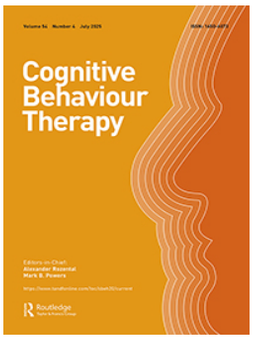

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Driving cognitive change: a guide to behavioural experiments in cognitive therapy for anxiety disorders and PTSD

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ABSTRACT

Behavioural experiments are experiential exercises used in Cognitive Behavioural Therapy to drive cognitive change by testing patients' idiosyncratic, emotionally linked beliefs. In this paper, we provide clinical guidance on how to deliver effective behavioural experiments that maximise cognitive change based on lessons learnt over the last 30 years from our work using Cognitive Therapy to treat Panic Disorder (CT-PD), Social Anxiety Disorder (CT-SAD) and Post-Traumatic Stress Disorder (CT-PTSD). We describe key steps for setting up and carrying out powerful experiments, including common blocks and barriers patients and therapists come across when using them.

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Introduction

"I hear and I forget. I see and I remember. I do and I understand". (Confucius)

Behavioural experiments (also referred to in this article as "experiments" as a short-hand) are one of several formulation-driven tools used in cognitive therapy (CT) to test patients' negative beliefs and develop alternative perspectives. Experiments can help patients to learn more about the psychological processes that maintain their emotional difficulties, explore whether their feared catastrophes happen at all, or are as bad as feared, and reflect on what they learn from this. The goal of behavioural experiments is new learning—cognitive change. For example, a patient with Social Anxiety Disorder who fears she will noticeably blush and be humiliated by others, avoids many social situations. When she does meet new people, she hides her face, monitors how hot she feels and avoids eye contact. During treatment, she carries out several behavioural experiments talking to strangers, without

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monitoring herself or hiding her face, to discover that others do not appear to notice her blush, they respond as if she is an acceptable person. Given that cognitive change has been associated with symptom improvement in CT (Kleim et al., 2013; Teachman et al., 2010; Thew et al., 2020; Wiedemann et al., 2023), experiments can be seen as an important driver of this change. It is recommended they are included in most sessions of CT for Social Anxiety Disorder (CT-SAD, Clark & Wells, 1995; Clark et al., 2003, 2006) and Panic Disorder (CT-PD, D. M. Clark, 1996; Clark & Salkovskis, 2009), and that several experiments are included across a course of CT for Posttraumatic Stress Disorder (CT-PTSD, Ehlers et al., 2005; see also Murray & El-Leithy, 2021) in addition to memory-focused work. For example, during a recent trial of CT-SAD, patients completed an average of 13.5 behavioural experiments within face-to-face treatment sessions and 21.5 experiments during a course of CT-SAD delivered online (iCT-SAD: Clark et al., 2023). Clément et al. (2019) observed that trials of CT-SAD with the largest treatment effects tended to include more behavioural experiments. Two studies (McManus, 2009; Warnock-Parkes et al., 2017) have demonstrated the impact of behavioural experiments by isolating two early experiential exercises in CT-SAD (the self-focused attention and safety behaviours experiment with video feedback) and shown significant change in cognition and social anxiety in the week after these experiments.

In anxiety disorders many, but not all, behavioural experiments involve intentional confrontation with a feared stimulus in order to disconfirm patients' beliefs about the likelihood and severity of feared outcomes. In such instances, the behavioural experiments approach was historically contrasted with traditional exposure therapy where experiential tasks were more likely to be presented with a habituation rationale, and designing the tasks to maximize cognitive change was less strongly emphasised. Over time, exposure therapy has had more focus on cognitive change, with the pioneering work of Michelle Craske on expectancy violations (Craske et al., 2014). In this paper, we focus on describing the procedures we have found most helpful for promoting cognitive change in our treatment development work. Some of these procedures will overlap with what would be suggested with more recent conceptualizations of exposure therapy. Over the last 30 years of developing treatments for Panic Disorder (PD), Social Anxiety Disorder (SAD) and Post-Traumatic Stress Disorder (PTSD) we have refined the ways in which we carry out behavioural experiments to maximise cognitive change. This paper is the first published guidance where we detail our accumulated experience. We hope this guidance will be helpful for both novice and experienced clinicians delivering CT to get the most out of behavioural experiments. We first describe general principles underpinning behavioural experiments in CT, followed by experiments used to help patients discover for themselves the role that maintaining processes play in their distress. We then describe the key steps in setting up and carrying out powerful experiments to put patient's predictions to the test through action. Finally, we cover troubleshooting common challenges. Further guidance and video demonstrations of a range of CT techniques and behavioural experiments are available at www.oxcadatresources.com. A range of behavioural experiments across different presenting problems are also described in Bennett-Levy et al. (2004). This paper will focus on SAD, PD and PTSD and Table 1 summarizes some of the common fear-inducing beliefs in these presenting problems.

Table 1. Common fear-inducing beliefs in SAD, PD and PTSD that are targeted in CT treatments.

Presenting problem and theme of fear-inducing beliefs	Examples of common fear-inducing beliefs
Social Anxiety Disorder (SAD) Patients fear they will do or say something in social situations that will lead to their embarrassment or humiliation.	What I will say sounds stupid; I'm boring; I will make a fool of myself; They don't like me; They'll see I'm anxious; I will blush/sweat/shake; I won't have anything to say; I'll babble or say something silly; People are staring at me; They think I'm inferior/weird/odd; I will be rejected by others; I'm unlikeable.
Panic Disorder (PD) Patients fear that body sensations will lead to catastrophic physical consequences (e.g. heart attack, stop breathing, fainting) that will either lead to death or embarrassment in public.	I am going to faint/pass out; I am having a heart attack; I will choke to death; I am going to die; I am going insane/losing control; I am going to have a stroke; I will suffocate/stop breathing and die; I will vomit/lose control of my bladder/bowels.
Post Traumatic Stress Disorder (PTSD) Patients fear a new trauma will happen (e.g. being attacked again, accident) or that others will judge them negatively if they knew what happened or see the physical consequences of the trauma (e.g. scars, problems walking).	I/others close to me are in danger; I cannot trust others; My reactions mean I am losing my mind; If I think about the event I will not be able to handle it; My life has been destroyed by the event; My body has been ruined since the trauma; There is something wrong with me as a person; The way I behaved is unforgivable; People blame me for what happened; Others will look down on me if they know what happened.

General principles underpinning behavioural experiments in CT

There are several general principles it is helpful for therapists to have in mind when using behavioural experiments in CT. First, that unlike the emphasis on reductions in arousal and anxiety in traditional exposure approaches, the framework of behavioural experiments in CT is focused on cognitive change. The primary aim is to test negative beliefs and develop new learning (i.e. did feared concerns happen or not? If they did, was the outcome as bad as expected?). As such, ratings taken during experiments are largely to do with whether the negative prediction occurred or not, rather than ratings of anxiety (with a couple of exceptions outlined later). Another key difference to traditional exposure approaches is that because the focus is on testing particular beliefs, it is usually not necessary to develop a fear hierarchy of situations to experiment in. Situations are instead chosen because of their availability and value in disconfirming a negative belief ("what will be the best test of this fear?"), rather than based on their position in a fear hierarchy.

Second, in all cognitive models of anxiety, safety behaviours and other key processes (such as self-focused attention or hypervigilance to threat) are proposed to maintain negative beliefs (see Clark & Wells, 1995; Ehlers & Clark, 2000; Salkovskis et al., 1996). Therefore, when carrying out behavioural experiments it is key that patients drop these maintaining processes for new learning to occur. If patients approach feared situations while continuing to do the things that maintain their negative beliefs, this will limit learning. This might be a "pain with limited gain" experience. However, if patients face feared situations while behaving differently from the way they normally do and observing the consequences they may feel anxious ("short-term pain"), but hopefully discover something new that ultimately leads towards freedom from their anxiety.

A good therapeutic relationship and collaborative empiricism are at the heart of good CT and run through all the steps of setting up and carrying out behavioural experiments. In our experience, the therapeutic relationship is also further strengthen through the process of carrying out powerful behavioural experiments. Although there are some

experiments that are typically used and recommended, and we describe some of these below, there is no one set list of experiments for all patients or set order. Experiments carried out in CT are always driven by the person's individualised cognitive model of their problems, tailored to their needs, and developed collaboratively.

Experiments that help patients learn about the role of key processes in their cognitive model

At the heart of any CT intervention is an individualised model of how the patient's beliefs, thoughts, behaviours and emotions interact. This formulation provides a less threatening explanation for the patient's difficulties, an understanding of why they persist and identifies processes to target in treatment. Early in therapy, patients are typically convinced by their threat appraisals and view safety behaviours as essential in preventing, or reducing the impact of, their fears. Behavioural experiments offer a valuable method to discover how these processes work, and this experiential approach is often more powerful than simply providing psychoeducation or discussion. These kinds of experiments are usually brought into CT as early as session one or two, given the importance of demonstrating the negative effects of safety behaviours and other maintaining strategies in providing a rationale for therapy. An explanation of the expected results is not typically given in advance. This allows patients to learn directly through experience. Examples in CT-PD, CT-SAD, and CT-PTSD are given below. We note this type of experiment often features heavily in cognitive behavioural treatments where short-term disconfirmation of patients' fears is not always possible, for example in treating health anxiety (Warwick & Salkovskis, 1990) or OCD (Salkovskis, 1999).

Examples of experiments used to demonstrate key processes in the cognitive model across a range of presenting problems. See oxcadatresources.com for video illustrations of each

CT-PD: the paired associates experiment. In Clark's cognitive model of panic disorder (Clark, 1986) catastrophic misinterpretations of bodily sensations play a key role in driving anxiety and further bodily sensations. To demonstrate this, patients are asked to read aloud pairs of words containing a common panic sensation and a linked feared consequence (e.g. heart racing—heart attack; dizziness—fainting, etc.). Most patients find that this task leads to increased bodily sensations like those they have during a panic attack. Subsequent discussion helps patients to discover that their thoughts play a key role in triggering their bodily sensations. This demonstrates the central role of catastrophic thoughts in the model (Clark, 1986) and provides evidence for viewing panic attacks as an anxiety problem rather than a physical health problem.

CT-SAD: the self-focused attention and safety behaviours experiment. In the Clark and Wells (1995) cognitive model of SAD, self-focused attention and safety behaviours play a key role in maintaining social anxiety. Early in CT treatment patients are encouraged to have two social interactions with a stranger, the first focusing on themselves and using their safety behaviours, and the second focusing externally and dropping their safety behaviours. For example, a patient who fears saying something stupid, focusses on themselves in the first conversation, monitoring how clever they sound and preparing

intelligent things to talk about. In the second conversation they speak spontaneously and try to get absorbed in the conversation. Several ratings are taken after each conversation and compared. Patients are usually surprised to discover that they feel less anxious and are less concerned about how they come across in the second conversation. This demonstrates the unhelpful role of self-focused attention and safety behaviours in maintaining anxiety, showing that although these strategies are understandable, they are inadvertently fuelling the problem.

CT-PTSD: the thought suppression experiment. In Ehlers and Clark's (2000) cognitive model of PTSD, thought suppression plays a key role in preventing trauma memories from being processed and updated. Early in CT-PTSD patients are asked to spend a few minutes trying not to think about a green rabbit sitting on the therapist's head (or a similarly striking image that is more personally relevant to them). Typically, patients discover that they find it difficult to think about anything else. The therapist then asks "What does this tell us about what might happen when you understandably try to push memories of the trauma away?". Patients usually learn that attempts to suppress memories of the trauma can lead to a rebound effect that maintains their distress.

The SAD and PTSD experiments above illustrate a common theme in anxiety disorders whereby attempts that people make to control their symptoms or to check for reassurance have the paradoxical effect of reinforcing negative beliefs. Behavioural experiments in which the person intentionally uses the control technique/safety behaviour or does checking while observing the consequences are a particularly effective way of helping people discover that these actions can be a major contributor to their anxiety, rather than a help. Patients with panic disorder who are concerned about going mad often provide an elegant example of this. Such individuals often complain that things look unreal in a panic attack and they take this perception as evidence that they may be going mad. In an effort to reassure themselves, they often check that the world around them continues to appear real. A common way of doing this involves intentionally staring at objects, fixating on a particular point and not moving their gaze. Unfortunately, for most people this fixed gaze tends to make an object seem less three dimensional. Unaware of this point, panic patients tend to interpret the fixated object appearing less real as a sign of madness, rather than a consequence of a particular fixation strategy which would have similar effects on anyone. Intentionally doing the fixation exercise as an experiment with their therapist can help them discover that the change of perception is just a normal mental process.

Key steps for powerful prediction testing experiments

Once the patient has a good understanding of what is driving and maintaining their distress treatment usually progresses to targeting the relevant beliefs in the person's cognitive model and behavioural experiments are a key tool in doing so. As patients tend to use their feelings to guide what is going to happen (e.g. "I feel like I'm going to die", "I feel anxious so I must look anxious" etc.), when introducing the idea of behavioural experiments, we often describe the need to become more scientific when testing patients feared catastrophise (e.g. "would it be sufficient for a judge to convict somebody because they felt they were guilty?", "would it be reliable for a scientistic to give out a drug because they felt confident it would work?").

Behavioural experiment record sheets

Whether you are carrying out an experiment that would benefit from being carefully planned together in advance using a behavioural experiment record sheet (see below), or an experiment that has not been written down together in advance (see examples above such as the thought suppression experiment), writing down key take home points after the experiment is essential in consolidating the learning. Behavioural experiment record sheets (a blank example is provided in the supplementary materials) are typically used when carrying out prediction-testing experiments. A completed example can be seen in Figure 1. They provide a template that prompts therapists and patients through the key steps in doing an experiment.

On some occasions, for example when the therapist accompanies the patient outside of the therapy room and multiple experiments are carried out more spontaneously, or if the predictions need to be made during the experiment itself (see later example of the staring experiment in CT-SAD), the record sheet may be filled in retrospectively after the

Situation *chosen to test fearful beliefs*	Predictions *What is the worst that you think could happen, if you did not do your safety behaviour. Be clear in specifying* ***observable outcomes****. Rate on 0-100% scale how much you believe this will happen.*	Experiment *How could you test this prediction? What safety behaviours or other maintaining processes (e.g. self-focused attention) will you drop?*	Outcome *What actually happened? Re-rate the belief*	Learning *What does this tell you more generally about the beliefs being tested? How can you take this learning forward?*
Going for a walk with my therapist to the supermarket	I will feel panicky and then if I don't hold onto the trolley tightly or sit down, then I think I will collapse – 60%	When in the supermarket, walk without a trolley, instead just hold a basket. Move more into the centre of the aisle so I cannot lean on the sides. Don't focus on sensations.	I didn't faint! It was uncomfortable but the feeling passed. Re-rate belief – 20%	This shows me the problem is one of anxiety not a passing out problem. I believe this 70%. I can keep testing this by repeating it whenever I feel panicky this week. If I have the urge to hold onto something tight or sit down – remind myself the feeling will pass.

Figure 1. An example of a completed experiment record sheet used in CT. This patient with panic disorder who fears fainting, conducts an out of office experiment with her therapist involving dropping her safety behaviours.

experiment is complete. If possible, it is preferred for the patient to write on the experiment record sheet themselves with the therapist's support. Digital versions could be used, provided that the patient and therapist have access to these, and they can be available to refer to in future sessions. Keeping a record of experiments is essential in accumulating evidence across therapy to test negative beliefs and develop more helpful ones. This is particularly important when targeting persistent problematic beliefs.

The key steps involved in carrying out a prediction testing behavioural experiment are: 1. Identify the beliefs to test; 2. Identify the best situation to test the belief; 3. Identify observable predictions; 4. Identify safety behaviours and other maintaining processes to drop; 5. Carry out the experiment; 6. Review the outcome and generalized learning; 7. Build on the learning by planning follow-up experiments. These are described in turn.

Step 1 identifying the beliefs to test

Which beliefs to address first? Patients often have a range of problematic beliefs and therapists often tell us they are unsure which beliefs to address first. In deciding which beliefs to start with, cognitive therapists are guided by the formulation and consider:

(1) Which are the highest rated beliefs linked to the patient's negative emotions that might lead to the biggest symptom improvement if changed? Relevant disorder-specific process measures can be used to track belief ratings session to session.
(2) Which beliefs are interfering the most in the patient's life right now?
(3) Which beliefs does the patient want to address first? Do any fit with their therapy goals?
(4) Where all their beliefs are equally high, interfering and problematic, we might consider which beliefs may be easier to disconfirm and more likely to lead to an early success experience for the patient.

As patients often have multiple feared catastrophes, it is likely that when setting up experiments to test specific beliefs, other fear-inducing beliefs become apparent and will need to be included as predictions.

Use process measures. We recommend using process measures weekly to help identify the most problematic cognitions that will need addressing in treatment, and track how these change over time. Process-focused questionnaires have been developed across cognitive therapies, for example the Social Cognitions Questionnaire (SCQ: Wells et al., 1993) for SAD, the Agoraphobic Cognitions Questionnaire (ACQ: Chambless et al., 1984) for PD, and the Post-Traumatic Cognitions Inventory (PTCI: Foa et al., 1999) for PTSD.

Is the timing right? It is understandable that patients will feel anxious about testing beliefs they hold with strong conviction that would have catastrophic consequences if they came true (e.g. "If I run, I will have a heart attack and die" – 80%). If experiments feel too difficult further cognitive techniques to loosen beliefs may be needed before experiential methods are considered any further. This might involve cognitive techniques like looking at the probability of their feared catastrophe happening. For example, looking at the number of panic attacks a patient has had and the number of times this

had led to a heart attack in CT-PD. A similar probability calculation can be done in PTSD, e.g. a patient whose trauma was a violent assault in public examines the number of times they have left home in their lifetime without being assaulted (a video illustration of this is given on the oxcadatresources.com website). The amount of intervention required to loosen beliefs in advance of an experiment considers how likely patients would be to try the experiment given the perceived risk it might pose. Below are two examples illustrating this point.

> SAD Case example—A patient who feared coming across as boring if he did not prepare what to say in advance benefitted from simply being asked "What have we learnt in treatment so far about the belief you are boring?", before he felt willing to try an experiment speaking to a stranger without preparing what to say during a session.

> PTSD Case example—A man who feared he would be seen as weak if others knew he had been assaulted, was not willing to experiment with disclosing his trauma to a friend for fear of being rejected. He and his therapist first explored what he would say if a similar trauma had happened to a friend of his. This helped, but it was only after he and his therapist sent out a survey to help loosen his belief and he reviewed the responses (asking people to read a short vignette of his trauma and rate how weak they would think he was) that he was willing to try the experiment. Surveys are powerful experiential techniques used in CT to shift beliefs about other people's negative judgement. For detailed guidance on carrying out surveys, see Murray et al. (2022).

Ask about images. Many patients' negative beliefs are represented in imagery. Negative imagery will be idiosyncratic and may include elements that would not be spotted by asking about thoughts and fears alone. As with all CT, it is key that we explore patients' negative images and target these in behavioural experiments along with other interventions in treatment.

> SAD Case example—A patient who thought of himself as boring described an image of himself with a "robotic face, looking wooden and miserable". This only started to shift after the therapist addressed it by adding it as a prediction within their experiments and when using video feedback of experiments carried out during the sessions to compare the image with what the patient actually looked like.

Step 2: find a good situation to test the belief

Patient and therapist collaboratively agree on a situation to carry out the experiment. Therapists and patients together use the formulation and their creativity to find situations that will best test a person's fears, and that are also relevant to their life and treatment goals. The situation will understandably be anxiety provoking, but needs to be something the patient is willing to try.

This therefore involves some degree of grading (for example, for most patients with SAD doing a presentation early in treatment as part of an experiment would be far too challenging). However, in our experience, it is not necessary to develop a fear hierarchy, instead we are guided by what is the best test of a particular belief that the person feels able to do at that point.

Therapists put suggestions on the table. As the therapist will have more knowledge and experience of CT than the patient, they will need to make suggestions of the kinds of

situations that will be helpful to test the patient's relevant fear. For example, in CT-SAD, *"we find it can help if we bring somebody you have not met before in to have a short conversation, is that something you would be willing to try?"* Earlier in therapy, when patient's fears are at their strongest, therapists might play a larger role in generating ideas for experiments, but as treatment progresses patients may be able to generate ideas more independently (e.g. "what would be a helpful way to test this belief?", "In what situations could we test this out?").

Producing anxiety sensations to activate the beliefs. To test patient's fearful predictions about the consequences of anxiety, it is often critical that anxiety is activated during experiments—because this is when the beliefs are activated and greatest learning is possible. For example, in CT-SAD, we must select a situation that brings on sufficient social anxiety for the beliefs to be activated and the patient to discover that, even when they feel anxious, they come across more acceptable than they think. In CT-PD, this might involve inducing panic sensations to activate the beliefs (for further examples see Clark and Salkovskis, Manual for Improving Access to Psychological Therapy (IAPT) High intensity CBT therapists, available to download from oxcadatresources.com.). Over-breathing is a common technique used to induce feelings of breathlessness and dizziness. Here, patients are asked to breathe quickly and deeply for a few minutes along with the therapist, before standing up to see if their feared belief (e.g. fainting) happens. A video demonstration of this experiment is available on the oxcadatresources.com website.

Set up the situations to get the most powerful data you can. It is important to think about ways to gather the most powerful data you can, that patients would find hard to discount. For example, in CT-SAD, we video-record as many experiments as we can to obtain footage of how patients come across and how others respond to the patient. Reviewing this footage, alongside written feedback obtained from the person/people the patient spoke to as part of their experiment (see forms for obtaining feedback from others at oxcadatresources.com) maximizes cognitive change, updates negative imagery and consolidates key messages learnt. This also allows still image flashcards to be created capturing moments of belief disconfirmation (see Figure 2; . Warnock-Parkes et al., 2017).

The patient is always in control. The treatment of anxiety almost always involves facing up to one's fears, which can generate negative emotion. It is important that whatever exercise is done is one that the patient agrees to do, they understand the purpose of it, and they feel in control. They should never feel coerced into doing an experiment.

Therapists take any concerns patients have seriously. This might involve taking time to discuss "*what might be the advantages of doing this experiment, even though it sounds challenging?*". It might be necessary to discuss making the experiment easier if patients did not think it was something they were able to try, by adapting it in some way (e.g. *"how about we have the conversations with a smaller group of people than we planned*?", or the therapist trying the experiment while the patient observes). It might be helpful to further loosen beliefs in preparation for the experiment, using cognitive techniques.

Figure 2. A still image flashcard used to freeze the moment of belief disconfirmation during a behavioural experiment with video feedback in SAD.

Do experiments together in sessions. In our experience, patients are more likely to do a challenging experiment with their therapist during a session than they would alone for homework. An in-session experiment carried out together can lead to significant belief change that can be built upon in the week to follow. Doing experiments together live also provides an opportunity for the therapist to model the experiment, guide the patient to drop any safety behaviours that might otherwise limit belief disconfirmation, and elicit generalized learning from the observations.

> SAD Case example—A patient feared that if they asked a stranger a question, the other person would get irritated with them. They first observed their therapist approaching a couple of people on the street to ask the time and for directions before then trying this themselves.

Get out of the office—make situations relevant. In CT, we have found that the most powerful situations to carry out as experiments can be the ones that are most relevant to the patient's life. This often involves leaving the therapy office together to experiment in the world outside. Many "out of the office" experiments take only a short time.

> Case examples—A patient with SAD who avoided speaking to strangers for fear of appearing foolish walked with her therapist to the street outside to ask a stranger for directions.
>
> A patient with PTSD, who had avoided walking on the roadside of the pavement since a road traffic accident, took a short walk with her therapist to test her prediction that she would be run over again, like in the accident.
>
> A patient with PD who avoided leaving the house when feeling panicky in case she vomits in public went for a walk with her therapist to the high street after bringing on panic sensations through overbreathing.

Be active—even at a distance. With some added creativity, and at times forward planning, all of the in-session experiments that can be done in person can also be done remotely. This might be done with the therapist providing support on the phone. At times co-therapists accompanying the patient in person (such as a partner or loved one)

can be helpful. Additional considerations include the fact that the therapist may have a limited view of the patient and need to ask more probing questions about their use of safety behaviours during the experiment. For example, a patient may be holding onto something off screen during an experiment to test fears about fainting in panic disorder. For examples of behavioural experiments that can be done remotely for SAD and PTSD see Warnock-Parkes et al. (2020) and Wild et al. (2020).

Situations that seize the moment! There are occasions in therapy when a naturally occurring event/situation presents itself to the therapist that will provide a good opportunity to discover something new or test a patient's fear in an unplanned experiment.

> PTSD Case example—A patient shared something they were ashamed about in PTSD treatment and the therapist then explored "How did I respond when you told me about this? What might this tell you about how others might respond?".

> SAD Case example—A therapist who was working with a patient who feared getting his words mixed up accidentally stumbled on their own words when talking and then asked the patient 'did you notice that I just tripped over my words? If so, what did you make of it? Did you think it meant I was anxious and incompetent [insert patient's belief]?

The therapist might also want to intentionally create these moments to make the most from them.

Consider individual circumstances and contexts when agreeing the situation. Getting inside the mind of the patient is made easier when we understand their difficulties in the broader context of them as a person. Each person's early experiences, cultural, religious or family contexts, communities, abilities, interests and strengths shape their cognitive and behavioural world. By understanding and embracing each patient's individual circumstances and contexts, tailoring as needed, we can ensure that the behavioural experiments we develop with them are as relevant and powerful as possible.

> PD Case example—An autistic patient with strong sensory processing (e.g. distress and nausea associated with sound) feared they would have a heart attack and die if they ran when feeling panicky. In setting up an experiment to test this fearful prediction, the therapist and patient first discussed helpful adjustments to make the experiment a more successful learning experience. For example, running in quieter nearby park rather than running down the noisy High Street outside the clinic meant the patient was more helpfully able to focus on whether their feared catastrophe happened.

> PTSD Case example—A Muslim woman had not returned to the Mosque since her assault as she felt such strong shame and feared how others would respond if they knew what happened. Reading a survey sent predominantly to Muslim respondents and carrying out an experiment during a session talking to a local faith leader helped her then experiment with reclaiming her life by returning to Mosque.

Step 3: identify observable predictions

Patients with anxiety disorders are "emotional processors" and habitually focus on themselves and how they are feeling, using their feelings as a guide to understand what is happening, which gives them unreliable information. Therefore, we need to get more accurate information about whether their feared predictions happened or not. To do this,

it is vital that patients make specific observable predictions about what they think will happen in a given situation (e.g. the prediction "I will be boring" could be made more specific and observable by adding "Other people will look away and stop speaking to me"). Then, during the experiment, they can focus on what is happening, rather than on themselves. Helpful questions therapists could ask to generate observable predictions include: *"How would we know if x/y happened?", "What would we see?", "Can you demonstrate that for me?", "How would others react?", "How would we know that?", "What would they do/say?". "What would disprove your predictions/fears?" "What would we see then?"*

Rate predictions of feared outcomes (not anxiety). In CT, we are interested in helping patients learn whether their feared catastrophes happen or not. Therefore, the 0–100% ratings that are taken during experiments are largely to do with whether the negative prediction occurred or not, rather than ratings of anxiety. We do not recommend repeatedly getting patients to rate how anxious they feel, which has the disadvantage that it can keep them focused on their body and emotionally processing rather than being externally focused on what is actually happening and disconfirms the prediction. The only exceptions to this would be when patients' feared beliefs are about anxiety itself (see examples below).

> PD Case example—A patient who thought "I will lose control if I allow my anxiety to get too high", rated their anxiety during a panic induction experiment, (where therapist and patient created sensations during a session by over-breathing), in order to discover if this happened or not.
>
> PTSD case example—A patient who feared if they looked at some trauma triggers (e.g images of people who look like their abuser) they would feel 100% anxious and this would last for days, rated their anxiety to test out if this happened or not.
>
> SAD case example—A patient who believed "I will look as anxious as I feel' was asked to rate how anxious they felt during a social interaction and then compare it to feedback given by the person they spoke to and how anxious they appeared when reviewing video footage of the interaction.

Step 4: identify safety behaviours and other maintaining processes to drop

In cognitive models of anxiety disorders patients' beliefs are maintained by a range of idiosyncratic safety-seeking behaviours and cognitive processes. To maximise belief change, the behaviours relevant in the individual's cognitive model will need to be dropped when putting fearful predictions to the test in behavioural experiments.

SAD case example—A young man felt constantly stared at when in busy public places and therefore avoided them. During his treatment, he was pleased that he managed to walk through a busy part of town. However, his belief that he was being stared at only shifted when he did so while purposefully dropping his safety behaviours of wearing his hood up and looking at the floor as he walked. Instead, when he felt people might be staring at him, he made a point of shifting his attention from focusing on himself to what was going on around him. When he looked up and around, he discovered that his feeling was misleading.

Take time to spot the relevant safety behaviours to drop. Safety behaviours are idiosyncratically linked to the beliefs that patients have and can vary considerably from patient to patient. For example, one patient with PTSD who feared being assaulted again when in public constantly looked over her shoulder. Another patient who had a similar trauma and fear kept her hand on her phone when walking, always prepared to make an emergency call. We recommend that therapists take time in CT to explore what safety behaviours patients use linked to their individual beliefs. It can also help to use process measures to identify them and monitor their use across treatment to ensure they are being dropped. These measures can also give more novice therapists an indication of some of the most common behaviours. For example, the Social Behaviours Questionnaire in CT-SAD (SBQ: D. M. Clark, 2005); the Safety Behaviours Questionnaire in CT-PTSD (SBQ: Dunmore et al., 2001) and the Panic Safety Seeking Behaviours Questionnaire in CT-PD (PSSBQ: D. M. Clark & Salkovskis, 2009).

"If . . . then" predictions can help. It is important that therapists and patients spend time to identify the safety behaviours linked with the fear-inducing belief that will need to be dropped during the experiment. Once patients are clear on exactly what they should be doing differently during an experiment, this is recorded on their experiment sheet. It can help to make IF . . . THEN predictions, based on what would happen if patients were to drop their safety behaviours. For example, "If I drive like I used to before my trauma, without excessively checking my mirrors, then there will be an accident" (PTSD); "If I speak spontaneously, without preparing what to say, then people will think I'm boring and stop speaking to me" (SAD); "If I keep standing when I feel panicky rather than sitting down, I will faint" (PD).

Operationalize what dropping safety behaviours would mean. It can help to spend a little time discussing what exactly patients will need to do differently when dropping them. This is of particular importance for patients who may have habitually used safety behaviours for years. For example, a patient with complex PTSD who has scanned for danger since childhood trauma may need help to think about what it would look like to walk down the street without doing this.

Use analogies if helpful. We have found that using analogies like the "brick layer's apprentice", commonly used in CT-PD, can be helpful when explaining the rationale for dropping safety behaviours. The therapist shares a story with the patient about an apprentice brick layer whose colleagues are having a joke at his expense by asking him to hold up a brick wall they are laying at every lunch break. The patient is encouraged to consider all the ways they would encourage the apprentice to discover that holding up the wall is unnecessary (e.g. taking his hands away from the wall, pushing the wall to test if it falls). The patient and therapist then consider how this story might apply to the patient's problem. "Taking hands away from the wall" becomes a shorthand in CT for referring to dropping safety behaviours (such as a patient who fears fainting stops holding onto something when feeling panicky), and "pushing the wall" a shorthand for scaling up the experiment (e.g. the same patient stands on one leg to further test if they faint when feeling panicky).

Step 5: carry out the experiment

Focus on the outcome, not feelings. When carrying out the experiment, whether it is during a therapy session or for homework, it is essential that patients drop their safety behaviours and consider whether their feared catastrophe happened, rather than on how they feel. If therapists are present during the experiment, it might be possible (unless the patient is involved in a conversation with somebody as part of their experiment) to help by gently asking questions to help shift patients' attention onto the outcome rather than their feelings. For example, *"Have you fainted yet? How much do you think right now you will faint?"; "How are other people actually responding to you?"; "Have we been attacked yet? How much right now do you think we will be? Is there anything more you are doing now to prevent that from happening?".*

Guide and prompt patients to drop safety behaviours. If the therapist is present during the experiment (either in person or remotely) it helps to prompt the patient to keep dropping their safety behaviours and check for any other maintaining strategies as the experiment progresses. This is important as patients may not always be aware when they are using them. For example, patients with SAD often need reminding to keep their head up and observe other people, focusing externally rather than on themselves, when carrying out experiments in public places. The therapist also helps the patient to look out for any other cognitive processes (such as high levels of self-criticism) that might interfere with the learning from an experiment if present. If the therapist accompanying the patient has become a safety behaviour, then this may need to be addressed.

Therapists model the experiment where possible. To loosen beliefs and facilitate patients to feel brave enough to try the experiment themselves, it is often helpful for therapists to do the experiment alongside the patient (as in the example of strenuous over-breathing to test panic cognitions in CT-PD above) or to briefly model the experiment first. This allows the patient to learn by observing from a distance without feeling as self-conscious or anxious that their feared catastrophe does not take place. Modelling is particularly relevant for more challenging decatastrophising experiments (see below).

Consider if traumatic memories might influence the processing of the present. For patients who have experienced traumatic memories, it is possible these can be triggered during behavioural experiments. This can lead them to process the present-day situation through the lens of the past. This might involve affect without recollection, whereby patients feel strong anxious feelings linked to past experiences without recalling specific memories. If this happens during a behavioural experiment it can lead patients to continue to feel high levels of distress, even in the face of information that does not fit with their predictions. This can then limit the cognitive change that we hope would follow a successful experiment. In these cases, we recommend that Then vs Now trigger discrimination is used. This is a technique initially developed in the treatment of CT-PTSD (Ehlers & Clark, 2000) to help discriminate between present day (often sensory) triggers for re-experiencing and their current context and similar, but different, stimuli in the context of past traumatic event/s. We have found it can be helpful in the treatment of other anxiety disorders if traumatic memories haunt patients in present day anxiety provoking situations. Patients are guided to spot their memory triggers and start to look

out for all the things that are different between THEN (the traumatic memory) and NOW (the present day situation). In doing so, their reexperiencing of emotions and moments from the trauma is reduced and they are better able to objectively process what is happening during their experiment.

> PTSD Case example—A patient who experienced a traumatic birth practised spotting her memory triggers (e.g. seeing medical equipment) and using Then Vs Now before carrying out behavioural experiments as part of her treatment. One experiment was to attend a hospital appointment with her child rather than avoiding them, which she had been doing since the trauma. The discrimination training she did meant that was able to spot when memories were triggered during the experiment (e.g. seeing a stethoscope) and to remind herself of all the ways in which the current situation was different now (e.g. I'm not giving birth now, I'm safe now, my child is now 4 years old, etc.).
>
> SAD Case example—A patient with SAD who was bullied by a group of people at school found experiments in groups very anxiety provoking and often came away with strong feelings of being humiliated, even when the group responded well to her. Looking out for differences such as "I am now an adult now", "These are other people, they look different", "They are not saying nasty things about me now" "I am now at work, not in school", helped her to focus on whether her feared catastrophes happened or not.
>
> PD case example—A patient who was locked in a cupboard as a child by an abusive teacher at school feared having panic attacks in small spaces. They found it helpful to purposefully notice all the differences between small spaces being used for their experiments in therapy and the cupboard they were locked into (e.g. "The abusive teacher is not here now", "This is my therapist now", "I am an adult now, I can go in and come out by choice now", etc.).

Snowball belief change by scaling it up. If the experiment has gone well, it can be scaled up to make it even more convincing. The patient can be asked to try something a little more challenging as they feel more confident discovering that their feared concern is not happening. These are experiments the patient would have been unlikely to try on their own for homework.

> PD Case example—A patient who feared having a heart attack avoided all exercise. He and his therapist set up an experiment to test his fear that if he went for a strenuous walk, he would have a panic attack and die of a heart attack. After walking for some time, the patient became more confident that the anxiety sensations he was experiencing were not a heart attack and started to feel calmer. At this point, the therapist suggested to scale up the experiment by gently jogging through the park together. After doing this, the patient was pleased to discover his feared concern did not happen and the therapist suggested they really go for the burn by doing a fast run on the way back to the clinic. Doing this in session led to the patient feeling confident to carry out further experiments for homework.

Step 6: review the outcome and generalize the learning

After the experiment is over, patients and therapists discuss the outcome, focusing on what happened, rather than on how the patient felt. Patients sometimes need extra guidance in doing this if they were focused on their anxious feelings at the time. Therapists can support them to consider each prediction and review whether their fearful concerns happened, and if so to what extent.

Generalizing the learning makes the experiment more powerful. Patients do not tend to generate generalized learning automatically following an experiment. Following an experiment, patients typically focus on the outcomes and learning from that specific situation. For example, a patient with PTSD who fears being attacked again experiments with walking without scanning for danger and concludes "I learnt I was not attacked". It can be helpful to use guided discovery to encourage patients to also consider the *generalised* learning they are taking from the experiment, i.e. going beyond the specific situation to consider what the experiment outcome says more generally about them, others, and about the feared belief being tested (Thew et al., 2023). In the PTSD example above an example of more generalized learning might be: *"This shows me I am safer than I feel I am—feelings of danger are coming from the trauma memory".*

> SAD Case Example—Following a conversation experiment, a patient with SAD is more likely to write down on their experiment record sheet outcomes and learning something like "I predicted I would be ignored but others spoke to me", than drawing more generalized learning, such as "This shows me I'm acceptable and likeable".

Helpful questions to elicit generalised learning include:

- *"What does this tell you about your belief x/y more generally?"*
- *"How does what we discovered fit with your belief x/y?"*
- *"What does this tell you more generally about . . . how you come across in social situations/how safe you actually are/what these sensations actually mean?"*
- *"What does this tell us about the impact of x/y behaviour/strategy more generally"?*
- *"What does this tell us about the future?"*

Rating the level of conviction in the alternative perspectives that arise from these questions can lead onto a discussion of the next steps to build on this learning.

Update negative self-imagery where relevant. Patients who experience negative images can also benefit from discussing how their learning fits with their negative images more generally, for example: *"How does this learning fit with the images you experience?", "What does this tell you about the image you have of yourself looking like x/y?".*

Consolidate the learning. In addition to writing down learning on behavioural experiment record sheets, making flashcards of important discoveries to use over the week to come can be helpful. Taking mental snapshots of key moments of discovery during the experiment, or preferably, creating still image flashcards from photographs taken at the time can be a powerful way to update patients' negative images from their experiment learning.

> PD case example—After a helpful experiment a patient with panic disorder created a flashcard on his phone to help hold onto the learning. He wrote: "Next time my heart rate increases remember- I ran at full speed when panicky in the park and nothing happened —it is just anxiety and will pass."

> SAD case example—A person pictured themselves looking boring and weird with wide eyes before treatment. They reviewed video footage of several experiments they carried out across

treatment to discover that although they often feel boring and weird, they come across acceptably to others and do not appear as anxious as they feel. A still image flashcard created from an experiment, showing them looking like any other "normal" person, was used to update their negative self-image (see Figure 2). They stored this on their phone to look at over the week (for other examples of using still image flashcards during experiments in SAD see Warnock-Parkes et al., 2017).

Case example PTSD—A woman re-experienced an intrusive image of herself alone in the bathroom in the aftermath of a rape. At this hotspot in her trauma, she felt totally ashamed and thought that nobody in her community would accept her if they knew what happened to her. The patient used the learning from a behavioural experiment she carried out during treatment (disclosing her rape to two close friends) to update this hotspot in her trauma memory by looking at a photo of her with these friends taken just after the experiment which is turned into a still-image flashcard.

Step 7: build on the learning by planning follow-up experiments

It is rarely the case that a single experiment will be sufficient to address a belief that has high emotion and conviction. Therefore, once an experiment has been completed patients and therapists will want to consider how they can build on the learning by planning follow-up experiments. This may involve refining the in-session experiment. For example, if a patient was unable to fully focus externally or drop their safety behaviours in a social situation, it may help to repeat the experiment, this time dropping all these strategies. If further experiments are being agreed for homework, they should not be significantly more challenging than the in-session experiment just completed. Therapists and patients may want to discuss whether a friend or loved one could support the patient with experiments done for homework.

The art of CT is listening for the doubt ("yes, but . . . "). Patients often have doubts about the outcome or learning from an experiment. Examples include: "*Maybe this means I am acceptable as I am"; "This shows me the panic problem is probably an anxiety one, rather than a going mad one"; "I might be safer than I feel I am"*. Therapists may be tempted to ignore these and focus just on the positives from the experiment, but this means the doubts are likely to persist. It is important to listen out for, elicit, and welcome doubts so they can be explored and addressed. They often provide an invaluable source of ideas for the next experiment whereby the doubt is turned into a prediction.

SAD case example—During discussion of a social experiment a patient expressed the following doubt: "It went well, but if I had been speaking to more people I probably would have made a fool of myself". This is then turned into a further experiment whereby the patient carries out the same experiment in a larger group.

Encouraging patients to use golden opportunities. Some experiments that patients do across the week will have been planned. Others will be in response to what we call *golden opportunities* that patients notice in daily life. In these experiments a patient will be instructed to look out for key moments of concern over the week. For example, a patient with PTSD who fears they are now at generalized risk of being assaulted again is asked to look out for moments when they feel in danger, or a patient with panic disorder who fears that chest pain is a sign of a heart attack might be guided to notice any twinges in his chest, a person with SAD who believes they are weird is asked to notice any experiences

when they feel like they are coming across as weird. When they notice these moments of concern, they are asked to use their negative thoughts and feelings as a cue to make a quick prediction, drop their safety behaviours and gather data. For example, the person with PTSD notices they feel they are in danger when in a local supermarket. They spend a moment predicting that they will be assaulted if they stay there without scanning for danger, and then spends 2–3 min dropping their safety behaviours to helpfully discover they are not assaulted—they were safer than they felt they were. This can generate powerful learning in only a minute or two. Patients can then retrospectively record what happened. This often allows for many opportunities for fearful predictions to be put to the test each day and generates a good log of alternative evidence. For examples of using golden opportunity logs to address persistent negative self-beliefs in SAD, see Warnock-Parkes et al. (2022).

Zero avoidance. Later in therapy, if experiments are going well, the idea of a zero avoidance week (or a day or afternoon if a week is too much) can be introduced for homework. The principle is like using golden opportunities, whereby patients across that week look out for the urge to avoid something, as this indicates a situation in which a problematic cognition would be triggered. Patients are encouraged to use this urge as a cue to engage, rather than avoid. They are asked to make a mental prediction, face the situation, drop their safety behaviours and discover what happens. They can retrospectively record their observations in a record sheet across the week.

> SAD case example—A person who feared coming across as stupid spent a day noticing her urge to keep quiet and uses this as a cue to speak up for a minute or two longer than usual while dropping her safety behaviours. This helped her to gather several examples of data that she was acceptable to others.
>
> PTSD case example—A person with complex PTSD had the urge to avoid getting close to others as she felt people would hurt and abuse her as they had done in the past. She used the urge to avoid connection with others as a cue to do the opposite and gather data she was safer with others than she felt she was.

Discovering that consequences of common feared outcomes may not be as bad as the patient assumes (decatastrophising experiments). Many patients overestimate both the probability of their feared catastrophe happening and the cost/awfulness if it were to happen. As CT progresses, patients learn that their feared catastrophes are much less likely to happen than anticipated. This is reflected in a reduction in their belief ratings and other measures. However, patients may still fear that if, in the unlikely event their feared catastrophe were to happen, it would be unbearable, exceedingly dangerous or otherwise catastrophic. If this is the case, it is important to explore whether patients have a distorted perception of the consequences, including how others would respond *("If ×happened, what would be so bad about that?")*. These kinds of beliefs are particularly common in SAD and PD. For example, "I am likely to noticeably blush, and if I do others will laugh at me"; "I am likely to faint when I feel panicky, and if I do nobody will help me, and I'll be left alone." If there is a distortion in thinking, as with these examples, decatastrophising experiments are introduced. This is where therapists and patients may intentionally demonstrate the specific worst feared outcome by faking it, rather than

waiting for it to happen naturally. This is because some of the things that patients worry about are unlikely to happen (e.g. being sick during a panic attack). Also, when patients are caught off guard by the natural occurrence of something they worry about (such as forgetting their words) they often feel highly anxious, and this can make them more self-focused and less able to observe the reactions of others. When intentionally acting out their feared catastrophe, they are more likely to be in the frame of mind where they can observe the consequences. Examples include purposefully saying something stupid or boring, or creating the appearance of a blush, shake or sweat for SAD or recreating a faint or vomiting in public for patients with panic disorder and then observing reactions. These experiments can also be helpful in PTSD. For example, a patient who suffered a leg injury during her trauma avoided walking in front of her work colleagues as she feared they would think she weak and incapable. To test her fear, she purposefully exaggerated her limp while walking in the office to observe her colleagues' reactions. The main aim of these experiments is to find out how others respond to the behaviour that patients are concerned about, so the level of anxiety patients experience during these experiments is inconsequential. When relevant for the individual and if done at the right point in treatment (usually later in therapy), these experiments are usually a powerful step in setting patients free from their fears, as they discover that even if their worst fears were to happen, it would not be as bad as they think. Figure 3 shows an example.

Key tips for decatastrophising experiments

- ***Target only things the patient is fearful of***. These experiments are used to test patients' idiosyncratic feared catastrophes. So do not do outrageous things simply to

Situation	Predictions	Experiment	Outcome	Learning
Going for a walk to local coffee shop during a remote session with blusher on	If I wear blusher to create an appearance of redness the shade I feel I blush, then people will stare at me, give a weird look and may laugh – 60%	Put blusher on and walk to local shop with therapist on phone (headphones). Look up and around, focus externally. Observe reactions.	Nobody stared at me, a couple of people glanced but looked away. Nobody laughed. Re rate belief – 10%	This shows me blushing may not be as big a deal as I think it is. Not as noticeable and people do not care as much as I thought. I am acceptable even if I look red in the face. I believe this 60% I can try wearing the blusher again tomorrow when I go to the supermarket

Figure 3. Example decatastrophising experiment carried out a remote CT-SAD session.

draw unnecessary attention to them. We have heard examples of these experiments not going to plan when therapists may have misunderstood the principle and asked patients to do something that is not linked to something they personally worry (e.g. putting on a funny accent, skipping down the street, screaming in public). None of these are things that patients with SAD, panic disorder or PTSD would typically worry about. Only do things to test the patient's own fears.

- ***Start them in session.*** Decatastrophising experiments are challenging for patients to try. It is recommended that they are first carried out as in-session experiments alongside the therapist before being set for homework.
- ***Therapist fakes it first.*** It is often most useful if therapists model acting out or creating the appearance of the feared catastrophe first so that patients can observe the responses of others when feeling less self-conscious. This usually means they feel more able to try the experiment themselves alongside the therapist. For example, for a patient who feared being sick when she panics, the therapist first fakes vomiting in public to test fears that others will crowd around and respond with disgust which then helps the patient feel more confident to try this themselves.
- ***Don't go over the top.*** There is also no need to dramatically exaggerate the fear. We want to maximise the chances that the experiment will be helpful by recreating the feared catastrophe to the level the patient is concerned about. For example, applying blusher to the shade they feel they turn red, or applying the same amount of water to their underarms to re-create the feeling they have when they feel sweaty.
- ***Specify what needs to be done and when.*** When the patient is doing the decatastrophising experiment themselves, it is usually helpful to agree exactly what the patient should do, how and when. This helps to avoid patients becoming too self-focused thinking about how they will carry out the task and less able to observe the reactions of others.
- ***Keep homework manageable.*** Any experiments set for homework should not be significantly more challenging than those the patient has already done in session.

Troubleshooting common challenges

We hope that therapists will find that experiments are successful when set up and carried out in the ways detailed above. However, over the years we have come across some common blocks to carrying out successful experiments that can limit cognitive change, lead patients to discount their findings or prompt therapists to abandon the experiment and move onto a different intervention. We encourage therapists and supervisors to work on spotting the block (be that on the part of the patient or therapist) and addressing it.

Common blocks patients face when doing experiments

When patients use their feelings to judge the outcome

One of the most common problems experienced during behavioural experiments is that patients use their anxious feelings to judge what has happened during the experiment and draw a negative conclusion. Sometimes some careful questioning can help patients to see that the outcome (i.e. what actually happened) was different to how they felt at the time.

PTSD case example—For example, after a car accident, a patient with PTSD had avoided driving for many years for fear of having another accident. As a behavioural experiment, she went for a short drive with her therapist while dropping excessive scanning for danger. At the end of the experiment she reported "That felt awful! I hated it!". Her therapist helped her to explore this feedback:

Therapist: I'm sorry that felt difficult. You did really well as this is something you have been avoiding doing for a long time. What actually happened?

Patient: I felt awful!

Therapist: Yes, that must have felt uncomfortable, but did your prediction come true—was there an accident?

Patient: No, there wasn't.

Therapist: You felt 80% sure there would be an accident, but there wasn't. What does that tell you about where this feeling of threat is coming from?

Patient: I guess maybe it's not as threatening as I feel it is. Maybe it's coming more from the memory.

Therapist: How much do you think there would be another accident if you drove again without scanning?

Patient: Probably 30%.

In CT-SAD, if this happens during a behavioural experiment that has been recorded during a therapy session (e.g. a patient feels that they blushed or said something stupid during a conversation with a stranger), the video recording can provide useful information to discover what actually happened. For guidance on using video feedback in this way, Warnock-Parkes et al. (2017).

When patients were still using safety behaviours or self-focused attention

Another common reason why experiments might not work as intended is that patients are continuing to use either their safety behaviours or they are remaining self-focused.

PD case example—A patient's belief that would faint during a panic attack did not shift much following a remotely delivered experiment inducing panic sensations by over-breathing and dropping safety behaviours. During an in-depth discussion afterwards, the patient revealed that they had moved their laptop nearer to the wall for the therapy session and placed a chair just off screen. During the experiment, they had kept telling themselves they would be OK because they had the wall and chair nearby. This discovery led to a further experiment where the patient stood in the middle of the room without an aid in reach.

The case above demonstrates the importance of asking about use of other safety behaviours during experiments, particularly when conducted remotely and we are unable to see all the patient or their environment.

When patients are highly self-critical

Some patients can experience negative thoughts or ruminations in a self-critical, self-attacking tone. We have found in some cases this can interfere with how patients process information at the time of an experiment and afterwards. It is important that therapists spot when patients are engaged in self-criticism and use simple manoeuvres to help switch off the inner critic to view the outcome of the experiment more objectively.

Case example SAD—A self-attacking patient with SAD who viewed video of themselves as part of an experiment processed what they saw on the video through the lens of their self-critical attack (e.g. "I look awful! I'm an idiot!"). This prevented them from focusing on the accepting reactions of other people. To address this the therapist helped the patient to turn the sound off and focus more on the reactions of those they were talking to (for further guidance, see Warnock-Parkes et al., 2017).

Case example PTSD—After a patient's assault, they believed their life had been ruined and they would never enjoy things they used to. Their therapist encouraged them to experiment with trying some activities they used to enjoy, like watching films. However, throughout the experiment they continually attacked themselves (e.g. "You are useless, you can't even focus on this film"). This self-criticism fuelled their distress and led to them concluding "I don't enjoy anything!". By identifying this self-critical rumination as a process, the therapist could then help them practise noticing it and speaking to themselves with more kindness during their experiments.

When patients do not believe the reactions of others during experiments

Most patients with SAD accept that if others did not respond negatively to them, this is a reliable sign that their fear did not happen. On rare occasions, some patients worry that even though the other person did not show any outward signs of judgment, they were still internally criticizing them. Here, obtaining feedback from conversational partners is helpful, as is the use of surveys. This can also be a sign that the patient is criticizing themselves and assuming that other people are thinking in the same way. If this is the case, helping them spot this self-criticism and reminding themselves "that is my inner critic, not what others are thinking" can be helpful.

A useful intervention can be to ask the patient: *"If that person was really going to reject somebody, to never speak to them again because they blushed, what would that say about them?"*. When reflecting on this question most clients tend to see that if somebody truly rejected another person because they were not socially perfect (e.g. because they looked sweaty or ran out of things to say) then this would say more about the other person than it would about them. Helpful follow up questions are "*Would you respect their values?*", "*Is that somebody you would like to be friends with?*". Patients usually respond that they would have little respect for somebody this judgmental and would not choose to befriend them. If patients continue to have concerns about what others are *"really thinking"*, a further step can be to try an intervention described by Christine Padesky called Assertive defense of the self (Padesky, 1997).

Therapist's fears and concerns about experiments

Therapists can understandably have a range of fears or blocking beliefs that can hold us back from trying some of the most powerful experiments for patients. We have tried to address some of the most common concerns and questions we have come across (and experienced ourselves) below. Therapists who find they face several of their own blocking beliefs may also benefit from further self-practice/self-reflection (see Bennett-Levy et al., 2015).

"The experiment might go wrong"

Therapists are never certain on what the outcome of a behavioural experiment will be. However, as patients' thoughts are usually distorted, the outcome of experiments is invariably better than patients predict if set up in the way we have described above. Therapists may also have their own fears about demonstrating feared outcomes in decatastrophizing experiments. A common concern is that other people might stare or respond negatively when the therapist and/or patient recreate patients' feared catastrophes in public. It is important that therapists look out for any of their own social fears about doing experiments, discuss these in supervision and put these to the test in their own behavioural experiments. Therapists might be pleasantly surprised to discover that people do not respond as negatively as they think. It is also helpful to have personal experience of carrying out different experiments and this can be done during supervision. Therapists may find our video on addressing our own fears about decatastrophising helpful, which is available on the oxcadatresources.com website.

"There is not enough time in the session to complete in-session experiments."

CT treatment protocols generally recommend 90-min sessions to allow sufficient time to carry out behavioural experiments in and out of the therapy room and discuss what the patient has learned from the experiment. However, many therapists find they come across service constraints that can limit their session time. In these cases, the following tips might be helpful:

- *Keep discussion about homework short and then get active.*
- *Keep the agenda brief.*
- *Some experiments can be as quick as a couple of minutes*

"My patient will have a panic attack or flashback and I won't be able to manage it"

We as therapists can have our own beliefs that we may need to put to the test about carrying out particular behavioural experiments with patients. For example, therapists who treat Panic Disorder or PTSD sometimes worry what they would do if a patient had a bad panic attack or strong flashback when carrying out an experiment out of the office. As outlined above, in CT-PTSD we usually recommend using trigger discrimination/Then Vs Now before and during challenging out of the office experiments to prevent reexperiencing of emotions and sensations from the trauma interfere with processing what is happening in the present and disconfirms their predictions. In panic treatment, although therapists may worry about it

happening, natural experiences of panic during a session can be used as a powerful learning opportunity as these usually do not last very long and they experience that the feared catastrophe does not occur. Discussion of therapists' fears and role play in supervision to increase confidence in managing distress during sessions can be helpful.

"The experiment is too challenging"

Social fears are common and it is rare to find a human being who does not have some concerns about what other people think of them. For example, many people, including therapists, find public speaking challenging. It is worth being aware that our own beliefs about challenging social scenarios may become a block to setting up certain helpful experiments for our patients. If experiments are timed well, beliefs have been loosened in advance, and the patient has collaborated in setting up the experiment, patients are usually willing to try them, even if they are challenging.

"My patient with SAD looks anxious—the treatment will not work"

Some therapists who treat SAD may worry that their patient does display some signs of anxiety and then have concerns about how effective the treatment will be. However, how the patient imagines they look (e.g. like a rabbit in headlights) is usually much more negative than what is noticeable to others (e.g. looking slightly tense in the conversation).

Conclusion

Behavioural experiments represent a powerful formulation driven technique in the CT practitioner's toolkit. The evidence suggests that the cognitive changes resulting from behavioural experiments and other CT techniques play a significant role in driving clinical improvement. This paper has summarized our group's accumulated learning, acquired over 30 years, in how to design and carry out behavioural experiments in CT. We hope that therapists will find this paper useful to support more frequent use of experiments in their clinical practice, or to plan an experiment for themselves to test any understandable therapist fears or concerns about doing this.

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