

# How stress can lead to inequality

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Stress is a staple of our lives today, and we know intuitively that it can influence our confidence in competing with others. But how exactly does stress do that? Scientists at EPFL have carried out the first behavioral study to show how stress actually affects our degree of confidence, implying that it can even be a cause of social inequality rather than just a consequence of it. On a biological level, the researchers have also associated the effects of stress with the release of the hormone cortisol. The study is published in *Psychoneuroendocrinology*.

Confidence is essential to our ability to compete in society; when we don't feel confident, we are less likely to make the kind of decisions that can give us a financial and social edge over others. By driving social competition, [confidence](#) becomes central in the organization and function of human societies, and marks the way individuals interact with each other.

At the same time, little is known about what influences people's confidence. Two major factors seem to be stress and the person's general anxiety. Technically, this is referred to as "trait anxiety", and it describes how prone a person is to see the world as threatening and worrisome. The question, however, is how stress and trait anxiety impact an individual's confidence in a competitive context.

## Stress and confidence

The teams of Carmen Sandi at EPFL and Lorenz Goette at UNIL have now shown that stress can actually boost the competing confidence of

people with low trait anxiety, but significantly reduce it in people with high trait anxiety. The scientists designed an elegant behavioral experiment, which began with more than two hundred people taking two online tests: one to assess their IQ, and one to measure their trait anxiety.

A week later, about half of the study's participants underwent a standard psychological procedure (called TSST-G) designed to cause acute social stress, such as going through a mock job interview and performing mental arithmetic tasks before an impassive audience. The other half of the participants formed the control group, and did not undergo the stress-inducing procedure.

All participants, stressed and non-stressed, were then given two options in a game where they could win money: they could either take their chances in a lottery, or they could use their IQ score to compete with that of another, unknown participant's; the one with the higher IQ score would be the winner.

In the non-stressed, [control group](#), nearly 60% of participants chose the IQ score competition over the lottery, showing overall high confidence in the participants, regardless of their trait anxiety scores. But in the group that experienced stress before the money game, things were different. The competitive confidence of participants varied depending on their [trait anxiety](#) scores. In people with very low anxiety, stress actually increased their competitive confidence compared to their unstressed counterparts; in highly anxious individuals, it dropped.

The findings suggest that stress is a catalytic force acting on a person's competitive confidence. Stress, it seems, can raise or suppress an individual's confidence depending on their predisposition to anxiety.

## **Stress and cortisol**

The researchers also found that the effects of stress on the participants' confidence were mediated by the [hormone cortisol](#), which is normally released from the adrenal glands, on the top of our kidneys, in response to stress. The team examined saliva samples from the stressed participants for the presence of cortisol. In people with low anxiety, those that showed higher confidence also showed a higher cortisol response to stress. But in highly anxious people, high cortisol levels were associated with lower confidence, which connects the behavioral [effects of stress](#) to a biological mechanism.

The findings of this behavioral experiment can be seen as a simulation of confidence in social competition and the way it relates to socioeconomic inequality. Studies have shown that, in areas with wide socioeconomic inequality (e.g. a wide rich-poor gap), people on the low end of the social ladder often experience high levels of stress as a consequence.

"People often interpret self-confidence as competence," says Carmen Sandi. "So if the stress of, say, a job interview, makes a person over-confident, they will be more likely to be hired - even though they might not be more competent than other candidates. This would be the case for people with low anxiety."

Far from being only a product of competitive inequality, stress must now also be regarded as a direct cause of it. In other words, stress can become a major obstacle in overcoming socioeconomic inequality by trapping highly anxious individuals in a self-perpetuating loop of low competitive confidence.

Carmen Sandi is now interested in relating the effect of [stress](#) on confidence with brain imaging. Although there is much yet to be learned in this area, she believes that it can change the way we look at social dynamics as a whole. "Stress is an important engine of social evolution," she says. "It affects the individual, and by extension society as whole."

**More information:** Goette L, Bendahan S, Thoresen J, Hollis F, Sandi C. Stress pulls us apart: Anxiety leads to differences in competitive confidence under stress. *Psychoneuroendocrinology* 18 February 2015.

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