Author’s response to reviews

Title: Beyond "implementation strategies": Classifying the full range of strategies used in implementation science and practice

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Responses to reviewers are detailed below. Major changes are highlighted in the text.

1.1. Clear definitions, consistency, and clarity in terms throughout would greatly improve the clarity of the framework and strengthen the manuscript. Response: We have added a Table 1 with definitions for each of the terms. We also reduced the number of terms and reviewed the manuscript to edit for consistency.

1.2. Adding a visual of the framework (e.g., possibly linking it to the ISF visual) may help offer clarity around the levels and determinants. Response: Figure 1 has been added to provide a visual for our strategy classification that links to the ISF visual.

1.3. The sections about clarifying strategies by linking them to determinants (p7 114-36) and levels (p7141-p8117) do not flow as easily as the rest of the manuscript. Putting these in context and adding more clarity around the definitions could help set these sections up to present the framework more clearly. Response: Building on Proctor et al.’s guidelines for reporting implementation strategies, we no longer use the term “level” to describe the Interactive System Framework and instead, refer to these as the “actors” who enact the
strategy (page 8). Also drawing on Proctor et al., we have clarified that the “action target” includes both levels and determinants targeted by a strategy (page 9). We also have included definitions for terms in Table 1.

1.4. Given the importance of the connections between levels of the ISF, it seems particularly important to mention the arrows linking levels of the ISF as these are where the "implementation strategies" often fit. Response: We have included the arrows in Figure 1. The text describes how some strategies are provided by one level to another while others occur within a level specifically, e.g., within the delivery system.

1.5. The description of scale-up strategies seemed inconsistent. It is defined as being similar to integration strategies (p14) but goes on to describe what appear to be more system-level capacity building strategies and possibly dissemination strategies. Response: We have revised classification system so that classes are mutually exclusive and have clarified text about scale-up strategies (page 16).

1.6. Rather than presenting Proctor's recommendations in the discussion, these could be used to frame how you set up Table 1 and help with defining the determinants, targets… Given the goal of the manuscript is to improve consistency in language, using Proctor's terms and definitions could help offer clarity and consistency. Response: Wonderful suggestion, we have implemented (page 7).

1.7. Given the goals of the manuscript and potential impact on the field, the opening paragraph of the background and abstract could be strengthened to make a more compelling argument for this framework. Response: Text was added to abstract, background (pages 5 and 6), and discussion (pages 17-19) to make a more compelling argument.

1.8. Add references for frameworks and lists p5 121. Response: References have been added (page 5).

1.9. What are the 4 components from Colquhoun's review (p724)? Response: The four components are what they aim to change, the strategy or technique, causal mechanism, and mode of delivery. We added this detail to text (page 9).

1.11. You later say there are 5 categories (p828), where did the 5th one come from? How are these similar or different from Colquhoun's? Response: We identify 5 “classes” of strategies, which is very different from Colquhoun’s identification of strategy components. Our use of multiple terms may have contributed to the confusion and we have carefully edited the paper to refer to “classes” and “classifications” when presenting our new system.
1.12. It would be helpful to add whether each of the newly classified implementation strategies is EBI-specific or not (e.g., are the capacity building strategies EBI specific?) Response: Detail has been added to specify strategies that are or are not EBI specific in both the text and Table 2.

1.13. Although you have included several examples, some of the most commonly cited examples were not included (e.g., EPIS, EPOC taxonomy, NIRN stages). Although the goal is not to make an exhaustive list, adding a few more would likely be helpful to readers familiar with these strategies. Response: We have added citations for EPIC and NIRN (Fixsen et al.) to Table 2. The Mazza citation already included in Table 2 details recent work on the EPOC taxonomy.

1.14. The example on p14l29 about providing patients with CRC screening kits appears to be more of an EBI than an integration strategy. This may be because more details are required; however it might be better to include another example using more common integration strategies. Response: We have replaced the screening kit example with monitoring patients’ screening rates and providing feedback to providers (page 15).

2.1. Unclear to me what the concrete purpose of the 'product' is - and I am using 'product' here because the article itself is not clear on whether you have developed a framework, a classification system, or a logic for categorising strategies - the article uses all three descriptions. The term 'logic' is probably the one that surprises me most as I could not see any interconnections described between the different types of strategies, which would be a prerequisite for a logic. I think this needs to be aligned and clarified….in the discussion section you highlight that (a) the different categories of implementation strategies are not mutually exclusive and a strategy therefore could be located under several categories, and (b) the framework contributes to the challenges to communication within the field of IS and practice - which almost undermines your ambition to create greater structure and clarity in this field? Response: We have revised to consistently use the term “classification system.” Classes are now mutually exclusive. A figure (Figure 1), a Table defining terms (Table 1), and more consistent use of language throughout have been employed to make the paper clearer.

2.2. Some of the strategy categories are difficult to clearly differentiate from each other. I therefore wonder how you decided on exactly these categories: Did you use the ERIC strategies as a starting point? Did you work inductively with them to develop these categories? Creating greater transparency around your method may help in making it clearer what the categories mean. For example, the description of an implementation process strategy as 'ensuring that an
integration strategy fits the needs and characteristics of a context' is too abstract and leaves the reader in doubt about what behaviours or what type of 'doing' is implied in this process of tailoring. If what you mean is that process strategies aim to create an enabling environment for the use of integration strategies, then this needs to be explained with greater clarity and examples of concrete process strategies should be given to help readers understand. I am not sure if that solves the problem re the blurry boundaries between process and integration strategies but it could be a first step in that direction. Response: At the suggestion of reviewer 1, we have applied Proctor et al.'s reporting guidelines to make the case for classifying strategies according to their actor and action target (level and determinant; page 7). We have drawn on Wandersman’s ISF to specify the categories of actors and also to distinguish between strategies that are general versus EBI specific (page 8). We use Damschroder’s CFIR to distinguish levels of action targeted (page 9). Using this approach, we have created a classification system that results in five mutually exclusive classes of strategies. We have noted in the discussion section that further work needs to be done to apply the framework to existing taxonomies such as the ERIC (page 18).

2.3. Another example relates to my comment below (see point 5) about capacity building potentially also taking place in the delivery system itself. If that is the case and capacity building strategies indeed are enacted by the delivery system, what does that mean for the product? Would capacity building strategies then become integration strategies? Supposedly not. Is it then important to define strategies by the system level at which they are used? The same question could be raised for scale-up strategies, which at times also may be enacted by the delivery and not only the support system - what consequences would that have for your thinking? Response: We agree that actors internal to the settings that implement EBIs can function as support systems and have added text to introduction section titled “Classifying strategies according to who enacts them (the actor)” to clarify that we are distinguishing between delivery system actors (those who adopt and implement EBIs) and those who are promoting/supporting adoption and implementation (support system actors). We also specifically note that individuals within a delivery system may function in the support role (page 8).

2.4. You aim to describe how the product can help implementation scientists pay greater attention to implementation strategies. It is difficult to understand how you see it applied in e.g. an empirical study testing different implementation strategies. As a heuristic? If so, the fact that single strategies can be assigned to multiple categories may make this a difficult heuristic as its reliability - if e.g. used for coding processes - may be weak. Furthermore, it worries me a bit that you have not discussed the potential use of the product for practice. I think in a field like implementation, this is close to a 'must'. Response: We have done extensive work to revise the framework so that strategies are classified in only one class. The classification functions to classify strategies into five broad classes and Table 2 provides references for lists of strategies pertinent to each class. We have added text to the abstract, background (pages 5 and 6), and
discussion (pages 18 and 19) to explain how the classification system might be used by those in both research and practice.

2.5. The bottom line of these four comments is that I think that there needs to be greater clarity around (a) what product you provide, (b) the purpose of the product, and (c) the conceptual clarity of the elements that form the product. Response: The revisions noted above are intended to address these concerns.

In addition to these overarching comments, a couple of more specific thoughts that emerged while reading your article:

• On page 7, the section on determinants could use two or three examples of what a determinant is. Response. Examples added to page 9.

• On page 8 you describe the support system as often being external to the delivery system, and while this may be correct in a U.S. system, this may not be the case in other parts of the world, where especially the development of general capacities would be in the hands of the delivery system itself - which makes the reading of the reminder of the article tricky. Response: See response to 2.3 above.

• The article uses a large number of abstract terms, and not all of them will be immediately familiar to readers. A glossary (maybe in a text box) will help readers keep an overview of the terminology. Some of the above may be defined in different ways by different readers, e.g. the term 'provider' sometimes is used for 'provider agency' whereas you seem to use it for an individual delivering services directly to clients. Through a glossary you will be able to avoid misunderstandings.

Response: We reduced the number of terms used and provide a table with definitions for key terms (Table 1).