

# Intervention to Reduce Misperception

Allison G. Harvey, Lisa S. Talbot

*Golden Bear Sleep and Mood Research Clinic, Psychology Department,  
University of California, Berkeley, CA*

## PROTOCOL NAME

Intervention to reduce misperception.

## GROSS INDICATION

This intervention is an approach to reversing misperception of sleep and misperception of daytime functioning.

## SPECIFIC INDICATION

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

## CONTRAINDICATIONS

Be mindful that there is a significant subgroup of patients who accurately perceive their sleep and daytime dysfunction. Tread gently with the approaches suggested here in case your patient falls into this group; these interventions then cease to be relevant.

## RATIONALE FOR INTERVENTION

There is a significant subgroup of people with insomnia who display a tendency toward misperceiving their sleep. Specifically, they perceive that they have slept significantly less than they have actually slept. Also, people often assume that they can accurately gauge the quality of their sleep by how they feel on waking. Using feelings on waking to judge sleep quality is likely to lead to erroneous conclusions, as these feelings may be influenced by many

factors. For example, patients often notice that if the day ahead involves challenges at the office, they feel worse on waking relative to if the day ahead involves a relaxing and fun outing with good friends. Moreover, for 3–20 minutes immediately on waking there is a period, known as sleep inertia, which is a transitional state between sleep and waking. During this time most people feel very tired, and experience body sensations such as a sore, heavy head and tired, heavy eyes. Monitoring at this time can lead to misinterpretations of normal feelings of tiredness on waking (e.g., “I had a rotten night’s sleep last night”). The approach to reducing misperception of sleep and daytime functioning described here makes use of natural opportunities and behavioral experiments (for rationale, see Chapter 7).

## STEP BY STEP DESCRIPTION OF PROCEDURES (SEE CHAPTER 7 FOR THE STEPS INVOLVED IN DEVISING EACH EXPERIMENT)

### Step by Step Description of Procedures for Misperception of Sleep

In all sessions, first watch for natural opportunities to explore the possibility your patient is misperceiving, and cover the content at the end of this section when such opportunities arise. However, if a natural opportunity does not arise and/or if the misperception is hard to alter, then use a behavioral experiment such as the ones described below.

An example of a natural opportunity that might arise is that patients will often come in to a session and report a possible misperception experience. Here is an example:

*Something weird happened last night. I honestly thought I’d hardly slept at all but when I told my wife over breakfast this morning she laughed and said that I was fast asleep, and breathing heavily, all night – she knew because she wasn’t feeling well so she was awake a lot. You know, I believe her, because she’s very supportive of me and wouldn’t say I was asleep if I wasn’t.*

If this happens, seize the opportunity to ask, “What sense do you make of that?”. If your patient doesn’t raise it, ask, “One other possibility that comes to my mind is ...” [and cover the content that seems most relevant below listed as points 1 to 8].

Often it does not work to try *verbally* to convince patients that sleep is hard to estimate. However, it can be incredibly powerful to set up, and draw attention to, the patient’s own experience of difficulty perceiving sleep. The latter is done through the use of behavioral experiments. One of the first behavioral experiments we do in the treatment aims to reduce misperception of sleep. This involves demonstrating the discrepancy between an objective estimate of sleep (measured via actigraphy or polysomnography) and the patient’s own

subjective estimate (measured via the sleep diary) (see Tang and Harvey [1] for a full description). Patients are taught to download the watch (actigraph) and compare their sleep recorded on the watch with the sleep in the diary in order to calculate how accurately they perceive their sleep. Typically, patients learn that they get more sleep than they think they are getting (and note that it is easily possible to be misperceiving sleep AND still be sleep deprived; for example, patients who think they aren't sleeping at all often discover they are getting 2–4 hours of sleep per night). In addition, and particularly if an objective measure of sleep is not available, we use a number of other methods to demonstrate misperception of sleep. For instance, we give patients a handheld counter (e.g., a golf counter) to place under their pillow to test beliefs like “I wake up more than 30 times each night”. When they wake in the morning, patients may find that in fact the handheld counter was only pressed three times. When conducting this experiment, it is important that patients *first* record how many times they thought they woke during the night and *then* look at the counter for the objective information.

In working with misperception of sleep, we make sure to cover the following points, in any order (this will depend on the patient):

1. Emphasize that sleep is incredibly difficult to perceive reliably, because sleep onset is defined by the absence of memories.
2. This provides an opportunity to draw a distinction between how much sleep you FEEL you get and how much you ACTUALLY get, and that it is easy to feel you get less sleep than you actually do.
3. We tend to give two examples of the difficulties perceiving sleep:
  - Example A.* I have often had the experience of meaning to nap, on a Sunday afternoon, for just 10–20 minutes, but then waking up 2 hours later unable to believe how much time has passed.
  - Example B:* Particularly vivid to me is sitting on a plane going to Europe from the US, falling asleep, thinking I was asleep for 2–3 hours and then waking up to find I had only slept for 20 minutes!
4. Discuss the influences on our perception of time. Ask, “Have you noticed situations in which time flies and situations in which time crawls?” Using Socratic questioning, try to draw out the point that time seems to go slowly when we're upset, unhappy, worried, or bored, but seems to go fast when we're having fun.
5. Discuss the difficulties associated with accurately estimating time of falling asleep using the clock, because sleep is defined by the absence of memories. Also, the following examples may help make this point:
  - Example A.* Have you ever been on a jogging machine and decided you were going to be really good that day and jog for a whole 20 minutes? If so, and if you kept a close track of every second that passed, it may have seemed like forever. On the other hand, if you became involved in your thoughts, watching the TV or listening to music, the time may have gone by in a flash.

*Example B.* When you were a child at school, do you remember sitting in class, knowing that there were 5 minutes until the bell signaling “home-time” sounded? You may have watched the second-hand tick, second-by-second – it seemed to take forever.

These are examples of time distortion due to clock monitoring.

6. Make sure you let the patient give their own examples too.
7. The bottom-line message is that it is very difficult to determine whether you have fallen asleep and, if so, how long you have been asleep.
8. Make sure you introduce the notion of sleep inertia here by saying something like:

“On waking, most of us, most mornings have a period of between 3 minutes and 20 minutes when we feel dazed, sleepy, and ‘out of it’. This is a normal transitional state called *sleep inertia*. Sleep inertia is a term that simply refers to the transition between a state of sleep and a state of wakefulness. It is not a pleasant feeling, especially if you have to rush around and get ready for work or get your children off to school, but it is a normal transitional state and doesn’t necessarily mean that you had a poor night of sleep.”

## Step by Step Description of Procedures for Misperception of Daytime Functioning

If you hypothesize that your patient is suffering from misperception during the daytime, devise one or more behavioral experiments to explore this. Common daytime misperceptions are that the sleep problem is ruining my ability to concentrate or remember, or is causing me to age prematurely.

### *Example Experiment: Does Tiredness Noticeably Affect My Appearance?*

When you have a patient who is very concerned that the effects of tiredness are very noticeable to others, try this behavioral experiment (or a variant of it). First, identify the associated beliefs, which tend to be along the lines of: “I look terrible in the morning. Everyone can tell how tired I am by looking at me. I can’t be as confident when I’m tired because I look terrible.” Then ask the patient to take his or her own photo every day for 1 week (using the “date” camera function so that the date is saved on each photo). The photo should be taken at the same time of the day (just before leaving for work), and under the same conditions (e.g., not wearing make-up in any of the photos). Ask the patient to also keep a sleep diary, recording estimated time slept and how he or she felt at the time of the photograph (e.g., tired, lethargic, headache, lively, etc.). Then in the next session look at the photos and ask the patient to pick the photo in which he or she looks most tired. Typically, most people either cannot choose a photo because they all look similar, or they choose a photo that does not correspond with the morning when he or she felt most tired.

### *Example Experiment: Does Tiredness Ruin My Ability to Concentrate?*

When you have a patient who believes that daytime concentration difficulties are directly connected to sleep, try this experiment. First, identify the associated beliefs, which are usually along the lines of “I can’t concentrate because of my poor sleep”. Then set up an experiment in which the patient rates his or her concentration on a 1–5 scale three times per day. Operationalize exactly when the recordings will be taken, such as daily upon arrival at work, post-lunch, and before dinner, for 1 week. The recordings should be kept on a log separate from the sleep diary. Then, in the next session, look at the ratings with the patient and relate them to the information in the sleep diary for each of the days. Typically, there is not a direct correlation between sleep and concentration ratings. This helps the patient to see that other factors besides sleep must contribute to concentration fluctuations.

### **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.

### **PROOF OF CONCEPT/SUPPORTING DATA/EVIDENCE BASE**

There is preliminary evidence that conducting the behavioral experiment described above that compares the sleep diary to actigraphy is more effective, relative to verbal instruction, for reducing the anxiety associated with misperception of sleep [1].

### **REFERENCES**

- [1] 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.
- [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.

### **RECOMMENDED READING**

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