Author's response to reviews

Title: Co-production in practice: how people with assisted living needs can help design and evolve technologies and services

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Author's response to reviews: see over
Dear Prof Rogers,

Many thanks for the very useful comments from the reviewers.

Please see below our responses to the comments and details on the amendments made to the manuscript.

Yours sincerely

Joe Wherton

Reviewer 1: Caroline Sanders

1) Defining ‘socio-technical’ infrastructure
It might be useful to unpack the term socio-technical infrastructure, and to clarify how the purpose of the workshops was described to participants. It makes that there is a need to focus on wider context which is reflected in the themes associated with socio-technical infrastructure. However, some explanation of this, together with more detail regarding analysis, might help to clarify the links between the data collected and analysed, and the final themes.

We have added text on page 4 to clarify this term and have also added text on page 5 to relate this to how the data was collected and analysed. We did not use the term ‘socio-technical’ with participants, but we did encourage them (through the workshop activities) to discuss technology and service issues. We did not have any particular technologies/services in mind, and so the workshops were structured for participants to lead discussions, and the data collection and analytical methods were conducted to reveal priority concerns and ideas.

2) Description of storyboards
I wondered what other storyboards were used, could these be summarised? Also, how did they decide on the topics for each storyboard?

We have added text on page 6 to summarise how the scenarios were developed and issues covered in the other storyboards.
3) Description of end-user sample

Workshops with end users were restricted to existing end-users and carers with experience of telehealth. I wondered did the team consider opening this out to ‘potential’ end users, especially because many older people invited to use telehealth (including in the WSD trial mentioned), choose not to use it, and the views of such people could also helpfully inform design of potential solutions/socio-technical infrastructure.

We agree that this is an important group, and should point out that our participants varied greatly in terms of their use of telehealth and/or telecare. Whilst some were active users, others were unable to use (or chose not to use) the technology provided to them. We have added text to page 5 to clarify this in the sample description.

4) Detail on final workshop

The authors describe taking initial themes to a final workshop ‘to provoke discussion about how the user could be supported through collaborative efforts of their care network’, but it doesn’t seem clear how this came to be the focus from the initial themes. Also, how did the final workshop feed into analysis?

We have added text on page 7 to make this clearer. The need for increased information sharing and coordination across people and organisations occurred frequently during the previous workshops. As we had the different user and stakeholder representatives present at the final workshop, we decided to explore this issue in more detail with the use of card prompts to facilitate dialogue.

5) Discussion on technology

The description of how workshops were structured seemed to indicate a fair degree of attention was paid to technology and associated features, in addition to broader context. However, the technology and design does not seem to feature very much in the presentation of the themes.

We found that when participants discussed the technology, they did not call for new devices or design features. Instead their technical input centred on configuration and combining of existing devices. This is reflected under the ‘customisation and adaptation’ theme, in which we give examples of how participants generated ideas around how they would like to customise their personal trigger alarms (pages 8-9). We think this is an important point, and so have added text on page 14 to highlight this in the discussion.

In addition, we have added text on page 17 to highlight that the card prompt activities provoked discussion on personalisation, and so reflect on how such formats could be taken forward to support service engagement with users as part of ALT delivery and support.

6) Distinction between themes

The first theme (raising awareness and sharing knowledge) seems to overlap with the fourth theme (information sharing and coordination). It might be helpful for the authors to elaborate on the distinctions between these two themes, and perhaps illustrating with more data might help support the distinction?

We have added text on page 15 to distinguish these two themes more clearly: ‘Raising awareness and sharing knowledge’ (tacit and explicit knowledge required to use and support the use of ALTs); and ‘Information sharing and co-ordination’ (knowledge and information about the older person and the care provided to them).
7) Reflections on outcomes and practical outputs
Are you able to reflect a little more on the outcome/outputs from the co-design events as the discussion and conclusions seem to indicate that the workshops helped to identify the gaps, but because of the excellent activities described, I wonder about practical outputs? Did the co-design events help you to formulate new strategies/resources to facilitate co-development of new care solutions/or even the socio-technical infrastructure outlined?

We have added some reflections on the methodology in the new section on ‘Conducting co-design workshops’ (page 16). This includes reflections on the benefits of using the vignettes/case narratives and how such insights should be routinely captured by the stakeholder groups. It also includes reflections on how the workshop format could be adapted to improve service engagement with end-users to increase their awareness and confidence to devise solutions together.

Reviewer 2: Rachael Gooberman-Hill

1) Recruitment and consent
For the sake of completeness, it would be useful to know how stakeholders were identified, and how the stakeholders and carers were approached. After this I would like to know about the consent processes for the workshops and about ethical approval for the study.

We have now added text on page 5 to provide these details.

2) Constant comparison analysis
Can there be more detail on analysis process, including detail of how the constant comparison process was conducted with the transcribed audio-recordings and how any data stemming from the visual techniques, storyboards and interactive tasks were analysed?

We have added text on page 7 to describe the data collection and analysis in more detail. The data consisted of audio and field notes. The interactive exercises were used to support dialogue among participants, as opposed to data gathering (e.g. number of cards selected etc.).

3) Discussion on social support
I was unsure of the basis for the following statement, and suggest that the evidence to support the claim should be made clearer: ‘Effective design and delivery of ALTs will rely on spontaneous cooperative acts to deal with task complexity and uncertainty…’ Why spontaneous and why cooperative?

This relates to participants’ comments on the role of informal networks to support the use of ALTs and their views about the role of professionals to take on such roles in the absence of these supports. As such actions and roles cannot be predicted or specified in advance (‘spontaneous’) and may span different services/skill sets (‘cooperative’), it raises questions about how this would be managed, and the extent to which workers will go beyond formalised protocols, roles and obligations. We have reworded this paragraph on page 15 to make it clearer and draw a more direct link with the data.
4) **Use of the term ‘de-coupling’**

On page 16, I was unsure about the introduction of the idea of ‘de-coupling’ in the context of this study, and wonder if it might work better if related to the study findings?

The term comes from CSCW literature on how electronic displays in hospital settings can support collaboration among staff (with different roles and expertise) by providing different ‘views’ of the same underlying information about the patient. We draw a link between this notion and our participants’ ideas about the potential role of ICT to bridge communication between different members of an older person’s care network (formal and informal). We have added text to the results section (page 13) and the discussion section (page 16) to make this link clearer.

5) **Discussion on methods**

The authors could consider whether they might wish to include an additional paragraph in the Discussion that could include consideration of the methods used, what worked well, any limitations and how methods might be carried forward in the future.

We have now added a section on ‘Conducting co-design workshops’ (page 16) with some reflections on the workshop methods.

6) **Relating to ‘bricolage’**

The introduction indicates that work is needed to enable bricolage to happen. While customisation is addressed in the discussion, there is no mention again of ‘bricolage’ per se. I wonder if the authors might make bricolage more explicit in the Discussion and expand further on how the workshops inform how to achieve, or promote, bricolage relating to ALTs.

We have added text to make ‘bricolage’ more explicit in the discussion and how it relates to the themes.

7) **Amendment to the Abstract**

In the Abstract, the authors write that the prevailing focus has been on technical aspects of ICT systems. I think that it may be a mild overstatement to say that the focus has been on the tech side, and this might be worthy of revision.

We have taken this out of the Abstract, and rephrased in the discussion. This relates to recent developments in ICT to support sharing of patient data. The co-design workshops highlighted an interesting design space for this, which aligns with CSCW literature (e.g. mutual awareness). We think that this design space is under-researched within the assisted living field.

8) **Other amendments**

- In the second paragraph on page 3, might it also be the case that the drive to invest in ALTs is not just due to modernism but might also reflect political economy as described in reference 6?

We have now added text to incorporate this point on page 3.
- Please define 'social affordances' for this audience.

We have now included a definition and reference for 'social affordance' (page 16).

- Please correct 'repairmen' to 'technicians' in relation to Orr's ethnographic study.

We have now corrected to 'technician'.

- In the Abstract: 'audio recoded' would be better than 'audiotaped' and would match the main text.

We have now changed this.

- I wondered if the authors might like to cite Bate and Robert (2007), as it provides a much more detailed description of experience-based design.

We have now included this reference.

- In the Results section I prefer that quotes from participants are accompanied by anonymised IDs or pseudonyms. I understand that there is debate around this.

We have now included the pseudonyms of the case participants.