Reviewer's report

Title: Altering micro-environments to change population health behaviour: towards an evidence base for choice architecture interventions

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Reviewer: Susan Michie

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This paper reports a scoping review of a subset of interventions aimed at changing health-related behaviour and an expert consensus exercise that drew on the results of this scoping review to provide a definition and typology of ‘choice architecture’. The goal of bringing conceptual clarity to the rather muddled thinking around what is fashionably termed ‘choice architecture’ is welcome. Whilst this paper has the potential to be useful, it will require more work to achieve this.

The aims of the study are not clear. Specific aims should be listed and the results reported according to aim. Some of the findings come as a surprise as they have not been set up as an aim e.g. “evidence base is characterised by a relative lack of evidence for several outcomes core to public health decision-making. These include sustained effects on behaviour; differential effects between population subgroups and corollary impacts on health inequalities; costs and cost-effectiveness; and, the potentially synergistic effects of combining interventions or intervention components.”

It is not clear exactly which interventions were searched for – did they have to be labelled as “choice architecture” or more broadly as “micro-environments” or broader still? It is not clear what the inclusion and exclusion criteria were nor what the search strategies were across what databases.

There needs to be more methodological detail both within the body of the paper and in the Appendix. The information in the main body of the text should be sufficient for the reader to be clear about the nature of the interventions reviewed and the information in the Appendix should be sufficient to allow replication. Although there is an in press methodological paper, the reader should have enough information to be able to understand the methodology and the nature of the interventions reviewed without having to look up another paper or website. The electronic nature of the Appendix means that a replicable method can be provided without concern about length.

Background

The background to this study needs to acknowledge the long and extensive research tradition into the effects of environmental cues and restructuring on behaviour, going back many decades. Operant learning theory research has produced a very solid evidence based, successfully translated into several branches of applied psychology and influencing collectively targeted as well as
individually targeted interventions. Only one recent reference to physical activities is provided in relation to this evidence base. ‘Choice architecture’ may be a relatively new phrase, but it is not a new concept. The only new aspect is to seemingly arbitrarily remove two aspects of environmental influence from the concept: financial incentives and restriction by regulation. The authors do not comment on the rationale for this exclusion. There is an ideological explanation, but it is not clear that any empirical or theoretical reason has been provided. A paper such as this should at least comment on this aspect of the definition.

The authors state that the term/concept has gained traction in policy circles worldwide, but provide only two UK references to support this statement. It would be helpful to provide a breakdown of countries of the retrieved articles so the extent to which worldwide is worldwide can be evaluated. My sense is that this term has been mainly restricted to US and UK government policy circles with some uptake beyond this, but that it is not a worldwide phenomenon.

The words “rational” and “conscious” are used to describe reflective processing. Both of these words are problematic in terms of their definitions (associative processing if not reflective but is conducted by conscious beings). The authors might like to consider using the word reflective in these instances, as used in their reference 12.

Methods
In addition to my comments above, it would be helpful to include an Appendix of the list of experts and their disciplinary backgrounds and contributions. At present, we have no information about numbers or who they were.

Results
Table 1. The title and captions need to be improved to explain the data. Do the numbers refer to reviews or studies or a combination? There should be an Appendix listing these papers – I would suggest by behaviour and then by country of first author within this.
Because specific aims have not been outlined, the results are not presented in a concise, accessible way.

Discussion
It would be helpful if the discussion started by summarising the key results and then discussed each of the results. The discussion refers to interventions that provide information, but this does not seem to be consistent with the definition of choice architecture presented in Box 1. It was difficult to evaluate the discussion given the lack of clarity about specific aims and results. Two example on p.7: “We found some notable gaps in the evidence base, including a lack of high-quality systematic reviews of the effects of interventions across this large field” – I wasn’t sure what interventions were included in this statement.
“it is premature to conclude whether or not interventions of this kind are likely to be effective” – what exactly does “of this kind” refer to, and were they included in the scoping review?
On p.8, there is reference to intervention theory, but the typology developed is
one of form/technology, not one of theory/mechanism. The typology could be usefully extended to consider theoretical mechanisms of action, for example, using the COM-B model of drivers of behaviour change to identify whether the putative drivers are increasing reflective or non-reflective motivation or physical or social opportunity.

The paper overstates its case for example: “This work provides a solid foundation for improving the design and evaluation of the effects of a broad array of interventions to change health behaviour by altering micro-environments.” If the statement is retained, the justification for it needs to be provided. Typologies do not improve interventions without guidance as to how they can be used. The benefit of the typology would appear to be in providing a potentially shared language for specifying the active ingredients of the interventions reviewed. The following sentence was not clear to me and I’m not sure that this adds anything: “This is important because these micro-environments mediate exposure to health risk as well as having the potential to protect against risk.”

Other issues:
The use of “conditional” on p.9 is not clear.
It would be helpful to list the four behaviours in the same order on each occasion.
If more detail of approach is given, it may be that the sentence on p.10 is warranted: “The approach we have used may also serve as a template for mapping other under-explored fields of enquiry.”

**Level of interest:** An article of importance in its field

**Quality of written English:** Acceptable

**Statistical review:** No, the manuscript does not need to be seen by a statistician.