so perhaps design could trigger in a playful way to stay active when no longer able to compete in soccer or tennis.

Patty has a strong drive to be busy and active: 'The recovery [knee surgery] went really well, because I thought what if I cannot go cycling and walking anymore! Home all day! What would I have to do then?'. Furthermore, she cycles on many occasions: 'I enjoy cycling as well. Once a year we go cycling for 50 km with the whole family. We have been doing that for 25 years already. Together with the elderly association once every 2 weeks. And once a month 40-50 km with my sisters (during winter walking – a local event), we have been doing that for 15-16 years already. Every time a different route, time flies! People are impressed we still keep up. And on Sundays whenever it's good weather, with my husband. I love it!'. Thus, perhaps we can create a service to let her map out the directions of the cycling tours, and meet others that are cycle enthusiasts. Or giving Patty a tool to provide insight in the frequency and duration of her activities, as she is competitive about her physical activity.

Tamara has the desire to travel: 'Because my husband does not like travelling, I visited my oldest sister in Brazil together with my daughter three years ago. Lots of fun! My daughter arranges the travel herself.' and 'To be able to make such travels [Brazil] you have to be healthy and have somebody who joins and that's not the case anymore. So, we'll go on a weekend trip in The Netherlands...'. Thus, perhaps we can trigger to find a match with someone else to travel abroad or find ways to improve travelling individually for older adults, if she feels healthy enough to go travelling.

Discussion

Our findings reveal barriers and motivators of hobbies and leisure time activities. These were found through applying the LTC, which allows participants to reflect on their activities in the past, present and future. Additionally, it revealed with whom, when and how often they executed these.

Supporting designers through the LTC to empathize with older adults

The stories generated through the LTC indeed provide us with rich contextual data to continue the design process. Still, we downscaled the number of stories based on common themes found in the thematic analysis (most prominent themes), emotional attachment to a story (impacting life, life changer) and extensiveness of a story (including who, what, where, how often). This means the designer makes the final call on prioritizing what characteristics to keep and share with others, and what lens to take in engaging with the user. On the one hand, this is the designer's freedom to pick quotes which he/she resonates with and sees potential for continuation. On the other hand, this means not including the user fully in the co-design process, because the

user cannot steer the findings and check misinterpretations. Therefore, we are interested in exploring the area of co-analysing the interpretations with the user similar to Doorn et al. (2013).

Furthermore, we found that social context has a major influence on which hobbies and activities are undertaken. Not having people to do activities with, limits acting on hobbies and similarly having people with similar interests promotes engaging with hobbies on a regular basis. Righi et al. (2017) argue this 'turn to a community' as well stating that when designing technology for older adults, we should say 'their community'. We are indeed not only creating a design space for an individual, but also for the people currently in their stories and even non-existing relationship which may be built through (new) design solutions. Furthermore, previous (traumatic) experiences can limit executing a hobby they would expect to enjoy. By knowing individual characteristics, we can create tailored designs while balancing barriers and motivators.

By this paper, we wanted to draw attention to older adults, of course, having commonalities such as cycling, the driver to execute a hobby and the routine can be diverse and highly individual. For example, for Amy and Frederick cycling is a replacement activity for a previous hobby, while Patty had many cycling occasions together with others and said 'What if I cannot go cycling and walking anymore! Home all day! What would I have to do then?'. Therefore, we should reflect on people's hobbies in the past, present, and future, and on a personal level to be able to understand to what extent certain activities are more meaningful than others. Perhaps we can as designers learn which elements of a previously enjoyed hobby we can use in a new design. This illustrates that we cannot design for all older adults in general terms, but that we can distil trends from specific users to design personalized interventions and services.

However, the view of finding meaningful data may be influenced by our belief in the value of gaining empathy in design. Results of the LTC can be unsatisfying when designers do not see the advantages of empathy in design or do not know how to engage with it (Kouprie and Visser 2009). The data analysis is therefore influenced by the designer/researcher who interprets the data. Though our canvas addresses clear design spaces to continue working with, and thus we argue for using hobbies to understand users on a more personal level and as input for design.

The earlier identified challenge that users reflect on familiar products which might result in more 'sameness' in design (van der Panne, van Beers, and Kleinknecht 2003) can be addressed by reflecting on leisure time activities as this has an open mindset and focuses on doing the activity rather than using a product. Also, by segmenting the stories into past, present, and future, gaps can be identified: what did a person use to do? What does a person currently enjoys doing or has been doing for many years? What does a person argue for willing to do in the future, but feels a barrier limits him/her? By putting these next to each other, experiences with different hobbies and activities can be compared and more accurately valued by the designer. We believe the follow-up step should be to not only show empathy in learning about the user, but also in analysing and designing with the user. Evaluating design concepts has been done before by van Doorn et al. (2013) addressing children becoming co-researchers, yet we are interested in to what extent this could be applied to older adults as well.

Supporting older adults to express themselves through the LTC

To summarize, the problem identified by Van Kleef et al. (2005) was three-fold namely the user: 1) may not be aware of their needs, 2) may not be able to formulate their needs and 3) may not be eager to speak about their needs.

Amy and Ella explicitly mentioned their concrete need, and for the remaining participants, we interpret this from their stories. By the description of their activities and events in their daily life, we were able to extract drivers. However, the storytelling experience of our participants may come even more to live when we would ask participants to bring artefacts to the session (Nassir, Leong, and Robertson 2015) or if we would have the session in people's homes, because people may feel more at ease to participate in the design process (Suijkerbuijk et al. 2015).

We argue that the user is facilitated through the LTC to formulate their perspectives and needs because they all were open while elaborating on their activities in their daily life in a brief session. Dorothy and Ella, for example, feel the need whenever they want to go for a walk; they want company as they do not dare to go alone. Tamara has a similar feeling but then in the context of traveling. Patty expresses a strong desire to keep her independence. Frederick currently does not seem to show a need for change, as he feels like he can do whatever he wants and feels free (this may be his need). Amy expresses the need for a to have someone to go to a museum with together.

Furthermore, we argue that the user with the help of our canvas was eager to speak about their needs, even including unrequested and personal topics such as surgery, anxiety, and people who deceased. These are somewhat surprising findings to us as we do not explicitly ask to discuss these topics. Apparently, our participants felt these were related topics for them and felt the need to bring these up. As the older adult steers the conversation, they may feel more at ease to highlight the things they feel comfortable sharing. This was an eye-opener what people dared to tell the design researcher as it was private information. This is relevant for design because, as much as identifying the drivers also the barriers are meaningful to be aware of to get a complete understanding of a user. If we map this information onto Fogg's behavioural model (2009), we can see that Amy has a high motivation to go to a museum, but does not feel able to do so because her husband is not interested and she does not want to go alone. Resulting in that in a design for Amy, we will try to think of ways to increase her ability, and thus facilitate her needs.

We see an improvement in the method to stimulate the awareness of needs more towards the user, instead of the designer interpretation. If the canvas would include the structure past/present/future already, the user may map his/her hobbies more consciously and explicitly onto a timeline. Perhaps newer/different hobbies can be added to be included for the future part. Also, we may trigger discussion further if we make more detailed cards, catering to the various needs. This facilitates personalization of the cards so it can convincingly fit a participant, rather than aiming to be an all-encompassing general term on the card. The concept of using activities and hobbies shows potential, and could even be explored in other domains such as their social network, favourite objects in the home or memories to elicit specific design opportunities.

Conclusion

We contribute the LTC to facilitate empathy with specific user groups for design and designers, in the early stages of the design process, to engage in empathic co-creation. Also, the user is facilitated to provide rich contextual individual stories through their leisure activities in an effective way. With this, the designer can frame a new design space based on the personal contexts of the users' hobbies and leisure time activities.

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