



Published in final edited form as:

*Health Psychol Rev.* 2016 September ; 10(3): 251–255. doi:10.1080/17437199.2016.1190294.

## On Taxonomies of Behavior Change: Multidimensional Targeting for Tailoring

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### Multidimensional Targeting for Tailoring: A Comment on Ogden (2016)

In a well-argued, compelling article, Ogden (2016) takes the position that standardized models of health-behavior change techniques may limit innovation and offer little to the individual practice of health behavioral change. In her view, a standard, generic, a priori type of approach is likely to reduce new theoretical developments and ultimately cap advancements in the field of health psychology. Further, she argues that it is not possible to generate an a priori account of individual sources of variance such as the particulars of individual patients.

#### Point 1. Need for Creativity and the Description-Prescription Cycle as an Open System

We agree with Ogden (2016) that research on behavior change has to capitalize on serendipity and potential for innovation, particularly given that our most optimistic assessments reveal moderate intervention efficacy (e.g., Albarracín et al., 2003; Albarracín, Gillette, Earl, Glasman, Durantini, & Ho, 2005; Bartlett, Sheeran, & Hawley, 2014; Johnson, Scott-Sheldon, & Carey, 2010; Sandler, et al., 2014; Sweet, & Fortier, 2010; Tannenbaum et al., 2015; Webb & Sheeran, 2006; Wilson et al., 2014). There is no risk for innovation if behavioral-change technique taxonomies are used descriptively. For example, Michie et al. (2009) wrote:

The 122 evaluations ( $N = 44,747$ ) produced an overall pooled effect size of 0.31 (95% confidence interval = 0.26 to 0.36,  $I^2 = 69\%$ ). The technique, “self-monitoring,” explained the greatest amount of among-study heterogeneity (13%). Interventions that combined self-monitoring with at least one other technique derived from control theory were significantly more effective than the other interventions (0.42 vs. 0.26). (p. 690).

However, the science of health-behavior change is inherently applied. Researchers often describe what has worked in prior program implementations in order to prescribe evidence-based policy recommendations. For example, meta-analyzing the efficacy of HIV-prevention

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interventions allowed Albarracin and her colleagues (Albarracin, Gillette, Earl, Glasman, Durantini, & Ho, 2005; for other domains, see also Tannenbaum et al., 2015; Wilson et al., 2014) to develop decision trees for the application of health-behavior intervention strategies. Based on the strategies coded as included in the intervention, the researchers primarily recommended implementing active interventions that involve self-management-behavioral-skills training, information, HIV counseling and testing, and information. If such active interventions are not feasible, the recommended policies were attitudinal and control persuasive arguments, as well as distribution of condoms.

This description- prescription process, however, is an open system and not closed to innovation. By definition, science is dynamic, and describing and prescribing based on what has worked previously does not preclude research on what might work in future. Innovative development of techniques to change behavior are indispensable for a vital discipline and improvements in public health. Therefore, having a taxonomy of what has worked is orthogonal to innovative research on the next generation of behavioral change techniques.

## **Point 2. Behavioral Taxonomies are Limited for Tailoring Individual Treatments**

**Response 1. Behavior Change Taxonomies Often Address Non-Individual Solutions**—Behavior-change-technique taxonomies recognize that health behaviors depend on biological and external factors that cannot be changed with behavioral interventions (Michie, S., & Abraham, C., 2008; Michie et al., 2009; Michie et al., 2011; Michie et al., 2011; Michie, van Stralen, & West, 2011; Michie et al., 2013). A healthy diet depends on the prices of healthy food (Raine, 2005), and adequate levels of physical activity on urban planning (Davison, & Lawson, 2006). Accordingly, the Behavior Change Wheel (Michie, van Stralen, & West, 2011) includes environmental planning, legislation, and fiscal measures, which are all far from being traditional behavioral interventions for a practitioner to implement. Thus, even if it were true that no general intervention knowledge is sufficient to treat individual patients, a broad taxonomy like the Behavioral Change Wheel makes a contribution to structural interventions that are beyond the scope of individual treatment.

**Response 2. We Need Multidimensional Targeting to Achieve Tailoring**—Although we agree with Odgen (2016) that no behavioral-change-technique taxonomy is perfect, the argument that taxonomies are not useful at the individual level is questionable. Clearly, the science of behavioral change follows a nomothetic paradigm; it is concerned with unveiling regularities and general patterns to explain phenomena. Implementation, however, lies at the intersection of general knowledge on intervention efficacy and the idiographic characterization of the individual recipient of the intervention. An adequate taxonomy for individual treatment must address the multiple dimensions associated with treatment efficacy (Albarracin & Durantini, 2010; Durantini & Albarracin, 2009, 2012; Noguchi et al., 2007; Powell et al., 2015). In this context, we disagree with Odgen's (2016) notion that addressing sources of health behavior variability is unfeasible because this variability is random. Residual patient variability becomes systematic when researchers understand the multiple determinants of efficacy pertaining not only to intervention components, but also to behaviors, facilitators, and settings (e.g., see Durantini, Albarracin, Mitchell, Earl, & Gillette, 2006, for a meta-analysis of source effects in HIV prevention).

In our view, the call to abandon taxonomies must be replaced with a call to refine taxonomies to include *multidimensional targeting*. The debate surrounding behavior-change-technique taxonomies, especially with Ogen's (2016) editorial as a counterpoint, suggests that more precise parameters of targeting are needed for practitioners to be able to tailor interventions. Intervention targeting refers to customizing strategies to the specific target population, such as women or Latinos living in the US. Intervention tailoring describes interventions developed to fit individual characteristics, including the language or behavioral choices of a particular client. This multidimensional targeting we propose requires consideration of the (a) intervention components, (b) behavior, (c) population, (d) facilitator, and (e) setting. Whether scientific research can help with tailoring is thus a matter of how many variables and higher order interactions can be properly estimated. With sufficient statistical power and diversity of variable values, researchers can characterize a fairly complex reality that distinguishes between the particulars of many patients. From this point of view, tailoring becomes a refined form of targeting (termed here *multidimensional targeting*) rather than a qualitatively different enterprise.

### Concluding Remarks

Although evidence-based models may constrain the discovery of alternative intervention strategies, such models are necessary to identify innovation. Evidence-based models involve broad theoretical developments and their supporting evidence, helping to distinguish innovation from established knowledge and limiting redundancy. As evidence accumulates, behavioral-change technique taxonomies are but one component of multidimensional targeting. Performing high-powered meta-analyses of multifaceted programs will permit multidimensional targeting, which provides an evidence-based route to intervention tailoring. Multidimensional targeting, however, must begin to recognize that the key to efficacy is not always in the strict contents of the program and it must consider the percentage of variance accounted for by (a) intervention components, (b) behavior, (c) population, (d) facilitator, and (e) setting.

We would like to end this commentary by making a point we have not found in the literature. Table 1 presents the heterogeneity indexes for selected factors associated with (a) intervention components, (b) behavior, (c) characteristics of the population, (d) facilitator, and (e) characteristics of the setting in our meta-analyses of HIV-prevention interventions (Albarracin et al., 2006; Durantini et al., 2006; Wilson et al., 2014). This table is organized by dimension and depicts the effects of intervention techniques exhaustively, followed by a selection of effects of recipient population, facilitator, and setting, as well as some two-way interactions.  $Q_B$ s are displayed along with degrees of freedom and  $Q_B$ s divided by degrees of freedom. The corrected  $Q_B$ s can be more directly compared and suggest that intervention techniques vary greatly in explanatory power, from an index of approximately 0.01 to an index of 2.06, with an average of 0.57. However, source and recipient population factors are highly influential as well, and so were some interactions, with indexes as high as 1.51. These results thus support the notion that tailoring is possible by obtaining systematic information about the impact of multiple critical dimensions that avoid the misconception that behavior change techniques dominate intervention efficacy.

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**Table 1**

## Heterogeneity Statistics for Dimensions of Targeting

<b>Dimension</b>	<b>Q<sub>B1</sub></b>	<b>df</b>	<b>Q<sub>B</sub>/df</b>
Intervention technique			
Normative arguments	173.09	199	0.869798995
Attitudinal arguments	53.74	199	0.270050251
Informational arguments	2.95	199	0.014824121
Behavioral skills arguments	44.49	199	0.223567839
Threat inducing arguments	201.43	199	1.012211055
Condom provision	33.78	199	0.169748744
Condom skills training	0.71	122	0.005819672
Interpersonal skills training	10.14	122	0.083114754
Self-managements training	251.08	122	2.058032787
HIV counseling and testing	125.28	122	1.026885246
Recipient variables			
Gender	7.26	105	0.069142857
Ethnicity	54.2	105	0.516190476
Age similarity	89.12	149	0.598120805
Source			
Expertise	224.91	149	1.509463087
Age similarity	54.21	105	0.516285714
Gender similarity	90.67	105	0.86352381
Clinical setting	0	200	0
Intervention technique (HIV CT) × recipient ethnicity	137.74	199	0.692160804
Recipient × source (Expertise × ethnicity)	167.6	151	1.109933775
Clinical setting × behavioral skills arguments	158.07	199	0.794321608