

How the stress hormone cortisol reinforces traumatic memories

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The stress hormone cortisol strengthens memories of scary experiences. However, it is effective not only while the memory is being formed for the first time, but also later when people look back at an experience while the memory reconsolidates. This has been published by cognition psychologists from the Ruhr-Universität Bochum in the journal *Neuropsychopharmacology*. They suggest that the results might explain the persistence of strong emotional memories occurring in anxiety and Post-Traumatic Stress Disorder (PTSD).

Memories of emotional experiences usually fade over time

Strong memories of [stressful experiences](#) occur frequently, but they usually fade away over time. People suffering from anxiety or Post-Traumatic Stress Disorder, however, are affected by terrifying memories that haunt them again and again. It had been shown that the [stress hormone cortisol](#) has a strengthening impact on the consolidation of memories, i.e. the several-hour process in the course of which a memory is formed immediately after the experience.

Cortisol influences the reconsolidation of emotional memories

The researchers from Bochum have demonstrated that cortisol effects memories in humans also during the so-called reconsolidation, i.e. the

consolidation of memories occurring after memory retrieval. The stress hormone can enhance this process. "The results may explain why certain undesirable memories don't fade, for example in anxiety and PTSD sufferers," says Prof Dr Oliver Wolf. If a person remembering a terrifying event has a high stress hormone level, the memory of that specific event will be strongly reconsolidated after each retrieval.

The experiment

On three consecutive days, the subjects took part in the study, carried out by Shira Meir Drexler, PhD student at the International Graduate School of Neuroscience in Bochum. On the first day, they learned an association between specific geometric shapes and an unpleasant [electric shock](#). On the second day, some of the participants were given a cortisol pill, others a placebo. Subsequently, they were shown one of the geometric shapes associated with the electric shock. On the third day, the memory for the geometric shapes was tested. Participants who had taken cortisol remembered the fear-associated shape particularly well. This was evident in a heightened skin conductance, which is an established measure for emotional arousal.

More information: "Effects of cortisol on reconsolidation of reactivated fear memories," *Neuropsychopharmacology*, [DOI: 10.1038/npp.2015.160](#)

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