Author’s response to reviews

Title: Aligning Implementation and User-Centered Design Strategies to Enhance the Impact of Health Services: Results from a Concept Mapping Study

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Bev J. Holmes, PhD, Managing Editor
Implementation Science Communications

Dear Dr. Holmes:

We greatly appreciate the opportunity to revise and resubmit our manuscript, “Aligning Implementation and User-Centered Design Strategies to Enhance the Impact of Health Services: Results from a Concept Mapping Study” (#ISCM-D-19-00039), for possible publication in Implementation Science Communications. We found the suggestions from you and the reviewers to be very helpful and think that they have strengthened the quality of the manuscript. A revised manuscript that incorporates these suggestions accompanies this letter, which outlines the changes that we have made in response to each reviewers’ comment (listed verbatim).

Issues Highlighted in Your Letter to Us

1. “The reviewers have a number of positive comments about your submission. However, based on their comments below, you may want to consider revising it as a short report, rather than a research article.”

We interpreted your suggestion to mean that we should consider submitting a short report if we were unable to adequately address the reviewers’ comments, as the short report format would not allow us sufficient space to attend to the points raised in review. We believe that we were able to address the comments and therefore have resubmitted the manuscript as a revised research article. However, please let us know if we have misunderstood your feedback.
2. “We suggest that you pay attention to the differences in your references to implementation, vs implementation science. The two areas - one a practice, one a study - are conflated at times, as are implementation scientists and implementation experts, who have quite different areas of expertise.”

We agree that it is important to distinguish between expertise in the science versus practice of implementation when discussing implementation experts. The same distinction is also important among experts in user-centered design (UCD). Unfortunately, we did not separately recruit participants with science versus practice expertise for our sample, but we have made several changes throughout the manuscript to clarify our discussions of expertise.

First, we removed any references to “implementation science experts” from the manuscript. Instead, we now refer to “implementation research and practice” when discussing this field in the Introduction (p. 5, first line; p. 7, second paragraph, line 2). We also refer more generally to “implementation experts” in our description of study participants and recruitment (p. 8, second paragraph, line 3 and third paragraph, line 1), as well as in our presentation of ratings by implementation versus UCD experts in Table 2.

Second, we clarified on page 8 (last three lines) how participants’ expertise was self-reported based on experience in research, practice/industry, and/or education; we did not ask participants to identify specific areas of expertise, but we believe many had both research and applied experience in their discipline based on our recruitment methods and our interactions with participants during the study. In order to make this point more clear, we also restructured the Method section to include a new sub-section titled “Recruitment and Participants,” which describes our recruitment procedures prior to describing participant characteristics (pp. 8-9).

Finally, we reframed the Discussion (p. 15, second paragraph, line 1) to focus on the potential for collaboration between implementation and UCD experts. We also included as a key limitation (p. 17, second paragraph, lines 5-8) that more research is needed to examine whether conceptualizations of these strategies differ among experts in the science versus practice of implementation and UCD, given that our recruitment strategy did not distinguish among these two types of expertise (between which there are notable gaps in both fields; Colusso et al., 2017; Westerlund et al., 2019; now [41] and [42], respectively, in the reference list).

3. “Finally and on a more minor note, please review the paper for word consistency ("compliment" is used for the most part, when "complement" is meant; implementation is referred to as implantation, etc.”

Thank you for pointing out these unintended spelling errors. We have corrected spelling throughout the manuscript. We do not provide a comprehensive list of changes to avoid further lengthening this letter, but we are happy to do so if you desire it (and all changes are highlighted in the manuscript itself).

Issues Highlighted by Reviewer 1
1. “Several mentions are made to future work, which could be accomplished with the existing data (e.g., follow-up survey and go-zones), this paper would be strengthened in describing partnerships by including those findings. For example, page 18, lines 21-26 indicates "Our efforts will be informed by analysis of the rank-order and qualitative feedback we collected from participants in this study about challenges and desired supports for cross-discipline collaboration.", but related findings are not include in the results. Perhaps the current paper could either be augmented with these additional results or framed more as preliminary findings with future direction clearly laid out?”

Indeed, we considered presenting results from other analyses (go-zones) and data sources (rank-order and qualitative feedback from the follow-up survey) in this paper. However, we decided that the different methods, results, and implications of these various components of the project were best addressed within separate manuscripts, each with its own focus. Specifically, the concept mapping results presented in this manuscript address the current state of alignment between implementation science and UCD, whereas the go-zones will be useful for informing specific approaches to collaboration and strategy prioritization, and the rank-order and qualitative data relate more to what must be done to increase that alignment in the future. A single manuscript does not allow adequate space to address all these different methods and foci.

We have clarified the sentence in question (p. 19, second paragraph, last three lines) to state that future efforts to align implementation science and UCD will be informed by continued analysis of additional data collected from participants in this study; for example, participants provided rank-order and qualitative feedback about challenges and desired supports for cross-discipline collaboration (see the study protocol [9] for details). We already addressed go-zones earlier in the manuscript (p. 16, first paragraph, last four lines) when we noted “in future work, we plan to examine ‘go-zone’ graphs [32] that plot individual strategies along key dimensions (e.g., importance vs. feasibility, implementation vs. UCD experts) to identify discrete strategies within and across clusters that are particularly promising for cross-disciplinary collaboration.”

2. “Throughout the paper, it would be helpful to clarify whether the efforts are around using UCD for innovation/evidence-based intervention development, implementation strategy development, or both. It seems that this would apply to both (e.g., first sentence of the discussion), but this does not come through consistently.”

We agree with Reviewer 1’s assessment that UCD is applicable to the design of both EBPs and implementation strategies. We have clarified in the Introduction (p. 7, first paragraph, last six lines) that UCD has most frequently has been used to design new health services and technologies, whereas applications to the delivery and sustainment of already-designed EBPs (including the design of implementation strategies) remain rare. But then, consistent with our point raised in the first sentence of the Discussion, we also emphasize that findings to date suggest that UCD has high relevance to most (if not all) EBPs, implementation strategies, and practice contexts within health care (see [31] in particular).

3. “Looking at the study protocol, the number of UCD participants was considerably lower than the target (22 of 30); could the authors comment on how this may impact the robustness and generalizability of the findings (even if the actual sample size is greater
than the number needed for analysis)? The paper does not seem to discuss limitations, but this seems important to consider, particularly given the findings among UCD experts, which remain un-explained.”

Part of the reason that we had fewer UCD expert participants is that we only had funding for 60 participants in total. When more participants self-identified as implementation experts than we had originally anticipated (because they had some expertise in both disciplines), we chose to still include them in the study, resulting in a total of 34 implementation experts and a remainder of 26 slots for UCD experts. We realize that this was unclear in the manuscript and now state it explicitly on page 9 (second paragraph, lines 2-3). Overall, although several enrolled UCD experts did not complete the study, we did recruit 85% of the potential participants for those 26 slots. Our experience with recruitment in general was that there were more sources to find implementation experts than UCD experts with health expertise, and thus it was likely unrealistic to expect equal sample sizes when planning the study. In addition, both groups sizes exceed the recommended 15 participants necessary in each group for concept mapping. Thus, we do not consider the sample size of UCD experts to be a major limitation of this study, although we appreciate the reviewer’s point and now explicitly acknowledge it in the Discussion as a limitation (described more next).

Speaking more broadly of limitations, we acknowledge that our Discussion section did not contain a separate paragraph about study limitations. We have added a sentence to the first paragraph of the Discussion (p. 15, second paragraph, last four lines) clarifying that, as a preliminary study, our work had limitations (e.g., the lower than anticipated recruitment of UCD experts) and left many unanswered questions, so we highlight the need for additional research throughout our subsequent discussion rather than presenting a stand-alone limitations paragraph.

4. “The alternate clusters identified among UCD expert responses are very interesting, and may be able to provide additional depth. Would it be possible to discuss the findings with UCD experts to gain insight into the meaning of these alternate clusters? Perhaps this could be noted as a future research direction or limitation, as re-engaging with stakeholders to interpret the concept map can be a part of concept mapping? For example, on page 17, lines 24-39: greater involvement from UCD experts might address some of the unanswered questions raised?”

We agree with the suggested future research direction. In our discussion of the alternative UCD-only cluster solution (p. 19, first four lines), we now suggest that an interpretation session in which UCD experts consider and discuss the alternative UCD-only cluster solution – perhaps guided by follow-up questions from implementation experts – might offer insights into how UCD strategies could best be conceptualized and defined to maximize alignment with implementation science.

5. “The manuscript describes a third consideration of the cluster map based on i-PARIHS, but does not describe how and why this model was selected or used, which seems particularly notable given the detailed description of how and why CFIR was selected and applied.”
In the description of our analytic strategy (p. 11, lines 3-4 from the bottom of the page), we expanded our discussion of how i-PARIHS was selected and used to clarify that it is a process framework, which complemented the determinant-focused nature of CFIR (see Nilsen, 2015 – now [37] in the reference list – for a detailed discussion of the function of various types of implementation frameworks). The reviewer is correct in their observation that we used i-PARIHS less extensively than CFIR, as the former was only applied during the evaluation of cluster solutions. We primarily reference CFIR in the manuscript when discussing our selection of implementation strategies for sorting and rating, and we did not use i-PARIHS during that activity.

6. “Page 17, lines 9-17: Looking at the Witteman et al review, it does not seem the UCD framework mentioned has a name ("These clusters were consistent with a separate framework for UCD [17] which proposes a cyclical process …"), but might it help IS readers engage more deeply with the UCD literature to also site some of the UCD references referenced by Witteman et al? Perhaps this could help IS researchers learn more about UCD concepts?”

For implementation researchers who are interested in deeper engagement with UCD literature, we recommend our companion publication referenced on page 6 of the manuscript (Dopp et al., 2018; [22]) – which is a compilation of UCD strategies for implementation experts – as well as the resources cited therein. To further highlight that this is a useful resource, in the Discussion (p. 19, second paragraph, line 12), we now highlight our UCD strategy glossary for implementation experts as another example of implementation training resources.

7. “Very minor: Should Page 4, line 48: "In the present study, we sought characterize" be "In the present study, we sought to characterize"?"

We thank the reviewer for catching this error, and have corrected it (p. 4, line 3 from the bottom).

Issues Highlighted by Reviewer 2

1. “I wonder why the authors decided to work on the strategies first to examine the relationship between these two fields instead of, for example, understanding relationship between frameworks between the fields. If we conceptualize this work as a series of steps on how one could understand the relationship between two fields, other readers may follow similar paths. Therefore, a well-defined argument as to why this step was taken in relation to many other paths would, I think, be beneficial to the audience of this journal.”

Our work builds on existing conceptual frameworks that join implementation science and UCD, rather than preceding framework development. To better reflect this procession, we now describe in the Introduction (p. 7, last seven lines) how experts from these two disciplines have only recently begun joining together to examine the role of design in implementation, and their efforts have been primarily in the form of conceptual frameworks (e.g., [15,31]). We then explain that we used concept mapping to characterize how experts from each discipline conceptualize the
relations among the strategies described in these frameworks. Thus, our study offers a novel empirical understanding of the proposed conceptual relationship between these two disciplines. That being said, however, we do not necessarily view the characterization of frameworks versus strategies as sequential tasks; instead, knowledge gained from progress on one task can advance the other and vice-versa. For example, in the Discussion (p. 19, last two lines, through p. 20, first two lines), we note that an important future step will be to continue merging implementation-focused frameworks (e.g., [10,36]) with frameworks that describe how to design for implementation (e.g., [15,31]) to provide a more complete account of the levels and processes involved in implementation.

2. “I would also like to encourage the authors to be more explicit in terms of to the value added of this particular compilation of strategies. To clarify: it was not surprising to me to see the definition of the clusters in the results, with only three of them having common strategies across the IS and UCD fields. In the conclusion section, the authors reflect on the differences in perspective around feasibility and importance between the fields but… isn't that true when we collaborate across any different fields? I would like to encourage the authors to be more specific about how this study can inform potential collaborations of researchers in the IS and UCD fields.”

We appreciate Reviewer 2’s feedback, which helped us recognize that our results might appear more obvious and unsurprising to a reader than we found them. We now explain in the Discussion (p. 15, second paragraph, lines 11-12) how our conclusions – namely, that implementation science and UCD offer complementary approaches to improving health and well-being, with each discipline making unique contributions that could be strengthened by the other – represented less interdisciplinary overlap than we had anticipated when planning the study, given the common objectives of the two fields (i.e., we referred to “integrating” implementation and UCD strategies in our protocol [9]). We also note that this discrepancy demonstrates the value of using empirical methods to inform conceptualization and confirm (or disconfirm) impressions. Given the above perspective, we believe that the recommendations offered throughout the Discussion section reflect the added value of our study, since they are directly based on our specific results. A different approach to conceptualization might have produced different conclusions (e.g., more overlap) that led to different approaches to collaboration (e.g., recommendations to develop “dual expertise” in implementation science and UCD). However, if there are other ways that we can clarify the added value, please let us know.

3. “An addition point that I would like to raise in terms of discussion is the potential context-dependency of the compilation of strategies. As I read these results, and saw that some IS strategies did not replicate ERIC clusters, I wonder how group-dependent are these compilations of strategies - and thus the overall benefit of these lists to the field? I would encourage the authors to expand this caveat in their discussion and offer suggestions to the readers on how to potentially address such context-dependency when using these compilations to select/examine implementation strategies in their studies.”

In order to give this point the attention that it deserves, we added a new paragraph to the Discussion (p. 17, last paragraph, through p. 18, first paragraph) that addresses how the apparent context dependency of concept mapping solutions suggests a number of other future research
directions. We discuss how it will be important to examine how well other samples of implementation and UCD experts can replicate the observed cluster solution, especially across different subdomains in health care (e.g., medical vs. mental health, adults vs. pediatrics). Moreover, the compilations from which we drew strategies for sorting and rating in this study [7,22] are themselves context-dependent in that they primarily describe implementation and UCD activities within health care. Therefore, we go on to describe a recent project that adapted the ERIC implementation strategies for use in school settings (Cook et al., 2019; now [43] in the reference list) and replicated key importance and feasibility ratings for each strategy (Lyon et al., 2019; now [44] in the reference list); the findings showed that ratings for one-third of the strategies shifted meaningfully from the original ERIC compilation to the school-adapted set. We close the new paragraph by recommending that future research similarly consider how UCD strategies transfer.

Thank you again for your willingness to consider our manuscript for potential publication in Implementation Science Communications. We want to produce the best manuscript possible and would be pleased to make additional changes if desired. We look forward to hearing from you.