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## Subliminal Messages Influence Our Experience of Pain

The brain can learn to associate certain images with more or less pain, even if the images never reach our awareness

By [Simon Makin](#) | Aug 13, 2015

Most people associate the term “subliminal conditioning” with dystopian sci-fi tales, but a recent study has used the technique to alter responses to pain. The findings suggest that information that does not register consciously teaches our brain more than scientists previously suspected. The results also offer a novel way to think about the placebo effect.



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Our perception of pain can depend on expectations, which explains placebo pain relief—and placebo's evil twin, the nocebo effect (if we think something will really hurt, it can hurt more than it should). Researchers have studied these expectation effects using conditioning techniques: they train people to associate specific stimuli, such as certain images, with different levels of pain. The subjects' perception of pain can then be reduced or increased by seeing the images during something painful.

Most researchers assumed these pain-modifying effects required conscious expectations, but the new study, from a team at Harvard Medical School and the Karolinska Institute in Stockholm, led by Karin Jensen, shows that even subliminal

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input can modify pain—a more cognitively complex process than most that have previously been discovered to be susceptible to subliminal effects (*timeline below*).

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The scientists conditioned 47 people to associate two faces with either high or low pain levels from heat applied to their forearm. Some participants saw the faces normally, whereas others were exposed subliminally—the images were flashed so briefly, the participants were not aware of seeing them, as verified by recognition tests. The researchers then applied a temperature halfway between the high and low levels, alongside either one of the conditioned faces or a previously unseen face. Participants rated how painful the new temperature was.

The faces previously linked with high or low pain increased and reduced pain ratings, respectively, relative to the new face. The finding held whether the participant had seen the faces normally or learned the association subliminally.

“Our results demonstrate that pain responses are shaped by expectations we may not be aware of,” Jensen says. If this applies to the placebo effect generally, one way it could have a beneficial effect is if our mind makes implicit connections between medical paraphernalia and getting better. Hospital settings or a doctor's behavior might then facilitate a placebo-like effect. The finding also adds to the growing body of research showing that information that never reaches our conscious awareness can nonetheless influence our later behavior.

*This article was originally published with the title "Subliminal Messages Influence Pain."*

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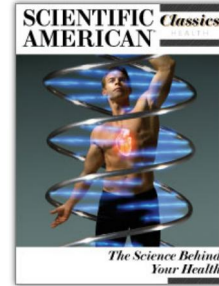
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