

# Hormonal Contraception Alters Stress Hormone Response

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The cameras were rolling at the APS 24<sup>th</sup> Annual Convention in Chicago, Illinois, USA. Watch as Shawn Nielsen, University of California, Irvine, describes her research.

Most people remember emotionally arousing material better than neutral material partly due to the body's natural stress response. But stress responses in women can vary during their menstrual cycle. Because ovarian sex hormone levels are commonly manipulated via hormonal contraception, Shawn Nielsen and Larry Cahill, at the [Cahill Laboratory at the University of California, Irvine](#), hypothesized that contraceptive use would influence stress/sex hormone interactions and emotional memory.

To track a stress response, participants viewed mixed emotionally arousing and neutral images. Immediately after, they were randomly assigned to cold pressor stress (CPS) test or a control condition. One week later, the participants received a surprise free recall test. Saliva samples were collected and assessed for salivary alpha-amylase (sAA), a biomarker for norepinephrine, and cortisol, a stress hormone.

The results indicate that women on hormonal contraception exhibited a significantly reduced noradrenergic response to the images compared to women who were not taking contraception. Women on hormonal contraception also exhibited a significantly smaller cortisol response to the cold pressor stress test. These reduced responses in women taking hormonal contraception appeared to be driven by the amount of stress hormones measured at baseline, but this pattern did not emerge in naturally cycling women.

There was also a difference in the recall of negative emotional images between the two groups. Women taking hormonal contraception recalled significantly more negative images when they had increased levels of norepinephrine during encoding, but they did not have a post-training release of cortisol. These findings suggest that hormonal contraception alters the body's natural stress response to both emotionally arousing images and a physical stressor.

These results suggest that sex and stress hormone interactions are critical for modulating memory, which may have important implications for understanding the underlying neurobiology of disorders of emotional memory, especially those that disproportionately affect women.