Author’s response to reviews

Title: Criteria for selecting implementation science theories and frameworks: Results from an international survey

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Version: 1 Date: 22 Sep 2017

Author’s response to reviews:

Dear Dr. Straus,

We thank you for this thorough, constructive review of our manuscript, "Criteria for selecting implementation science theories and frameworks: Results from an international survey." We appreciate your time and that of the reviewers, as well as the opportunity to revise the manuscript.

We hope that our responses meet your expectations. If you find that our responses do not address your concerns, please let us know; we would be happy to revise further.
Please find our responses follow your specific comments below:

Reviewer #1

1. Abstract: Would it be possible to list the suggested criteria in the abstract? I know there are length limits but without these criteria the abstract feels a bit vague.

Reporting all of the criteria in the abstract would substantially limit our ability to describe other critical features of the study. In the abstract, we list the four criteria that the most respondents reported using and the three criteria that the fewest respondents reported using. To address your concern, we have indicated that these are seven of 19 criteria total (p.3).

2. Background: Please explain how you and / or the papers cited here define underuse, misuse or superficial use of theories. If possible, please provide examples. This will help ground the paper a bit.

We have revised the text to ensure that we clearly define underuse, superficial use, and misuse of theories and offer examples of each as follows:

“Kirk et al. (2016) [9] reviewed studies citing the Consolidated Framework for Implementation Research and found that few applied the framework in a meaningful way (i.e., superficial use). For example, many articles cited the CFIR in the background or discussion sections to acknowledge the complexity of implementation, but did not apply the CFIR to data collection, analysis, or reporting findings.” (p.5)

“Gaglio, Shoup & Glasgow (2013) [11] found that the most frequently studied dimension of the RE-AIM framework (reach) was often used incorrectly (i.e., misuse) [12]. Reach compares intervention participants (numerator) to non-participants (denominator). Examples of misuse include comparisons of participants to each other rather than to non-participants (e.g., [13]).” (p.6)

“In one review, Tinkle et al. (2013) [4] highlighted pervasive underuse of theory (i.e., not using a theory at all)…” (p.5). (Note that found offering an example of underuse of theory to be challenging, aside from identifying one or two of the many studies that do not use theory. If the reviewer suggests that we do this or can recommend an example of misuse, we would be happy to incorporate it.

3. Results: Table 1 is a bit of a teaser! It would be helpful to include a table that gave more detail on which models were used for each of the purposes listed there.
We agree that understanding the ways in which particular theories have been used would be useful. We did not collect those data, so we have identified this as an opportunity for future research in our revised conclusion section:

“Several areas of future research would extend our initial attempt in this paper to explore criteria for selecting implementation theories. Specifically, the criteria that implementation scientists use to select theory may relate to how they intend to use theory. Understanding this relationship would help to refine the criteria presented here.” (p.15)

4. Discussion: It should be mentioned, when discussing which criteria for picking theories are most important, that importance may differ between projects.

We have revised our discussion of study limitations to address this point and call for future research on the topic:

“Several areas of future research would extend our initial attempt in this paper to explore criteria for selecting implementation theories. Specifically, the criteria that implementation scientists use to select theory may relate to how they intend to use theory. Understanding this relationship would help to refine the criteria presented here.” (p.15)

5. Overall this paper would be richer with more Discussion about what these findings mean for the field.

We enrich our discussion of the implications of these findings for the field by revising the discussion and conclusions sections as follows:

“Findings indicate that implementation scientists use a large number of criteria to select theories. It is possible that this large number reflects the varying sets of criteria that implementation scientists must consider depending on a theory’s intended use. (We describe this possibility in more detail below.) It may also be possible that the large number of criteria that implementation scientists consider when selecting theories reflects a lack of clarity regarding how to select theory. Indeed, our findings suggest that there is little consensus on which criteria are the most important. This may contribute to the persistent underuse, superficial use, and misuse of theories [4-8]… (p.12)

“Our results suggest that implementation scientists may benefit from guidance for theory selection and reporting the criteria that they use to justify their theory selection. Developing such guidance is challenging given potential variation in implementation scientists’ roles, priorities, and objectives, limiting the benefit of prescriptive guidance. Indeed, there may not be one “best” theory for a given project. Instead, implementation scientists will benefit from considering the
broad range of criteria that we propose in this paper, and the field of implementation science will benefit from transparent reporting of criteria used to select theories. Transparent reporting may encourage implementation scientists to carefully consider the relevance of a selected theory instead of defaulting to theories that are convenient or familiar but are poorly suited to implementation scientists’ objectives. In turn, transparent reporting may diminish silos in the field by making explicit scientists’ thinking in selecting a particular theory, thus promoting progress through generalizable findings and shared understanding… (p.13)

“Several areas of future research would extend our initial attempt in this paper to explore criteria for selecting implementation theories. Specifically, the criteria that implementation scientists use to select theory may relate to how they intend to use theory. Understanding this relationship would help to refine the criteria presented here. We also recognize that substantive differences between theories and frameworks likely have implications for the criteria used to select them. For example, specificity of causal relationships among constructs is likely to be of greater importance for selecting theories than for selecting frameworks. We are currently refining the criteria and working to develop a useful, practical, and generalizable checklist of criteria based on concept mapping by implementation scientists. The exercise will categorize the criteria and rate their clarity and importance. Our goal is for the checklist to take into account how and what kind of theory implementation scientists intend to use. This represents a first step toward what we hope will be a continued effort to refine the criteria, thus promoting more consistent and appropriate use of theory in implementation science and more effectively build the range of knowledge necessary to help ensure successful implementation across diverse settings.” (p.15)

6. It is not clear enough that the criteria posed by these authors are those that were given as options in their survey. Further, the authors do not suggest a prioritization scheme for these criteria; this would be helpful.

We have clarified that the criteria presented in the survey were the ones derived from the seminal text and iterative review and consensus process as follows:

“In the survey, we asked respondents to identify: . . . Criteria that they use to select a theory (e.g., analytic level; disciplinary origins) (select all relevant options provided based on the seminal text and iterative review and consensus process described above).” (p.7)

Regarding a prioritization scheme for the criteria, we direct the reviewer to our rationale for not doing so:

“Our results suggest that implementation scientists may benefit from guidance for theory selection and reporting the criteria that they use to justify their theory selection. Developing such
guidance is challenging given potential variation in implementation scientists’ roles, priorities, and objectives, limiting the benefit of prescriptive guidance. Indeed, there may not be one “best” theory for a given project. Instead, implementation scientists will benefit from considering the broad range of criteria that we propose in this paper, and the field of implementation science will benefit from transparent reporting of criteria used to select theories.” (p.13)

7. Conclusion: The two examples given in the Conclusion feel a bit odd as they are the first examples given of the use of criteria to select a guiding theory. I think this text might be better used in the Background to illustrate this selection process.

The objective of the study was to offer guidance to implementation scientists for theory selection. In the original draft of the manuscript, we also indicated in the background section that implementation scientists would benefit from guidance for reporting the criteria used for selecting theory. We have removed those references from the background section and restricted them to the conclusion section, as we view the recommendation to report criteria used for selecting theory as an implication of our study findings. We have revised the conclusion section as follows:

“The field of implementation science will benefit from transparent reporting of the criteria that implementation scientists use to select theories. Transparent reporting may encourage implementation scientists to carefully consider the relevance of a selected theory instead of defaulting to theories that are convenient or familiar but are poorly suited to implementation scientists’ objectives. In turn, transparent reporting may diminish silos in the field by making explicit scientists’ thinking in selecting a particular theory, thus promoting progress through generalizable findings and shared understanding. (p.14)

“Examples of transparent reporting of the criteria that we identified in this study (or any others) exist. Birken et al. (2015) [25] justified the use of a taxonomy of top manager behavior [26] to explore of the relationship between top managers’ support and middle managers’ commitment to implementation by describing three categories of behavior in which top managers might engage to promote middle managers’ commitment (i.e., logical consistency; description of a change process). Alexander et al. (2015) [27] described using Klein & Sorra’s (1996) [28] theory of innovation implementation to assess the influence of implementation on the effectiveness of patient-centered medical homes [29] because the theory explains how the proficient and consistent use of an innovation influences its effectiveness (i.e., outcome of interest; specificity of causal relationships among construct). Yet transparent reporting of criteria used to justify theory selection is limited. Requiring manuscripts to include a section describing the criteria used to justify theory selection may promote more consistent reporting.” (p.14)
Reviewer #2

1. The authors purposely combine the terms theories and frameworks and use one term to represent them both throughout the paper. In light of substantive differences between the two (including the differences between conceptual and theoretical frameworks), I believe the paper needs justification for combining these terms and further explanation of what kinds of frameworks are being referred to.

We agree with the reviewer that there are substantive differences between theories and frameworks. In our revised discussion section, we recommend that future research distinguish between theories and frameworks with respect to uses and criteria for selection as follows:

“Several areas of future research would extend our initial attempt in this paper to explore criteria for selecting implementation theories. Specifically, the criteria that implementation scientists use to select theory may relate to how they intend to use theory. Understanding this relationship would help to refine the criteria presented here. We also recognize that substantive differences between theories and frameworks likely have implications for the criteria used to select them. For example, specificity of causal relationships among constructs is likely to be of greater importance for selecting theories than for selecting frameworks. We are currently refining the criteria and working to develop a useful, practical, and generalizable checklist of criteria based on concept mapping by implementation scientists. The exercise will categorize the criteria and rate their clarity and importance. Our goal is for the checklist to take into account how and what kind of theory implementation scientists intend to use. This represents a first step toward what we hope will be a continued effort to refine the criteria, thus promoting more consistent and appropriate use of theory in implementation science and more effectively build the range of knowledge necessary to help ensure successful implementation across diverse settings.” (p.15)

However, this paper constitutes an initial treatment of criteria for selecting any kind of theory, framework, or model for implementation research or practice. As such, we refer to these collectively for the sake of efficiency. To better justify our approach, we have revised the sentence in which we introduce this approach as follows:

“Theories and frameworks (see Department of Veterans Health Administration’s Quality Enhancement Research Initiative [2013] for a taxonomy of theories, frameworks, and models; hereafter “theories”)” (p.5)

2. Methodology: Did the authors follow any particular methodology to create the survey instrument that was used? It would be helpful to see more background on the approach used for the methods, including what criteria was used to determine the seminal text and conference presentation that were chosen to establish the baseline of theories used. It seems that the items on the survey could have been different depending on the epistemological
stance that underpinned the different "seminal texts" that were used to develop it. Although one would anticipate that the open-ended questions in the survey would have prompted descriptions of different theories used, the items in the instrument could influence the type of responses provided - therefore it would be helpful to understand the "theoretical" underpinnings that informed the survey instrument developed in addition to a methodology to develop it.

We have added an acknowledgement of this limitation in the discussion section as follows:

“We opted not to conduct a systematic literature review to develop the survey because the literature on this topic is likely diffuse and difficult to identify; thus, we began with key contributions of which we were aware. We included open-ended items to address the bias associated with this approach; however, we acknowledge that the criteria listed in the survey may have influenced responses.” (p.13)

3. Results: With 73% of the sample being based at an academic institution and the professional characteristics of respondents asked as part of the survey - I was surprised that the professional discipline that respondents were from was not provided. As a discretionary revision, I think this would provide more insights into the particular theories used.

In Table 4, we report training discipline and work discipline.

4. Discussion: I feel that findings from this study warrant a deeper discussion than provided in the manuscript - there are only two paragraphs prior to the study limitations, the first of which is a summary of the findings. A more fulsome discussion of what these finding mean in relation to the current literature and state of the science is needed to justify the conclusion that implementation scientists would benefit from guidance on theory selection. For example, why does it matter that selecting implementation theories are driven by prior experience or convenience - or that different criteria are used in different research to select a theory - if the researchers have a good rationale for why they selected a particular theory? Further discussion is needed to understand and justify the conclusions in the paper and I would suggest that this should include some critical discussion (i.e. pros and cons) of how guidance on theory selection and reporting criteria for theory justification would inform and advance (or not) the science.

We have expounded on our discussion and conclusion sections to address the reviewer’s comment as follows:
Why does it matter that selecting implementation theories is driven by prior experience or convenience?

“Our qualitative results suggest that the process for selecting implementation theories is often haphazard or driven by convenience or prior exposure. Selecting theories based on convenience or prior exposure may deepen knowledge about a given theory with repeated use; however, doing so also has the potential to limit theories’ benefits, particularly if theories are poorly suited to users’ objectives (e.g., selecting implementation strategies; framing study questions; motivating hypotheses). Convenient or familiar theories may contribute to silos in the field, limiting our ability to generalize findings, promote progress, and promote shared understanding.” (p.12)

Why does it matter that different criteria are used in different research to select a theory if the researchers have a good rationale for why they selected a particular theory?

“Findings indicate that implementation scientists use a large number of criteria to select theories. It is possible that this large number reflects the varying sets of criteria that implementation scientists must consider depending on a theory’s intended use. (We describe this possibility in more detail below.) It may also be possible that the large number of criteria that implementation scientists consider when selecting theories reflects a lack of clarity regarding how to select theory. Indeed, our findings suggest that there is little consensus on which criteria are the most important. This may contribute to the persistent underuse, superficial use, and misuse of theories [4-8].” (p.12)

How would guidance on theory selection and reporting criteria for theory justification inform and advance the science?

“Our results suggest that implementation scientists may benefit from guidance for theory selection and reporting the criteria that they use to justify their theory selection. Developing such guidance is challenging given potential variation in implementation scientists’ roles, priorities, and objectives, limiting the benefit of prescriptive guidance. Indeed, there may not be one “best” theory for a given project. Instead, implementation scientists will benefit from considering the broad range of criteria that we propose in this paper, and the field of implementation science will benefit from transparent reporting of criteria used to select theories. Transparent reporting may encourage implementation scientists to carefully consider the relevance of a selected theory instead of defaulting to theories that are convenient or familiar but are poorly suited to implementation scientists’ objectives. In turn, transparent reporting may diminish silos in the field by making explicit scientists’ thinking in selecting a particular theory, thus promoting progress through generalizable findings and shared understanding.” (p.13)
5. Reference 26: check authors spelling - I believe you mean Yukl, and not Yuki

Thank you for identifying this mistake. We have corrected it.

Sincerely,

Sarah A. Birken, PhD