# Injecting theory into the dental behavior intervention research process

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#### Keywords

theory; behavior interventions; theory testing.

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## doi: 10.1111/j.1752-7325.2011.00224.x

Bartholomew and Mullen present an Intervention Mappingbased approach calling for the use of theory at each step of the dental intervention development and testing process. I would like to discuss three issues for additional consideration.

First, the authors describe the prevailing view in clinical research that solving problem behaviors is the primary goal, and that theory development is peripheral. However, there appears to be little discussion on how these two goals are consistent. In intervention research, I believe that the dividing line between a deductive approach (using theory to generate empirical evidence) and an inductive approach (using empirical evidence to develop theory) is artificial. For many dental researchers, the deductive approach is appealing because it creates evidence for more immediate clinical solutions. The inductive approach is frequently overlooked or forgotten, as "theory amnesia" sets in between the time that interventions are designed and tested. Inductive approaches are equally as important as deductive approaches because the former enable dental researchers - individuals who are designing and implementing the solutions - to have a role in constructing relevant models that can be used to develop and test future behavioral interventions. Dental intervention researchers should consider solving problem behaviors and developing theory as inseparable activities.

Second, in the section on developing logic models, there appears to be an emphasis on using the literature to identify model elements. A potential limitation with this approach is that it may reproduce biases of the investigator or past work. In addition, the role of non-research-oriented clinicians in developing these models is not discussed. Including clinicians in this process may help to avert omission of clinically meaningful model elements and diminish the gap between intervention researchers and clinicians (1). To address these concerns, one approach would be to assemble teams of clinicians and behavioral researchers to develop the preliminary models. Then, findings from the literature can be used to supplement the logic model, organize elements into theoretically relevant domains, hypothesize causal relationships between domains, and construct final logic models.

Third, some dental researchers lack expertise in the behavioral sciences, which the authors suggest is a potential barrier to the implementation of the proposed approach. There are several ways to address this challenge, including training opportunities for investigators with limited experience in applying behavior theory to intervention research, and the recruitment of discipline-trained behavioral and social scientists with interests in intervention research. These steps would help to grow trans-disciplinary teams that are better equipped to carry out research that solves public health problems and builds on behavioral theories (2,3).

Dental intervention research is at a crossroad. It is imperative that we identify ways to incorporate theory into the intervention development and testing process. Theory and model development also allow us to contribute to the disciplines from which we borrow (e.g., psychology, anthropology, economics, sociology), which has the potential to lend greater credibility to dental research and help integrate oral health research into the broader health science field. By doing so we can elevate the science of dental research, develop interventions with greater theoretical and clinical relevance, and improve the oral health of our patients.

## Conflict of interest

The author has received an NIDCR grant.

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