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Proposing a new approach to funding behavioural interventions using iterative methods

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\textbf{ABSTRACT}

Current research funding models for health psychologists tend to be biased toward support for large-scale ‘definitive’ behavioural trials. This approach emphasizes rigorous tests of one or more key questions, but, unintentionally, may lead to the funding of interventions that are based on myriad untested assumptions. We propose that future funding models should provide support for ‘iterative’ research that tests assumptions at each stage of the intervention development process, including design, deployment, efficacy, implementation, and sustainability. More funding should be allocated to these developmental stages with funding allocated to testing the efficacy of definitive trials only when it is appropriately supported by research that indicates that key assumptions have been met. This shift should foster more robust behavioural interventions that have appropriate efficacy and effectiveness, and ‘work’ in the ‘real world’ contexts. Funders should support assumption testing using a diversity of methods (e.g., qualitative, quantitative, expert consensus), and encourage behavioural researchers to adjust their assumptions according the data produced. We contend that time is now to shift funding models to support assumption-testing research and ensure that funding applications for research testing ‘definitive’ behavioural trials have clear evidence supporting underlying assumptions.

Behavioral interventions informed by theory and research in health psychology are central to the goal of prevention and management of chronic disease. Health psychologists, together with other investigators in the behavioral and medical sciences,

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are often at the forefront of developing applications for funding behavioral interventions to achieve these goals. Often, these applications are submitted to national research funding agencies (e.g., the National Institutes of Health in the US, the National Health and Medical Research Council in Australia, and the Medical Research Council in the UK), which allocate substantive funding for behavioral research aimed at delivering effective outcomes on priority health issues.

However, many funders adopt a model primarily focused on supporting large-scale efficacy testing of behavioral interventions may lead to biases in the evidence base (Ioannidis, 2016), particularly when underlying assumptions have not been adequately tested a priori. Such a model may hinder scientific progress by supporting research that may not hold up in 'real world' contexts because they depend on unreasonable assumptions about methodological, contextual, and population parameters. We argue that funders of behavioral interventions should consider funding research that follows iterative development models that actively engages users and stakeholders throughout the process of intervention development, testing, implementation, and sustainability (Ioannidis, 2016).

We use an iterative approach from the business development literature, known as the ‘lean start-up’ method (Ries, 2011), to illustrate the virtues and advantages of an iterative model to develop behavioral interventions. Ries (2011) suggested lean start-up methods can assist companies in saving money and shortening the product development process by validating the assumptions of initial product ideas through a validated learning process. The process consists of iterative product releases and a series of hypothesis driven experiments (Ries, 2011). The goal is to save time and money, and develop products and services that customers need, want, and are willing to use and pay for. We propose that these principles could be used to guide the development of behavioral interventions.

In the lean start-up approach, early adopters are presented with the minimum viable product (MVP) to test for issues like usability, user-friendliness, and perceived value for money. In the case of behavioral interventions, early adopters could include members of the specific target or patient population group. The MVP is developed quickly and efficiently using currently available resources similar to pilot testing in behavioral trials, with the goal of providing initial data on usability, viability, and value for money. At this stage the development of a finalised product is not the goal, rather it is to produce a feasible prototype that will function well in subsequent pilot trials.

Similar principles can apply to the development of behavioral interventions, and each ‘product’ appropriately funded. Each iteration would be part of an ongoing process to move an intervention towards scaled implementation and sustainability. Applying this perspective to intervention development, researchers may need to pivot and present alternative options and solutions, such as adapting the intervention or even rethinking if they created the right intervention in the first place (Nahum-Shani et al., 2015).

The heavy emphasis on funding large-scale behavioural trials with very strict quality criteria is understandable given the need for scientific rigour. However, such a rigorous approach has disadvantages including loss of flexibility and adaptability in behavioural intervention development, and a lack of continuous input and iterative
improvement based on feedback from the target population, environmental agents, and implementers. This has been advocated elsewhere. For example, the UK Medical Research Council guidance, recommends systematic development, feasibility testing, piloting, evaluation, and implementation of the intervention in an iterative fashion (Craig et al., 2008). Another example is the Intervention Mapping approach (Bartholomew-Eldredge et al., 2016), which articulates a series of iterative steps toward building evidence-based behaviour change interventions. While an iterative approach is increasingly acknowledged as important for the development of effective interventions, this has not generally been accounted for by funders.

**Flexible funding**

Our suggested solution is for research funders to consider more flexible funding models with funding made available for rigorous iterative development work for behavioural interventions that involve users and stakeholders in advance, during, and after trials. This should not mean systematic division of funding into a series of small successive subprojects which is often not practical. Instead, we propose two alternatives. First, agencies could approve the whole project plan, but allow shifts when new insights should lead to change. For example, a recent study proposed an initial plan to work with children who were visiting obesity clinics (ten Hoor et al., 2016). As program plan evolved it became apparent that there was need to shift the focus from the obesity clinics to secondary schools, a setting where social comparison played a stronger role (ten Hoor et al., 2017). Second, agencies could fund the iterative process of intervention development itself, instead of large-scale multi-year intervention efficacy trials.

The proposed approaches would necessitate change to a different model of applying for, and evaluating, funded research. Reviewers of applications need to evaluate the thoroughness of the iterative research plan in terms of ongoing monitoring of progress and evidence. In addition, reciprocal feedback between the researchers and the funding agency is needed to evaluate progress that allows for flexibility in decisions, with the funder serving as a ‘sympathetic critic’. Iterative approaches, such as lean start-up, emphasise iterative steps, continuous feedback, and continuous adjustments to reach deployed, sustained solutions that are used in the real-world and therefore provide a useful model for this process (Agile alliance, 2001; Collins & Kugler, 2018; Hekler et al., 2016; Norman & Stappers, 2015). The path may take longer and may not adopt a traditional linear approach to behavioural intervention development, but the final solution may be more effective and more scalable (Norman & Stappers, 2015). Applicants should explain the ultimate goals, but also propose smaller steps focused on testing assumptions through a variety of channels such as expert feedback and on-going peer support.

**Conclusion**

Currently, funders rarely invest in iterative research aimed at testing assumptions of behavioral interventions, and allow for flexibility in making alterations in design interventions that may make them more effective and scalable in the long term.
Future funding models should support iterative development and testing methods primarily, over large-scale efficacy-focused trials. This shift should foster more robust behavioural interventions that work in the real-world based on observations favouring this approach elsewhere. Funders should support researchers in stating assumptions, efficiently testing those assumptions using a diversity of methods, and be flexible in allowing for adjustments to research proposals based on what they learn after each iteration. This should facilitate better interventions that people will use and engage with and are willing to adopt and pay for in order to improve health.

Authors’ contributions

All authors contributed equally to this commentary.

Disclosure statement

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