COMMENTARY ON MACKINNON AND LUECKEN

Be prepared: capitalizing on opportunities to advance theory and practice

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Interventions to promote oral health come in many different forms. Some may involve informal interactions between a parent and a child regarding brushing and flossing, whereas others may involve a structured series of interactions between a health professional and a patient. Some interventions target interactions between individuals (e.g., a dentist and a patient), whereas others focus on changes in policy or infrastructure (e.g., dental insurance; availability of services). Although interventions to promote oral health may vary on numerous dimensions, they all share an underlying feature all interventions rest on a hypothesis or set of hypotheses regarding the relation between different constructs and, in particular, the relation between those constructs and oral health outcomes. In some cases, the underlying hypotheses are formally stated, even grounded on empirical evidence [e.g. the premise that perceptions of personal risk motivate precautionary behavior (1)], but in other cases, the underlying hypotheses are never stated explicitly but instead are implied by the structure of the intervention.

Regardless of whether investigators formally articulate a set of underlying hypotheses, these principles represent the theory (or theories) that guided the design and implementation of intervention strategies. Thus, all interventions are theory based. Yet, interventions vary greatly in the coherence and specificity of the underlying theoretical framework, the degree to which they capitalize on the implications of their underlying theoretical framework, and, in particular, whether they are designed to test the implications of their theoretical assumptions, and thereby generate evidence that can inform advances in theory and practice. In their paper, "Statistical analysis for identifying mediating variables in public health dentistry interventions," MacKinnon and Luecken (2) provide investigators with an invaluable guide for how to maximize the information afforded by their efforts to promote oral health.

Why is maximizing the information afforded by interventions important? Although investigators aspire to identify intervention strategies that are always effective, this has proven to be an elusive goal. Interventions may not produce the desired outcome or only do so in certain situations or for certain people. Given this somewhat sobering state of affairs, investigators need to be prepared to evaluate the theoretical principles on which their intervention is grounded and, in doing so, provide insights into why an intervention did or did not afford the predicted pattern of results.

The effectiveness of an intervention is predicated, to a great degree, on the accuracy of the theoretical principles that guided its design. Specifically, the success of an intervention rests on its ability to alter (in the desired direction) the construct or constructs that are assumed to mediate the effect of the intervention on oral health (i.e., an action hypothesis) and on the strength of the expected relation between the putative mediator(s) and oral health (i.e., a conceptual hypothesis). Thus, the better specified the theoretical principles available to investigators, the better decisions they are able to make regarding the design and implementation of intervention strategies (3-5). For example, the more that is known about when, how, and for whom a particular construct (e.g. perceived risk) guides behavior, the more precise investigators can be regarding when to devote resources to target and how to elicit changes in that construct. And it is the empirical information afforded by well-designed interventions that provides investigators with the evidence needed to develop more refined theoretical principles.

The methodological and analytic strategies enumerated by MacKinnon and Luecken enable investigators to specify and test the hypothesized paths that underlie an intervention strategy. If every investigative team were, when appropriate, to utilize these tools, investigators would not only have a more accurate understanding of their own study, but also find it easier to draw connections between studies, thereby transforming a disconnected set of empirical findings into a coherent program of research. Moreover, the findings afforded by these analyses provide a common, structured language that should enhance communication between investigative teams and make it easier for them to determine why an intervention strategy proved to be more effective in some situations than others.

In the end, advances in theory and in practice move forward hand in hand. Well-designed intervention studies – through the information they generate – afford refinements and revisions to the prevailing theoretical models and these refinements and revisions, in turn, afford changes in the design and implementation of subsequent interventions. With each cycle through this sequence, investigators should find that they are able to improve the quality of not only their theories but also their interventions. However, for this cycle to be productive, investigators – regardless of whether their primary goal is to enhance theory or practice – must be prepared: prepared to evaluate interventions, prepared to revise theoretical models, and prepared to communicate with each other.

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Conflict of interest

The author declares no conflict of interest.

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