

# Study: Stress hormone blocks testosterone's effects

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High levels of the stress hormone cortisol play a critical role in blocking testosterone's influence on competition and domination, according to new psychology research at The University of Texas at Austin.

The study, led by Robert Josephs, professor of psychology at The University of Texas at Austin, and Pranjal Mehta, assistant professor of psychology at the University of Oregon, is the first to show that two hormones—testosterone and cortisol—jointly regulate dominance.

The findings, available online in [Hormones and Behavior](#), show that when cortisol—a hormone released in the body in response to threat—increases, the body is mobilized to escape danger, rather than respond to any influence that testosterone is having on behavior.

The study provides new evidence that hormonal axes (complex feedback networks between hormones and particular brain areas that regulate [testosterone levels](#) and cortisol) work against each other to regulate dominant and competitive behaviors.

"It makes good adaptive sense that testosterone's behavioral influence during an emergency situation gets blocked because engaging in behaviors that are encouraged by testosterone, such as mating, competition and aggression, during an imminent survival situation could be fatal," Josephs said. "On the other hand, fight or flight behaviors encouraged by cortisol become more likely during an emergency situation when [cortisol levels](#) are high. Thus, it makes sense that the

hormonal axes that regulate testosterone levels and cortisol levels are antagonistic."

As part of the study, the researchers measured hormone levels of saliva samples provided by 57 subjects. The respondents participated in a one-on-one competition and were given the opportunity to compete again after winning or losing. Among those who lost, 100 percent of the subjects with high testosterone and low cortisol requested a rematch to recapture their lost status. However, 100 percent of participants with high testosterone and high cortisol declined to compete again. All subjects who declined a rematch experienced a significant drop in testosterone after defeat, which may help to explain their unwillingness to compete again, Josephs said.

The researchers suggest these findings reveal new insights into the physiological effects of stress and how they may play a role in fertility problems. According to research, chronically elevated cortisol levels can produce impotence and loss of libido by inhibiting [testosterone](#) production in men. In women, chronically high levels of cortisol can produce severe fertility problems and result in an abnormal menstrual cycle.

"When cortisol levels remain elevated, as is the case with so many people who are under constant stress, the ability to reproduce can suffer greatly," Josephs said. "However, these effects of [cortisol](#) in both men and women are reversed when stress levels go down."

Provided by University of Texas at Austin

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