Behavioral Experiments

Allison G. Harvey, Lisa S. Talbot
*Golden Bear Sleep and Mood Research Clinic, Psychology Department,
University of California, Berkeley, CA*

PROTOCOL NAME

Behavioral experiments.

GROSS INDICATION

Behavioral experiments provide:

- an approach to challenging unhelpful beliefs about sleep and developing/testing new (and helpful) beliefs about sleep;
- an approach to facilitating awareness of perpetuating cognitive and behavioral processes and bringing about change in/reversal of these processes.

SPECIFIC INDICATION

There is no evidence that this form of therapy is differentially effective for subtypes of insomnia.

CONTRAINDICATIONS

Based on clinical experience, this treatment modality may be difficult to utilize when the context only allows for short therapy sessions (i.e., therapy sessions less than 50 minutes) because most behavioral experiments need time to set up and then, in a subsequent session, debrief.

Specific behavioral experiments have contraindications (see Chapters 8–10 in this volume for examples).

RATIONALE FOR INTERVENTION

Because verbal techniques like directly questioning the logical basis of thoughts and beliefs, Socratic questioning, and guided discovery are typically not enough on their own to bring about profound change, behavioral experiments are used. Behavioral experiments are "planned experiential activities, based

on experimentation or observation, which are undertaken by patients in or between ... therapy sessions. Their design is derived directly from a ... formulation of the problem, and their primary purpose is to obtain new information which ... [includes] ... contributing to the development and verification of the ... formulation" [1]. Behavioral experiments encourage patients to become scientists (i.e., to make judgments in their lives based on data they collect, rather than based solely on their subjective feelings).

STEP BY STEP DESCRIPTION OF PROCEDURES

There are essentially six steps to completing a behavioral experiment [1]:

1. Precisely identify the belief/thought/process the experiment will target.
2. Collaborate with your patient to brainstorm ideas for an experiment; be as specific as you can.
3. Write predictions about the outcome and devise a method to record the outcome.
4. Anticipate problems and brainstorm solutions.
5. Conduct the experiment.
6. Review the experiment and draw conclusions.

Finally, identify follow-up experiments if needed.

Before explaining each of these steps in more detail, it is important to note that conducting behavioral experiments requires an openness to any outcome. The purpose of the experiment is to facilitate your patient to have new experiences and to discover new possibilities (even if they are not the experiences/outcomes you expected). Very often, the experience of a behavioral experiment brings about profound disconfirmation of unhelpful beliefs or stunning demonstrations that certain behaviors or thoughts are important contributors to the insomnia. They can also provide deep experiential learning that new thoughts/beliefs/behaviors can reduce distress/anxiety and improve sleep.

If you are going to make use of behavioral experiments, introduce the idea in Session 1. Explain to the patient that:

A big part of this treatment is that you and I will be thinking together creatively to devise ways of working out which of the things that you are currently doing are helpful or unhelpful. We'll do this by setting up and completing behavioral experiments. Behavioral experiments are just like experiments that scientists do. They enable us to collect data on important issues in our lives and they are also a means of generalizing what we're working on in session to your day-to-day life so that the changes really "stick". We'll also use behavioral experiments to figure out what works best for you. Everyone is different, so it is important that you are willing to experiment to find out what works for you. That is, we'll be trying new things or stopping doing some familiar things. And I'll be asking you to tell me honestly how these changes work out for you. Based on your experience, we will learn what helps and what makes things worse. The more experiments you do, the faster we can figure out what will help you.

Then ask, "Are you willing to do some experiments and then report what you notice?"

Also, when possible, it may be better to do behavioral experiments within the therapy hour rather than across 2 or more days, as it creates a more controlled environment (i.e., fewer potential confounding variables). However, as will become clear in this chapter and in Chapters 8–10 in this volume, many behavioral experiments for insomnia need to be conducted *between* therapy sessions. For these experiments, particular care is needed to ensure maximally efficient and effective learning. Be very specific when planning the experiment. Operationalize exactly what the experiment involves, define the outcomes and – this is very important – when possible, *practice* the skills needed for the conduct of the experiment within the therapy session *before* the patient goes home to try the experiment. When possible, we also suggest that experiments conducted during the daytime be conducted within 1 day. If conducted over 2 days, the results can be attributed to sleeping better on one of the nights or to differences inherent to the days (e.g., the work I was doing wasn't so hard that day) [2].

We've found that therapy outcome is better when we really move the treatment along. That is, if an opportunity arises to do a behavioral experiment, go for it. The therapist should try to accumulate as much evidence as possible (against unhelpful beliefs, etc.) as quickly as possible. Aim to complete at least one behavioral experiment per session.

Now to return to the step-by-step process of setting up a behavioral experiment.

Step 1: Precisely Identify the Belief/Thought/Behavior/Process the Experiment will Target

Be clear about the reason for doing the experiment. Define the target. Write it down as the "aim" of the experiment. Sometimes the aim is to challenge a currently held unhelpful belief, a style of thinking, or an unhelpful behavior. Sometimes the aim of the experiment is to test a new (more helpful) belief, style of thinking, or behavior. Sometimes an experiment compares these two. Other times the experiment is "observational" [1]. The survey experiment described in Chapter 8, on unhelpful beliefs, is example of this. This involves gathering evidence regarding specific beliefs and behaviors related to sleep. In the example we will discuss in this chapter (patient John), frequent worrying in bed was identified as an unhelpful behavioral process to target through a behavioral experiment (see Table 7.1).

Step 2: Collaborate with your Patient to Brainstorm Ideas for an Experiment

Be as specific as you can. Define a time and a place for the experiment. Identify people and resources needed to complete the experiment [1]. Be creative, and try

TABLE 7.1 Behavioral Experiment Record Sheet for John

Aim and prediction	Experiment	Outcome	What I learned
What do I want to find out? What do I think will happen?	**How will I test my prediction?**	**What actually happened? Was the prediction correct?**	
Aim: Determine whether savoring is a process that will reduce my worrying in bed and improve my sleep. *Prediction*: Savoring will make lying awake more pleasant, but will not help my sleep quality.	On 3 nights, when lying awake in bed, try the process of *savoring* (recall, appreciate, and enhance positive experiences of the day; focus on each experience in an in-depth way by remembering feelings, words, scents, and other details associated with the experience)	*Night 1:* Sleep quality rating (1–10): 5 Pleasantness rating (1–10): 6 (Time spent savoring: 15 min) *Night 2:* Sleep quality rating (1–10): 8 Pleasantness rating (1–10): 7 (Time spent savoring: 25 min) *Night 3:* Sleep quality rating (1–10): 6 Pleasantness rating (1–10): 8 (Time spent savoring: 20 min)	Savoring made me feel calmer and it was much more pleasant than worrying. I felt less anxious. Savoring seemed moderately helpful for my sleep quality. It might become even more helpful if the process is more "natural" for me. I plan to practice it during the day so that savoring becomes easier for me.

to arouse a patient's curiosity and interest. If your patient comes up with an idea for an experiment that tests beliefs or behaviors, go with it. This may increase interest in this approach and motivation to complete the experiment. Write down all of the decisions made. In the example of John (see Table 7.1) he believed that worrying in bed was likely to be unhelpful, but he could not think of alternative cognitive strategies that could occupy his mind. The therapist suggested the concept of savoring – a process that involves recalling, appreciating, and enhancing positive experiences of the day. John expressed interest in this idea, particularly given that he was working on developing a more positive approach to his life in general. John and the therapist decided to test the effectiveness of savoring by having John try it, instead of worrying, while lying awake in bed on 3 nights.

Step 3: Write Down Predictions about the Outcome and Devise a Method to Record the Outcome

This should be done as soon as possible after the experiment is completed. This is critically important. If a patient waits until the next therapy session, a number of days later, to report the outcome, the memories may be vague and inaccurate. In such a case, the learning would be greatly reduced. In John's experiment, he predicted that savoring would not help him fall asleep faster but would make the experience of lying awake in bed more pleasant. The outcome variables of "sleep quality" and "pleasantness", with 1–10 scales, were listed for John to rate each morning after completing savoring during the previous night. In addition, John estimated how long he tried savoring during the night (see Table 7.1).

Step 4: Anticipate Problems and Brainstorm Solutions

Ask, "What things might prevent you from doing this?" Collaborate with your patient to identify possible obstacles, and think together about how to prevent these from becoming impediments to the conduct of the experiment. We emphasize again that it is really important to *practice* the skills needed for the conduct of the experiment within the therapy session *before* your patient goes home to try the experiment. In the case of John, he expressed a genuine interest in trying savoring, but also discussed his concern that he was naturally a "more negative guy". The therapist reassured him that the two of them would practice savoring in session. After reviewing the guidelines of the savoring process, the therapist and the client each closed their eyes for 2 minutes and tried savoring. The therapist then asked John about his experience. He expressed that he had experienced a few moments where he felt he was attending to the "positives" of the day, but that he also felt frustrated that his mind jumped between experiences. The therapist and John brainstormed ways he could enhance his connection with savoring, such as through focusing on each experience in a more in-depth way by remembering the feelings, words, scents, and other details associated with the experience. John wrote down these ideas associated with savoring to review at home. At the end of the session, he felt more confident in his ability to use savoring as an in-bed process.

Step 5: Conduct the Experiment

In John's case, he attempted savoring while in bed on 3 nights during the week between therapy sessions, and each time completed the ratings in the morning (see Table 7.1).

Step 6: Review the Experiment and Draw Conclusions

Ask the patient to summarize the session/main point learned. Help the patient by filling in the gaps. Write down the conclusions; make a copy for the patient to take home and keep a copy for the files.

In our example, John returned to the next therapy session with his behavioral experiment form completed. It indicated that on all 3 nights John found the experience of savoring pleasant (scores of 6, 7, and 8 consecutively on a 1–10 scale). Interestingly, on each successive night the experience became more pleasant. He believed this upward trend was a result of the process becoming easier with more practice. To John's surprise he also found that his sleep quality generally improved following savoring, though there was some variation (ratings of 5, 8, and 6, see Table 7.1). He concluded that savoring increased his sense of calm and pleasure when lying awake in bed, while decreasing his anxiety. He found it moderately helpful for his sleep quality.

Keep a look out for, and a list of, the conclusions drawn for each experiment. In subsequent sessions, keep reminding the patient about these. The goal is to promote deep encoding of the new material. Repetition of the core conclusion helps with this.

Sometimes an experiment will not generate the outcome you or your patient were expecting. When this happens, walk patients through the experiment step-by-step. Start with an understanding of the context (What was their mood? Where were they? Had anything significant happened just prior to starting the experiment?). Then cycle through questions like, "What happened next?", "What did you do then?", "What did you think?", and, again, "What happened next?", until you have a hypothesis about what happened. Typically, via careful questioning, learning can be derived from an experiment regardless of the outcome. In John's case, the therapist and patient discussed that his sleep had improved, albeit not dramatically, on the savoring nights. After some questioning regarding his experience of the savoring, John hypothesized that his sleep quality might improve if savoring became more "second nature" for him. He suggested that he practice savoring during the day three times in the next week, in addition to continuing to implement it during the night.

Step 7: Identify Follow-up Experiments if Needed

If the experiment wasn't completed fully, or if the outcome was ambiguous and raised another question, return to Step 1 and devise a further experiment.

POSSIBLE MODIFICATIONS/VARIANTS

While a stock of behavioral experiments useful for patients with insomnia is beginning to accrue (see, for example, Ree and Harvey [2]), behavioral experiments should be personalized for each patient. As such, there is an infinite range of possibilities (see Chapters 8–10 in this volume for examples). The use of behavioral experiments in therapy creates opportunities to collaborate with your patient, being highly creative together, while making substantial progress in the treatment.

PROOF OF CONCEPT/SUPPORTING DATA/EVIDENCE BASE

There is preliminary evidence that conducting a behavioral experiment, relative to traditional verbal/educational approaches, is more helpful in the context of insomnia [3]. There is no evidence for this specific approach as a monotherapy. However, there is evidence from an open trial that behavioral experiments used as part of a multi-component approach to insomnia are effective [4]. We emphasize, though, that testing within a randomized controlled trial is required.

REFERENCES

[1] J. Bennett-Levy, G. Butler, M.J.V. Fennell, et al., The Oxford Handbook of Behavioural Experiments, Oxford University Press, Oxford, 2004.

[2] M. Ree, A.G. Harvey, Insomnia, in: J. Bennett-Levy, G. Butler, M. Fennell, et al., (Eds.), Oxford Guide to Behavioural Experiments in Cognitive Therapy, Oxford University Press, Oxford, 2004, pp. 287–305.

[3] N.K. Tang, A.G. Harvey, Altering misperception of sleep in insomnia: Behavioral experiment versus verbal feedback, J. Consult. Clin. Psychol. 74 (4) (2006) 767–776.

[4] A.G. Harvey, A. Sharpley, M.J. Ree, et al., An open trial of cognitive therapy for chronic insomnia, Behav. Res. Therapy 45 (2007) 2491–2501.

RECOMMENDED READING

J. Bennett-Levy, G. Butler, M.J.V. Fennell, et al., The Oxford Handbook of Behavioural Experiments, Oxford University Press, Oxford, 2004.

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