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Researchers identify brain region that generates optimism bias

By [David Cornish \(/search/author/David+Cornish\)](#) | 26 September 12 (Wed, 26 Sep 2012 10:27:00 +01:00)



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"Always look on the bright side of life" might seem a simplistic piece of schoolboy philosophy offered by the likes of Monty Python, but they might just have been on to something. A team of University College of London (UCL) neuroscientists and psychologists has discovered that not only does the brain produce an optimism bias for good news, but that such a bias could actually be harmful for our decision-making capabilities. [Their results](#) (<http://www.pnas.org/content/early/2012/09/17/1205828109.full.pdf+html>) were published on 24 September in the *Proceedings of the National Academy of Sciences*.

"Humans form beliefs asymmetrically; we tend to discount bad news but embrace good news," [the UCL report](#) (<http://www.pnas.org/content/early/2012/09/17/1205828109.full.pdf+html>) explains. "This reduced impact of unfavourable information on belief updating may have important societal implications, including the generation of financial market bubbles, ill preparedness in the face of natural disasters, and overly aggressive medical decisions."

The research was led by UCL's Dr Tali Sharot, who specialises in understanding how people form judgments and actions. [In a report published in 2007](#) (<http://www.nature.com/nature/journal/v450/n7166/full/nature06280.html>), Sharot discovered that humans tend to expect positive future events, even when there is no evidence to support such expectations -- if it improves your life, or just makes you feel good, you're more likely to believe it will happen despite what the statistics tell you.

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Using functional magnetic resonance imaging (fMRI), Sharot identified that a region of the brain called the inferior frontal gyrus (IFG) -- a frontal lobe with both left and right divisions -- was crucial to a person's ability to update their beliefs with new information. Participants in the 2007 study appeared to have a high optimism bias originating from the right IFG, and were worse at modifying their beliefs in the face of undesirable information.

The latest study set out to establish if the formation of a person's beliefs could be altered by selectively manipulating different regions of the IFG. To test the hypotheses that the IFG was involved in the formation of belief, Sharot and her research group used a transcranial magnetic stimulation (TMS) to disrupt the brain functions of three groups of volunteers. One group would have their right IFG disrupted, another their left IFG, and the final group an unrelated control area of their brain.

With the different regions of their brain effectively "shut off" by the TMS, the researchers asked the volunteers to estimate their chances of experiencing 40 different nasty fates, from Alzheimer's disease to robbery. Having recorded the test subject's responses, the researchers presented the participants with the actual likelihood of each of the 40 unpleasant events happening to them, thus modifying their knowledge of the subject. The volunteers were then asked to recalculate their estimates.

The researchers found that participants who received TMS to the control site or right IFG showed the typical good news/bad news effect; they updated their beliefs more when presented with good news relative to bad news. But for the group that had their left IFG disrupted, the results were remarkably different.

This group of volunteers appeared to give equal weight to good or bad news. They would update their opinion if it turned out they were less likely to be robbed (good news), but they would also update their opinion if it turned out they were more likely to suffer from Alzheimer's disease (bad news).

"Our results should not be interpreted as suggesting that the disruption of left IFG function improves learning or decision-making in general," Sharot wrote in the UCL report. "Rather, our study provides an interesting instance of how a selective disruption to a specific brain region may enhance the tendency to integrate negative information into [a person's beliefs]".

Sharot believes that her work could find clinical applications, targeting the right brain area to encourage people to be more explorative in life, or reduce a person's natural tendency to be anxious or stressed.

The UCL team are yet to speculate on the commercial aspects of such an application. Wired.co.uk is reminded of the Penfield mood organ of Philip K Dick's novel *Do androids dream of electric sheep?* (http://www.philipkdick.com/works_novels_androids.html), an electronic device that could stimulate different emotions in users by simply dialling in a number. Creating or removing an optimism bias could have interesting consequences for people taking on various activities, from assessing stock market moves to deciding on whether to go white water rafting.

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