

## PEER REVIEW HISTORY

BMJ Open publishes all reviews undertaken for accepted manuscripts. Reviewers are asked to complete a checklist review form (<http://bmjopen.bmj.com/site/about/resources/checklist.pdf>) and are provided with free text boxes to elaborate on their assessment. These free text comments are reproduced below.

### ARTICLE DETAILS

<b>TITLE (PROVISIONAL)</b>	SCALS: A fourth-generation study of assisted living technologies in their organisational, social, political and policy context
<b>AUTHORS</b>	Greenhalgh, Trisha; Shaw, Sara; Wherton, Joe; Hughes, Gemma; Lynch, Jennifer; A'Court, Christine; Hinder, Sue; Fahy, Nick; Byrne, Emma; Finlayson, Alexander; Sorell, Tom; Procter, Rob; Stones, Rob

### VERSION 1 - REVIEW

<b>REVIEWER</b>	Dean Sittig University of Texas Health Science Center at Houston, TX USA
<b>REVIEW RETURNED</b>	15-Oct-2015

<b>GENERAL COMMENTS</b>	This is paper reports on the protocol for what looks to be an excellent study. I'm going to use this paper as an example of how to write a complex, qualitative research proposal. It is excellent. It is easy to see why this project was funded. best of luck with the research. can't wait to read the papers that come out of it.
-------------------------	---

<b>REVIEWER</b>	Laurie Lovett Novak Vanderbilt University, USA
<b>REVIEW RETURNED</b>	02-Nov-2015

<b>GENERAL COMMENTS</b>	<p>The manuscript describes a large action research project that aims to identify practical strategies to improve the development and implementation of assisted living technologies, make theoretical contributions regarding structuration as it relates to technology, health, and institutions, and finally to further the notion of fourth-generation assisted living technology research.</p> <p>The project is well-designed and will make important contributions in all of the areas described. The introduction and background sections are very clear and the authors have an impeccable theoretical positioning. I have just a few suggestions to clarify the rest:</p> <ol style="list-style-type: none"><li>1. It would help to align the details of the methods (pages 14-18) with the Overview of Study Design on page 11. For example, in the Overview, the authors state that the research focus is the "process of bricolage", and in the conceptual framework include numerous references to practice and structuration theory, suggesting a focus on structuring. However in the section on Micro-Level Ethnographies there not much detail on how bricolage will be documented, or how structuration will be examined. Examples might include how the study will collect and analyze data on material artifacts, spatial and temporal microstructures that impact practices, and construction of meaning (there is a reference to analyzing for symbolic aspects of</li></ol>
-------------------------	---

	<p>technology but no mention of what data will reveal these insights).</p> <p>2. Unless there is a reason not to, I would suggest describing the analyses in the order of “micro, meso, and macro” on pages 14-18.</p> <p>3. Just a small clarification about the relationship between the micro and meso studies. Will the 5-15 participants in each technology implementation/ case study (e.g. heart failure patients having Skype consultations) be the actual participants in the micro ethnography, and also in the co-creation project?</p> <p>4. I appreciate the authors playing down the possibility of panacean solutions, however I think that “useful rules of thumb and good-enough solutions” gives the study short shrift. This study will produce new categories of problems and solutions, and shed light on new aspects of the problems that need to be studied and evaluated.</p> <p>5. Finally, there was little mention in the study design of patients’ families, lay caregivers and other participants in everyday illness work. How will this group be treated in the home-based ethnographic work, for example?</p> <p>I thoroughly enjoyed reading this manuscript and am looking forward to circulating the final paper.</p>
--	--

<b>REVIEWER</b>	Jeffrey Braithwaite Macquarie University
<b>REVIEW RETURNED</b>	11-Nov-2015

<b>GENERAL COMMENTS</b>	<p>Thank you for sending this manuscript for my review. I was expecting the customary high standard from this group. I wasn't disappointed by the proposal and its aims in the main, but there is scope for clarification of some issues and for strengthening the design.</p> <p>Abstract—Introduction</p> <p>An unstable system? Do such studies view the technology as unstable? I'd talk about the complexity of it, but things are stable enough to have lasted for decades, and we've kept on delivering care to millions of people.</p> <p>Abstract—Methods and analysis</p> <p>Emergence of what?</p> <p>Structuration – I understand Giddens's structuration theory but the average reader of BMJ Open won't. Just a clause on what it means, would help the readership.</p> <p>(In general, think about explaining in slightly relaxed language in the Abstract, to non-technical readers, what you are proposing to do).</p> <p>Abstract—Ethics and dissemination</p>
-------------------------	--

	<p>I suggest talking about the power of the studies and generalizability in different terms than making an apology (“the impossibility of generating context-free findings ... and universally transferable ... solutions.”). Rather than the impossible, talk about the possible? Surely given the letter to the BMJ that qualitative researchers have contributed recently, we don’t have to apologise for qualitative research? Perhaps more like (you’ll have better words than this) “We will document the studies’ credibility and rigour and assess the transferability of our findings to other settings while recognizing the unique aspects of the contexts within which they reside”.</p> <p>Strengths and limitations of the study—perhaps a final bullet point (if you agree with the point above):</p> <ul style="list-style-type: none"> <li>• Designed to show <i>in situ</i> behaviours and transferability to like settings</li> </ul> <p>Introduction</p> <p>Page 5, second paragraph, sixth line: “... was not borne out.” Perhaps more like “... has not yet been borne out, and their future is not promising.”</p> <p>Page 6, third paragraph, second line: “... studies are becoming...”, perhaps “... studies have become ...”.</p> <p>Page 6, third paragraph, third line: I’m not sure why you had brackets round the phrase “version of the”. It works without them.</p> <p>Page 6, third paragraph, thirteenth line: Standardise your punctuation—before or after the citation?</p> <p>Page 7, second paragraph, last line: as indicated above, I think a bit of thought may be called for in respect of the idea of instability. In a CAS, just because you perturb a system, you don’t necessarily render it unstable. There’s lots of work on this but amongst that which I know, see for example Braithwaite et al Health care as a complex adaptive system in Hollnagel et al, Resilient Health Care, Ashgate, 2013; Nugus et al, Soc Sci Med 2010; 71(11):1997-2004. doi: 10.1016/j.socscimed.2010.08.013; and Braithwaite et al, Qual Saf Health Care 2009;18:37-41 doi:10.1136/qshc.2007.023317.</p> <p>Page 7, fifth paragraph, fourth line: “... who’s interests ...”</p> <p>Page 10, end of Introduction. The only weakness I could detect in the argument to here (it’s strong, and convincing in the broad, on my reading of it) is if you take the counter-veiling argument and run it up the flagpole. Apple technology, for instance. The iPhone is the obvious example. It has transformed the way we live and work. Not always fundamentally – we still need to do similar things to earlier eras: eat, sleep, do the basics of living. But I have 162 apps on mine, and use it to catch news, to travel, to monitor my calorie intake, to do email, to tweet, to wake me up ... well, you know this well. (I rarely use it as a phone). It has transformed many aspects of my doing, thinking and imagining, working and living, and it’s not</p>
--	---

	<p>local, it's ubiquitous, and it's not a modernist myth. I'm reminded of Steve Barley's early work on Technicians in the Workplace in ASQ, which could at some point be worth revisiting. You allude to him at reference #32. But I digress ... .</p> <p>Page 12, Theoretical/conceptual framework, first paragraph. You raise philosophy and then move into a thoroughly sociological and CAS approach here. Apart from the ethical practice dimension, the "... grounded in phenomenological philosophy" claim, you do not demonstrate this further or follow it up. There's a case for either dropping it or replacing it: perhaps "...phenomenological sociology, but with a fundamental perspective which is inspired by phenomenological philosophy ..."</p> <p>Page 12, third paragraph, second line: This is the first time the reader is told about interviews (contrasted with observational ethnography.) It prompted the thought about whether you should have an earlier section entitled Method, bringing out what you are going to do in more clear terms.</p> <p>Page 13, Setting and context, fourth line: "... change a service to older people ..."? <i>For</i> older people, or <i>in respect of</i>, perhaps? "To" sounds deterministic, which you are arguing against.</p> <p>Page 14, third paragraph "... (and with up to four additional case studies added later)." It triggered me to ask why? What for? What is this designed to achieve?</p> <p>Page 14, Meso-level case studies. Some of this is duplication, already explained. Could be summarized.</p> <p>Page 18, last paragraph, Integrating the dataset. Maybe it's just me, but this seems to be stuck in at the end as an afterthought. Should it at least be alluded to earlier; it crosses over with Method.</p>
--	---

### VERSION 1 – AUTHOR RESPONSE

Reviewer: 1

Dean Sittig  
University of Texas Health Science Center at Houston, TX USA

This is paper reports on the protocol for what looks to be an excellent study. I'm going to use this paper as an example of how to write a complex, qualitative research proposal. It is excellent. It is easy to see why this project was funded. best of luck with the research. can't wait to read the papers that come out of it.

Thanks! I think this is the best review I've ever had. (Writing the protocol was of course easy compared to the execution of this challenging study).

Reviewer: 2

Laurie Lovett Novak  
Vanderbilt University, USA

The manuscript describes a large action research project that aims to identify practical strategies to improve the development and implementation of assisted living technologies, make theoretical contributions regarding structuration as it relates to technology, health, and institutions, and finally to further the notion of fourth-generation assisted living technology research.

The project is well-designed and will make important contributions in all of the areas described. The introduction and background sections are very clear and the authors have an impeccable theoretical positioning. I have just a few suggestions to clarify the rest:

1. It would help to align the details of the methods (pages 14-18) with the Overview of Study Design on page 11. For example, in the Overview, the authors state that the research focus is the “process of bricolage”, and in the conceptual framework include numerous references to practice and structuration theory, suggesting a focus on structuring. However in the section on Micro-Level Ethnographies there not much detail on how bricolage will be documented, or how structuration will be examined. Examples might include how the study will collect and analyze data on material artifacts, spatial and temporal microstructures that impact practices, and construction of meaning (there is a reference to analyzing for symbolic aspects of technology but no mention of what data will reveal these insights).

This was very useful feedback, thanks, though please note we will be producing a further paper giving more detail on this aspect of the work. We’ve amended the text as suggested to give a little more detail on the bricolage aspect (see page 16).

2. Unless there is a reason not to, I would suggest describing the analyses in the order of “micro, meso, and macro” on pages 14-18.

The reason why we didn’t do that (though we initially tried) is that the micro level ethnographies are being used to inform and shape the meso level case studies, and our unit of analysis is the [organisational] ‘case’. I am increasingly frustrated by ethnographies of the patient experience that float free of the meso level. Hence the focus is on the organisation, and we ‘zoom in’ from that to the patient experience and ‘zoom out’ to the wider policy/professional/etc context. So there is a logic to it.

3. Just a small clarification about the relationship between the micro and meso studies. Will the 5-15 participants in each technology implementation/ case study (e.g. heart failure patients having Skype consultations) be the actual participants in the micro ethnography, and also in the co-creation project?

Broadly, yes (see revised text page 15).

4. I appreciate the authors playing down the possibility of panacean solutions, however I think that “useful rules of thumb and good-enough solutions” gives the study short shrift. This study will produce new categories of problems and solutions, and shed light on new aspects of the problems that need to be studied and evaluated.

On reflection we agree. We’ve sharpened it in the revised version (page 17).

5. Finally, there was little mention in the study design of patients' families, lay caregivers and other participants in everyday illness work. How will this group be treated in the home-based ethnographic work, for example?

Families are key, and we should have mentioned them. Their experiences and insights will be part of the ethnographic work of course. We've amended the text to reflect this (page 16).

I thoroughly enjoyed reading this manuscript and am looking forward to circulating the final paper.

Thanks, we hope to persuade BMJ of the value of qualitative research in time for submission of main findings papers.

### Reviewer 3

Thank you for sending this manuscript for my review. I was expecting the customary high standard from this group. I wasn't disappointed by the proposal and its aims in the main, but there is scope for clarification of some issues and for strengthening the design.

#### Abstract—Introduction

An unstable system? Do such studies view the technology as unstable? I'd talk about the complexity of it, but things are stable enough to have lasted for decades, and we've kept on delivering care to millions of people.

Point taken, though I'm not sure that much in UK NHS / social care is "stable enough to have lasted for decades". We've inserted "potentially" in front of "unstable" (page 3) and repeated this later in the paper.

#### Abstract—Methods and analysis Emergence of what?

Structuration – I understand Giddens's structuration theory but the average reader of BMJ Open won't. Just a clause on what it means, would help the readership.

(In general, think about explaining in slightly relaxed language in the Abstract, to non-technical readers, what you are proposing to do).

Sorry, we're up against a word count of 300 here, so whilst we agree in principle it's hard to comply. We think it's important to mention structuration theory in the abstract because when people search for articles in PubMed or Google Scholar, abstract words are picked up. The reader who doesn't understand the term can ignore it (the abstract was penned so it would be understood without knowing what structuration theory is), and will know that it's explained in the main text. We have however taken on board the general point that we need to explain some bits more clearly for the general reader and have tried to do this throughout.

#### Abstract—Ethics and dissemination

I suggest talking about the power of the studies and generalizability in different terms than making an apology ("the impossibility of generating context-free findings ... and universally transferable ... solutions."). Rather than the impossible, talk about the possible? Surely given the letter to the BMJ that qualitative researchers have contributed recently, we don't have to apologise for qualitative research? Perhaps more like (you'll have better words than this) "We will document the studies' credibility and rigour and assess the transferability of our findings to other settings while recognizing

the unique aspects of the contexts within which they reside”.

Thanks, we agree. Though we fear BMJ editors won't. The whole point of that letter (to which we have yet to receive a reply) is that BMJ editors do NOT value qualitative research. But that's a subject for another day. We've changed the abstract as suggested (page 3).

Strengths and limitations of the study—perhaps a final bullet point (if you agree with the point above):

- Designed to show in situ behaviours and transferability to like settings

Agree, added (page 4).

Introduction

Page 5, second paragraph, sixth line: “... was not borne out.” Perhaps more like “... has not yet been borne out, and their future is not promising.”

Amended broadly as suggested (page 5).

Page 6, third paragraph, second line: “... studies are becoming...”, perhaps “... studies have become ...”.

Amended as suggested (page 6).

Page 6, third paragraph, third line: I'm not sure why you had brackets round the phrase “version of the”. It works without them.

Amended as suggested (page 6).

Page 6, third paragraph, thirteenth line: Standardise your punctuation—before or after the citation?

Sorted (page 6).

Page 7, second paragraph, last line: as indicated above, I think a bit of thought may be called for in respect of the idea of instability. In a CAS, just because you perturb a system, you don't necessarily render it unstable. There's lots of work on this but amongst that which I know, see for example Braithwaite et al Health care as a complex adaptive system in Hollnagel et al, Resilient Health Care, Ashgate, 2013; Nugus et al, Soc Sci Med 2010; 71(11):1997-2004. doi: 10.1016/j.socscimed.2010.08.013; and Braithwaite et al, Qual Saf Health Care 2009;18:37-41 doi:10.1136/qshc.2007.023317.

Ah OK, now I see what you mean. Amended broadly as suggested: we've changed to 'potentially unstable' and also flagged the resilience book in the next paragraph as another established 'fourth generation' approach (page 7).

Page 7, fifth paragraph, fourth line: “... who's interests ...”

I stand by the original grammar! (“Who's” = “who is”; whose = possessive, according to my English teacher).

Page 10, end of Introduction. The only weakness I could detect in the argument to here (it's strong, and convincing in the broad, on my reading of it) is if you take the counter-veiling argument and run it up the flagpole. Apple technology, for instance. The iPhone is the obvious example. It has transformed the way we live and work. Not always fundamentally – we still need to do similar things to

earlier eras: eat, sleep, do the basics of living. But I have 162 apps on mine, and use it to catch news, to travel, to monitor my calorie intake, to do email, to tweet, to wake me up ... well, you know this well. (I rarely use it as a phone). It has transformed many aspects of my doing, thinking and imagining, working and living, and it's not local, it's ubiquitous, and it's not a modernist myth. I'm reminded of Steve Barley's early work on Technicians in the Workplace in ASQ, which could at some point be worth revisiting. You allude to him at reference #32. But I digress ... .

Agree, for balance we should run the countervailing argument up the flagpole. See page 10 where we've attempted this. We have some early data already on an attempt to introduce iPads in a community healthcare trust in one of the SCALS case studies. It's a mess.

Page 12, Theoretical/conceptual framework, first paragraph. You raise philosophy and then move into a thoroughly sociological and CAS approach here. Apart from the ethical practice dimension, the "... grounded in phenomenological philosophy" claim, you do not demonstrate this further or follow it up. There's a case for either dropping it or replacing it: perhaps "...phenomenological sociology, but with a fundamental perspective which is inspired by phenomenological philosophy ..."

We've revised the wording of this paragraph to highlight that phenomenology is central to strong structuration theory (we just forgot to make that explicit in the original draft), See page 12.

Page 12, third paragraph, second line: This is the first time the reader is told about interviews (contrasted with observational ethnography.) It prompted the thought about whether you should have an earlier section entitled Method, bringing out what you are going to do in more clear terms.

I had a go at this but the offending section IS that earlier section (we expand on it later in the paper)! We do mention interviews in the abstract, so it shouldn't come as a complete surprise. We've clarified the wording slightly to make the methods section flow better (page 13).

Page 13, Setting and context, fourth line: "... change a service to older people ..."? For older people, or in respect of, perhaps? "To" sounds deterministic, which you are arguing against.

Agree, changed (page 14).

Page 14, third paragraph "... (and with up to four additional case studies added later)." It triggered me to ask why? What for? What is this designed to achieve?

In all honesty the sample size of 7 or 8 was a trade-off in the grant application between the depth I wanted and the breadth I felt the funder would want. Because we were funded to do 7 or 8, this is what's in the protocol! I've alluded to the reason for sample size on page 14.

Page 14, Meso-level case studies. Some of this is duplication, already explained. Could be summarized.

Agree, duplicate material culled (page 15).

Page 18, last paragraph, Integrating the dataset. Maybe it's just me, but this seems to be stuck in at the end as an afterthought. Should it at least be alluded to earlier; it crosses over with Method.

We've briefly mentioned the cross-case analysis earlier in the text (page 11), but still feel that most of the 'integrating the dataset' belongs towards the end of the description so have left it there. Happy to take an editorial steer here if we're missing something.



## VERSION 2 – REVIEW

<b>REVIEWER</b>	Dean sittig University of Texas, houston Texas USA
<b>REVIEW RETURNED</b>	22-Nov-2015

<b>GENERAL COMMENTS</b>	Good response to reviewers, mostly cosmetic suggestions.
-------------------------	--

<b>REVIEWER</b>	Laurie Lovett Novak Vanderbilt University, USA
<b>REVIEW RETURNED</b>	20-Nov-2015

<b>GENERAL COMMENTS</b>	Thank you for the responses to my questions and comments. I look forward to seeing this paper in the journal.
-------------------------	---

<b>REVIEWER</b>	Jeffrey Braithwaite Australian Institute of Health Innovation, Macquarie University, Australia
<b>REVIEW RETURNED</b>	18-Nov-2015

<b>GENERAL COMMENTS</b>	Thank you for the opportunity to re-review this study protocol. I have read the paper and the comments by way of response to my points and am happy with the way the authors have handled them. I hope the authors and editors agree that this has helped strengthen (or, more accurately clarify) the protocol. I am looking forward to seeing the results of the work that will emerge from this protocol over the next few years. I agree with reviewer 1 and reviewer 2 who are also supportive of the paper and hope to see it in print in BMJ Open.
-------------------------	---