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Shedding Light on the Placebo Effect

*Fabio Lombardi**

*Corresponding author. Email: fabiolombardi32@gmail.com

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Abstract

The placebo effect is a genuine psychobiological phenomenon in which the expectation of improvement can lead to actual changes, including alterations in perception, behaviour and physiological responses. This article explores this phenomenon by dispelling common misconceptions and highlighting its significance for critical thinking.

Introduction

Many people claim that strange, pseudoscientific remedies are effective in alleviating medical symptoms. As proof of this efficacy, they often rely on personal experience: 'I use it all the time, and it works!' However, a treatment's effectiveness cannot be determined based on personal anecdotes. Why? Because improvements observed *after* taking a drug are not necessarily *caused* by the drug itself. For instance, some illnesses improve on their own over time. If you have the flu, for example, and do not take any medicine, you will typically recover after a few days. However, if you take a homeopathic remedy during that period, you might mistakenly attribute your recovery to the drug, when in reality, the illness spontaneously remitted. Many variables, known as *confounders*, can create the illusion that a treatment is effective when it is not. Spontaneous remission is just one example. Rather than examining every possible confounder that could lead to an overestimation of a treatment's efficacy, this discussion will focus on just one – arguably the most fascinating: the placebo effect.

Placebos and Their Psychological Effects

Defining terms can sometimes be very challenging. What is art? What is science? What is reality? These are the kinds of questions that philosophers grapple with, as they are experts in the art of definition. Offering a clear and comprehensive definition of the term 'placebo' is particularly complex, so I will leave that task to the philosophers. For the purposes of this discussion, I will use a simplified definition (for which counterexamples can be raised) to provide a general idea of the concept. A *placebo* can be loosely defined as a *sham therapy*. It might take the form of any kind of treatment – pills, injections or surgery – but the key is that it is fake. A striking example of a placebo is an acupuncture procedure that uses a special instrument known as the 'Streitberger needle'. This particular needle does not penetrate the skin; instead, it retracts into its handle. So, the term 'placebo' is closely tied to the idea of simulating a therapeutic intervention.

Placebos are not interesting in themselves. What makes them fascinating is their ability

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to trigger remarkable psycho-biological effects, namely the placebo and nocebo effects. The *placebo effect* occurs when, after taking a placebo, some form of improvement takes place. For example, after ingesting a dummy pill – which you believe to be a powerful painkiller – you begin to feel less pain. The placebo effect can create the illusion that a treatment is effective when it is not. This is one of the reasons why drugs must demonstrate efficacy beyond that of a placebo before being approved for the market. The *nocebo effect*, by contrast, occurs when the administration of a placebo combined with negative suggestions makes you feel bad or worse, such as by increasing your pain. It can also occur when you experience side effects that are not caused by the drug itself but by negative expectations. As a result, the nocebo effect can lead to the false belief that a treatment is more harmful than it actually is. To sum up, placebo and nocebo effects are mind–body phenomena through which your beliefs can influence physiology, cognition and behaviour.

Are Placebo and Nocebo Effects Real?

Suppose you are a doctor administering a placebo to a patient suffering from a headache. After taking the placebo pill, the patient reports feeling better. You might think that a placebo effect has just occurred, but that's not necessarily the case. Remember, some symptoms tend to improve spontaneously over time. It could be that the improvement is simply an instance of spontaneous remission. Additionally, the patient might be attempting to please you by claiming they feel better when, in reality, they do not. This creates the illusion of relief from your perspective, as the patient is not truthful. The proper way to test the existence of placebo and nocebo effects – which is the method currently used by scientists – involves comparing a group of people taking a placebo with a group receiving no treatment. This comparison allows researchers to determine whether the improvement in the placebo group exceeds what can be attributed to the natural progression of time.

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Furthermore, to ensure that patients are not lying about their improvements, the inclusion of objective measures (e.g. heart rate) can be helpful. Properly conducted research shows that placebo and nocebo effects can influence perception, behaviour and physiology. For example, the placebo effect can reduce many forms of pain, leading to significant improvements. We also know that this analgesic effect is mediated by the release of *endogenous opioids*, chemicals similar to morphine. Another example is that the placebo effect can alleviate symptoms of Parkinson's disease by triggering the release of dopamine in the brain. As an example of nocebo effect, a study found that informing chemotherapy-treated cancer patients about the link between chemotherapy and cognitive problems led to higher self-reported cognitive complaints and poorer performance on a memory test requiring word recall.

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A Bunch of Disbelievers

The late neuroscientist Patrick Wall described the placebo effect as something that 'provokes a shudder of discomfort like a cold hand in the dark'. It is indeed a highly counterintuitive phenomenon. It is unsurprising, then, that some intelligent individuals on the web argue that the placebo effect is largely illusory. Even some doctors believe that the placebo phenomenon is mostly a myth. Several arguments are often used to deny the existence of placebo effects. Below, I examine the two most frequent ones and demonstrate their flaws.The first argument asserts that the improvement seen after administering a placebo is merely the effect of the passage of time. This is clearly false. As previously mentioned, it is standard practice to compare a placebo group with a no-treatment group to distinguish the placebo effect from the effect of time. No placebo researcher would claim to have found a placebo effect if their experimental study did not include a no-treatment comparison group.

The second argument claims that placebo effects only influence *subjective outcomes*, and this is supposed to be evidence that they are illusory. First of all, the idea that placebos only affect subjective outcomes is incorrect. Placebos can also influence objective outcomes, such as symptoms of Parkinson's disease, immune and endocrine parameters, objective sports performance, and more. Secondly, even when placebos are aimed at purely subjective symptoms like pain, we often observe that subjective improvements are correlated with objective changes. For instance, placebo-induced pain reduction is associated with decreased activity in brain regions related to pain processing and with the release of endogenous opioids. So, it's hard to believe that patients are simply lying about their improvements. However, it might be that when critics claim the placebo effect is illusory, they do not mean that patients are lying. Instead, they may argue that although the placebo effect can reduce subjective symptoms, it cannot eliminate their underlying cause. For example, a placebo might reduce pain but it cannot remove the tumour which is causing the pain. That is correct. We are not aware of any disease that can be cured using a placebo. The placebo effect primarily reduces symptoms. Nevertheless, this limitation does not render the placebo effect illusory. For instance, painkiller drugs alleviate pain without addressing its ultimate underlying cause. Should their effects be considered illusory for this reason?To be clear, my goal is not to portray the placebo effect as a miraculous phenomenon. My aim is to report what the scientific literature demonstrates: placebo and nocebo effects do exist and can influence both

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subjective perceptions and objective physiological parameters.

Placebo and the pseudoscientist

One reason some people may be sceptical about placebo effects is their perceived association with pseudoscience. The placebo effect is often cited as evidence that the body can heal itself or used to justify alternative medicine. However, I argue that both of these claims are unfounded.

Let us begin with the assertion that the placebo effect proves you can heal yourself through the power of the mind. This idea is frequently promoted in self-help books and online content. However, I don't think placebo research supports such a bold claim. First of all, as previously mentioned, placebos rarely result in actual healing. They usually alleviate symptoms without curing the underlying disease. For instance, placebos may reduce the symptoms of Parkinson's disease, but they do not halt the underlying neurodegeneration. Even setting that aside, I don't see how placebos demonstrate that you can heal yourself. Pain cannot be reduced at will. What placebo research shows is that false information – such as a sham treatment – can influence your perception of pain. In other words, the effect relies on external deception; it is not something you can achieve independently. Psychologists recognize '*expectation*' as one of the key psychological mechanisms underlying the placebo effect. An expectation is a belief that follows the form of 'if X, then Y'. For example, 'if I take a painkiller, I will feel less pain'. Placebo and nocebo effects are highly influenced by what individuals believe. It is important to note that *beliefs* and *desires* are not the same, even though they may appear to be similar psychological states. Philosophers of mind argue that they differ fundamentally in their '*direction of fit*'. Beliefs have a mind-to-world direction of fit, meaning they aim to represent reality and must align with it. Desires, in contrast, have a world-to-mind direction of fit, representing how one wishes the world to be. Merely desiring symptom improvement is insufficient to trigger a placebo effect; one must believe that an effective treatment has been administered. I am not aware of any evidence suggesting that the adoption of a belief that activates the placebo effect is a deliberate choice. Therefore, it looks that the placebo effect does not demonstrate an ability to feel better at will. What it does show is that we possess the psychological resources to alleviate distress, but those resources need to be activated by false information. Another common misconception is that the placebo effect can be used to justify alternative medicine. Proponents of alternative therapies often argue that, since placebos can have real effects, this somehow validates treatments like homeopathy, acupuncture, or energy healing, even when these therapies lack scientific support. I think this reasoning is flawed. Claiming that a therapy works solely through the placebo effect is essentially admitting that the theory supporting the therapy is false and that the therapy itself contains no active ingredient. It follows that the use of alternative medicine to exploit the placebo phenomenon is based on deception: the patient is led to believe in a false medical theory and to believe falsely that the treatment is effective. In conventional medicine, deceiving the patient by administering a placebo is considered unethical and therefore prohibited. I fail to see why this ethical standard should not equally apply to alternative medicine. More importantly, you don't need to administer a placebo to trigger the placebo effect. Since the placebo effect is dependent on the patient's expectations, you can activate those expectations by administering a truly effective therapy. As a result, the placebo effect will combine with the treatment effect, potentially leading to greater overall efficacy. This approach should be preferred, as it avoids ethical dilemmas and can, at least in principle, result in higher effectiveness. Some might object that certain treatments offer only a small benefit over placebo, or that no effective treatments exist for a given condition, and therefore administering a pure placebo is justified in those cases. However, this brings back the ethical concerns. Is it ethical to administer a placebo in these cases? I don't know the answer to this question. Anyway, it looks to me that whatever the answer

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is, there's no room for alternative medicine. If it is ethical to administer a placebo, why must it be framed as an alternative therapy, and why would an alternative medicine practitioner be necessary to administer it? Conversely, if it is unethical, then administering a placebo is not permissible, no matter how it is presented. It's worth noting that recently researchers are exploring methods of administering placebos that don't involve deception. It seems that placebos can still be effective even if the patient is aware that they are receiving a placebo; this is known as 'open-label placebo'. If this approach proves effective, physicians could openly prescribe placebos when appropriate, resolving the associated ethical issues. In conclusion, I don't see any reasonable way in which the placebo effect can justify the use of alternative medicine. This is not to say that alternative medicine has no value or should not be used, but rather that the placebo effect is no reason for its application.

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Critical thinking

Having established that both placebo and nocebo effects are real phenomena, I argue that, rather than serving as a justification for pseudoscientific claims, they can be a valuable tool for fostering critical thinking. These effects illustrate how our beliefs and expectations can shape the reality we experience. In some cases, merely expecting a particular outcome can bring it about. This complicates the disconfirmation of certain false beliefs, as such beliefs can become self-confirming. For example, suppose you believe that crossing your fingers will enhance your performance on a maths test. This belief may indeed lead you to perform better when you cross your fingers compared to when you do not. While this could lead to the adoption of a superstition, it may also be interpreted as an instance of the placebo effect. In fact, research has shown that certain superstitious rituals can improve performance on various tasks by boosting self-confidence.

It is important to emphasize that expectation effects are not confined to a few gullible individuals; they permeate our lives and affect everyone. For example, we might prefer a certain kind of wine simply because we believe it is expensive, even if it is actually quite cheap. We may feel significantly better after taking a particular drug, despite recent research indicating that it is no more effective than a placebo. Additionally, relationships can be undermined by stereotypes or biased expectations we hold about others. The overarching lesson is well captured by the words of magician James Randi: 'no matter how intelligent or well-educated you are, you can be deceived'.

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Further Reading

Frisaldi, Elisa, et al., 'Placebo and Nocebo Effects and Mechanisms Associated with Pharmacological Interventions: An Umbrella Review', *BMJ open* 13.10 (2023).

Fabio Lombardi

Fabio Lombardi is a recent Masters graduate in Psychology and Neuroscience.

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