

See Also

1. Syllogisms: some C are B, no A is B, therefore some C are not A. Deductive: reasoning in which the conclusion necessarily follows from true premises (e.g., if X, then Y). Inductive: the sort of reasoning that Sherlock Holmes might use, in which he draws a conclusion (which might be wrong) based on possibly incomplete or irrelevant information.
2. Johnson-Laird, P. N., Legrenzi, P., & Sonino-Legrenzi, M. (1972). Reasoning and a sense of reality. *British Journal of Psychology*, 63, 395–400.
3. Manktelow, R. I., & Evans, J. St. B. T. (1979). Facilitation of reasoning by realism: Effect or non-effect? *British Journal of Psychology*, 70, 477–488.
4. Cheng, P. W., & Holyoak, K. J. (1985). Pragmatic reasoning schemas. *Cognitive Psychology*, 17, 391–416.
5. Cosmides, L. (1989). The logic of social exchange: Has natural selection shaped how humans reason? Studies with the Wason Selection task. *Cognition*, 31, 187–276.
6. Evolutionary psychology is the study of how evolution may have shaped the way we think, and often controversial. “Evolutionary Psychology: a Primer” (<http://www.psych.ucsb.edu/research/cep/primer.html>), by Leda Cosmides and John Tooby, provides an introduction.

—Adrian Hon

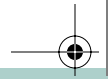
**HACK**
#72

Fool Others into Feeling Better

Many of the unpleasant phenomena associated with injury and infection are in fact produced by the brain to protect the body. Medical assistance shifts the burden of protection from self to other, which allows the brain to reduce its self-imposed unpleasantness.

Injury or infection triggers a coordinated suite of physiological responses involving the brain, hormones, and immune system. The brain generates pain and fever, stress hormones mobilize energy from fat, and immune cells cause local swelling and redness. These processes are collectively known as the *acute phase response* because they occur rapidly and tend to subside after a few days. Medical assistance can help these unpleasant signs and symptoms to subside more quickly, even when that assistance is completely bogus—such as a witch doctor waving a rattle at you or a quack prescribing a sugar pill. This is known as the *placebo effect*.





In Action

It's hard to invent a placebo and try it on yourself, because the effect relies crucially on the true belief that it will work. Several experiments have shown that pure placebos such as fake ultrasound produce no pain relief when they are self-administered. So unless you can fool yourself that other people are caring for you when they are not, your experiments with placebos will have to involve other people.

Moreover, you will also probably have to lie. The placebo effect depends not just on other people, but also on the belief that those people are providing bona fide medical assistance. If you don't believe that the assistance provided by those around you is going to help you recover, you won't experience a placebo effect.

Sometimes a placebo effect seems to be triggered despite the absence of other people and the absence of deception. If you have ever felt better after taking a homeopathic remedy, for example, or after applying dock leaves to the pain caused by a stinging nettle, that was almost certainly a placebo effect, because it has been scientifically proven that such treatments are completely bogus. The essential factor, however, must still be present—a belief that this kind of treatment will help. Once you discover the truth about such bogus treatments, therefore, they cease to be capable of producing placebo effects.

Because it is hard (some might say impossible) to deceive yourself into believing something that you know to be false, deception is important for most placebo experiments. This plays a central role in many psychological experiments, and this raises serious ethical problems. In universities and other research environments, an ethics committee must, quite rightly, approve experiments before they are allowed to proceed. It is therefore advisable to conduct the following experiment in the privacy of your own home, where ethics committees have no jurisdiction.

First, take an old medicine bottle and clean it thoroughly. Then fill it with a solution of tap water, sugar, and food coloring. The next time someone you know gets a headache or is stung by a stinging nettle, tell her that you have a special remedy that will help. If she asks what it is, tell her that it is a special solution of water and sugar and food coloring, and say that you have read somewhere (in this book) that this will help her feel better (that way, you won't even be lying!). Give her the colored water and ask her to drink a teaspoonful (if she has a headache) or to rub a small amount onto the affected area (if she has been stung by a nettle). See if it helps her feel better.

**Fool Others into Feeling Better**

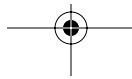
It will, if she believes it will—and if there’s nothing really wrong with her (be careful here; don’t delay medical treatment for someone who is hurt because you want to see if you can placebo-cure her).

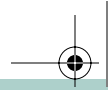
Studies have shown that for some people in some situations the placebo effect can be as strong as morphine. In one particularly striking study [2], patients who had undergone tooth extraction were treated with ultrasound to investigate whether this would reduce the postoperative pain. Unknown to both doctors and patients, however, the experimenters had fiddled with the machine, and half the patients never received the ultrasound. Since ultrasound consists of sound waves of very high frequency—so high, in fact, that they are inaudible to the human ear—there was no way for either the doctors or the patients to tell whether the machine was emitting sound waves; the test was truly double-blind. After their jaws were massaged with the ultrasound applicator, the patients were asked to indicate their level of pain on a line with one end labeled “no pain” and the other “unbearable pain.” Compared with a group of patients who were untreated, all those treated with the ultrasound machine reported a significant reduction in pain. Surprisingly, however, it didn’t seem to matter whether the machine had been switched on or not. Those who had been massaged with the machine while it was turned off showed the same level of pain reduction as those who had received the proper treatment. In fact, when the ultrasound machine was turned up high, it actually gave less pain relief than when it was switched off.

Other studies have shown that placebo medicines are more effective if delivered in person by doctors and that it helps more if the doctors are wearing white coats. Red pills give a bigger placebo effect than white pills, and placebo injections are more powerful still.

How It Works

Nobody knows for sure yet how the placebo effect works, but one theory is that the brain is very sensitive to the presence of social support during the process of recovery from injury and infection. The various components of the acute phase response are all designed to promote recovery and prevent further injury while recovery is taking place. Pain, for example, makes you guard the wounded area. But these measures also have costs; high levels of pain, for example, can actually lengthen the healing process. The brain makes a trade-off between the risks of further damage to the injured area and the delay to the healing process. The presence of social support during recovery shifts the balance between these competing risks because some of the burden of preventing further damage is transferred from the sick person to those around them. The sick person can therefore reduce his own costly





self-protective measures, such as pain, and allow the healing process to progress more rapidly.

Another suggestion is that the placebo effect works by means of conditioning (see also “[Make the Caffeine Habit Taste Good](#)” [Hack #91]). Conditioning is a very general kind of learning process in which one stimulus is substituted for another. The classic example is Pavlov’s dogs, which learned to salivate on hearing a bell after Pavlov had trained them to associate the sound of the bell with the arrival of food. In technical terms, an *unconditioned stimulus* (the sight of the meat), which leads naturally to a certain *unconditioned response* (salivating at the sight of the meat), is repeatedly paired with a *conditioned stimulus* (the sound of the bell). Eventually, the dogs learn the *conditioned response* of salivating at the sound of the bell. Pavlov’s students showed that immune responses can also be conditioned, and others have gone on to suggest that this is what lies behind the placebo response. The unconditioned stimulus is a real drug or some other medical treatment that works even if you have never tried it before and don’t believe in it. The unconditioned response is the improvement you feel after receiving the treatment. The conditioned stimuli are all the things that are repeatedly paired with the treatment—the size, shape, and color of the pill, for example. If you then take a pill that has the same size, shape, and color as the real one, but which lacks the active ingredient, you may still experience some improvement because your immune system has been conditioned to respond to such stimuli.

Placebos won’t cure the vast majority of medical conditions. It is much easier and quicker to list the things that placebos *can* influence—pain, swelling, stomach ulcers, some skin conditions, depression, and anxiety—than the things they don’t. Everything else is probably not placebo-responsive. That said, placebos are able to help in the management of nearly all illnesses because nearly all illnesses involve pain, depression, and/or anxiety.

See Also

1. Evans, D. (2003). *Placebo: Mind over Matter in Modern Medicine*. London: HarperCollins.
2. Hashish I., Harvey, W., & Harris, M. (1986). Anti-inflammatory effects of ultrasound therapy: Evidence for a major placebo effect. *British Journal of Rheumatology* 25, 77–81.

—Dylan Evans

