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Using Behaviour Change Techniques: Guidance for the road safety community

Dr Fiona Fylan
Brainbox Research Limited
April 2017

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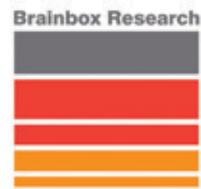


Using Behaviour Change Techniques: Guidance for the road safety community

Dr Fiona Fylan
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Disclaimer

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Key



Summary of key points



Further information

Foreword

Running road safety interventions can be an intensive and time-consuming activity, so we all want to be sure they're going to work. But designing effective interventions that will genuinely impact on behaviour isn't easy.

Let's face it, changing any of our behaviours is a challenge, and changing our behaviour as road users is particularly hard. Most of the training we go through as drivers is understandably focused on the skills needed to control a vehicle, rather than the attitude we bring to the task.

That said, the more we learn about behavioural change techniques, and the more we share best practice in what works, the better our chances of making a real contribution to improved road safety.

That's why we commissioned this guide – to pull together advice in one place with a step-by-step process for the design and delivery of interventions.

We hope you find it useful, and if you have experience that would help us improve it then please do share.

Steve Gooding

A handwritten signature in black ink that reads "Steve Gooding". The signature is fluid and cursive, with a long horizontal flourish extending to the right.

Director, RAC Foundation

Overview

There is currently a great deal of interest in behaviour change across a number of sectors – many different approaches are being used to change the way that people behave, such as information leaflets, small-group workshops, social support programmes, incentive schemes and one-to-one support/advice sessions. Some of these threaten terrible consequences if you behave in a certain way, while others highlight the health benefits of changing your behaviour; some help you to develop new habits, and others teach you new skills. But which of the many approaches – ‘interventions’ (see the green box) – works the best?

You might think that finding this out is straightforward, but there are two main challenges making it harder than it seems.

The first is that it’s often the case that interventions are not described in much detail: there is very little information on what was actually done. For example, it might simply be stated that “a nurse held a small-group session with patients to explore using diet to manage their diabetes”. This does not contain enough detail to let us understand what actually happened in these sessions, to tell us how the nurse might have helped people to change what they eat.

The second problem is that different interventions use different terms to describe the same methods of changing behaviour: there has been no ‘shared language’ for defining how an intervention works. For example, an intervention intended to help clients understand the health benefits of exercise could be described in numerous ways, with varying levels of detail: “a motivational talk”, “educational information”, “a group workshop with a health trainer“, or the statement that “clients were provided with facts about exercise” – and so on. This makes it very difficult to compare the effectiveness of different methods of changing a behaviour.

Throughout this guide you will come across green and blue boxes – the green boxes contain a summary of the key points, while the blue boxes contain further information which you may find interesting but you don’t need to read them to understand the guide.



An ‘intervention’ is doing something to a person, or to their life/surroundings, to try to change something about them. You ‘intervene’ to change some aspect of the person or their environment to try to produce a better outcome. In healthcare an intervention might be a drug, an operation, physiotherapy, or counselling, to give a few examples. Examples of road safety interventions include driving lessons, a presentation by a road safety officer, a booklet about child car seats, a roadside display that shows the speed at which you are travelling, a radio advert, or a social media post.

‘Behaviour change techniques’ (BCTs) are an attempt to address both of these problems – to encourage intervention designers to fully describe their interventions, and to do so using a standard defined set of terms. The benefit of defining which BCTs are included in an

intervention is that it then becomes possible to compare the results from several different ones to find out which techniques are more effective in achieving behavioural change.



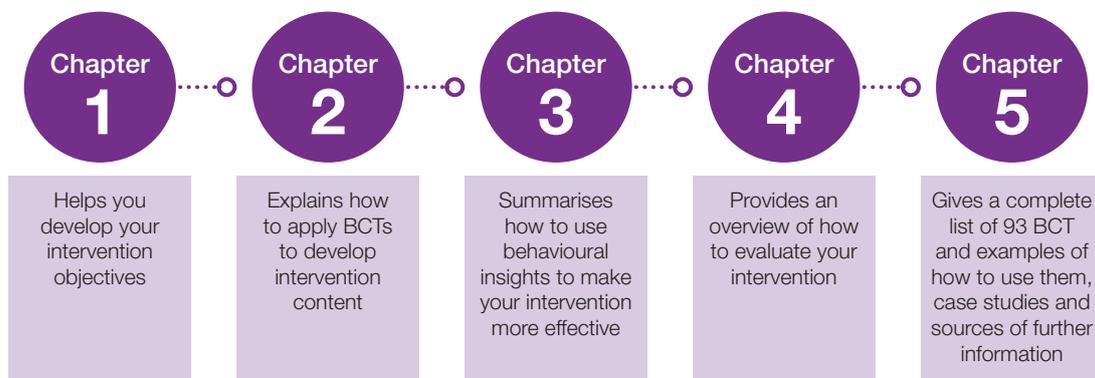
Behaviour change techniques (BCTs) are the 'active ingredients' of an intervention – the things that bring about behaviour change. Most interventions contain several BCTs.

An extra benefit of BCTs is that you can use them to help you develop content for an intervention. This is very useful, as without ideas for different techniques that can be used it's easy to fall into the trap of only using a few of the more obvious. Within road safety interventions, only a few different techniques are typically used. Fylan and Stradling (2014) reviewed six different interventions that aimed to make young people safer on the roads, and found that they all used a very small set of BCTs, usually: providing information about risk, providing information about consequences, telling people what to do, identifying the things that might make it more difficult to change their behaviour, and giving people general encouragement. But there are many more BCTs that could be drawn upon to make your intervention more effective.

This guide will help you to use BCTs, along with theory of behaviour change and behavioural insights, to build more effective interventions. It will also help you to evaluate the extent to which your interventions succeed in actually changing behaviour.

When designing any intervention, it's important to use a psychological model of behaviour, so in Chapter 1 we've included some background information on the psychological concepts that form behavioural models to help you design your intervention. We introduce BCTs in Chapter 2, and provide examples of how to use them in different contexts. Chapter 3 gives you an overview of how you can use behavioural insights when planning an intervention. Chapter 4 gives you information about how you can evaluate your intervention. Finally, in Chapter 5, we provide you with links to additional resources that you can use for inspiration when you are developing your intervention. Figure i shows this structure.

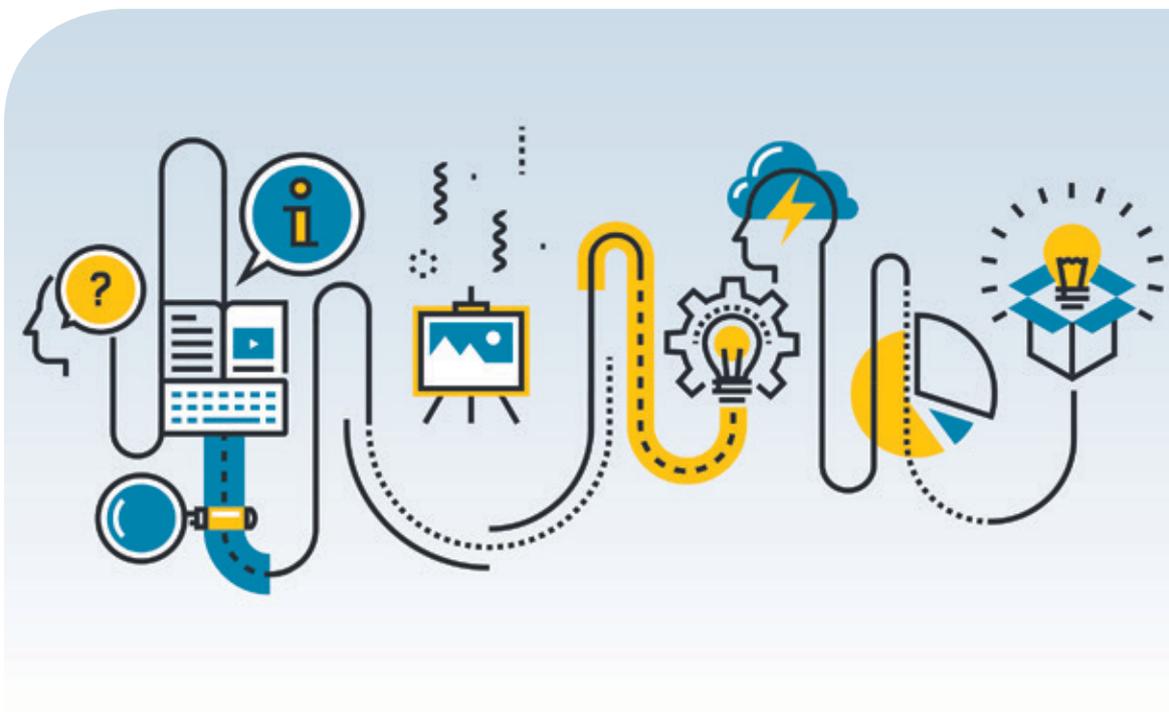
Figure i Structure of this guide



This guide has been developed for road safety professionals who have an interest in developing interventions. It doesn't assume any knowledge of psychology or research, and it avoids using jargon or complicated psychological theories.

Good luck with your interventions, and we hope you find this guide useful!

1. Designing an Intervention



This chapter provides an overview of some useful points to bear in mind when designing an intervention. It's worth putting aside plenty of time for this stage, as it will help you select the BCTs that are most appropriate, develop content for your intervention, and make your evaluation much easier to carry out.

1.1 Step 1. Define the problem

The first thing to do is to define – as specifically as possible – the problem that you want to address. This involves examining the evidence for the problem. Most of the time we tend to overgeneralise by saying things like “We have a problem with young drivers.” At this stage you need to break the problem down by exploring the evidence thoroughly. For example:

- What do we mean by **young**? Is there an age group that is specifically at risk? Is it just young drivers, or does it include novice drivers of any age?
- Is there any particular **time of day** that is high or low risk?

- What about **location** – is the problem worse in any particular region or on any particular road type?
- Is there any **particular journey** that is more risky, for example coming home late at night or going to work early in the morning?
- Is there any specific **demographic** at greater risk – maybe students?
- What particular **driving behaviour** seems to underlie the problem? For example, is it using a mobile while driving? Performing unsafe manoeuvres? Fatigue? Seatbelt neglect? And so on.

This process of defining the problem helps you to clarify its various aspects: the behaviour you want to change, what the intervention objectives should be, who the target audience is, which BCTs you should include, and how you should use them. Defining the problem will enable you to work from a clear statement of need, for example:

- Motorists are driving on lanes closed by a red X on the newly opened smart motorway between Junctions 39 and 42 of the M1.
- There is a high number of crashes involving young male drivers aged 19–23 who live in student areas, particularly when driving home with friends after a night out, between the times of 10.30 p.m. and 3.00 a.m.
- There is an increase in the number of secondary school children hit by motorists near schools around the end of the school day. The children are often using their mobile phones at the time of the crash.

1.2 Step 2. Define the intervention

Define the target behaviour

The ‘target behaviour’ is the behaviour that you want to change. You should be as specific as possible, so rather than state “risky driving”, for example, try to specify exactly what these risky behaviours are. Here are some examples:

- using a mobile phone to access social media while driving;
- poor use of mirrors while driving;
- not wearing a cycle helmet.

The target behaviour can refer to what you want people to do (e.g. take a rest stop every two hours of a long drive) or to what you don’t want them to do (e.g. drive while tired). We can distinguish between them by calling them ‘wanted’ and ‘unwanted’ behaviours.

Define the target audience

The ‘target audience’ (also called the ‘target population’ or the ‘target group’) is the group of people that the intervention is aimed at. This group is often the one that is most at risk (either to themselves or others) or if it is not possible to target this group selectively, then it may be a wider group. Here are some examples:

- people who drive on smart motorways;

- young drivers aged 17–24;
- parents who don't fit child seats in their car;
- children in Year 7 in local schools;
- young people in their pre-driving year, aged 15–16;
- drivers who exceed the speed limit by up to 20%.

Define the aim and objectives

You need to be very clear about what you want to change in your intervention. You need to state the aim in terms of what behaviour you want people to change, for example not using a mobile phone while driving. You also need to state exactly how this change will happen, for example: increased awareness of the risks of crashing, more negative attitudes towards using a mobile phone when driving, fewer barriers to putting the phone in the glovebox. These are the 'objectives'. This section will help you to understand what influences behaviour, which in turn will help you to develop your objectives. When developing your objectives you should take a look at a model of behaviour change (see Section 1.4). Your objectives might begin with the following terms:

- increased knowledge of...
- change in attitudes towards...
- increased confidence in...
- increased skills in...
- increased intentions to...

You can combine your target audience and your objectives to produce very specific intervention objectives. For example:

- increased intentions to book refresher driving lessons among drivers aged 55+ who live in Yorkshire;
- an increase in safe road crossing skills in children aged 8–10 attending local primary schools;
- increased confidence to commute to work by bicycle in adults who live within ten miles of the city centre;
- increased awareness of the negative consequences of speeding among drivers attending a National Speed Awareness Course;
- greater confidence to ask passengers to stop distracting the driver in young people aged 15–24.



Before you design your intervention you should specify the target behaviour (what specific actions you want people to do differently), the target audience (who your intervention is aimed at) and the objectives (how you will change their behaviour).

1.3 Step 3. Use the evidence base

When you are developing your intervention, you don't need to start from scratch. It's worth finding out what is already known about the problem behaviour and ways of changing it. There could be some research that explores why people behave in that way, which will be very useful when you are developing your intervention content. You may also find that other people have tried to tackle the same problem, so it's useful to find out what they have done – and whether or not it was successful. Here are some actions that you should take:

- Find out if other interventions have already been developed that you could use or adapt for your target audience. If so, what is the evidence that they are effective? Don't just assume that because somebody else is using them, they must therefore work.
- Contact other road safety professionals for advice. There may be research projects on this topic that you could learn from. The Road Safety Observatory and the Road Safety Knowledge Centre are good places to start (see Chapter 5 for more details).
- Search the research literature, e.g. in road safety journals. A list of journals is provided at the end of subsection 5.4, "Additional resources". You can also use tools such as Google Scholar, which will often show you abstracts of research papers. Ask yourself what the research tells you about how you can change behaviour.

1.4 Step 4. Use a behaviour change theory

Psychologists have developed several different theories – or models – to try to explain behaviour. Most of these models are broadly similar and can, confusingly, use different terms for very similar concepts. Also, the models tend to change over time as more evidence is collected about behaviour. Nevertheless, it's really important that you use a model when you start to plan your intervention, as it provides a previously validated framework for developing it. You can think of it as the equivalent of using established methods when doing DIY: you pick from the available, validated options for fixing shelves to walls (e.g. fixed brackets, adjustable brackets, or floating shelves) rather than developing a brand new one.



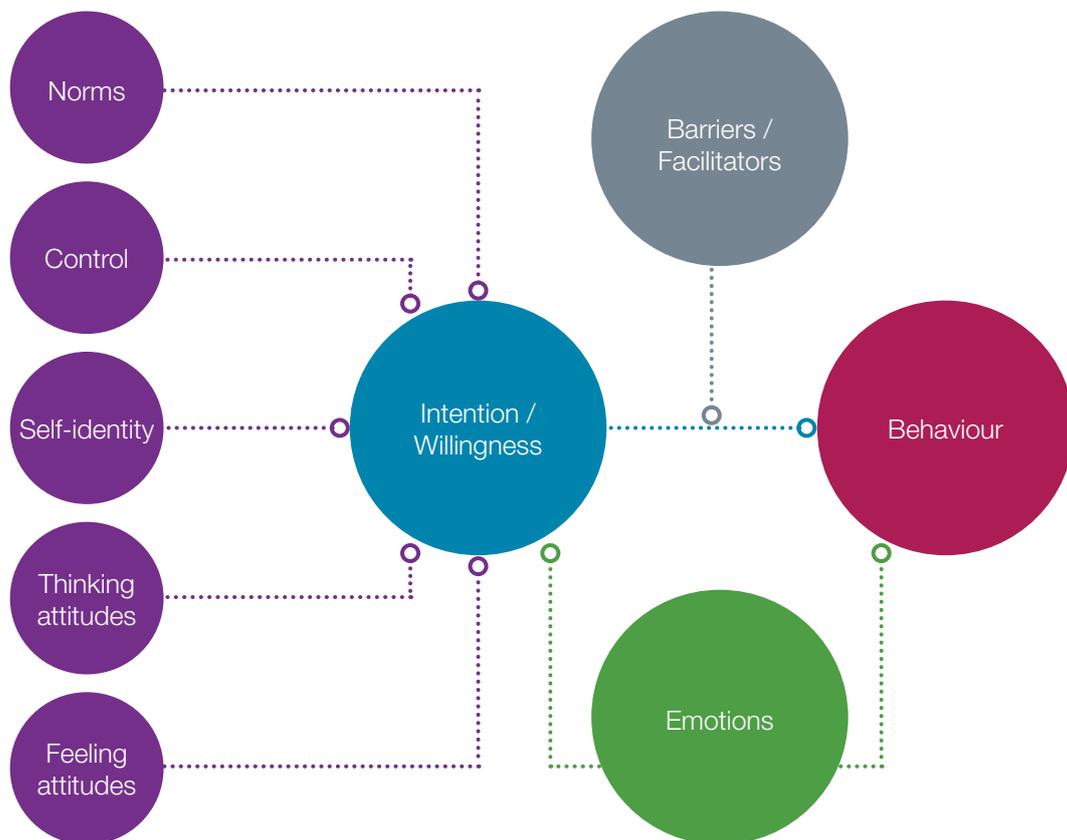
Perhaps the most well-known model in road safety is the Theory of Planned Behaviour; you may also come across the Health Belief Model, the Theory of Reasoned Action, the Reasoned Action Approach, the Dual-Process Approach, the Health Action Process Approach, and the Prototype Willingness Model. Chapter 5 gives information about where you can read more about the different models. While the number of different models can seem confusing, a major advantage is that they are not specific to any particular behaviour. So you can apply just one model to tell you how to change any behaviour, from attending appointments for bowel cancer screening, to donating blood, to wearing seat belts, to speeding.

The example model we describe here is based on an extended version of the Theory of Planned Behaviour, using a Dual-Process Approach with elements borrowed from the Prototype Willingness Model. The model shows that people's intention or willingness to behave in a particular way is based not only on their attitudes, but also on:

- their beliefs about what other people do (norms);
- the control that they feel they have over their behaviour;
- how their behaviour fits with their self-identity;
- their emotions; and
- things about the system – for example, barriers in the environment that stop them engaging in the behaviour.

The model is illustrated in Figure 1.1 and each component of the diagram is described below.

Figure 1.1 Psychological model of behaviour



Source: Author's own

Behaviour

This is the target behaviour we want to change – for example: wearing a seatbelt; not using a mobile phone while driving; walking to school rather than getting a lift. To help you understand the model, let's use an example many will relate to. Let's assume that the behaviour we are trying to change is going to the gym.

Intention or willingness

This is deciding that you are going to do something, i.e. intending to carry out the wanted target behaviour, or not to do the unwanted target behaviour. In our example, our intention would be actually deciding “Yes – I want to tone up and get fitter – I am going to the gym.”



We don't always act on our intentions. This is called the 'intention-behaviour gap'.



One of the models (the Prototype Willingness Model) includes whether you would be *willing* to do the behaviour, which can be useful if we are considering a behaviour that we wouldn't normally intend to do, for example, you may intend never to answer your mobile phone while driving but there may be some circumstances in which you might be *willing* to do so, for example if the call is from your child's school and you are very worried that there might be an emergency.

Barriers and facilitators

Barriers are things that get in the way of acting on your intentions to perform the target behaviour. They can be situations, other people, unexpected events – in fact just about anything. Facilitators, on the other hand, are the things that make it easier for you to perform the target behaviour – for example: being organised; having social support; having plenty of time. In our gym example, you intend to go to the gym, you've packed your kit bag, and then you find that your partner has taken the car and it's 30 minutes before the next bus is due. Eventually your partner gets home so you can drive to the gym after all, but this makes you late and the spin class is about to start... and it's full. But there is another class on instead – a body sculpt class. But when you go to the class you find that everybody else is well-toned and wearing trendy gym kit, and that the only space left is right at the front of the class, in front of the instructor. You feel as if everybody is staring at you, and you certainly don't want the instructor to notice you're not doing the right moves, so you slink off and sit in the café with a coffee and cake instead.

These are all examples of barriers, and your intervention should help clients to anticipate them and identify ways of overcoming them. Facilitators might be having a gym within easy walking distance, having the facility to reserve a place in the class, and having a friend who can make a space for you at the back of the class.

Emotions

Not many of the models have a specific element labelled 'emotions', but it's shown here as there is evidence that the way you feel can influence how you drive. There are two types of emotions.

Anticipated feelings

These emotions arise from how you imagine you will feel *after* performing the behaviour (rather than how you feel during it) – for example: proud, ashamed or embarrassed. In psychological models it is usually called the 'anticipated affective response'. The most commonly studied emotion is regret: the idea behind this concept is that people don't want to make a bad decision that they end up regretting. In our example, you are more likely to go to the gym if you expect that you will feel energised afterwards than if you expect to feel exhausted.

Experienced feelings

These emotions are the way that you are feeling from moment to moment – for example: happy, sad, angry, frustrated, scared, calm, giddy or anxious. These emotions directly influence your behaviour without any link through intentions, so changing intentions won't change this influence on behaviour. Instead, an intervention could teach people how to recognise and manage their emotions. In our example, you felt acutely embarrassed when you walked into the gym class, and this meant that you walked out and went to the café instead.

Norms

Norms are all about what we think is normal, or usual, behaviour. There are two different types.

What's normal

These beliefs are about what other people do: do people like me perform the behaviour? Psychological models usually call these 'descriptive norms'. We're more likely to perform the behaviour if we believe that others like us are also doing it. Your intervention could increase people's beliefs that others like them perform the behaviour. In our gym example, we are more likely to go to the gym if we think our friends go.

What's expected

These beliefs are about whether others approve or disapprove of the behaviour in question, and accordingly what others expect us to do, especially people whose opinion we value. Psychological models usually call these 'injunctive norms'. Your intervention could encourage clients to believe that others want them to perform the behaviour. In our example, we're more likely to go to the gym if we think that our family wants us to, and less likely to go if we think our family resents the time we spend at the gym.

Control

Most theories contain some element of how much control people believe they have over their behaviour. Some models split this into two different components. Some use the terms Self-Efficacy and Perceived Behavioural Control.

Capacity

Capacity, also called capability, refers to the beliefs someone has about how able they are to perform the behaviour. Your intervention could make clients believe that they are more capable of carrying out the behaviour, for example by giving them new skills or improving their confidence. In our example, it is how capable you believe you are to go to the gym: can you get there? Are you able to join in a class? Do you know how to operate the gym equipment?

Autonomy

This is about your beliefs that it is within your power to carry out the behaviour. In our example, if our client is a teenager who is relying on their parents to pay for gym membership, and their parents refuse, then they feel they don't have autonomy. An intervention could help them to focus on what they do have autonomy over – for example, doing an online fitness video with friends. It's important to explore the issue with the individual so that they can come up with an alternative that has the potential to create the desired behaviour change.

Self-identity

This concept isn't in all of the models, but it is a useful one, so we're including it here. It addresses how your sense of self aligns with the target behaviour. For example, if you believe you are a safe driver, you are more likely to stick to the speed limit than if you believe you are a boy racer. Identity doesn't need to be just about driving. Your self-identity as a manager, a parent, or an environmental supporter can make you more or less inclined to perform the target behaviour. An intervention would focus on helping to change a person's self-identity, or to find a solution that fits with their current identity. In our example you are more likely to go to the gym if you think of yourself as a person who takes their health and well-being seriously.

Thinking attitudes

These are beliefs about performing the behaviour and making a judgement as to whether it would be good or bad. The official term is 'instrumental attitudes'. They focus on what we 'think' about the behaviour, and so they are also sometimes referred to as 'cognitive beliefs'. We might believe that a behaviour is healthy or unhealthy, safe or unsafe, sensible or reckless, interesting or boring. We also need to factor in our judgement about whether each of these attributes of the behaviour is good or bad. In our example, we might think that going to the gym is healthy, that it will help us lose weight and tone up, and that we might make new friends there – all of which we think are good. But we also think that it will be time-consuming, which is bad. Notice that these attitudes address both performing the behaviour (going to the gym) and the outcome (toned body).

We make a judgement about whether, on balance, there is more good than bad about the target behaviour. However, often one bad thing can outweigh a multitude of good things.



Some psychologists don't like the term 'attitudes' because it implies that these beliefs and judgements are constant rather than being context-based. In practice, beliefs can change – as can our judgement of whether they are good or bad – and we can even hold conflicting beliefs about the same behaviour at the same time, such as “getting drunk is fun when I do it, but irresponsible when others do it”.

Feeling attitudes

These are beliefs – and the judgement of whether they are good or bad – about how you will *feel* when you perform the target behaviour. The official term is 'affective attitudes'. For example, you might believe that the behaviour will be enjoyable or unenjoyable, and you might expect to feel reassured or scared, happy or sad, proud or embarrassed. Again, the same feeling can be good or bad in different situations – so for example, feeling scared while watching a horror film is good, but feeling scared while cycling is not. In our example, we may think that going to the gym will be fun and that we will feel happy and confident, which is good. Alternatively, we may think that going to the gym will be horrible and that we will feel miserable and embarrassed, which is bad.



One thing to be aware of is that these models have generally been tested on all sorts of different behaviour – but tested in terms of how well they **predict** behaviour rather than how well they **change** behaviour. Statistical models are produced that show exactly how much variation in the target behaviour is explained by each component of the model (descriptive and injunctive norms, instrumental and affective attitudes, and so on). We know that the components are very good at predicting intentions, but less so at actually predicting behaviour (this being the intention-behaviour gap mentioned previously). There is now some research that looks at whether interventions can actually change these components but there is much less evidence about how effective they are. For example, feeling attitudes are often found to be the strongest predictor of a behaviour, but how likely is it that we can change feeling attitudes? If people believe that they will hate going to the gym, that they'll feel uncomfortable and embarrassed, how likely is it that we can successfully change these beliefs and make people think that they will enjoy going? A more effective approach might be to concentrate on instrumental attitudes by highlighting that going to the gym will make them healthier, fitter and more toned. And to close the intention-behaviour gap, our intervention should definitely include activities to identify and overcome barriers.

COM-B

Another model, a very simple one, which can help shape your thinking is 'COM-B'. This simply states that if you are going to change a behaviour (B), you need to change one or more of these three things ('COM'):

1. **C**apability to perform the behaviour;
2. **O**pportunity to perform the behaviour; and/or
3. **M**otivation to perform the behaviour.

This is a useful starting point, because it helps orient you towards which aspects of the psychological model your intervention should focus on. For example, if you want to increase cycling to work, and if somebody can't ride a bike, or doesn't feel confident enough to cycle on the roads – in other words they lack the *capability* – then you know that your intervention should concentrate on skills. If, however, somebody doesn't have a bike – that is, they lack *opportunity* – then your intervention needs to focus on helping them source a bike, for example by means of a bike rental scheme. If somebody isn't interested in cycling and lacks the *motivation* to cycle, then your intervention needs to focus on things that will increase their motivation by helping them to understand why they would want to cycle to work, i.e. by changing their attitudes.

The model also helps to identify what we *don't* need to include in our intervention. For example, if lack of knowledge is not an issue, the intervention does not need to focus on providing information. This model also encourages us to consider whether or not a behaviour change intervention for our target audience is needed in the first place. It might be that a more effective approach to changing behaviour would be to change a policy, for example to increase opportunity or motivation, or to take a systems approach.

1.5 Ready to start

Once you have completed these four steps you'll be ready to start developing content for your intervention. This is where BCTs come in – you can use them to build your content. There is more about using BCTs in Chapter 2, but before we finish this chapter, we need to talk about testing your intervention (called 'piloting'), and, once its design is complete, how you then describe it.

Piloting your intervention

Once you have developed your intervention, don't forget to pilot it. 'Piloting' means practising your intervention with members of your target audience. You need to find out whether the intervention has the effect you expect. You also need to find out whether it is acceptable – will people actually agree to go through with your intervention? In the pilot you will need to evaluate the intervention with a small number of clients and – this is the important bit – take the feedback on board and make changes. There is no point piloting your intervention if you look at the disappointing results and then conclude that it's your clients' fault that it didn't work. You need to make changes – and if they are big changes,

you need to pilot again. You can also involve other stakeholders, for example the people who will be delivering the intervention. This is useful so that they can identify any potential problems with delivery and how they can be overcome.

Describing your intervention

You will need to produce a manual or other notes for your intervention so that other people can understand what it comprises. Interventions are most commonly delivered by a range of trainers, rather than solely the person who developed it, so you need to provide enough information to ensure that the trainers understand the content, how it is delivered, and what it is intended to achieve.

You need to provide information on which BCTs you used, as well as other key aspects of the intervention. There is a checklist developed by an international group of experts and stakeholders ('Template for Intervention Description and Replication' checklist, or TIDieR) that recommends what you need to report when describing an intervention. This is:

1. **The name of the intervention** – you should give your intervention a short snappy title or acronym, ideally one that makes it clear what the intervention is about.
2. **Why the intervention is appropriate** – describe your rationale for the intervention: what problem it is trying to solve, and why your chosen approach is appropriate.
3. **What materials it involves** – you need to describe any equipment or informational materials used in the intervention, including materials used by the trainers and materials given to clients. Provide information on where the materials can be accessed (for example, in an online appendix, or anywhere online at a URL you provide).
4. **What procedures it involves** – describe each of the procedures, activities, and/or processes used in the intervention.
5. **Who delivers it** – describe the professional role and expertise of the trainers who deliver the intervention (e.g. an approved driving instructor, a psychologist, a teacher). Also describe any training they received in delivering the intervention.
6. **How** – describe the modes of delivery (such as face-to-face or by some other mechanism, such as internet or telephone) of the intervention, and whether it is provided individually or in a group.
7. **Where** – describe the types of location where the intervention takes place (e.g. in-car, in the classroom) and specify any necessary infrastructure or relevant features.
8. **When and how much** – describe the number of sessions involved in the intervention, when they take place and how long each one lasts.
9. **Tailoring** – if the intervention can be personalised or adapted then describe what, why, when, and how this is decided and done.
10. **Modifications** – if the intervention has been adapted over time, describe the changes (what, why, when, and how).
11. **How well (planned)** – if you assess how accurately the trainers deliver the intervention, describe how you carry out the assessment and any strategies to maintain or improve the standard of delivery.

12. How well (actual) – if you assess how accurately the trainers deliver the intervention, describe the extent to which the intervention is delivered as planned.



In their review of 87 randomised controlled trials of pharmacy interventions, Scott et al. (2016) found that 18 didn't appear to include any BCT, which they assumed is due to poor reporting rather than a lack of content. They highlight that even if an intervention were effective, there would be no way to replicate it given the lack of information on which BCTs were used in it.

2. Selecting and Using BCTs



2.1 What BCTs are there?

There have been several different versions of taxonomies (schemes of classification) of BCTs released, beginning with one that comprised 26 different techniques (Abraham & Michie, 2008) and with the most recent comprising 93 (Michie et al., 2013; Michie et al., 2015).



Why increase the number of BCTs?

One of the reasons for expanding the number of BCTs from 26 was to make sure that each BCT is truly unique – that it is a ‘non-reducible component’, i.e. the most basic building block of an intervention to change behaviour. While this enables us to distinguish exactly which BCTs have been used in an intervention and how they were applied, it means that there are lots of different BCTs that sound similar. This guide will focus on a subset of these 93, comprising those that you are likely to find most useful.

The 93 BCTs are arranged into 16 different groups, with each group containing BCTs that share a common approach. These groups are:



Group 1.

Goals and planning (9 BCTs)

These BCTs are all about setting goals for the target behaviour and what this will achieve. For example, the target behaviour might be to pass your driving test and the outcome might be more independence and an easier commute to work or college. This group also includes anticipating what barriers might make it more difficult to complete the target behaviour, planning what you will do to overcome the barriers, and making very specific plans about how you can carry out the behaviour.



Group 2.

Feedback and monitoring (7 BCTs)

These BCTs are concerned with monitoring progress towards the goals, and giving clients feedback about how well they are doing. The BCTs cover the client monitoring their own behaviour and its outcomes, somebody else monitoring it, and the client receiving feedback.



Group 3.

Social support (3 BCTs)

These BCTs cover providing social support, for example from friends, family, colleagues or professionals. This support can be unspecified, practical or emotional.



Group 4.

Shaping knowledge (4 BCTs)

These BCTs are about clients better understanding what causes them to behave in a certain way, and about actually knowing how to perform the target behaviour.



Group 5.

Natural consequences (6 BCTs)

These six BCTs are about highlighting the consequences of performing the behaviour, including the social, environmental and emotional consequences, making these consequences seem more real to clients, and making them realise that they would regret failing to change their target behaviour.



Group 6.

Comparison of behaviour (3 BCTs)

These BCTs involve showing clients what to do, comparing their behaviour with that of others, and leading them to consider whether others approve of their behaviour. As such, this group addresses norms from our psychological model.



Group 7.

Associations (8 BCTs)

These BCTs are about associating the target behaviour with positive rather than negative things, reminding clients to perform the behaviour, and eventually withdrawing the reminder so that clients go on to carry out the behaviour independently.



Group 8.

Repetition and substitution (7 BCTs)

These BCTs are about practising and developing skills in the behaviour, and it becoming a habit.



Group 9.

Comparison of outcomes (3 BCTs)

These BCTs involve considering the outcomes of performing the target behaviour or not, and hearing from a credible source about why the wanted target behaviour is a good thing to do.



Group 10.

Reward and threat (11 BCTs)

These BCTs are about rewarding the wanted target behaviour and punishing the unwanted target behaviour. It doesn't have to be financial – rewards can also be praise, a gift, an enjoyable experience, and so forth.



Group 11.

Regulation (4 BCTs)

These BCTs are about making it easier for clients to perform the target behaviour, and can include medication, simplifying the behaviour, and reducing negative emotions arising from the target behaviour.



Group 12.

Antecedents (6 BCTs)

These BCTs are about understanding what triggers the behaviour, taking practical steps to avoid those triggers, and changing the physical and social environment to make it less likely that clients will do the unwanted behaviour and more likely they'll do the wanted behaviour.



Group 13.

Identity (5 BCTs)

These BCTs draw on self-identity to encourage clients to believe that the target behaviour is right for them and that it aligns with their 'sense of self'.



Group 14.

Scheduled consequences (10 BCTs)

These BCTs are about arranging a schedule of punishments and rewards based on the client performing the wanted behaviour and not the unwanted behaviour.



Group 15.

Self-belief (4 BCTs)

These BCTs build the client's confidence that they can perform the target behaviour.



Group 16.

Covert learning (3 BCTs)

These BCTs get the clients to imagine the positive or negative consequences that arise from the target behaviour, and to observe the consequences to others when they perform the behaviour.

2.2 Which BCTs are more effective?

So you've planned your intervention: you know your target behaviour and your target audience, and you've based your intervention objectives on evidence and theory. But how do you select which BCTs to use? Is it a case of trying to fit in as many as possible? No, although it is true that you should select a range of BCTs rather than relying on just one or two. You can use your behaviour change theory (Figure 1.1) to guide you in selecting which type of BCTs are most appropriate. For example, if you want to increase skills, you should use BCTs in Group 8 (repetition and substitution). If you want to change attitudes,

you should look at BCTs in Groups 4 (shaping knowledge), 5 (natural consequences) and 9 (comparison of outcomes). If you want to increase control, you should use BCTs in Group 15 (self-belief). If you want to strengthen intentions, you should use BCTs in Group 1 (goals and planning). Are all BCTs equally effective? Again, the answer is no. But fortunately there has been research to identify which BCTs are most effective.



By selecting the BCTs that are more effective, you will make it more likely that your intervention will work.

BCTs identified from research

There have been several different reviews of the BCTs that feature in interventions that have used statistical techniques to identify which are the more effective BCTs. These reviews show similar outcomes, particularly when they have focused on the same behaviour. But there are differences, as you would expect, across different behaviours and different target audiences. A common finding is that BCTs that encourage people to monitor their behaviour and its outcomes tend to be effective. However, a word of warning: one consistent finding is that even the most effective interventions typically have only a medium effect on intentions to perform the behaviour, and an even smaller effect on the behaviour itself (e.g. McDermott et al., 2016). This highlights the fact that it can be very difficult to get people to change their behaviour: just because you use BCTs doesn't mean that your intervention will work. However, by selecting the right techniques, you should be able to increase the effectiveness of your intervention.

Sullman's review of the evidence (Sullman, 2017) identified those BCTs for which there is strong evidence of effectiveness across several different target behaviours. Note that "strong evidence" means that several different interventions that successfully changed behaviour have made use of them. It does not mean that the BCTs changed behaviour a lot, or that they worked on everybody. The review also distinguished between BCTs that are more effective in adults, in teenagers, and in children.

In adults, the BCTs that demonstrate the strongest evidence for their effectiveness are shown in Table 2.1.



Table 2.1 Behaviour change techniques demonstrated to be more effective

	BCT – 1.1 Goal-setting (behaviour)	Set or agree a goal defined in terms of the behaviour to be achieved.
	BCT – 1.2 Problem-solving	Set or agree a goal defined in terms of the behaviour to be achieved.
	BCT – 1.3 Goal-setting (outcome)	Set or agree on a goal defined in terms of a positive outcome of the wanted behaviour.
	BCT – 2.2 Feedback on behaviour	Monitor or observe the behaviour and give informative or evaluative feedback on performance of the behaviour (<i>e.g. form, frequency, duration, intensity</i>).
	BCT – 2.3 Self-monitoring of behaviour	Establish a method for the person to monitor and record their behaviour(s).
	BCT – 2.4 Self-monitoring of outcome(s) of behaviour	Establish a method for the person to monitor and record the outcome(s) of their behaviour.
	BCT – 2.7 Feedback on the outcomes of behaviour	Monitor and provide feedback on the outcome of the behaviour.
	BCT – 3.1 Social support (unspecified)	Advise on, arrange or provide social support (<i>e.g. from friends, relatives, colleagues, 'buddies' or staff</i>) or encouragement for performing the behaviour.
	BCT – 3.2 Social support (practical)	Advise on, arrange, or provide practical help (<i>e.g. from friends, relatives, colleagues, 'buddies' or staff</i>) for performing the behaviour.
	BCT – 5.1 Information about consequences	Provide information (<i>e.g. written, verbal, visual</i>) about the consequences of performing the behaviour. This can be for self or others.

Source: Author's own

As well as the above BCTs, Sullman reported that there is evidence for an additional three BCTs being more effective in teenagers – see Table 2.2.

Table 2.2 Behaviour change techniques demonstrated to be more effective in teenagers



BCT – 1.5
Review behaviour goal(s)

Work with the client to review their goals, i.e. the behavioural change that they want to achieve. Consider whether the goals are still relevant, whether they need to be changed, and whether more goals should be added.



BCT – 1.7
Review outcome goals

Work with the client to review their outcomes, i.e. what has happened as a result of them changing their behaviour. Consider whether the outcome goals are still relevant, whether they need to be changed, and whether more outcome goals should be added.



BCT – 4.1
Instruction on how to perform a behaviour

Advise or agree on how to perform the behaviour.

Source: Author's own

In children, Sullman (2017) reported that in addition to the above, one more BCT has strong evidence of effectiveness, and he also noted that overall, interventions in children were more effective than those in adults – see Table 2.3.

Table 2.3 Behaviour change technique demonstrated to be effective in children



BCT – 8.1
Behavioural practice/
rehearsal

Prompt practice or rehearsal of the performance of the behaviour one or more times in a context or at a time when the performance may not be necessary, in order to increase habit and skill.

Source: Author's own

There have been several additional reviews of effectiveness. For example, Howlett et al. (2016) distinguished between BCTs used in interventions that are effective in the short and long term in increasing physical activity in inactive adults. Interventions were more effective in the long term if they included: 'Action planning' (1.4), 'Instruction on how to perform a behaviour' (4.1), 'Prompts/cues' (7.1), 'Behavioural practice/rehearsal' (8.1), 'Graded tasks' (8.7) and 'Self-reward' (10.9). However, as applying these techniques to driving behaviour

is a new approach, there aren't any published reviews yet describing which BCTs are most effective in driving behaviour interventions.

Now just to be clear, this doesn't mean that these are the only BCTs that will ever work. It just means that we have evidence for these, and that there is less (or no) evidence for the others. This is the "absence of evidence is not evidence of absence" problem, in other words, just because we don't know whether or not the other BCTs work, it doesn't mean they don't.

When designing interventions you should therefore look first at theory to find out which BCTs are more appropriate for your target behaviour, and then select from the 23 BCTs identified as having the strongest evidence of effectiveness. If, based on theory or research evidence, you have identified other BCTs as being particularly important for your intervention, but there is no evidence about whether or not they are effective, you can still use them – but you need to evaluate whether or not they have produced the intended change. Your evaluation will provide valuable evidence that future researchers and intervention designers can use. However, if there is evidence that they **don't** work for your target audience or target behaviour, then don't use them.

In practice, some BCTs will be effective for specific target behaviours with a certain target audience, and some won't. We're still in the early stages of collecting evidence about BCT effectiveness, so it is important that when you document your intervention, you clearly state which BCTs are used. This will help future researchers to find out whether or not the BCTs in your intervention were effective or not. This is also helpful to the people who are delivering the intervention – if they understand how the content is supposed to change behaviour, they are more likely to 'stick to the script' and deliver the intervention as you intend.



Sullman's work provides evidence of which BCTs are *ineffective* in changing specific target behaviours. He identified one BCT that was never effective: 'Provide contingent rewards', which maps onto BCT 10.2 – 'Material reward'. It is important for you to select BCTs that have both theoretical and research evidence that they are likely to be effective for your particular target behaviour. In the future we hope to have more evidence of BCTs that are ineffective in changing specific target behaviours.

BCTs linked to behaviour change theory

While the evidence is not strong enough to say that all these (shown in Table 2.4) are 'must-include' BCTs, they link well to theories of behaviour change, and so – theoretically – there are good grounds for including them in addition to the BCTs identified in research studies as more effective.

Table 2.4 Further useful behaviour change techniques

	BCT 1.4 Action planning	Prompt the client to make a detailed plan of exactly how they will achieve the target behaviour, e.g. specifying where, when, for how long and how much.
	BCT 4.2 Information about antecedents	Provide information about things that trigger the behaviour. This can include events, situation, thoughts and feelings.
	BCT 5.5 Anticipated regret	Get the person to imagine how regretful they would feel if they perform the unwanted behaviour and something negative happens.
	BCT 7.1 Prompts/cues	Introduce or define an environmental or social stimulus with the purpose of prompting or cueing the behaviour. The prompt or cue would normally occur at the time or place of performance.
	BCT 8.3 Habit formation	Prompt rehearsal and repetition of the behaviour in the same context repeatedly so that the context elicits the behaviour.
	BCT 9.3 Comparative imagining of future outcomes	Prompt or advise the imagining and comparing of future outcomes of changed versus unchanged behaviour.
	BCT 12.1 Restructuring the physical environment	Change, or advise to change the physical environment in order to facilitate performance of the wanted behaviour or create barriers to the unwanted behaviour.
	BCT 12.2 Restructuring the social environment	Change, or advise to change the social environment in order to facilitate performance of the wanted behaviour or create barriers to the unwanted behaviour.
	BCT 13.3 Incompatible beliefs	Draw attention to discrepancies between current or past behaviour and self-image, in order to create discomfort.

Source: Author's own

So in total this gives us 23 BCTs to choose from. If you have good evidence that other BCTs are important to use, you can use them too. Chapter 5 describes the full set of 93 BCTs, together with examples of how to use them in road safety interventions.

2.3 Using BCTs to design an intervention

Now let's look at an example of how you can use the BCTs to design an intervention. Let's look into the future and imagine that to tackle pollution, the local council has invested in a fleet of driverless electric cars that the public can use as an alternative to buying their own. You are developing an intervention to encourage people to use these cars rather than owning their own vehicle. There could be several variations of the intervention aimed at different target audiences, but for the sake of this example, your research has shown that people often buy a car when they are expecting their first child, so let's assume that our intervention is targeted at prospective parents. Our intervention aim is to increase the number of people who use the council's driverless electric car, rather than buy a car of their own. We should develop our objectives from our behaviour change theory, which lists the components that influence behaviour. So our intervention objectives might be:

1. Increase positive attitudes towards the council's driverless electric cars.
2. Increase awareness of the negative consequences of owning a car.
3. Increase positive norms towards booking driverless electric cars.
4. Increase knowledge about how to book a driverless electric car.
5. Strengthen beliefs about capacity to manage without owning a car.
6. Reduce barriers to booking driverless electric cars.
7. Increase intentions to use the council's driverless electric cars.

We need to choose the BCTs that best fit these objectives, making use, where appropriate, of the BCTs that have greater evidence of effectiveness. Table 2.5 shows each BCT, its definition and how (and if) it will be applied. The final column shows which objective the BCT addresses.

Table 2.5 Behaviour change techniques with definitions and applications, linked to objectives

Number	Label	Description	Application	Objective
1.1	Goal-setting (behaviour)	Set or agree a goal defined in terms of the behaviour to be achieved.	Set a goal of using council driverless electric cars.	7
1.2	Problem-solving	Help or encourage the client to reflect on factors influencing the target behaviour and generate or select solutions and strategies to help them achieve it.	Identify the barriers to booking driverless electric cars and how to overcome them.	6
1.3	Goal-setting (outcome)	Set or agree on a goal defined in terms of a positive outcome of the wanted behaviour.	Set a goal for the money saved or pollution avoided from using council driverless electric cars.	1
1.4	Action planning	Prompt the client to make a detailed plan of exactly how they will achieve the target behaviour, e.g. specifying where, when, for how long and how much.	Ask the client to make a diary of the journeys they will need to make, and specify exactly when they will book the council driverless electric car for each journey, and using which device (e.g. phone, tablet).	6
1.5	Review behaviour goal(s)	Work with the client to review their goals, i.e. the behavioural change that they want to achieve. Consider whether the goals are still relevant, whether they need to be changed, and whether more goals should be added.	Not applicable – the intervention only has one face-to-face session.	N/A
1.7	Review outcome goals	Work with the client to review their outcomes, i.e. what has happened as a result of them changing their behaviour. Consider whether the outcome goals are still relevant, whether they need to be changed, and whether more outcome goals should be added.	Not applicable – the intervention only has one face-to-face session.	N/A
2.2	Feedback on behaviour	Monitor or observe the behaviour and give informative or evaluative feedback on performance of the behaviour (e.g. <i>form, frequency, duration, intensity</i>).	Clients practise using the booking site, and are able to ask the trainer for help if they encounter any problems.	4
2.3	Self-monitoring of behaviour	Establish a method for the person to monitor and record their behaviour(s).	Fill in a record of how often you use a council driverless electric car.	5
2.4	Self-monitoring of outcome(s) of behaviour	Establish a method for the person to monitor and record the outcome(s) of their behaviour.	Fill in a record of how much money was saved, or pollution avoided, or how relaxed you felt when you used a council driverless electric car.	1

Number	Label	Description	Application	Objective
2.7	Feedback on the outcomes of behaviour	Monitor and provide feedback on the outcome of the behaviour.	Publish the reduction in pollution resulting from the use of council driverless electric cars on the council website.	1
3.1	Social support (unspecified)	Advise on, arrange or provide social support (e.g. from friends, relatives, colleagues, 'buddies' or staff) or encouragement for performing the behaviour.	Arrange a trip with friends using a council driverless electric car.	3
3.2	Social support (practical)	Advise on, arrange, or provide practical help (e.g. from friends, relatives, colleagues, 'buddies' or staff) for performing the behaviour.	Not applicable – the booking site is easy to use and so there is no need to obtain practical social support.	N/A
4.1	Instruction on how to perform a behaviour	Advise or agree on how to perform the behaviour.	Give a demonstration on how to book a council driverless electric car.	4
4.2	Information about antecedents	Provide information about things that trigger the behaviour. This can include events, situation, thoughts and feelings.	Explain that having a baby can make people feel that they need a car so that they can easily get to appointments and don't need to carry lots of equipment, but it is perfectly possible to manage without a car.	5
5.1	Information about consequences	Provide information (e.g. written, verbal, visual) about the consequences of performing the behaviour. This can be for self or others.	Provide information about the financial savings from using council driverless electric cars. Provide information about council driverless electric cars being safer and easier. Provide information on the negative consequences to health of car pollution.	1 1 2
5.5	Anticipated regret	Get the person to imagine how regretful they would feel if they perform the unwanted behaviour and something negative happens.	Clients discuss how their children's lives will be affected if pollution levels mean that it's not safe for them to play outside.	2
7.1	Prompts/cues	Introduce or define environmental or social stimulus with the purpose of prompting or cueing the behaviour. The prompt or cue would normally occur at the time or place of performance.	Provide a household planning app that families can use to log their appointments. The app links to the booking site.	6
8.1	Behavioural practice/rehearsal	Prompt practice or rehearsal of the performance of the behaviour one or more times in a context or at a time when the performance may not be necessary, in order to increase habit and skill.	Not applicable – not relevant to practise as the booking site is easy to use.	N/A

Number	Label	Description	Application	Objective
8.3	Habit formation	Prompt rehearsal and repetition of the behaviour in the same context repeatedly so that the context elicits the behaviour.	Encourage clients to put aside an hour on the first Sunday of each month to plan their journeys for the coming month.	7
9.3	Comparative imagining of future outcomes	Prompt or advise the imagining and comparing of future outcomes of changed versus unchanged behaviour.	Ask clients to imagine taking their child on a day trip to the countryside. How will that day be different if the air is clean because people didn't buy cars, or if the air is toxic because they did?	1, 2
12.1	Restructuring the physical environment	Change, or advise to change the physical environment in order to facilitate performance of the wanted behaviour or create barriers to the unwanted behaviour.	Clients download the booking app.	6
12.2	Restructuring the social environment	Change, or advise to change the social environment in order to facilitate performance of the wanted behaviour or create barriers to the unwanted behaviour.	Encourage clients to form a driverless electric car group, or to avoid socialising with people who are only prepared to visit places too far away for a driverless electric car.	3
13.3	Incompatible beliefs	Draw attention to discrepancies between current or past behaviour and self-image, in order to create discomfort.	Ask clients to if a good parent should protect their child. Ask clients if they want to be good parents, then highlight that by buying a car they are damaging, not protecting their child.	1, 2

Source: Author's own

2.4 Ordering the intervention

Once you have decided which BCTs to use you need to consider which order to place them in. There are no definite rules, although it's a good idea to first change the predictors of intentions, such as attitudes, norms and control. Then you can add material to help clients to carry out their intentions, for example by addressing barriers and recognising emotions that can trigger the unwanted behaviour.

2.5 Mapping the intervention

This stage is all about making sure that your BCTs address all of your objectives. Table 2.6 lists how the BCTs are used and which objectives they map against. It is useful to note how many BCTs relate to each objective to ensure that each one receives appropriate attention.

Table 2.6 The number of behaviour change techniques used to address each objective.

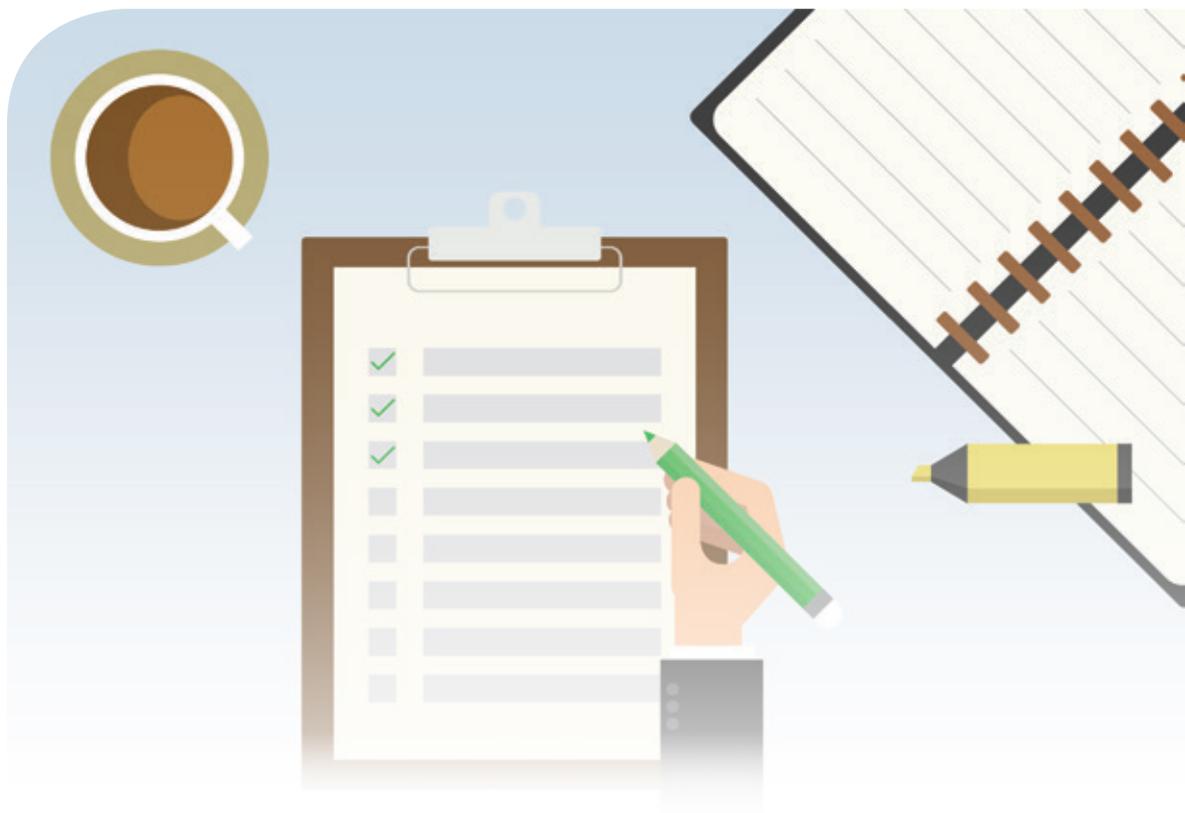
Objective	Number of BCTs
Increase positive attitudes towards the council's driverless electric cars.	7
Increase awareness of the negative consequences of owning a car.	4
Increase positive norms towards booking driverless electric cars.	2
Increase knowledge about how to book a driverless electric car.	2
Strengthen beliefs about capacity to manage without owning a car.	2
Reduce barriers to booking driverless electric cars.	4
Increase intentions to use the council's driverless electric cars.	2

Source: Author's own

We can see that Objective 1 has more BCTs than the other objectives. Is this appropriate? Cast your mind back to the COM-B model, which highlights that to change a behaviour we need to change Capability, Opportunity or Motivation. As it's easy to use the booking system (Capability) and the driverless cars are available to book (Opportunity), we can conclude that it is OK that our intervention addresses mainly Motivation by changing beliefs. Objective 7 ('Increase intentions to use the council's driverless electric cars') has only two BCTs that directly address it, but as intentions are predicted by factors such as attitudes, norms and control – which are addressed by several BCTs – we can accept that.

If you decide that some of your objectives aren't addressed sufficiently, you can look to see if there is scope to apply the more effective BCTs. If not, you may also want to review the full list of 93 BCTs to see which ones would fit well with your intervention. The full list is shown in 5.1 in Chapter 5. To help you understand how to use each BCT, the list includes examples of how you can apply each one.

3. Applying Behavioural Insights



3.1 What are behavioural insights?

Behavioural insights are findings from research in the field of behavioural science (which encompasses disciplines such as psychology, economics and sociology) that provide evidence about why people behave in a certain way, and what can be done to influence the decisions they make. The focus is not so much on conscious decisions that involve weighing up the pros and cons of different decisions as on behaviours that are more subconscious or automatic.



Behavioural insights provide guidance about how we can influence people's subconscious choices.

Most importantly, behavioural insights guide us as to how we can make small changes to interventions to make them more effective, or how we can change the environment to bring about automatic changes in behaviour (unconscious decisions). Behavioural insights include the ‘nudge’ approach, which is about how to present different choices to people in such a way that they adopt the wanted behaviour. Behavioural insights are useful tools for policymakers who want to encourage positive behaviour change.



You may be wondering why this is different to the approach already described in Chapters 1 and 2. Behavioural change models are based on health and social psychology, and concentrate more on conscious (or rational) decision-making, although they do also consider why we don’t always do what we intend to. Behavioural insights, on the other hand, apply our understanding of how people’s behaviour can be subconsciously affected by factors such as the environment, our preference for the status quo, and our tendency to do nothing rather than act. They are based on theories such as Prospect Theory (Kahneman & Tversky, 1979) and Intertemporal Choice (Loewenstein & Prelec, 1992). A fascinating account of these biases, and the research that highlighted them, is given by Kahneman (2012).

Here we describe six different biases in the way that people think, and how we can exploit these biases to help make behaviour change interventions more effective. Using these behavioural insight biases is sometimes called ‘choice architecture’, as we are carefully designing the way in which options are presented to make it more likely that people will choose the wanted behaviour.

To illustrate the biases, we’re going to use the example of an intervention to stop new drivers messaging while driving.

3.2 People don’t like losses

This bias, called ‘loss aversion’, is all about how people dislike losing something (suffering losses) more than they dislike missing out on something (forfeiting gains). For example, they dislike losing £100 more than they dislike missing out on gaining £100. This is a very powerful bias, with people in general being around twice as reluctant to risk losing something they already have than they are to risk failing to gain the same thing. This is especially the case when the losses happen straight away rather than in the future (this is called the ‘present bias’).

This bias also informs us as to whether messages should focus on the negative consequences of the unwanted behaviour (i.e. be ‘loss-framed’) or the positive consequences of the wanted behaviour (i.e. be ‘gain-framed’). Even though we know, theoretically, that a loss-framed message will be more effective, in some behaviours gain-framed messages are actually the more effective, so you need to test a few out with a small

number of the target audience to find out which is more effective.

Related to this is the fact that people give far more weight to a bad outcome than a good one. If people are considering the advantages and disadvantages of the target behaviour, one single negative can override lots of positives. The rather graphic example often used to illustrate this bias is that one cockroach in a bowl of cherries will rather effectively put you off the cherries, whereas one cherry will do nothing to enhance a bowl of cockroaches.

When you design your intervention, you can highlight how the wanted behaviour will avoid losses. You also need to anticipate any negatives people are likely to expect to experience from the wanted behaviour, and show how these negatives aren't as bad as imagined. For example, when talking about speeding you could highlight how little time is actually gained by driving a few miles an hour over the speed limit in an urban environment, thus framing this in terms of how little time is gained, rather than how much time is lost by driving within the speed limit.

In our example of an intervention to reduce messaging, we could highlight to new drivers that if they are caught just once messaging while driving they will have a fixed penalty notice of a £200 fine and six points, which will mean that they lose their driving licence, with the accompanying loss of freedom as well as the financial cost and hassle of having to retake their test after the ban has ended. This could be compared with what they actually gain from messaging, which might feel important at the time but is in reality much less important and much less valuable than keeping their driving licence.

3.3 People prefer to do nothing

This is called the 'status quo bias', and it describes how people dislike taking action to change things, and will tend to stick to an existing choice even though a different option would be to their advantage. This is the case even when it would be relatively easy to change things, or when the potential disadvantages of making a bad choice are low. In other words, people experience more anticipated regret for action than for inaction (which you can use when applying BCT 5.5 – 'Anticipated regret').

There are several ways you can exploit this bias. First, you can make it as easy as possible for people to change their behaviour by removing the barriers to the target behaviour: even small barriers can make it much less likely that people do what you want them to (these are called 'friction costs'). In some respects this is similar to BCT 1.2 – 'Problem-solving' – but in this case the *intervention designers* are doing the work to anticipate and remove the barriers that people might encounter to performing the wanted behaviour, not the people to whom the intervention is being directed. Therefore you could make the target behaviour the default choice – so when people change nothing they do what you want them to. You can also make it very clear what you want people to do, so it is easy for people to understand when, where and how they should perform the wanted behaviour. You can even use this bias to increase the uptake of your intervention: you could arrange that if people don't take action to not attend, they will automatically have the intervention. For example, if your intervention

is a video that aims to decrease the number of people who message while driving you could work with local colleges and employers to arrange that when people start at the college or at a new employer, their induction includes them watching the video.



This is often called 'opt-in versus opt-out'. In the former, people have to make a request to have the intervention, and in the latter they have to make a request not to have it. Unsurprisingly, take-up is much higher for opt-out than opt-in interventions, because few people bother to opt out. If you use an opt-out intervention you will need to consider whether this is ethical (and legal), and make sure that people know how to opt out.

3.4 People can be primed

This bias describes how people's behaviour can be influenced, or 'primed', by information that they receive, or by how they feel before they are asked to commit to the target behaviour. Feeling happy, sad, proud, ashamed, strong or weak – all these can affect people's willingness, and even ability, to engage in the target behaviour. If people feel happier, or better about themselves, they are more likely to agree to requests, or to commit to the wanted behaviour. The physical environment can also be used to alter behaviour subconsciously, and engineers have been using this method for some time. For example, wide roads with chicanes painted on them to make them seem narrower result in people driving more slowly. In our intervention to reduce messaging, new drivers could be asked to recall receiving or sending a message that upset them before being asked to commit not to message while driving.

3.5 People are social

This is about taking into account the fact that humans are social beings, existing in social groups and networks, and that we notice and copy what others do and usually like to behave in ways that our friends and family approve of. This is sometimes called 'following the herd' and relates to the 'norms' part of our model of behaviour (see page 7). This is very frequently seen with young drivers, who can be reluctant to speak out if they feel unsafe, for fear of being judged negatively by their friends. We can sometimes use this to our advantage – for example, if we can change one person's behaviour, this can spread through their social group so that other people change too. There are a few ways that this principle can be used. We can make the target behaviour more visible, so that our target audience thinks that this is a great new thing to do and that lots of other people are doing it. We can approach a person who has kudos with our target audience to act as a 'champion', so that others in their social network will follow their lead: this makes use of BCT 9.1 – 'Credible source'. Or we can simply tell people that most others are engaged in the wanted behaviour

and that few are doing the unwanted behaviour (although if we say this, it should be true). To increase the uptake of an intervention, you can personalise the invitation to make it clear that others want that person to attend.

In our intervention to reduce messaging, for example, we could highlight that just because their friends message doesn't mean that it is safe to do so, and could present statistics on the number of new drivers who have lost their licence as a result of using their mobile while driving. We could encourage new drivers to develop a code of conduct in which they don't expect their friends to read or respond to messages while they are driving.

3.6 “It won't happen to me”

'Optimism bias', or 'unrealistic optimism', is the tendency for people to overestimate the chances of positive things happening to them and underestimate the chances of negative things happening to them: in this way they are showing themselves to be poor at estimating personal risk. It enables people to accept that a behaviour does indeed carry a risk, or lead to a bad outcome, but to nevertheless believe that they will escape any negative outcomes – that they will be alright. This phenomenon is observed in many different aspects of behaviour, and allows people to recognise that, for example, messaging while driving means that people are more likely to crash, but to nevertheless believe that they can message without crashing. This bias tends to be particularly strong in young adults. It's thought to occur because people focus on what they do that protects them (such as “I would never message on the motorway”) rather than the risks they take (they still message in an urban environment). There is no easy way of overcoming this bias, other than drawing people's attention to how this way of thinking doesn't make sense. This could perhaps be tackled as part of BCT 13.3 – 'Incompatible beliefs' – by highlighting that they believe that they are a responsible driver, and yet they message while driving despite knowing that it dangerous to do so; or by asking them to rate how much more – or less – likely they are to crash while messaging than other people, and then discussing that they aren't in fact at less risk.

3.7 Creating a story

When faced with an event or fact, people tend to create a story to explain it. They seek to try to understand what caused this situation and its outcome. This is called the 'narrative fallacy', and it is thought that it helps events, particularly negative ones, to become more understandable. If people understand why an event has happened (or think they do), they also feel that they have more control over it, and therefore more control to stop it happening to them. For example, if there has been a collision, people search for reasons why it might have happened, and if, for example, they hear that the person who crashed was a teenage driver, they might assume that they were probably speeding and overtaking where it wasn't safe to do so, and/or distracted by their friends. There is a related bias – the 'attribution bias' – in which people attribute their own risky behaviour to the circumstances, but the same behaviour in someone else to the individual themselves, citing factors such as their

personality, attitudes or deliberate decisions. For example, “I sent that message because it was an emergency, whereas others send messages because they are irresponsible.” In our intervention to reduce messaging while driving, we could include an activity to help people understand that the reasons why, and the situations in which, other people message are very similar to their own reasons and situations, and that they are also at a real risk of crashing or losing their licence if they message while driving.

4. Evaluation



4.1 What is an evaluation?

An evaluation is a piece of research. It involves collecting evidence that helps the people involved in the intervention – such as those delivering it, and those considering purchasing or funding it – to understand the outcomes of the intervention, the impact that it has, and how to improve it.

An evaluation tests whether your intervention works, i.e. whether it achieves its objectives.

Why evaluate?

As we have seen, humans are complex, and just because an intervention *should* work theoretically doesn't mean that it actually does. There are wider benefits of evaluation too:

- Evaluation tells you whether your intervention has had the intended effect. For example, has it changed people's intentions to drive at an appropriate speed?
- Evaluation ensures that your intervention doesn't do any harm or have unexpected negative consequences. For example, an intervention that involves on-road practical driving might increase confidence and lead to people taking more risks.
- Evaluation can tell you how your intervention can be improved to better meet your objectives.

- Evaluation can tell you which version of a message will be more effective in changing behaviour.
- Evaluation can tell you if there are any additional benefits to your intervention.
- Evaluation can also help you provide evidence to funders and policymakers about the effects of your intervention.

4.2 Setting evaluation questions

Setting questions for your evaluation should be straightforward if you have clearly specified the intervention objectives. Your questions should ask whether your intervention objectives have been met. Most evaluations measure behaviour directly or use questionnaires to measure self-reported behaviour.

Some examples of evaluation questions are:

- Does the intervention reduce intentions to drive in excess of the speed limit?
- Does the intervention increase knowledge of how to drive on smart motorways?
- Does the intervention increase positive attitudes towards seatbelt use?
- Does the intervention increase awareness that being angry may make people drive faster?
- Does the intervention reduce intentions to use mobile phones whilst driving?
- Does the intervention increase intentions to drive within 20 mph speed limits?
- Does the intervention increase knowledge of how to identify the correct speed limit?
- Does the intervention increase the number of employees who cycle to work?
- Does the intervention increase the number children using the walking bus?
- Does the intervention decrease the average speed of cars travelling through the village?



Your intervention objectives directly inform your evaluation objectives. If you aim to increase children's road safety knowledge using a classroom-based pedestrian training course, your evaluation should measure their knowledge, not the number of attendees or how much they enjoyed the session.

Types of evaluation

In this guide we will focus on evaluations that explore whether intervention **outcomes** have been achieved. However, there are other types of evaluation. For example, a **structure** evaluation can tell you if you have the equipment and facilities you need to deliver your intervention. A **process** evaluation will tell you if the mechanisms delivering the intervention operated as you intended – for example, was the booking system easy to use?

When to start your evaluation

A common mistake is to assume that an evaluation begins after an intervention has been run. Many designs require that data are collected both before and after the intervention, so remember to plan the evaluation well in advance and leave time to develop the outcome measures required. Ideally, the evaluation should be planned at the same time as the intervention is being developed.



Evaluation should not be an afterthought. Remember to design your evaluation when you design your intervention. It will make it easier to write your evaluation questions, collect any baseline data you may need, and allocate the necessary time and resources to the evaluation process.

4.3 Evaluation designs

There are different designs you can use to evaluate your intervention, as described below. The strongest design is a randomised controlled trial (RCT), so this is what you should aim for if at all possible.

The three most commonly used evaluation designs

Randomised controlled trial (RCT)

An RCT is the best way of evaluating interventions. It involves randomly allocating people to receiving the intervention or not receiving it. The idea is to compare people who have the intervention (the intervention group)



with those who don't (the control group). Because you randomise people to one group or the other, there should be no prior differences between the intervention and control groups, meaning that any difference after the intervention is a result of the intervention.



Randomising people is often difficult to achieve in practice, as interventions may be delivered to entire classes in schools, for example. Even if half the class received the intervention and half didn't, the children might talk to each other about what happened in the intervention, so the control group would be exposed to some of the intervention content. This is why researchers may randomise at school level, with the result that some schools receive the intervention and some do not. This is referred to as a 'cluster randomised controlled trial'.

Comparison

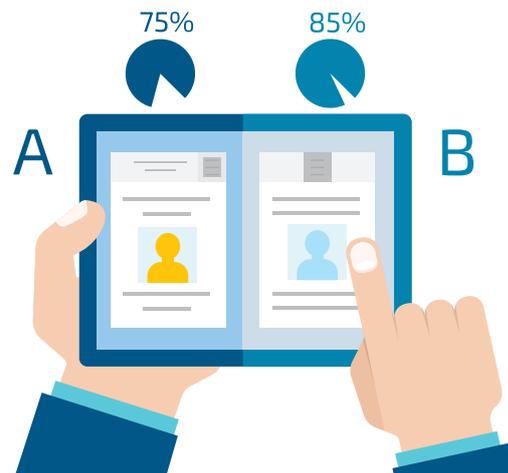
In a comparison design, one group of people has the intervention and one group doesn't. You compare the two groups. Usually, you compare them before the intervention and again afterwards. It's not as good as an RCT, as people aren't allocated randomly to the intervention and the control group, so it is possible



that the two groups differ in some way. For example, people who volunteer to have the intervention might be more safety conscious, so if you find that the intervention group improves more than the control group, it might just be because they are more interested in staying safe.

Before-and-after

Before-and-after designs collect data from the same group of people before they have the intervention, and again afterwards. You measure any change your intervention has produced. The problem with this design is that you don't have control over external factors that might influence the target behaviour. For example, you give Year 11 students a presentation on the dangers of not wearing a seatbelt. You measure their attitudes towards seatbelts one week before the intervention and again



one week afterwards. But the day after your intervention it so happens that there was a storyline on a TV soap in which a popular character was in a car crash. Most of the students had heard about the storyline, and this changed their attitudes towards wearing seatbelts. Your questionnaire one week after your intervention showed a large increase in safe attitudes towards seat belts, which you incorrectly assumed was due to your intervention.

4.4 Six steps to an RCT

If you possibly can, you should evaluate your intervention using an RCT. Here's a guide to running an RCT in six simple steps, with each step then explained in more detail:

1. Develop your evaluation outcome measures.
2. Recruit clients to take part in the evaluation and randomly allocate them to receive your intervention (the intervention group) or not to receive it (the control group).
3. All clients complete the 'Before' measure.

4. Clients in the intervention group have the intervention.
5. All clients complete the 'After' measure.
6. Analyse the results.

1. Develop your evaluation outcome measures

An outcome measure is simply something that you are measuring which indicates the outcome of your intervention. Sometimes it's really obvious. For example, if our intervention aims to help people lose weight, then our outcome measure is their weight. In road safety it can be more complex. If our intervention aims to increase seat belt wearing, then how often people wear their seat belt is the obvious measure to use. But how can we measure this? We can't install sensors in everybody's car – but we could perhaps place observers in the car park to record how many people put their seat belt on and how many don't. Sometimes, though, we need to come up with a 'proxy measure', i.e. something that is related to the objective measure. So let's think back to our model of behaviour. We might not be able to measure the behaviour itself, but we can measure the things that predict that behaviour, for example intentions to always wear a seat belt – remember that the best predictor of behaviour in the model is intentions. We can measure other predictors of behaviour as well. If our intervention objectives include attitudes towards wearing a seat belt, norms and confidence to always wear a seat belt, these are things we can measure using a questionnaire. A lot of road safety outcome measures are based on questionnaires. Writing a questionnaire can be straightforward as long as you keep it simple, and make sure that the questions ask directly about the things you are interested in. There are some examples in Chapter 5.

2. Recruit clients to take part in the evaluation and randomly allocate them to the intervention group or the control group

You will need a group of clients to take part in the evaluation research. The key thing is that some of them have the intervention (the intervention group) and some do not (the control group). You can have what is called a 'waiting-list control group', in which the people in the control group have the intervention also, but only later, after the evaluation. The control group 'controls' for things that might happen outside of your intervention, so that if you find a difference between the intervention and control group after your intervention you can be confident that this is due to the intervention. It's important to randomise who gets the intervention and who doesn't. For example, in your intervention to increase commuting by bicycle, you advertise that you are looking for 100 people to take part in a workshop to increase safe cycling skills. You don't want to allocate the first 50 who sign up to the intervention group because it is possible that they will be the keenest to start cycling. There are various methods you can use to randomise people, such as simply rolling a die (for example allocating those who get even numbers to the intervention group, those with odd numbers to the control), or using an online random number generator.

Sometimes it's simply not possible to allocate people randomly to the intervention or control group. For example you have arranged for premier league football players to visit a Young Offender Institution to talk to young people about how to recognise and resist impulsive behaviour (using BCTs 4.2 – 'Information about antecedents' and 9.1 – 'Credible

source'). They are only willing to make one visit, and the staff are unhappy about some of the young people missing out 'just' so that you can evaluate the intervention. You could use a comparison design, although this is less robust than an RCT. For example, you could compare your intervention group with young people at a different Young Offender Institution. Both groups complete the same outcome measures before and after the intervention. If this isn't possible either, then you would use a 'before-and-after' design, and while this is the weakest form of evaluation, it still provides valuable evidence.



How many people should I include in the evaluation?

This is actually a tricky question, as it depends on how effective your intervention is. If it achieves large changes then you need fewer people to be able to detect the changes. If the intervention produces only small changes then you need to include more people, so that your statistical test has enough power to detect them. There are many books, papers and online sample size calculators that cover this topic. As a very rough guide, a sample size of 300 should be sufficient to detect most small-to-medium intervention effects, with 150 being adequate for medium-to-large effects.

3. All clients complete the 'Before' measure

Before the intervention you need to measure everybody in your RCT. This is called the 'Before' measure, or 'Time 1', 'T1' or the 'baseline' measure. Because people have been randomly allocated to your control and intervention groups, there shouldn't be any difference between the two groups at this point. There's not a lot you can do if there is a difference, but if you are analysing the data statistically, your statistical tests can take this into account.

4. Clients in the intervention group have the intervention

Run the intervention. Clients in the intervention group have the intervention and clients in the control group do not. If you are not running the intervention, it is helpful that you nevertheless attend so that you can understand whether it ran as you intended. Lots of interventions don't actually run the way they are supposed to. For example, if your intervention is a presentation at a school, by the time the students arrive and any announcements have been made, there may be only 45 minutes available for an intervention which lasts an hour. The people delivering the intervention therefore need to miss some aspects out, which is likely to affect the outcomes it has.

5. All clients complete the 'After' measure

At some point after the intervention everybody is measured once again using the same outcome measure. You can measure them straight after the intervention, or any time afterwards. If you are measuring short-term changes in attitudes and intentions, you can measure them immediately after the intervention, but if you are measuring self-reported behaviour then you need to wait until clients have had the opportunity to change their

behaviour. Any effects you measure are likely to be stronger in the short term, so you can also measure people a few months later to measure the longer term effects of your intervention. This is often called 'follow-up'.

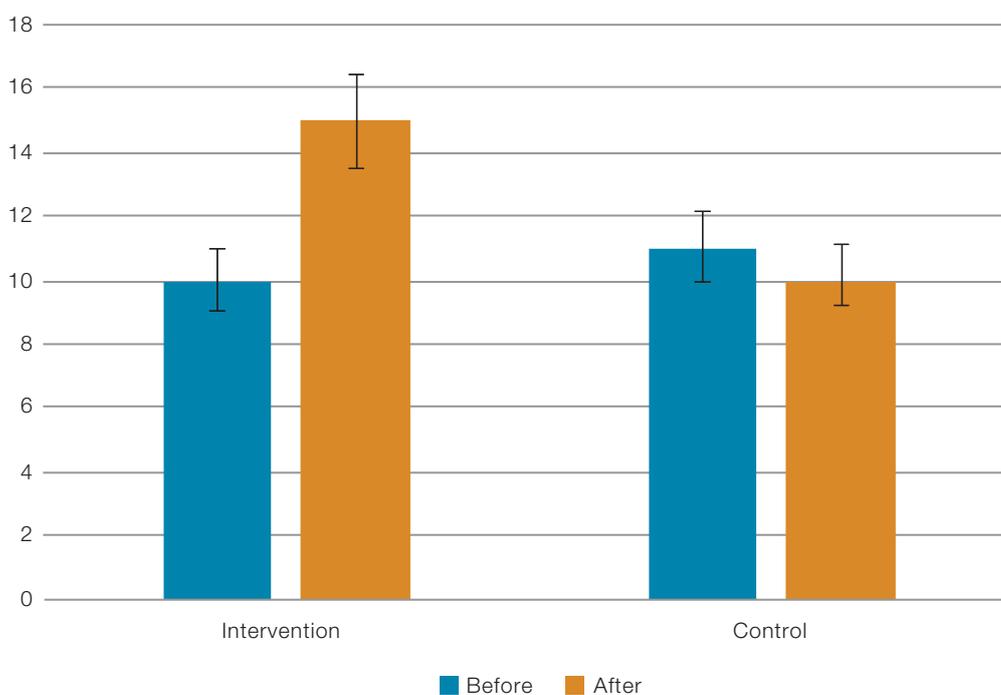
6. Analyse the results

The simplest way of analysing the results is to display your measurements in a chart, showing the results separately for your intervention and control groups – see Figure 4.1 for an example. Decide whether any changes between T1 and T2 (the 'After' measure) are greater for the intervention group than the control group. If they are, this shows your intervention has been effective.



Without using statistics you can't state that there is a statistical difference, but you can do some statistics without specialised software. You can calculate the 'confidence intervals' around your scores and display these on the chart. You want the confidence intervals from the 'Before' measurements of the two groups to overlap, which shows that there is no statistically significant differences between them. If your intervention is effective, then the confidence intervals won't overlap on your 'After' measurements. You may have analysts within your organisation who can help you with these statistics.

Figure 4.1 Example of how to illustrate the results of a behaviour change intervention



Source: Author's own

If you have access to a statistical package such as SPSS – and the expertise to use it – you can do more sophisticated tests to explore any differences your intervention has on different subgroups – for example to examine outcomes based on age.

Adding a qualitative element

RCTs usually measure outcomes and are analysed statistically. Many also include a qualitative aspect, such as interviews or focus groups. This provides valuable insight into how the target audience experienced the intervention, and more importantly, why they did or didn't change their behaviour afterwards. The data from qualitative research consists of the things that people say, and how they talk about things. As such, analysing the data is more complex than reporting percentage and averages. However, qualitative research can provide depth of insight, and it can in particular help you to understand any changes that you could make to the intervention, or how it is delivered, that have the potential to make it more effective. It's particularly valuable to use qualitative research when you pilot the intervention.

What if it doesn't work?

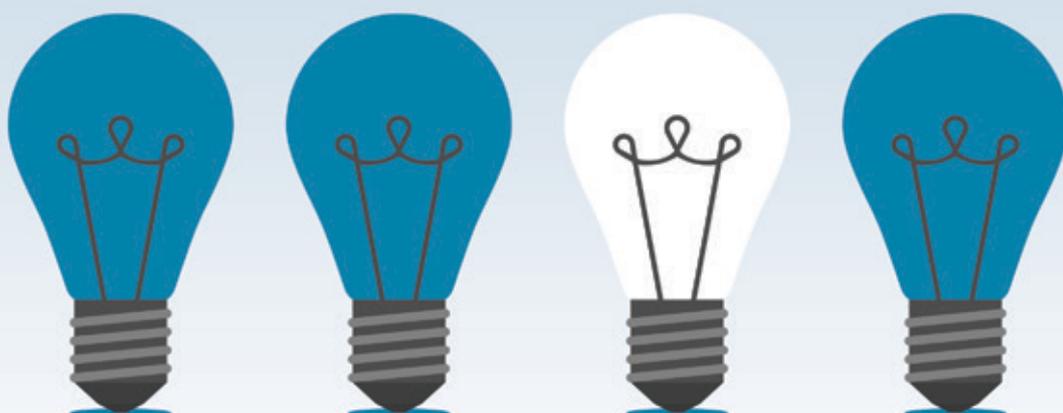
Lots of people are nervous about evaluating their intervention in case the results show that it doesn't work. There's no denying that it is disappointing to find out that despite all the work, your intervention doesn't do what you hoped it would. But it's important to know this. You can then better allocate your funding or redesign your intervention. This helps you learn what works and what doesn't work, and so avoid wasting resources.



Getting full involvement of the staff

It is important to keep the stakeholders who involved in the intervention informed about the evaluation, including the purpose of the evaluation and the research questions that are being asked. Without clear communication about the evaluation it is easy for staff who are involved in delivering the intervention to believe that it is them (perhaps their delivery style) that is being evaluated, rather than the intervention content. If, for example, the intervention is delivered in schools, without clear communication with the teachers involved, they might think that their pupils are being evaluated. It is best to be completely honest about the evaluation aims and the processes involved, and to keep stakeholders informed about the progress. Any evaluation is much easier to conduct with full and informed co-operation from stakeholders. At the end of the evaluation, it is important to feed back to them what was found out and any conclusions that were drawn.

5. Inspiration



This chapter aims to give you a bit of inspiration to develop your own intervention. First it describes all 93 BCTs and gives examples of how you can use them. Next there are some case studies that illustrate how BCTs have been used in different interventions. There follow some example questionnaire items that you can adapt. Finally, there are links to some additional resources that you might find useful to consult.

5.1 The 93 BCTs and how you can use them

Table 5.1 lists all 93 BCTs, each one with an example of how you could use it as part of an intervention. Each group of BCTs has a different target behaviour. The BCTs likely to be more effective, based on evidence and theory, are highlighted in purple.

Table 5.1 93-item taxonomy

	Name	Definition	Example
1: Goals and planning – Example is using a mobile phone while driving			
1.1	Goal-setting (behaviour)	Set or agree on a goal defined in terms of the behaviour to be achieved.	The client agrees that they will not use their mobile phone while driving.
1.2	Problem-solving	Analyse, or prompt the person to analyse, factors influencing the behaviour and generate or select strategies that include overcoming barriers and/or increasing facilitators.	Work with the client to help them to identify the barriers that make it more difficult for them change their behaviour, and what they can do to overcome these barriers. For example, a client may feel they have to answer their mobile because it might be a message resulting in a change of plans. They could overcome this by identifying a point on the journey they will stop the car and check their messages.
1.3	Goal-setting (outcome)	Set or agree on a goal defined in terms of a positive outcome of the wanted behaviour.	Work with the client to help them to identify that by not using their mobile phone while driving they will not have any points on their licence or be fined, which will mean their insurance is cheaper and they don't spend their money paying fines.
1.4	Action planning	Prompt the client to make a detailed plan of exactly how they will achieve the target behaviour, e.g. specifying where, when, for how long and how much.	Help the client develop a plan for exactly what they are going to do to make sure they don't use their mobile while they are driving, e.g. to record an answer machine message to say they are driving and when they will be able to respond to messages, and that before every drive they will turn their phone off and place it in the glove box.
1.5	Review behaviour goal(s)	Work with the client to review their goals, i.e. the behavioural change they want to achieve. Consider whether the goals are still relevant, whether they need to be changed or more goals added.	Work with the client to review their progress against their goal of never using their mobile while driving: what have they mastered, how successful has this been, and do the goals need to be changed? For example, a client has mastered not answering calls, but it still tempted to check social media notifications – and so the goals can be changed to focus on social media.
1.6	Discrepancy between current behaviour and goal	Draw attention to discrepancies between a person's current behaviour and the goals they want to achieve (either behaviours or outcomes) or their action plan.	Point out that the client is still looking at texts, even if they are not sending them.
1.7	Review outcome goal(s)	Work with the client to review their outcomes, i.e. what has happened as a result of them changing their behaviour. Consider whether the outcome goals are still relevant, whether they need to be changed or more outcome goals added.	Work with the client to review their progress against their goal of not having licence points or fines: what have they mastered, how successful has this been, and do the outcome goals need to be changed? For example, the client has stopped answering phone calls but is still responding to social media messages, so their licence is not safe, and they could still be fined; this outcome goal is therefore still relevant.

	Name	Definition	Example
1.8	Behavioural contract	Create a written specification of the behaviour to be performed, agreed on by the client, and witnessed by another.	The client creates and signs a contract saying they won't use their mobile while driving for the next week.
1.9	Commitment	Ask the client to confirm their commitment to changing their behaviour.	Ask the client to use an "I will" statement to confirm a strong commitment to the behaviour, e.g. "I will always put my phone in the glove box before setting off."
2: Feedback and monitoring – Example is sharp braking			
2.1	Monitoring of behaviour by others without feedback	Observe or record behaviour with the person's knowledge.	Watch the client driving and note how much sharp braking they do, but don't at this stage give them feedback. For example, a black box monitors sharp braking events but doesn't have an interface to show the client when their braking is sharp.
2.2	Feedback on behaviour	Monitor or observe the behaviour and give informative or evaluative feedback on performance of the behaviour (e.g. form, frequency, duration, intensity).	Watch the client driving and give them feedback about their braking. For example, a black box monitors sharp braking events and an interface feeds back on how they are doing using green, amber and red LEDs.
2.3	Self-monitoring of behaviour	Establish a method for the person to monitor and record their behaviour(s).	Ask the client to review the feedback provided by the black box, e.g. to view daily, weekly and monthly summaries of the number of sharp braking events.
2.4	Self-monitoring of outcome(s) of behaviour	Establish a method for the person to monitor and record the outcome(s) of their behaviour.	Ask the client to track the reduction in fuel consumption arising from reductions in sharp braking.
2.5	Monitoring outcome(s) of behaviour by others without feedback	Observe or record the outcome(s) of the behaviour with the person's knowledge.	Monitor the decrease in fuel consumption that arises from reductions in sharp braking, but don't feed this back to the client.
2.6	Biofeedback	Provide feedback about the body (e.g. physiological or biochemical state) using any external monitoring device.	Provide feedback on physiological changes, e.g. demonstrating that their blood pressure or heart rate increases with sharp braking.
2.7	Feedback on outcome(s) of behaviour	Monitor and provide feedback on the outcome of the behaviour.	Show the client how much their fuel consumption has reduced and how much money they have saved as a result of less sharp braking.
3: Social support – Example is drink-driving			
3.1	Social support (unspecified)	Advise on, arrange or provide social support (e.g. from friends, relatives, colleagues, 'buddies' or staff) or encouragement for performing the behaviour.	Suggest the client asks their friends to help them not to drink-drive by not offering them an alcoholic drink when they are meeting in the pub.
3.2	Social support (practical)	Advise on, arrange, or provide practical help (e.g. from friends, relatives, colleagues, 'buddies' or staff) for performing the behaviour.	Ask the client to think of ways their friends could give them practical help not to drink-drive, e.g. agreeing a rota for a designated driver.

	Name	Definition	Example
3.3	Social support (emotional)	Advise on, arrange, or provide emotional social support (e.g. from friends, relatives, colleagues, 'buddies' or staff) for performing the behaviour.	Ask the client to think of ways that they could access emotional support, e.g. asking their friends to praise them for ordering a soft drink in the pub when they are driving.
4: Shaping knowledge – Example is speeding			
4.1	Instruction on how to perform a behaviour	Advise or agree on how to perform the behaviour.	Tell the client how to identify the speed limit, or how to use gears to control the vehicle's speed.
4.2	Information about antecedents	Provide information about things that trigger the behaviour. This can include events, situation, thoughts and feelings.	Work with the client to help them identify what causes them to speed, such as feeling worried about being late, not knowing the speed limit on a stretch of road, or being with friends.
4.3	Re-attribution	Get clients to review what they think causes their behaviour and suggest alternative explanations.	Ask clients to generate reasons why they speed, and highlight that even though they might assume they are externally controlled (e.g. being tailgated, not being sure what the speed limit is, being late for a meeting), the speed at which they drive is actually within their personal control.
4.4	Behavioural experiments	Work with the client to help them identify and test alternative explanations of the causes and consequences of a behaviour.	Ask a client to measure how much longer a journey takes when they drive within the speed limit, or to watch how far ahead a car gets if they are speeding through an urban environment, or how much fuel they use on a specific journey if they drive at 70 mph rather than 85 mph.
5: Natural consequences – Example is driving while tired			
5.1	Information about consequences	Provide information (e.g. written, verbal, visual) about the consequences of performing the behaviour. This can be for self or others.	Tell the client about how driving tired affects driving performance, such as drifting across lanes, slower reaction times, inappropriate speed, falling asleep.
5.2	Salience of consequences	Make the consequences seem more real or memorable to the individual.	Show a video of a driver drifting across lanes on a motorway because they are driving tired and get the client to imagine that they are the driver, and that they have their family or friends in the car with them.
5.3	Information about social and environmental consequences	Provide information (e.g. written, verbal, visual) about social and environmental consequences of performing the behaviour. This can be for self or others.	Ask the clients to consider the effect on the road network if a driver falls asleep at the wheel and crashes into another vehicle, and how this affects the driver, their family, the people in the car they hit, and the people at the scene.
5.4	Monitoring of emotional consequences	Ask people to think about and record how they feel after trying to perform the behaviour.	Agree with the client that they make a record of how they feel when they plan rest stops into their journey. Do they really feel frustrated? Or refreshed and relaxed?
5.5	Anticipated regret	Get the person to imagine how regretful they would feel if they perform the unwanted behaviour and something negative happens.	Ask the client to imagine how they will feel if they fall asleep at the wheel and crash, writing their car off and injuring themselves and their passengers.
5.6	Information about emotional consequences	Provide information (e.g. written, verbal, visual) about the emotional consequences of performing the behaviour.	Tell clients that most people feel relaxed and refreshed after a rest stop, rather than angry and frustrated.

	Name	Definition	Example
6: Comparison of behaviour – Example is using child car seats			
6.1	Demonstration of the behaviour	Show the person the behaviour so they can aspire to or imitate it. This can be either directly in person or indirectly, e.g. via film or pictures.	Show the client how to correctly fit a child car seat.
6.2	Social comparison	Draw attention to others' performance to allow comparison with the person's own performance <i>Note: being in a group setting does not necessarily mean that social comparison is actually taking place.</i>	Provide statistics to show that other people use child car seats.
6.3	Information about others' approval	Provide information about what other people think about the behaviour. The information clarifies whether others will like, approve or disapprove of what the person is doing or will do.	Ask the client whether their family love their child and want to keep them safe, and tell the client that their family approve of them using child car seats.
7: Associations – Example is cycling to work/college rather than driving			
7.1	Prompts/cues	Introduce or define an environmental or social stimulus with the purpose of prompting or cueing the behaviour. The prompt or cue would normally occur at the time or place of performance.	Agree with the client they will leave a cycling jacket on top of their work bag.
7.2	Cue signalling reward	Identify an environmental stimulus that reliably predicts that reward will follow the behaviour.	Agree with the client that they will reward themselves with a treat (e.g. chocolate) whenever they ride their bike.
7.3	Reduce prompts/cues	Gradually withdraw prompts to perform the behaviour.	Agree with the client that they will reduce the number of "don't drive, ride your bike" reminder notes that they leave around their home.
7.4	Remove access to the reward	Advise or arrange for the person to be separated from situations in which unwanted behaviour can be rewarded in order to reduce the behaviour.	Agree with the client that they will surrender their parking space, so that if they drive to work/college they have to walk further.
7.5	Remove aversive stimulus	Advise or arrange for the removal of an aversive stimulus to facilitate behaviour change.	Arrange that the client's colleagues stop teasing them about their cycling clothing.
7.6	Satiation	Advise or arrange repeated exposure to a stimulus that reduces or extinguishes a drive for the unwanted behaviour.	Agree with the client that over the next week they will make long journeys by car rather than rail.
7.7	Exposure	Provide systematic confrontation with a feared stimulus to reduce the response to a later encounter.	Agree with a client who is nervous about riding that they will ride into work or college accompanied a Bikeability cycle trainer once a week for a month.
7.8	Associative learning	Present a neutral stimulus jointly with a stimulus that already elicits the behaviour repeatedly until the neutral stimulus elicits that behaviour.	Agree with the client that they will have their favourite breakfast every time they cycle to work or college.

	Name	Definition	Example
8: Repetition and substitution – Example is learning to cross the road safely			
8.1	Behavioural practice/ rehearsal	Prompt practice or rehearsal of the performance of the behaviour one or more times in a context or at a time when the performance may not be necessary, in order to increase habit and skill.	Ask children in a school hall to rehearse safely crossing the road.
8.2	Behaviour substitution	Prompt substitution of the unwanted behaviour with a wanted or neutral behaviour.	Agree with the child that they will look out for cars rather than look at their phone when they are approaching a road.
8.3	Habit formation	Prompt rehearsal and repetition of the behaviour in the same context repeatedly so that the context elicits the behaviour.	Ask the child to stop, look and listen before crossing every road.
8.4	Habit reversal	Prompt rehearsal and repetition of an alternative behaviour to replace an unwanted habitual behaviour.	Ask the child to walk across the road, rather than run across, which they had done previously.
8.5	Overcorrection	Ask to repeat the wanted behaviour in an exaggerated way following an unwanted behaviour.	If the child has crossed the road between parked cars, ask them to cross the road only in places nowhere near parked cars.
8.6	Generalisation of a target behaviour	Advise to perform the wanted behaviour, which is already performed in a particular situation, in another situation.	Encourage the child to apply safe road crossing skills on other roads that they have not practised crossing with the road safety officer.
8.7	Graded tasks	Set easy-to-perform tasks, making them increasingly difficult, but achievable, until behaviour is performed.	Begin by teaching the child to cross the road on a straight quiet road on a pedestrian crossing, then when that is mastered make the road increasingly complex, such as a busier road at a junction.
9: Comparison of outcomes – Example is taking a refresher driving lesson			
9.1	Credible source	Present verbal or visual communication from a credible source in favour of or against the behaviour.	Show learner drivers a video of a celebrity encouraging them to take a refresher driving lesson.
9.2	Pros and cons	Advise the person to identify and compare reasons for wanting (pros) and not wanting to (cons) change the behaviour.	Advise the client to list and compare the advantages and disadvantages of taking a refresher driving lesson.
9.3	Comparative imagining of future outcomes	Prompt or advise the imagining and comparing of future outcomes of changed versus unchanged behaviour.	Prompt the client to imagine and compare likely or possible outcomes following attending or not attending a refresher driving lesson.

	Name	Definition	Example
10: Reward and threat – Example is improving fuel economy			
10.1	Material incentive (behaviour)	Inform that money, vouchers or other valued objects will be delivered if and only if there has been effort and/or progress in performing the behaviour.	Arrange for an annual incentive scheme to be set up. Inform the employees that at the end of the year , the employee who has the best fuel economy will receive a salary bonus.
10.2	Material reward (behaviour)	Arrange for the delivery of money, vouchers or other valued objects if and only if there has been effort and/or progress in performing the behaviour.	Arrange for an incentive scheme to be set up. Each month, employees who have improved their fuel economy receive shopping vouchers.
10.3	Non-specific reward	Arrange delivery of a reward if and only if there has been effort and/or progress in performing the behaviour.	Arrange for an incentive scheme to be set up. Each month, the employee with the best fuel economy receives vouchers for an activity of their choice, e.g. a spa day or tickets to a sporting event.
10.4	Social reward	Arrange verbal or non-verbal reward if and only if there has been effort and/or progress in performing the behaviour.	Arrange for an incentive scheme to be set up. Each month, the fleet manager sends a company-wide email praising the employee with the best fuel economy.
10.5	Social incentive	Inform that a verbal or non-verbal reward will be delivered if and only if there has been effort and/or progress in performing the behaviour.	Arrange for an incentive scheme to be set up. Inform the employees that at the end of the year the employee with the best fuel economy will receive an award from the fleet manager at the annual company conference.
10.6	Non-specific incentive	Inform that a reward will be delivered if and only if there has been effort and/or progress in performing the behaviour.	Arrange for an incentive scheme to be set up. Inform the employees that at the end of the year the employee with the best fuel economy will receive vouchers for an activity of their choice, e.g. a spa day or tickets to a sporting event.
10.7	Self-incentive	Plan to reward self in future if and only if there has been effort and/or progress in performing the behaviour.	Agree with the client that at the end of each month they will calculate how much money they have saved on fuel and spend it on themselves, e.g. new clothes, a restaurant trip.
10.8	Incentive (outcome)	Inform that a reward will be delivered if and only if there has been effort and/or progress in achieving the behavioural outcome .	Arrange for an incentive scheme to be set up with a target for the overall cost savings that will be made from improved fuel economy. At the end of the year, if the target is reached, employees will receive a shopping bonus.
10.9	Self-reward	Prompt self-praise or self-reward if and only if there has been effort and/or progress in performing the behaviour.	Agree with the client that they will reward themselves every week that their fuel economy reaches an agreed level. The reward is anything of their choice, e.g. new clothes, a restaurant trip.
10.10	Reward (outcome)	Arrange for the delivery of a reward if and only if there has been effort and/or progress in achieving the behavioural outcome .	Arrange for an incentive scheme to be set up with targets for cost savings on fuel. Each month that the cost savings have been made, employees receive shopping vouchers.
10.11	Future punishment	Inform that future punishment or removal of reward will be a consequence of performance of an unwanted behaviour.	Inform employees that if their fuel economy does not improve they will be disciplined and attend a fleet driver lesson in their own time.

	Name	Definition	Example
11: Regulation – Example is older people maintaining safe driving skills			
11.1	Pharmacological support	Provide, or encourage the use of or adherence to, drugs to facilitate behaviour change.	Suggest that the client seeks a medicines review to identify whether any of their medications are likely to make it more difficult to concentrate, and if so, if there are any alternative drugs, or alternative times to take them that will impact less on driving ability.
11.2	Reduce negative emotions	Advise on ways of reducing negative emotions to facilitate performance of the behaviour.	Advise on the use of stress management skills, e.g. to reduce anxiety about driving in unfamiliar places.
11.3	Conserving mental resources	Advise on ways of minimising demands on mental resources to facilitate behaviour change.	Suggest to the client that the next time they buy a car they consider an automatic, as it is easier to drive and frees up their concentration for other aspects of driving.
11.4	Paradoxical instructions	Advise to engage in some form of the unwanted behaviour with the aim of reducing motivation to engage in that behaviour.	Suggest to the client that they try to manage without their car for a week, and identify how their life would be different if they do not maintain their driving skills.
12: Antecedents – Example is refusing a lift with a drunk/drug-driver			
12.1	Restructuring the physical environment	Change, or advise to change the physical environment in order to facilitate performance of the wanted behaviour or create barriers to the unwanted behaviour.	Advise the client to carry a separate store of money for a taxi fare and pre-book a taxi.
12.2	Restructuring the social environment	Change, or advise to change the social environment in order to facilitate performance of the wanted behaviour or create barriers to the unwanted behaviour.	Advise the client not to socialise in bars or clubs with people who are likely to drink- or drug-drive.
12.3	Avoidance/reducing exposure to cues for the behaviour	Advise on how to avoid exposure to specific social and contextual/physical cues for the behaviour, including changing daily or weekly routines.	Suggest to the client that they arrange to leave the venue before friends who they suspect will be drink- or drug-driving.
12.4	Distraction	Advise or arrange to use an alternative focus for attention to avoid triggers for unwanted behaviour.	Suggest to the client that if they are offered a lift by a drunk driver they should think about something pleasant (e.g. their plans for the coming weekend or their next holiday) rather than how easy or convenient it would be to accept the lift.
12.5	Adding objects to the environment	Add objects to the environment in order to facilitate performance of the behaviour.	Suggest that the client downloads a taxi app, so that they don't need to have cash in order to take a taxi.
12.6	Body changes	Alter body structure, functioning or support directly to facilitate behaviour change.	Suggest that if a client feels anxious about waiting alone for a taxi then they take relaxation training, or increase their physical strength.
13: Identity – Example is reducing aggression			
13.1	Identification of self as role model	Inform that one's own behaviour may be an example to others.	Advise the client that their children watch how they drive and will learn to respond aggressively or calmly.

	Name	Definition	Example
13.2	Framing/ reframing	Suggest the person deliberately adopts a perspective or new perspective on the behaviour (e.g. its purpose) in order to change cognitions or emotions about performing the behaviour.	Suggest that client tries to feel sympathy for rather than anger at a motorist in front who is driving slowly and seems to be lost.
13.3	Incompatible beliefs	Draw attention to discrepancies between current or past behaviour and self-image, in order to create discomfort.	Highlight that the client believes they are a good driver, yet they also believe a good driver is calm and considerate.
13.4	Valued self-identity	Advise the person to write or complete rating scales about a cherished value or personal strength as a means of affirming the person's identity as part of a behaviour change strategy.	Ask the client to rate themselves on positive personality attributes before taking them on an on-road driving lesson to help them tackle their road rage.
13.5	Identity associated with changed behaviour	Advise the person to construct a new self-identity as someone who 'used to engage with the unwanted behaviour'.	Ask the client to state their new identity as a considerate driver.
14: Scheduled consequences – Example is stopping passengers distracting the driver			
14.1	Behaviour cost	Arrange for withdrawal of something valued if and only if an unwanted behaviour is performed.	Get the clients to agree that if a passenger distracts the driver, that passenger will not be invited on trips for the next two weeks.
14.2	Punishment	Arrange for aversive consequence contingent on the performance of the unwanted behaviour.	Get the clients to agree that they will all tell a passenger off if they distract the driver.
14.3	Remove reward	Arrange for discontinuation of contingent reward following performance of the unwanted behaviour.	Get the clients to agree that if nobody distracts the driver they will reward themselves by going for fast food on the way home. Any passenger who distracts the driver is not allowed to eat.
14.4	Reward approximation	Arrange for reward following any approximation to the target behaviour, gradually rewarding only performance closer to the wanted behaviour.	Get the clients to agree that if any distraction is limited to talking (rather than messing about in the car or obstructing the driver's view) then they will reward themselves by going for fast food on the way home.
14.5	Rewarding completion	Build up behaviour by arranging reward following final component of the behaviour; gradually add the components of the behaviour that occur earlier in the behavioural sequence.	Get the clients to agree that in Week 1 they are rewarded (e.g. a shopping trip, fast food) if they do not distract the driver because they do not interact with the driver or one another. In Week 2 they are rewarded if they don't distract the driver although they interact with one another. In Week 3 they are rewarded if they interact with one another and the driver without distracting the driver.
14.6	Situation-specific reward	Arrange for reward following the behaviour in one situation but not in another.	Get the clients to agree that they will reward motorway journeys with no distractions, but not urban journeys. They choose the reward, e.g. a shopping trip, cinema trip.

	Name	Definition	Example
14.7	Reward incompatible behaviour	Arrange reward for responding in a manner that is incompatible with a previous response to that situation.	Encourage the client to identify how they will reward themselves when they refuse a lift to a friend they know is likely to distract them.
14.8	Reward alternative behaviour	Arrange reward for performance of an alternative to the unwanted behaviour.	Get clients to agree that they will reward themselves for helping the driver, e.g. with directions, looking out for hazards at junctions, and planning rest stops, rather than distracting them.
14.9	Reduce reward frequency	Arrange for rewards to be made contingent on increasing duration or frequency of the behaviour.	Get the clients to agree that in Week 1 they will reward every journey in which they don't distract the driver, whereas in Week 2 they need to go for a whole day without distracting the driver, and in Week 3 they need to go through the whole week with no distractions in order to get the reward.
14.10	Remove punishment	Arrange for removal of an unpleasant consequence contingent on performance of the wanted behaviour.	Get the clients to agree that they will clean the car if they distract the driver, but if there are no distractions the car will be valeted.
15: Self-belief – Example is overcoming fears about using a motorway			
15.1	Verbal persuasion about capability	Tell the person that they can successfully perform the wanted behaviour, arguing against self-doubts and asserting that they can and will succeed.	Tell the client that they are confident when they drive on dual carriageways and they have all the skills required to drive safely on the motorway.
15.2	Mental rehearsal of successful performance	Advise to practise imagining performing the behaviour successfully in relevant contexts.	Suggest that the client imagines themselves driving safely and confidently on the motorway.
15.3	Focus on past success	Advise to think about or list previous successes in performing the behaviour (or parts of it).	Ask the client to describe previous occasions they have driven safely on motorways.
15.4	Self-talk	Prompt positive self-talk (aloud or silently) before and during the behaviour.	Prompt the client to tell themselves that they have mastered all the skills needed to drive safely on the motorway and their journey will be safer and faster than driving on A-roads.
16: Covert learning – Example is riding a motorbike safely			
16.1	Imaginary punishment	Advise to imagine performing the unwanted behaviour in a real-life situation followed by imagining an unpleasant consequence.	Advise the client to imagine themselves speeding on their bike then losing control and hitting a tree.
16.2	Imaginary reward	Advise to imagine performing the wanted behaviour in a real-life situation followed by imagining a pleasant consequence.	Advise the client to imagine themselves feeling relaxed, in control and enjoying their ride when riding their bike safely and legally.
16.3	Vicarious consequences	Prompt observation of the consequences (including rewards and punishments) for others when they perform the behaviour.	Suggest that the client observes what happens to other bikers who take risks while riding their bikes, e.g. speeding tickets, injuries.

Source: Michie et al. (2015) (modified and simplified, with examples supplied by author)

5.2 Case studies

Here are some examples of how BCTs and behavioural insights have been used to develop an intervention. We have focused on the selection of appropriate BCTs, rather than how the intervention is delivered or how good/poor its outcomes are.

BCTs to help young people tackle risky driver behaviour

Greater Manchester Fire and Rescue Service wanted to develop a resource that could be used by teachers to help young people reduce risky driver and passenger behaviours. A review of the research literature identified impulsivity as a risk factor. They also did some research to understand the context of risky driving in Manchester teenagers. This took the form of focus groups to explore what it is like to be a young driver or passenger when others in the car are taking risks or pressurising you to do so. The groups highlighted that young people didn't feel confident that they could challenge risky driving without 'losing face'. They talked about what it would be acceptable to say and do in a risky situation and from this the intervention team developed the idea of SAFE plans. SAFE stands for:

- **S**ay something funny
- **A**sk them to stop
- **F**eel uneasy
- **E**xit the situation

The intervention helps young people to recognise when they are being impulsive, and they prepare an action plan for what they will do to ensure that they don't let feeling impulsive mean that they take risks while a driver or passenger. It also helps them to anticipate risky situations that they might find themselves in and they develop a 'SAFE' plan to tell them exactly what they will do and say in that situation.

These BCTs are used:

BCT 4.2 'Information about antecedents' – young people are told about impulsivity and why it can cause people to take risks on the roads.

BCT 1.2 'Problem-solving' – young people undertake activities to identify what they do that is impulsive, and how they can guard against acting on their impulsivity in the car.

BCT 4.1 'Instruction on how to perform a behaviour' – young people get an explanation and an example of a SAFE plan.

BCT 2.2 'Feedback on behaviour' – young people create a SAFE plan for the character in a case study and they are given feedback on their SAFE plan.

BCT 1.4 'Action planning' – young people create their own SAFE plan.

BCTs to help people to stop speeding

The National Driver Offender Retraining Scheme runs a course that drivers can be offered

instead of being prosecuted for speeding. The course contains a lot of BCTs to change attitudes and norms, which should in turn act on intentions. But we're going to look at the BCTs used to help clients implement their changed intentions to drive at an appropriate speed within the speed limit. There is an activity in which clients explore the things that make it more difficult for them to drive within the speed limit – their barriers. They then consider a specific journey in which they are at risk of speeding – for example the commute to work, or the school run. They are asked to complete an action plan that specifies what they will do differently before the journey and during the journey to ensure they don't speed. They also consider whether they will need anybody's help to do this. A few minutes into the activity, the trainers delivering the course generate anticipated regret by stating "If you are not ready to change anything, just write down what would have to happen before you wished you'd changed something."

These BCTs are used:

BCT 1.2 'Problem-solving' – reflecting on the barriers that make it more difficult to drive within the speed limit, and identifying what can be done to overcome those barriers.

BCT 1.4 'Action planning' – identifying exactly what they will do to make sure they don't speed on a specific high-risk journey.

BCT 3.1 'Social support (unspecified)' – identifying somebody who can help you avoid speeding.

BCT 5.5 'Anticipated regret' – considering the situation (e.g. you killed something or someone) that would mean that you regretted not changing.

BCTs to encourage older drivers to take refresher lessons

Dyfed-Powys Police and their road safety partners developed a course to help mature drivers maintain their driving ability to enable them to continue driving safely for longer. One of the target behaviours is to take refresher driving lessons. Clients are encouraged to set this as a goal. Trainers suggest that friends and family could give a refresher lesson as a birthday or Christmas present. Trainers also suggest that when their MOT is due, clients book a refresher lesson.

These BCTs are used:

BCT 1.1 'Goal-setting (behaviour)' – clients are asked to set a goal of taking a refresher driving lesson.

BCT 1.3 'Goal-setting (outcome)' – clients are asked to set a goal of continuing to drive and therefore maintaining their social activities and independence.

BCT 3.2 'Social support (practical)' – asking friends and relatives to buy refresher lessons.

BCT 4.1 'Instruction on how to perform a behaviour' – clients are told how to select a driving instructor.

BCT 5.1 'Information about consequences' – clients are told how skills can become outdated without refreshers and they are given an explanation and a demonstration of why refresher lessons maintain safe driving skills.

BCT 5.2 'Salience of consequences' – clients are asked to plan their next week as if they couldn't drive, e.g. being unable to attend social activities or meet family commitments.

BCT 7.1 'Prompts/cues' – clients are encouraged to use key dates (Christmas, birthday and their car's MOT) as cues to book a refresher lesson.

Using behavioural insights

In September 2016 Kirklees Council began using behavioural insights and behaviour change intervention design as part of a transformation programme. They are applying these techniques across the council, and it is still early days, but they are seeing some promising results. For example they wanted to maximise the number of people who respond to a letter reviewing the council tax single person discount they receive. They drew on the following biases:

- **People prefer to do nothing.** They recognised that the letter they sent out was complicated and required lots of effort to understand so that many people wouldn't read it or respond to it. They therefore used the technique of 'Simplification' – they broke the letter down into manageable chunks of information with sub headings and used simple, easy to understand language. They also gave a date by which people needed to respond, rather than saying, for example, "within 21 days" which requires people to calculate their own deadline.
- **People don't like losses.** If people don't respond to the letter they can be fined £70. The letter therefore highlighted how much it will cost to ignore the letter.
- **People are social.** Each letter was personalised by addressing the recipient by name to make the person feel that the council is contacting them individually, rather than them being just one anonymous person from a list of thousands. Also, the letter highlighted that 88% of people responded during the last review, so that they are aware that most other people respond to the letter.

The council is going to measure the responses received and are planning to run a randomised controlled trial to provide a more accurate measure of the impact.

5.3 Questionnaires

If possible, you should use a validated questionnaire to evaluate your intervention. However, it's not always possible to do so, e.g. when your intervention addresses a very specific target behaviour. Here are some example questionnaire items that you can adapt to use as your outcome measure. The example intervention for this subsection on questionnaires is to increase the number of employees who cycle to work. If you design your own questionnaire try to use standard categories, e.g. for age. This will help you and others compare your results with those available nationally.

Example of measuring behaviour

- Take an audit of how people arrive into work over a day or a week: use a monitor at the entrance to the workplace to record mode of transport (e.g. car, bus, walking, cycling).
- Record the number of bicycles in the bike cages.
- Ask the staff how they travelled to work that day.

Example of measuring intentions

In the future, how often will you cycle to work? (tick one)

Never	<input type="checkbox"/>	Occasionally	<input type="checkbox"/>	Sometimes	<input type="checkbox"/>	Often	<input type="checkbox"/>	Always	<input type="checkbox"/>
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Or it is often useful to be more objective:

On how many days will you cycle to work next week? _____

Sample questionnaire items to measure attitudes, control and norms

How much do you agree or disagree?

	Strongly disagree	Slightly disagree	Neither disagree or agree	Slightly agree	Strongly agree
Cycling to work is safe	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cycling to work reduces pollution	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cycling to work keeps me fit	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cycling to work is unpleasant	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cycling to work would make me feel happy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cycling to work would make me feel nervous	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I could cycle to work if I wanted to	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other people like me cycling to work	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
My colleagues would like me to cycle to work	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

When reporting the results you can show what percentage of respondents answer in each way, or you can allocate a numeric value to each response, e.g. strongly disagree = 1, slightly disagree = 2, Neither disagree or agree = 3, slightly agree = 4, strongly agree = 5. This would mean that higher scores indicate more positive attitudes and norms towards and greater control over cycling. You need to 'reverse score' the questions that are negatively worded ("Cycling to work is unpleasant" and "Cycling to work would make me feel nervous"), so that strongly disagree = 5, etc.

Sample questionnaire item for measuring barriers

What will make it more difficult for you to cycle to work? *Please tick all that apply*

The weather	<input type="checkbox"/>	I'm not fit enough	<input type="checkbox"/>	I wouldn't enjoy it	<input type="checkbox"/>	I live too far away	<input type="checkbox"/>
I don't have access to a bike	<input type="checkbox"/>	There is nowhere to store my bike	<input type="checkbox"/>	There is nowhere to get changed	<input type="checkbox"/>	I don't like cycling in traffic	<input type="checkbox"/>

If you develop your own questionnaire you should pilot it: ask several of your potential target audience to complete it, and, ideally, talk you through what is running through their mind while they are completing it. This will highlight any problems with the wording (e.g. questions are difficult to understand), the instructions and layout (e.g. it is confusing) and the response options that people can choose from. It's important to get your questionnaire right before you run your evaluation.

5.4 Additional resources

Here is a list of resources that you can draw upon to help you to better plan, develop and evaluate your intervention.

- The Road Safety Observatory publishes research reviews, and so provides a useful starting point when you are reviewing the evidence on the target behaviour and the target audience. See www.roadsafetyobservatory.com
- The Road Safety Knowledge Centre provides links to evidence on many different road safety topics, and there is a forum that you can use to post questions and answers. See www.roadsafetyknowledgecentre.org.uk
- The Department for Transport commissions and publishes research into many different aspects of road safety. See www.gov.uk/government/organisations/department-for-transport
The Department for Transport has produced a guide on how to evaluate educational road safety interventions: <https://injuryobservatory.net/wp-content/uploads/2012/09/Road-Guide-2004-Guidelines-for-evaluating.pdf>
- The Royal Society for the Prevention of Accidents (RoSPA) has developed a road safety evaluation website that guides you through evaluating interventions. See www.roadsafetyevaluation.com
- The Transport Research Laboratory publishes many useful research studies and reviews (available upon registration): see <https://trl.co.uk/publications>
- The University College London behaviour change group publishes guides and hosts conferences and courses on behaviour change: see www.ucl.ac.uk/behaviour-change/resources
One of their books – ABC Of Behaviour Change Theories (Michie et al., 2014) – describes the different theories of behaviour change and how they relate to one another. See www.behaviourchangetheories.com They have also produced a resource that you can purchase – the behaviour change wheel – that guides you

through intervention design: see www.behaviourchangewheel.com

- The TIDieR checklist guides you as to how to report an intervention:
<https://doi.org/10.1136/bmj.g1687>
- The Behavioural Insights Team¹ publishes various reports about the interventions they have developed and evaluated. The team have also produced a pack of cards that you can use to guide your intervention by giving you ideas about applying behavioural insights. Information on how to purchase them is on their website. See:
www.behaviouralinsights.co.uk
www.behaviouralinsights.co.uk/publications/
www.behaviouralinsights.co.uk/east-cards/
- Examples of research journals that publish road safety research:
Accident Analysis & Prevention
Injury Prevention
Journal of Safety Research
Journal of Transport & Health
Journal of Travel Research
Transportation Research Part F: Traffic Psychology and Behaviour
Transportation Science
Travel Behaviour and Society

¹ The Behavioural Insights Team is a social purpose company jointly owned by the UK Government, Nesta (the innovation charity) and its employees.

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