

All models are wrong, but some are useful:

A comment on Ogden (2016)

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In “Celebrating variability and a call to limit systematisation”, Ogden (2016) offers an interesting perspective on a trend observed in recent developments, represented in the Behaviour Change Technique (BCT) Taxonomy, COM-B, and the Behaviour Change Wheel. Ogden argues that existing variability in persons and interactions is neglected by this aim to systemize behavior change science (and its application in intervention development), and that existing and valuable variability in theories is diminished to the detriment of both the effectiveness of behavior change science and its potential to progress. We agree that the current trend to systematize has some flaws, but at the same time we are considerably more optimistic about the potential of behavior change interventions to change behavior, as well as about the ability to apply behavior change science systematically while celebrating variability at the same time.

In her discussion of person variability, Ogden emphasizes the many gaps between various psychological determinants and behavior that have been identified by health psychology, and argues that as an additional gap, many interventions suffer from low fidelity. These gaps accumulate to considerably attenuate the strength of the association between BCT application and behavior. We agree that many gaps exist, but argue that instead of obstacles, these gaps represent pitfalls that can be avoided by proper application of health psychology. A meta-analysis of experimental studies into behavior change shows that a change in one psychological determinant (intention) is accompanied by a smaller change in behavior (Webb & Sheeran, 2006). This change being smaller supports the presence of gaps; but these gaps fail to eliminate the change. Clearly, despite these gaps, behavior change science can do its name justice.

However, this requires proper application, and this is where the acknowledgement of and respect for variability in persons, but also practitioners and even situations, manifests. A distinction from the Intervention Mapping (IM; Bartholomew et al., 2016; Bartholomew, Parcel, Kok, Gottlieb, &

Fernández, 2011) vocabulary can be enlightening. IM distinguishes a number of aspects of the dynamics of behavior change that are neglected in the BCT taxonomy and related initiatives (Kok et al., 2016; Peters, de Bruin, & Crutzen, 2015), and of these, the distinction between methods and applications and the related concept of parameters of effectiveness are pivotal to the current discussion. This distinction is illustrated in Figure 1. IM considers methods for behavior change to be “general techniques or processes that have been shown to be able to change one or more determinants of behavior”, applications as “specific translations of theory-based methods for practical use in ways that fit the intervention population and the context in which the intervention will be conducted”, and parameters for effectiveness as “the conditions that must be satisfied in practical applications for the method to be effective” (Kok et al., 2016).

This distinction is important because methods for behavior change exploit characteristics of human psychology that developed for altogether different reasons, usually because they yielded some advantage to humans possessing those characteristics. For example, ‘modelling’ leverages vicarious learning. Successfully exploiting these characteristics of human psychology requires understanding the relevant psychological theory and respecting the relevant parameters of effectiveness described therein. These parameters can often be formulated as guidelines that capture those aspects of a situation that are crucial to successfully engage the psychological processes that constitute the relevant method of behavior change. For example, in the case of modelling, two of the parameters of effectiveness decree that intervention recipients must be able to identify with the presented model and that the model must be positively reinforced. When considering the background of vicarious learning, this makes sense. Selectively copying behavior with positive consequences is a superior strategy to copying all observed behavior. Similarly, if a peer experiences positive consequences of a behavior, it is more likely that one will experience these oneself when copying that behavior than when the behavior is copied from an individual that is, for example, much higher or lower in social status.

Thus, these parameters for effectiveness are crucial to effective behavior change. They are also the key to acknowledging variability between persons in behavior change science. For example, Empathy Training, a method to reduce stigma (Batson, et al., 2002; Table 8 in Kok et al., 2016) requires

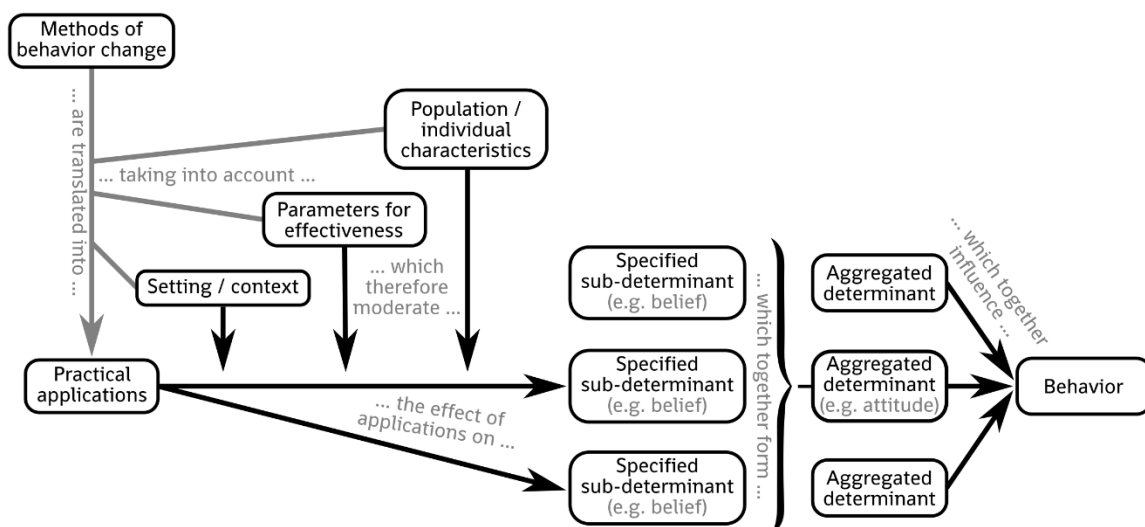


Figure 1: The dynamics of behavior change illustrated using the Intervention Mapping vocabulary. For a more elaborate introduction, see Kok (2014) and Peters (2014).

intervention recipients to be able and willing to identify with the stigmatized person, and Implementation Intentions, a method to change habits (Gollwitzer & Sheeran, 2006; Table 4 in Kok et al., 2016) require an existing positive intention. Both these parameters provide means to acknowledge person variability, and determine which methods may be applicable for a given target population. When counsellors are available to tailor the message at the personal level, it becomes possible to use powerful methods that in fact *require* taking person variability into account, such as Providing Contingent Awards (Bandura, 1986; Table 7 in Kok et al., 2016), which require that rewards are tailored to the individual, group or organization, or Community Assessment (Rothman, 2004; Table 13 in Kok et al., 2016), which requires expert assistance and possibilities for feedback. Of course, in those cases, the counsellor must be trained properly. Such training facilitates proper method application, and decreases variability between counsellors in those aspects where it may interfere with counsellors' potential to achieve the intervention goals. Thus, when behavior change is regarded in its proper psychological context, acknowledging variability between persons, sometimes even leveraging it, becomes more straightforward. Not easy, unfortunately – but straightforward.

So, we do not share Ogden's (2016) somewhat fatalistic interpretation of the consequences of person variability. We are completely on the same page concerning theory variability, though, and we share the concern that attempting to build a Theory of Everything of behavior change likely retards both the effectiveness of behavior change science and its potential to progress. As Occam's razor emphasizes, theories are reductions of reality. That is not a shortcoming, but a definition. Therefore, one theory will never explain all aspects of a real-life problem. Using a multi-theories approach encourages the intervention planner to consider the complexity of designing behavior change interventions (Schaalma & Kok, 2009). Theories can be formulated with differing degrees of specificity. Generic theories apply to a broad range of phenomena, behaviors, situations, or populations, such as learning theory (see e.g. Johnston, 2016). The Reasoned Action Approach (Fishbein & Ajzen, 2010) works well for the situations it applies to, but at the cost of pertaining less well to behavior that is not reasoned. The Health Belief Model (Carpenter, 2010) is even more specific, dealing only with health behavior. The unique skill of the well-trained behavioral scientist is to link the relevant elements of a given problem to useful theories (Buunk & Vugt, 2013; Crosby & Noar, 2010; Ruiters, Massar, van Vugt, & Kok, 2012), which emphasizes a benefit of including behavioral scientists and their unique expertise on an intervention planning team (Kok, 2014).

The majority of psychology theories may be relevant to any given health behavior problem. When one's goal is to integrate theories, there are three approaches to resolving this situation, and each is problematic. The first approach would be to include all constructs and the relationships between them. This would yield a superfluous Theory of Everything, too unwieldy to be applicable. The second option would be to formulate criteria to exclude some constructs, theories, or relationships. This would fail to achieve the goal, instead yielding a Theory of Quite a Lot of Things. The third option would entail the assumption that the variability in theories reflects redundancy in theories, rather than complexity of the reality that psychology tries to model. This approach would suffer from two problems. First, subtle differences between constructs often reflect real differences. Second, few theories, even those with similar constructs, postulate exactly the same relationships between those constructs, so even if successful integration of constructs could be achieved, each theory makes different predictions about how they interrelate.

Ignoring these problems and going ahead anyway will, of course, still yield results, similar to how statistical software will happily churn out results of analyses that make no sense, such as a Pearson correlation between two nominal variables. As Ogden (2016) argued, those results will likely be

harmful to the practice and theory of behavior change and create a false impression of simplicity. Already, too many professionals untrained in behavior change think they know how to change behaviour (Peters, et al., 2014).

Instead of attempting to try and systematize or integrate our theories, we should invest in training people to acknowledge the complexities of behavior change that our field has identified in the past decades. We should provide health psychology practitioners with the tools they need to leverage this variability by searching for and evaluating theory, behavior change methods, and the parameters for effectiveness that are crucial to effective behavior change. After all, the skilled practice of health psychology (research) “is not merely about knowing the rules but about deciding which rule is most relevant to the particular situation in hand” (Ogden, 2016).

References

- Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory*. Upper Saddle River, NJ, US: Prentice-Hall, Inc.
- Bartholomew Eldridge, L. K., Markham, C. M., Ruiters, R. A. C., Fernández, M. E., Kok, G., & Parcel, G. S. (2016). *Planning Health Promotion Programs: An Intervention Mapping Approach* (4th ed.). Hoboken, NJ: Wiley.
- Bartholomew, L. K., Parcel, G. S., Kok, G., Gottlieb, N. H., & Fernández, M. E. (2011). *Planning health promotion programs: an Intervention Mapping approach* (3rd ed.). San Francisco, CA: Jossey-Bass.
- Batson, C. D., Chang, J., Orr, R., & Rowland, J. (2002). Empathy, Attitudes, and Action: Can Feeling for a Member of a Stigmatized Group Motivate One to Help the Group? *Personality and Social Psychology Bulletin*. doi:10.1177/014616702237647
- Buunk, A. P., & Vugt, M. Van. (2013). *Applying social psychology: From problems to solutions* (2nd ed.). London: Sage.
- Carpenter, C. (2010). A Meta-Analysis of the Effectiveness of Health Belief Model Variables in Predicting Behavior. *Health Communication*, 25(8), 661–669. doi:10.1080/10410236.2010.521906
- Crosby, R., & Noar, S. M. (2010). Theory development in health promotion: are we there yet? *Journal of Behavioral Medicine*, 33(4), 259–263. doi:10.1007/s10865-010-9260-1
- Fishbein, M., & Ajzen, I. (2010). *Predicting and changing behavior: The Reasoned Action Approach*. New York, NY: Taylor & Francis.
- Gollwitzer, P. M., & Sheeran, P. (2006). Implementation Intentions and Goal Achievement: A Meta-analysis of Effects and Processes. *Advances in Experimental Social Psychology*, 38(06), 69–119. doi:10.1016/S0065-2601(06)38002-1
- Johnston, M. (2016). What more can we learn from early learning theory? The contemporary relevance for behaviour change interventions. *British Journal of Health Psychology*. doi:10.1111/bjhp.12165
- Kok, G. (2014). A practical guide to effective behavior change: How to apply theory- and evidence-based behavior change methods in an intervention. *European Health Psychologist*, 16(5).
- Kok, G., Gottlieb, N., Peters, G.-J. Y., Mullen, P. D., Parcel, G. S., Ruiters, R. A. C., ... Bartholomew, L. K. (2016). A taxonomy of behavior change methods: an Intervention Mapping approach. *Health Psychology Review*. doi:10.1080/17437199.2015.1077155
- Ogden, J. (2016). Celebrating variability and a call to limit systematisation: The example of the behaviour change technique taxonomy and the behaviour change wheel. *Health Psychology Review*, 10(3), 245–250. doi:10.1080/17437199.2016.1190291

- Peters, G.-J. Y. (2014). A practical guide to effective behavior change: how to identify what to change in the first place. *European Health Psychologist*, 16(4), 142–155.
- Peters, G.-J. Y., de Bruin, M., & Crutzen, R. (2015). Everything should be as simple as possible, but no simpler: towards a protocol for accumulating evidence regarding the active content of health behavior change interventions. *Health Psychology Review*, 9(1), 1–14.
doi:10.1080/17437199.2013.848409
- Peters, G.-J. Y., Ruiter, R. A. C., & Kok, G. (2014). Threatening communication: A qualitative study of fear appeal effectiveness beliefs among intervention developers, policymakers, politicians, scientists and advertising professionals. *International Journal of Psychology*, 49(2), 71–79.
doi:10.1002/ijop.12000
- Rothman, J. (2004). Three models of community organization practice, their mixing and phasing. In F. M. Cox, J. L. Erlich, J. Rothman, & J. E. Tropman (Eds.), *Strategies of community organization: a book of readings*. Itasca, IL, US: F. E. Peacock.
- Ruiter, R. A. C., Massar, K., van Vugt, M., & Kok, G. (2012). Applying social psychology to understanding social problems. In A. G. de Zavala & A. Cichocka (Eds.), *Social psychology of social problems: The intergroup context* (pp. 337–362). London, U.K.: Palgrave Macmillan.
- Schaalma, H., & Kok, G. (2009). Decoding health education interventions: The times are a-changin'. *Psychology & Health*, 24(1), 5–9. doi:10.1080/08870440801995802
- Webb, T. L., & Sheeran, P. (2006). Does changing behavioral intentions engender behavior change? A meta-analysis of the experimental evidence. *Psychological Bulletin*, 132(2), 249–268.
doi:10.1037/0033-2909.132.2.249



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