

The Behaviour Change Wheel in Action – applying behaviour change methods and techniques to environmental issues

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Many of the problems our society faces today can only be contained and reversed through a collective change in behaviour. This is as true for the obesity epidemic in the Western world as it is for antimicrobial resistance and climate change. Here, I will focus on behaviours associated with environmental issues around climate change. The IPCC (2013) suggests that climate change is already affecting many regions across the world, for instance through increased frequency of extreme weather such as heatwaves, flooding, and drought, and global temperatures are projected to increase by 1-4 degrees Celsius by the end of the century. In the UK in particular, flooding and heatwaves are projected to increase in frequency and severity under our changing climate (Defra, 2012). Accordingly, it is vital that we adequately prepare for changes in our climate and weather patterns and take action now while we can still slow down changes. Here, I outline a framework for designing behaviour change interventions, the Behaviour Change Wheel, and provide an example of how it can be applied to climate change mitigation behaviours. I outline the benefits of using a framework and will showcase that its application can be straightforward.

The Behaviour Change Wheel

When designing an intervention, it is important to follow a systematic approach that allows for an intervention to be developed with the highest likelihood of success. Despite this perhaps seeming obvious, there are still a plethora of interventions that are developed simply using a common-sense model of behaviour and without a systematic method. While such interventions may be successful and may even be those that have the highest probability of success, these outcomes would be largely driven by chance rather than method.

Moreover, although it is recommended to use theory when developing complex interventions (Craig, Dieppe, Macintyre, Michie, Nazareth and Petticrew 2008), many behaviour change interventions are still developed without a systematic method or theoretical basis and do not take into account existing evidence (Michie, West, Campbell, Brown and Gainforth, 2014). This is also the case in the area of environmental behaviour change interventions (McKenzie-Mohr, 2000) and may lead to many interventions being not, or less, effective. However, theory provides a scaffold for intervention development from being an evidence based source for understanding the behaviour of interest and possible leavers of change (Michie et al., 2014) to allowing a systematic evaluation of the intervention outcomes. Because there are an abundance of behaviour change theories, indeed 83 were identified in a recent systematic review (Michie et al., 2014), intervention developers require guidelines for how to select a theory that is appropriate for their behavioural problem and/or setting.

The Behaviour Change Wheel (BCW), is a framework that provides developers with a comprehensive, coherent, and universal toolkit for intervention design and thus can help overcome the problems outlined above. It represents a concise way of linking a model of behaviour to a range of intervention functions to change behaviour, linking, in turn, these intervention functions to policy categories that can facilitate each intervention function. Developed in 2011 by Michie and colleagues, the BCW synthesises 19 pre-existing frameworks of behaviour change into a single

interface incorporating a theory of behaviour, intervention functions, and associated policy categories (Fig. 1). Because policy can only influence behaviour through interventions, which in turn act through capability, opportunity, and motivation, the framework has been represented as a wheel with outer layers influencing the next layer inwards until behaviour is changed at the very centre of the wheel. However, each specific component of the behavioural model is likely to react better to some intervention functions than others. For example, while coercion may influence an individual's motivation to perform a behaviour, it is unlikely to improve the individual's physical capability to do so. Therefore, before deciding on an intervention function, the behaviour to be changed needs to be analysed in terms of which barriers or facilitators have an effect on the behaviour.

To this end, at the heart of the wheel sits a simple 'behaviour system', the COM-B system, that postulates that for any behaviour to occur the person performing the behaviour needs to have the physical and psychological **C**apability to perform the behaviour, the social and physical **O**pportunity to perform the behaviour, and be more **M**otivated to perform the target behaviour than any other behaviour in the moment in time that the target behaviour is performed. Physical capability refers to having the necessary skills and physical abilities to perform the behaviour, while psychological capability refers to the required knowledge and mental capacity to perform it. Having the required stamina to ride your bike to work and knowing what items to recycle into which bin are examples of capability. Social and physical opportunity are defined as all factors that lie outside the person performing the behaviour and that make the behaviour possible or prompt it. The presence of cycle paths and recycling bins are examples of physical opportunity for cycling to work and recycling respectively, and being part of a social circle that values and encourages eating local produce may provide the social opportunity for doing so. Motivation refers to cognitive processes that energize and direct a behaviour and includes reflective motivation, such as conscious decision-making, as well as automatic motivation, such as habits or emotional responses.

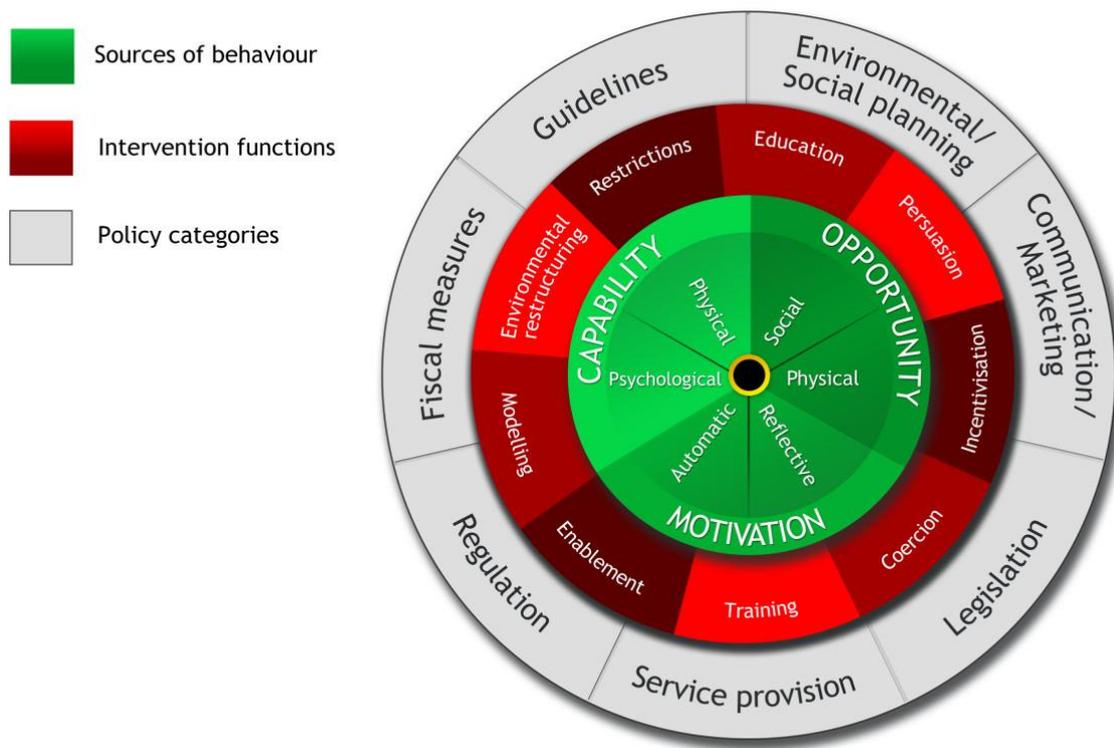


Figure 1: The Behaviour Change Wheel.

A behaviour change intervention may target one or more of these three pre-cursors to behaviour. For an intervention to be successful, it is critical to understand which of these three components require changing. For example, an intervention designed to motivate people to recycle is not going to be effective if the main reason for not recycling is in fact a lack of knowledge around what can be recycled and how. In this case an intervention targeting psychological capability (i.e. knowledge) would much more likely lead to success.

The second layer of the BCW comprises of nine intervention functions: Education, Persuasion, Incentivisation, Coercion, Training, Enablement, Modelling, Environmental Restructuring, and Restriction. Once the target behaviour to change and barriers to and facilitators of this behaviour have been identified, the next step towards intervention development involves deciding which intervention functions to use. Coding each identified barrier or facilitator into the components of the COM-B model will aid this process as possible intervention functions can then be identified (see table 1). For many of the COM-B sub-categories more than one intervention function can be effective. Which exact function one chooses will depend upon the specific behaviour in question and should be guided by the literature and expert consultation. In many cases previous interventions that have targeted the same or a very similar behaviour will have been published and can guide the decision making process.

Table 1: Links between the components of the 'COM-B' model of behaviour and the intervention functions. Adapted from Michie et al., 2011.

COM-B component	Intervention Function
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	Education	Persuasion	Incentivisation	Coercion	Training	Restriction	Environmental restructuring	Modelling	Enablement
Physical capability					✓				✓
Psych. capability	✓				✓				✓
Physical opportunity					✓	✓	✓		✓
Social opportunity						✓	✓	✓	✓
Automatic motivation		✓	✓	✓	✓		✓	✓	✓
Reflective motivation	✓	✓	✓	✓					

The final layer of the BCW contains seven policy functions that may act as levers or change. These are Environmental/Social Planning, Communication/Marketing, Legislation, Service Provision, Regulation, Fiscal Measures, and Guidelines. Policy changes may support or indeed be the core of a behaviour change intervention and may refer to national policy but also organisational policy. Policy change has the advantage of reaching a wide audience and conveying a sense of authority compared to a behaviour change intervention implemented through a different channel. However, policy change is often slow and hard to achieve and as such may be best suited for interventions that are already known to work well.

Case study: recycling at UCL

In a recent study (Gainforth, Sheals, Atkins, Jackson and Michie, in press) the BCW was applied to improve recycling behaviour at a major London university. The aim was to understand facilitators of and barriers to recycling behaviour at work and identify suitable intervention functions that could then be turned into interventions in future. To understand barriers and facilitators a range of staff and students at the university were interviewed using questions designed to tap into each COM-B domain.

Analysis of the interviews revealed physical opportunity to be a major barrier to recycling behaviour. In particular, recycling bins were not readily available when a recyclable item was to be disposed of. An additional barrier was identified as psychological capability: many participants were unsure over which items they could or could not recycle, and this was further amplified by a lack of physical opportunity of appropriate signage informing participants what could be recycled into which bin. Within the domain of motivation, beliefs about positive consequences of recycling acted as a facilitator of the behaviour and worry about contamination deterred participants from throwing non-recyclable items into recycling bins. A further motivation-based facilitator was a sense of personal responsibility to recycle.

This analysis indicated that the major barriers around recycling were within the domains of psychological capability and physical opportunity. Accordingly, for psychological capability the most relevant intervention functions were identified as education (i.e., increasing knowledge or

understanding), training (i.e., imparting skills), and enablement (i.e., increasing means/reducing barriers to increase capability and opportunity). Intervention functions relevant for physical opportunity were identified as restriction (i.e., using rules to increase the target behaviour by reducing the opportunity to engage in competing behaviours), environmental restructuring (i.e., changing the physical or social context), and enablement.

This study illustrates how the Behaviour Change Wheel methodology can be applied to understanding a behaviour in context, in the workplace, and to identify those intervention functions that are most likely to be successful. Although this method does not provide a silver bullet with guaranteed success, it does increase the likelihood of an intervention being successful since any intervention based on a behavioural analysis will target actual barriers with an intervention function known to be effective for similar scenarios.

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