Author's response to reviews

Title: Building theories of KT interventions: Use the entire menu of constructs

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Author's response to reviews: see over
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RE: Manuscript ID #7197985266591417; Brehaut & Eva

Dear Editor:

Thanks to you and the other reviewers for your very thoughtful comments. We believe that the depth and volume of the comments speaks to the timeliness of and interest in development of theoretical innovation in KT/Implementation research. This notion has encouraged us to engage in the rather substantial revisions this re-submission represents.

Rather than addressing every reviewer comment in the order they were presented in the reviews, we identify several major themes that were common between multiple reviewers, and target them first. We then address the reviewer-specific points.

Major themes

1) Editor: “The emphasis on a theory around A&F is confusing and more should be made of the MoC approach - A&F has been used as an example.”
   - This point, also alluded to by both Reviewers 1 and 2, is well taken. We agree that our goal was to use A&F as an illustration of how this menu of constructs approach might help us think differently about theory-building, rather than seeking to build a theory of A&F per se. We have modified the title of our paper, and made changes in the introduction of the paper to make this point more clearly.

2) Editor: “The authors do need to consider Gardener's work on A&F...”
   - This omission was noticed by all three reviewers, and rightfully so. This paper has informed our thinking in important ways, and it was discussed in earlier drafts of this paper but got left out of the submitted draft because of some referencing problems; this was also true of some papers by Oxman (the “OFF theory” papers), which were inadvertently left out. We now have incorporated it back into the current draft, and now discussed it in more detail in the introduction on page 13. We have also included and discussed several of the references suggested by Reviewer 1.

3) Reviewer 3: “(not sure the TPB is a likely candidate to explain A&F interventions)…” Reviewer 1: “it would have been more appropriate to challenge some of the better attempts to use theory in KT.”
   - While we understand that there are examples in the KT literature that use more appropriate theories, or use theories in a more useful way, we maintain that the Theory of Planned Behaviour still has pride of place in the larger literature on changing health-related behaviours. Not only is it the most commonly used theoretical approach, and one that is still commonly in use, we feel it has become the ‘poster child’ in the broader research community for how theory from social science can (and should?) be applied to the health
sciences. We have now clarified this position in the introduction (pp10-12), and tried to be more specific about when we are talking about the TPB specifically, and when the point applies to a broader range of theories.

4) Reviewer 3: “All of these are essentially open to empirical testing and I found myself wishing that the authors would present empirical evidence, rather than stating that the issues they discuss ‘may be a fruitful area of research’"  
Reviewer 1: “This argument would suggest that any additional constructs require empirical support as a predictor of behaviour, but this argument is not applied to the proposals they bring forward.”
- There were several comments related to providing empirical evidence that inclusion of the kinds of constructs discussed in the paper would improve KT interventions. All of the constructs we propose in this paper come with a long history of empirical evidence from non-KT applications. A key point of this paper is to encourage their use and validation in real-world KT contexts. We maintain that without broadening our search to consider cognitive principles separately from the theories from which they were first derived, few of these constructs would ever be identified as relevant to a KT context. We have clarified this argument in the introduction (p13, 17).

5) Reviewer #1: “in proposing MOC, the authors are suggesting what Bandura has criticised as ‘cafeteria style research’, but deal with none of his criticisms...”
- This point was also brought up by Reviewer #3. We weren’t familiar with this paper, and so were glad it was brought to our attention. The essential argument seems to be that the approach leads to a needless proliferation of constructs, for example by splitting higher-order constructs into multiple lower-order ones. We simply disagree that this is always needless; when lower-order constructs (i.e. the cognitive constructs proposed in this paper) make specific predictions about how to improve interventions, and higher-order ones do not, then ‘drilling down’ to the lower order can be warranted. We have addressed this issue in the Summary (p25)

6) Reviewer #1: “We (the reviewer’s group) have also combined constructs from a variety of theories, but based on empirical evidence rather than simply trying to identify those that are relevant (e.g. Eccles et al 2007; Bonetti et al 2006).” And “the criteria for judging a theory or theoretical approach to be good or bad were never made clearly explicit” and “First, the method of selecting constructs for inclusion seems unreliable and likely to be determined by some combination of prejudice and ignorance of the range of possible constructs.”  
Reviewer #3: “Examples are presented of ‘theory-derived, contextually relevant constructs that may need to be incorporated into a constructed theory of A&F’ (p13) – but by what criteria is relevance judged, and how reliable are judgements of relevance?”
- We are not arguing that constructs be included in a final theory simply by judged relevance alone. Instead, we are proposing something more like the process used in the Eccles and Bonetti papers; judged relevance guides whether or not a construct is worth measuring at all, as was the case in these
studies; empirical data then determines whether it is incorporated into a final theory. We address this issue, as well as being explicit about what determines ‘relevance’, in the introduction (p12). We have also expanded on how the MoC approach related to Michie’s domains approach, which we agree is a way of trying to be comprehensive about which constructs to consider for inclusion (pp 22-23).

7) Reviewer #3: “misleading concepts such as ‘theory transportation’ are introduced”.
- Both Reviewers 2 and 3 argued against inclusion of the notion of theory transportation, i.e. using a theory in a different context. We have removed this term, and tried to be more explicit about the intended applications of discussed theories, as suggested by reviewer 3.

8) Editor: “The use of examples will enhance the paper and help to clarify some of the broad points made”.
- This point was also alluded to by the reviewers. We have tried to include more examples throughout the text; e.g. pp10-11.

9) Reviewer 1: “A major part of the latter criticism of MOC style selection of constructs is that it loses the relationship between constructs in predicting behaviour. For example, in the TPB, one would not expect ‘intention’ to predict behaviour if there was not at least a modicum of ‘perceived behavioural control’, nor vice versa – we do not develop intentions simply because we believe we can do it. A major part of theory is the clear distinction between the critical elements and the propositions about the relationships between them; separation of the elements or constructs from the specification of their relationship is clearly problematic.” also Reviewer 3 suggests theory is comprised of “a theory core (definition of constructs and their relationships)…”
- This is an important point. We acknowledge that theories are comprised both of constructs, and the relationships between them. By examining a theoretical construct independently of the theoretical relationships with which it was first developed, one potentially loses some of the meaning of the construct itself. We now acknowledge this in the discussion (p26), but we maintain that this approach is critical for KT theory to progress, and an explicit discussion of the approach is worthwhile. Reviewer#1 is a co-author on work consistent with the menu of constructs approach (as she acknowledges, and provides helpful examples that we have now incorporated into the text), perhaps further recommending an explicit discussion of the benefits and drawbacks of such an approach to theory-building.

Reviewer-specific comments
Reviewer #1
A. “Equally, in criticising the use of correlational designs, it would have been useful if the paper had considered the papers where the authors use experimental designs (e.g. Bonetti et al 2005, Eccles et al 2009) or even RCTs such as Clarkson et al.”
We agree, and now include discussions of these papers in the introduction (pp 13-14), as they are broadly consistent with the MoC approach we are elucidating. We have eliminated the discussion around criticism of correlational designs as well, as this criticism was specific to TPB and not essential to our arguments.

B. “There has been such a strong body of evidence using theory in this (the A&F) field...”
   - We see this point as debatable. We are conducting a SR of the use of theory among A&F trials, and find a relatively small proportion of such studies appear to have involved theory in any way {Colquhon, Brehaut et al, in prep}, although some SRs have sought to search out whether A&F interventions are consistent with specific theories {Hysong, Gardner}. We have now discussed the state of theory use in this literature more explicitly in the introduction (p9).

C. “Similarly the theoretical domains (TD) approach of (Michie et al 2005) can revert to something of a cafeteria style if the domains are not used to direct attention to the relevant theory. Nevertheless it is not clear how MOC advances on the TD methods.”
   - We agree that the MoC approach can be consistent with the TDI approach; we have expanded on this in the discussion. (pp 26-27).

D. “The authors argue for theories that ‘explain mechanisms contributing to a behaviour, rather than attempting to account for behaviours in general and acontextually’. [12] I could not understand this...” And “They also argue for theory that explains differences between instances rather than behaviour in general...This is not a critique of theory but about how theories have been applied.”
   - We have eliminated this section.

Reviewer #2

A. “I found the authors’ treatment of the TDF on pp21-22 rather unfair. Michie et al proposed that the TDF be used to identify intervention techniques, and Francis et al showed that the TDF could also be used to identify theoretical explanations of clinical problems. Yet the authors present Michie et al and Francis et al’s work as examples of conceptually distinct approaches to intervention development, respectively based on context-specific data generation and theory transportation.”
   - We have substantially re-worked this section, removing reference to the theory transportation and bottom-up distinction, and emphasizing that the MoC approach provides another means by which the TDF framework might be applied, one that may address the reservations expressed by Oxman et al about the use of theory in KT.

B. “The critique of existing ‘theory transportation’ methods is unconvincing.”
   - This terminology has been removed from the current draft.
C. “...no detail is provided of what the MoC approach entails, how it proceeds, and how it may be applied.”
- We have tried to clarify one way in which this approach might be applied, in the context of the TDI framework (pp 22-23).

D. “The A&F analysis is ... asymmetrical, being weighted much more heavily towards theory-derived hypotheses about the mechanics of A&F than to contextual empirical evidence about ground-level experiences of A&F among stakeholders. This also begs the question: from where comes the context-specific evidence that informs the MoC approach?”
- This is a fair point; our MoC approach as it currently is conceived says more about choosing theoretical constructs than it does about identifying context-specific factors, although we think that thinking at the level of the construct rather than the theory addresses some reservations some have had with the application of theory in KT being equivalent to being uninformed about the specific context (e.g. Oxman OFF theory papers). We have addressed this issue in the discussion (pp 26-27).

E. “the TDF offers a benchmark to which the MoC approach must be compared. The authors must present a convincing argument that the MoC confers advantages above the TDF…”
- We have outlined in more detail how the MoC and TDI approaches may work together (pp22-23)

Reviewer #3

A.“A range of insufficiently defined and elaborated attributes are used to describe theory (well travelled; context specific; mechanistic, etc) and based on this unclear attributions, misleading concepts such as ‘theory transportation’ are introduced... It does not help to call theories context-specific and refer to context-translation, without analysing the intended applications of theories. Unhelpful as it may be as a theory, the TPB claims to be applicable to all voluntary human behaviour.”
- This was a very helpful comment. While we feel that the KT literature includes many examples of theories that are ‘transported’ from their original context into quite new ones for KT application, we agree that applications of the TPB, which is a focus of this paper, might be thought to be ‘within context’, since it is explicitly intended to apply to “all voluntary human behaviour”. We have eliminated use of the term ‘theory transportation’ in favour of theory application, and tried to be clearer about when a theory is being applied in or outside of its original intended context. We have also eliminated the term ‘mechanistic’ and tightened up the use of the other language, to be more consistent throughout the paper.

B. “Throughout the manuscript, I felt a lack of clarity when referring to theories... (their) definition does not emphasise the key function of theory to provide testable assumptions for future observations...”
- We agree that the definition we chose did not emphasize making testable predictions, which is central to our arguments about the MoC approach. We have chosen a different definition, taken from Eccles and others (p6).

C. The following paragraph would benefit from further elaboration...“Such theories typically consider the behaviour...”
- We have eliminated this section.

D. “I am not sure if the statement ‘Note that this menu of constructs approach is not inconsistent with an important new approach to the use of theory in KT research started by Michie and colleagues [13]’ has any actual implications.”
- We have re-worked this section.