



# In Pursuit of a Contextual Diagnostic Approach to Behavior Change Interventions

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## INTRODUCTION

Realization of the importance of large-scale behavior change has proliferated in recent years. In spheres such as the military (Mackay & Tatham, 2011), ethnic conflict (Paluk, 2009) and sustainability (Jennings & Duffy, 2006), advocates are pursuing a scientifically derived evidence-based approach for implementing effective behavior change interventions to help solve human problems.

However, many of the techniques and methodologies employed in behavior change campaigns suffer from poor scientific credibility or a lack of a coherent framework for development and evaluation (Michie & Johnston, 2012; Rowland, 2011). To address these limitations Susan Michie and colleagues have developed the Behaviour Change Wheel (BCW; Michie, van Stralen, & West, 2011), a novel, scientifically valid innovation for designing interventions.

Despite the BCW's considerable merits, it lacks a crucial component. Namely, it lacks the diagnostic step of exactly how one moves from the cause of the behavioral problem to the *optimal intervention* for maximal change. For instance, how would one match a motivational problem with, say, an incentivisation intervention? Which incentive would work best; and which aspect of motivation should it target? To begin to bridge that vital gap, an approach is presented here that potentially improves the diagnostic process for behavior change interventions.

## MATERIALS AND METHODS

The framework presented here was derived from the academic literature on behavior change, social psychology and communication theory, and from the twenty years of experience of the Behavioural Dynamics Institute – a London-based not-for-profit institute that specializes in behavior change com-

munication. Through collaboration with many academics (all listed at: <http://www.bdinstitute.org/about-us/contributors/>) and from research across the globe, specific parameters (see below) have been identified as being most relevant and potent for effective behaviour change.

## THEORY AND CONCEPT

The framework is an innovation for the design of more accurate and effective interventions. It follows a diagnostic procedure similar in concept to that used in medical diagnosis: A doctor attempts to diagnose a disease and its cure using (a) a vast corpus of medical knowledge, and (b) a hypothesis-testing process that rules out competing explanations.

Behavior change interventions could potentially be strengthened by first diagnosing the cause(s) of the problem, based upon an accurate model of human behavior and motivation, and then subsequently identifying an intervention that stimulates change *given known parameters*. Knowledge drawn from the social, behavioral and medical sciences must be deployed to move from behavior, to correct diagnosis, to optimal intervention. It is this transition that we attempt to articulate.

## Behavior Change Framework

The framework presented here is contextual and emphasizes *change*. That is, it details not just internal behavioral drives (e.g., motivation), but also the external factors in a behavioral system that stimulate and change behavior (e.g. information). See Figure 1.

There are two overarching components to the framework:

1. A *behavior change model*;
2. A set of *diagnostic parameters* that correspond to elements of the model.

The core model follows that of Michie et al. (2011) by including *Motivation* and *Capability* as internal to the individual actor, and *Social Context* and *Physical Context* factors as ‘opportunities’ (Michie et al.’s terminology) external to the individual actor. The present framework adds *Informational Context* as an external factor, as behavior is frequently affected by the quality, content and delivery of information (Aronson, 2008).

In this ‘behavior system’, motivation and capability are necessary and sufficient for behavior to be enacted. In order for a practitioner to attempt to change behavior, elements of the external physical, social, and informational components must be changed, thereby effecting change in the motivation and capability components. Enacting behaviors may have feedback effects, and also there are interactions within the internal and

external systems of the behavior system. (Please see Michie et al. (2011) for definitions of the motivation, capability, and opportunity model components.)

Each of the components of the model is furnished with a suite of variables that are instrumental in producing or changing behavior. These we term parameters<sup>1</sup>, and are the defining feature of the framework. The *diagnostic parameters* are the variables that any behavior change research or intervention must measure or identify. For instance, motivation is modulated by a plethora of psychological, social and environmental variables; and so too is the social context in which behaviors are enacted. To design effective interventions it is necessary to identify precisely what those factors are and how they can be utilized to change behavior.

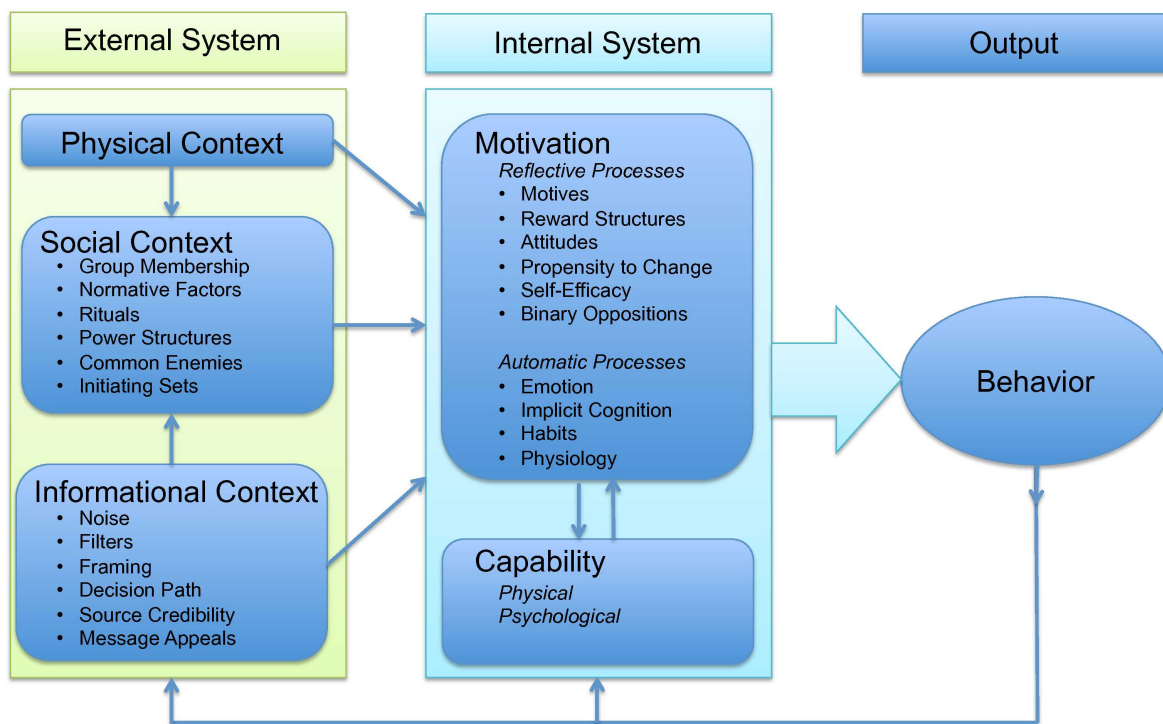


Figure 1: behavior change framework including some diagnostic parameters.

<sup>1</sup> The relevant definition of parameter in the Oxford English Dictionary is: 7. A distinguishing or defining characteristic or feature, esp. one that may be measured or quantified; an element or aspect of something; a boundary or limit.

Parameters from the Motivation (*reflective* only), Social and Informational contexts displayed in Figure 1 are presented in brief below. Each section is followed by a table that addresses how a parameter might function diagnostically in identifying the aetiology of a behavioral problem or as an intervention to solve the behavioral problem. The aim of the tables is to provide a flavor of usage, and not to cover the full extent of potential usage.

## MOTIVATION

**Motives:** Recent findings have demonstrated that the effect of motives on behavior is determined by context (e.g. see Pink, 2010, for a popular overview). Rubin and McNeil (1983) classify motives according to whether they are (a) survival or physiological motives or (b) competence or cognitive motives. Behaviors will be sustained or changed according to the degree to which the behavior contributes to satisfying core motives.

**Reward Structures:** Reward Structures are systems through which rewards (financial and non-financial) motivate people towards a particular course of action or influence preference for one of a number of choices. Rewards and punishments are effective ways of providing external justification for actions (Aronson, Wilson, & Akert, 2004) and may be used to gain compliance or to adjust attitudes, depending on the size of a reward or severity of a punishment.

**Attitudes:** There have been countless definitions of 'attitudes', but a simple and intuitive one is provided by Eagly and Chaiken (1993): "a psychological tendency that is expressed by evaluating a particular entity with some degree of favor or disfavor". Attitudes may be conscious or automatic, and are able to guide behavior – although how and when they do depends on other motivational and external circumstances.

**Propensity to Change:** This refers to the extent to which an individual, group, community or society is predisposed to change its behavior, with or without a particular rationale. An awareness of a propensity to change provides some insight into the likely continuation of an existing behavior and the potential adoption of a new one (Ajzen, 1991).

**Self-Efficacy:** Bandura (1978) defined self-efficacy as "a judgment of one's ability to execute a particular behavior pattern." Individuals with strong self-efficacy beliefs exert greater efforts to achieve a goal while those with weak self-efficacy beliefs are likely to reduce their efforts or even quit (Bandura & Schunk, 1981).

**Binary Oppositions:** A binary opposition is, simply put, a pair of opposites (e.g. savage vs. civilized). Structuralist theory asserts that such binary oppositions constitute essential organizers of human experience and thinking, and thus may determine behavior (Levi-Strauss, 1969).

MOTIVATION		
Parameter	Aetiology	Intervention
Motives	What is motivating the current behavior? What is intrinsically motivating to the individual?	Can the intervention be aligned with a different motivation from the one currently driving the behavior?
Reward Structures	What is most valuable or coveted by the actor(s)? What is a strong deterrent?	Can a reward or deterrent be used to encourage the cessation/adoption of a behaviour?
Attitudes	Which, if any, attitudes contribute to behavioral patterns?	Interventions should be consonant with strong attitudes. If attitudes are weak then interventions can be 'behavioral'.
Propensity to Change	Is there a burgeoning desire for change?	Can an intervention utilize that propensity for change to direct a behavioral shift?
Self-Efficacy	Is a target behavior precluded because an individual does not feel confident to initiate it?	Different styles of interventions are required for high and low self-efficacy cases – e.g. more encouraging vs. more authoritative.
Binary Opposition	Is behavior governed in part by a powerful binary system? Will behaviors/messages that fall on a negative side of a binary be sidelined?	Interventions must ensure that they activate representations of existing binary oppositions in a manner that stimulates target behaviors.

## SOCIAL CONTEXT

**Group Membership:** Most people belong to one or more reference groups that play a part in shaping behavior and self-identity (Paulus, 1989). Seeing oneself as bound to a group can exert powerful influences over individual behavior, a classic example being the Stanford Prison Experiment (Haney, Banks, & Zimbardo, 1973).

**Normative Factors:** This refers to the extent to which individuals behave in accordance with (or identify with) the norms of a group (including society) that they are part of. Cialdini and Trost (1998) define norms as “rules and standards that are understood by members of a group and that guide and or/constrain social behavior without the force of laws.”

**Rituals:** Rituals are those habitual, stylized activities that we enact, or participate in, to affirm and outwardly signify our membership of a particular group. They are powerful events that can solidify an identity and unite a group (e.g. Bell, 1997).

**Power Structures:** These describe how decisions are made and obeyed within a given population. Power structures can be divided into two broad types: Formal, such as a Government or tribal Chief; and informal, such as an elder or respected mentor. People are inclined to obey those persons who they perceive to have legitimate power over them (e.g. Raven, 1993).

**Common Enemies:** George Orwell’s novel Nineteen Eighty-Four illustrates the tactic: The leader of the protagonist nation uses border conflicts with the other two major powers to lessen internal strife. From time to time the enemy shifts, but there is always an enemy. Indeed, the nation seems to need an enemy. For a nation or a group, having a common enemy is a powerful unifier (e.g. Aronson & Cope, 1968).

**Initiating Sets:** This refers to sub-sets of a group whose changed behavior could act as a catalyst for changing the behavior of the larger group. They may be pre-disposed to the desired behavior change, or particularly credible within the larger group. Minority groups can be enormously influential on the majority group (Martin & Hewstone, 2008).

SOCIAL CONTEXT		
Parameter	Aetiology	Intervention
Group Membership	Do the people strongly self-identify with a specific group? What unites that group?	Consider promoting group identity to motivate target behavior.
Normative Factors	Is behavior facilitated/inhibited by powerful social norms?	An intervention must work in accordance with the effects of strong norms.
Rituals	Is a behavior enacted, and thus fortified, as part of a ritual?	Could a ritual be instantiated to consolidate a new behavior?
Power Structures	Is a behavior enacted because of a powerful influence?	Could a powerful and influential person help initiate behavior change?
Common Enemies	Is behavior sustained by uniting against a common enemy?	Would the creation/identification of a common enemy strengthen an intervention?
Initiating Sets	Is the majority behaving according to the examples of an influential minority?	Could an influential minority help spread a new target behavior?

## INFORMATIONAL CONTEXT

**Noise:** In communication theory the reception of a message/signal can be interfered with, depending on the degree of informational noise in the environment (Weaver & Shannon, 1963). Communication will be more readily perceived – and more attended – when the number and frequency of competing messages is low.

**Filters:** The human mind cannot process all incoming information, and thus filters out much of what is irrelevant to current goals and preferences (e.g. Lavie, 2006). Certain messages will be ‘filtered’ as irrelevant in accordance with specific cognitive or motivational biases.

**Framing:** This concept is well known in psychology due to the work of Kahneman and Tversky (e.g. 1984). Messages can present information in such a way as to ‘frame’ it to promote one choice over a competing one.

**Decision Path:** This refers to the series of decisions that people take and which progressively increase their predisposition to a particular behavior. Influential messages that have the potential to change behavior will only be maximally effective if they are received at crucial stages in the decision process (e.g., Thaler & Sunstein, 2008).

**Source Credibility:** communications can differ in their influence depending on the sources by which they are conveyed (e.g. Hovland & Weiss, 1951). The trustworthiness, appearance, and expertise of a source impact the effectiveness of a message, although many variables interact (for a review see Aronson, 2008).

**Message Appeals:** “[T]he manner in which a communication is stated plays an important role in determining its effectiveness.” (Aronson, 2008.) Some communications are more persuasive if designed to appeal to the emotional characteristics of an audience, others if aimed at their reasoning ability.

## DISCUSSION

A framework was presented that could improve the design of behavior change interventions. We offered three sets of diagnostic parameters that are scientific and practical, and, whilst not exhaustive, serve as an innovation that future behavioral science may add to and refine.

Further research should aim to develop the approach so that a powerful tool for behavior change can be realized.

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INFORMATIONAL CONTEXT		
Parameter	Aetiology	Intervention
Noise	Is noise preventing message perception/reception?	Can noise be lowered? Can a message be crafted to overcome noise?
Filters	Is a message failing to reach awareness because it is filtered?	Can filters be bypassed? Can a message be changed to avoid being filtered?
Framing	Is an argument ineffective due to poor framing?	Can an intervention be strengthened by better framing of information?
Decision Path	Is a message/intervention impacting at an appropriate decision point?	Could a message/intervention be channeled at an earlier decision point?
Source Credibility	Is a message communicated by someone with low credibility?	Could high credibility of a messenger help boost the impact of information?
Message Appeals	Is a message presented in an inappropriate register?	Would a different idiom or appeal ensure greater message impact?

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