

Editorial

Current issues and new direction in *Psychology and Health*:

Advancing the science of behavior change

Interventions to change health-related behaviors have had some success, but behavior change has proved to be a formidable challenge. Substantial advances in efforts to improve the behavioral determinants of health will require renewed commitment to the science of behavior. In particular, we believe there are three areas that would benefit from greater attention.

Refining theory

Theories provide an explanatory framework for understanding the relation between constructs – whether they be features of the environment, psychological states, or biological markers – and in doing so inform the work conducted by all health psychologists. To this end, there is no shortage of articles that extol the virtue and value of theories. There are repeated calls for research and practice to be theoretically informed (e.g., Marteau, Dieppe, Foy, Kinmonth, & Schneiderman, 2006) and the creation of the new journal, *Health Psychology Review*, is motivated, in part, to enrich the role of theory in health psychology. But how do we treat this object of our affection? Despite a shared commitment to theory, there is a growing concern that we are not tending to our theories as well as we ought (Noar & Zimmerman, 2005; Rothman, 2004; Weinstein & Rothman, 2005).

As Kurt Lewin once said, “There is nothing so practical as a good theory” (1951, p. 169). Although we share Lewin’s faith in the value of theory, it is essential that we recognize that it is predicated on the availability of *good* theories. Theories need to be nurtured by the community of researchers and practitioners. Over time, theoretical models should evolve, based on a series of activities in which formal predictions are derived from the theory and tested, with the results feeding back into our understanding of the theory. Through this process, our theories should be able to specify more precisely when findings will be obtained as well as the underlying processes that regulate those effects. For example, empirical work should allow investigators to transform the initial thesis that satisfaction is a critical determinant of sustained behavior change (Rothman,

Baldwin, & Hertel, 2004) to a more refined thesis, if supported, regarding the factors that determine feelings of satisfaction and the conditions under which satisfaction is not a relevant determinant of behavior.

To date, the extent to which the dominant theories in health psychology have evolved would appear to be slow and inefficient at best. We believe this is due, in part, to poor specification of the processes through which theories are refined. Among the many issues that would benefit from careful consideration are: How much evidence is needed to refine a theory? At what point should a modification of theory require a new name (e.g., consider the change from the “theory of reasoned action” to the “theory of planned behavior”)? When should an elaboration of a theory (e.g., the specification of the factors that determine an important construct) be considered a new theory and when should it be merely integrated into the initial theory? If we can clarify the processes by which theories are refined, they should prove not only more productive, but also easier to use by researchers and practitioners throughout the health sciences.

Methods, measurement, and mediation

A “good” theory in health psychology will specify causal relations between variables and proffer implications for designing interventions to promote people’s health. Because the structure and implication of our theories therefore involve questions of the form, “Does changing factor X cause a change in outcome Y?”, a “good” test of a theory requires an experimental design – because this is the only design that can answer questions about whether changing X engenders change in Y (see also Yardley & Moss-Morris, 2007). However, correlational tests of theories still predominate. For instance, only 24% (10/42) of quantitative studies published in *Psychology and Health* in 2007 involved experimental designs (e.g., Graham, Prapavessis, & Cameron, 2006; Kiviniemi & Rothman, 2006). Correlational tests do not permit inferences about the causal impact of X on Y; moreover, they can misrepresent the causal power of a particular factor. For instance, the magnitude of the effect of intention on behavior in experimental tests is considerably smaller than the effect of intention on behavior in correlational tests (Webb & Sheeran, 2006), whereas the magnitude of the effect of subjective norm on intention is considerably greater in experimental tests as compared to correlational tests (Sheeran, 2006).

If a theory proposes that changing factor X will cause a change in outcome Y and an Intervention (I) is designed to test this prediction, then it is important to test not only the effects of the intervention on the outcome ($I \rightarrow Y$) but also to test whether the intervention affected the outcome because it changed the hypothesized mediating factor (i.e., $I \rightarrow X \rightarrow Y$). As Michie and Abraham (2004) pointed out, even this *mediating construct* analysis (e.g., that attitude-change-intervention [I] changed behavior [Y] by changing attitude [X]) is too often omitted. Although discovering what is the mediating construct in intervention studies is important, refining a theory involves identifying the *processes* through which causation occurs (i.e., specifying the intervening cause or

mediating process). Thus, a more complete mediation analysis will specify not only what changed (i.e., attitude X) but also *how* intervention (I) changed attitude (X). For instance, the intervention could have changed attitude by (a) changing particular behavioral beliefs underpinning attitude, (b) altering the weight attached to key behavioral beliefs, or (c) increasing the accessibility of pro-behavior beliefs. Research that addresses this level of analysis is rare, but has the potential to enhance our understanding of how interventions produce outcomes.

The foregoing analysis of mediation suggests that there is considerable scope for what might be termed *causal chain analysis* in Health Psychology. For instance, it might not be feasible, due to practical or resource constraints, to measure relevant processes (e.g., behavioral beliefs or belief accessibility) alongside relevant constructs (e.g., attitude) in a particular randomized controlled trial. However, smaller scale studies could be used to test components of the causal chain [e.g., whether the effect of the intervention on attitude change is mediated by belief valence (B_1), belief weighting (B_2), and/or belief accessibility (B_3)]. Studies of this type ($I \rightarrow B_1$ and/or B_2 and/or $B_3 \rightarrow X$) would provide insight into change processes that could bolster hypotheses about why interventions are effective, and could inform future intervention design.

Designing theory-based interventions

A well-specified theory can indicate the primary determinants of behavior, but the practical value of these ideas rests on the design and implementation of effective behavior change techniques for use in interventions. We know remarkably little about what techniques are used in behavioral interventions and how effective they are. For example, a “lifestyle” intervention to increase physical activity and improve the diet of those at risk of type 2 diabetes produced a 58% reduction in incidence of diabetes, twice the rate of the pharmacological intervention, metformin (Diabetes Prevention Program Research group, 2002). The intervention employed a diverse array of behavior change techniques, but it is difficult to identify exactly what individual techniques were used (the intervention is described merely as “a 16-lesson curriculum covering diet, exercise and behavior modification [that] was designed to help the participants achieve these goals”, p. 394). Moreover, we remain unable to specify which techniques were essential to the intervention’s success. The absence of this information limits our ability to advance the science of behavior change.

Preliminary work to develop a taxonomy of behavior change techniques has identified over 70 behavior change techniques (Francis, Michie, Johnston, Hardeman, & Eccles, 2005) and produced a reliable taxonomy for describing the content of published interventions (Abraham & Michie, submitted). This work needs to be advanced so that we can precisely describe a broader range of interventions and generate links between the component techniques and their respective theoretical mechanisms of change. Only when we know which techniques change which theoretical constructs and processes will we be able to

optimally apply our theories to design interventions, and to use the results of intervention evaluations to refine our theories. Moreover, describing interventions by component techniques and their theoretical underpinnings will also enrich the manner in which investigators can characterize and categorize interventions in secondary data analyses.

Conclusion

If health psychology research is to maximize its impact on improving health, it needs to move beyond merely applying existing theory to *developing* theories. To achieve this, we need to move from using correlational methods to using all of the methodological tools available to us, especially experimental methods and mediational analyses. We need to move beyond assuming the theory indicates how to change behavior to studying behavior change techniques in their own right. This requires greater precision: in articulating the processes through which theories are refined, in specifying the mediating constructs and processes of change, and in describing techniques to change behavior and their links with theory. Only if we, as health psychologists, change our own behavior can we hope to advance the science of behavior change.

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Susan Michie, University College London, UK
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