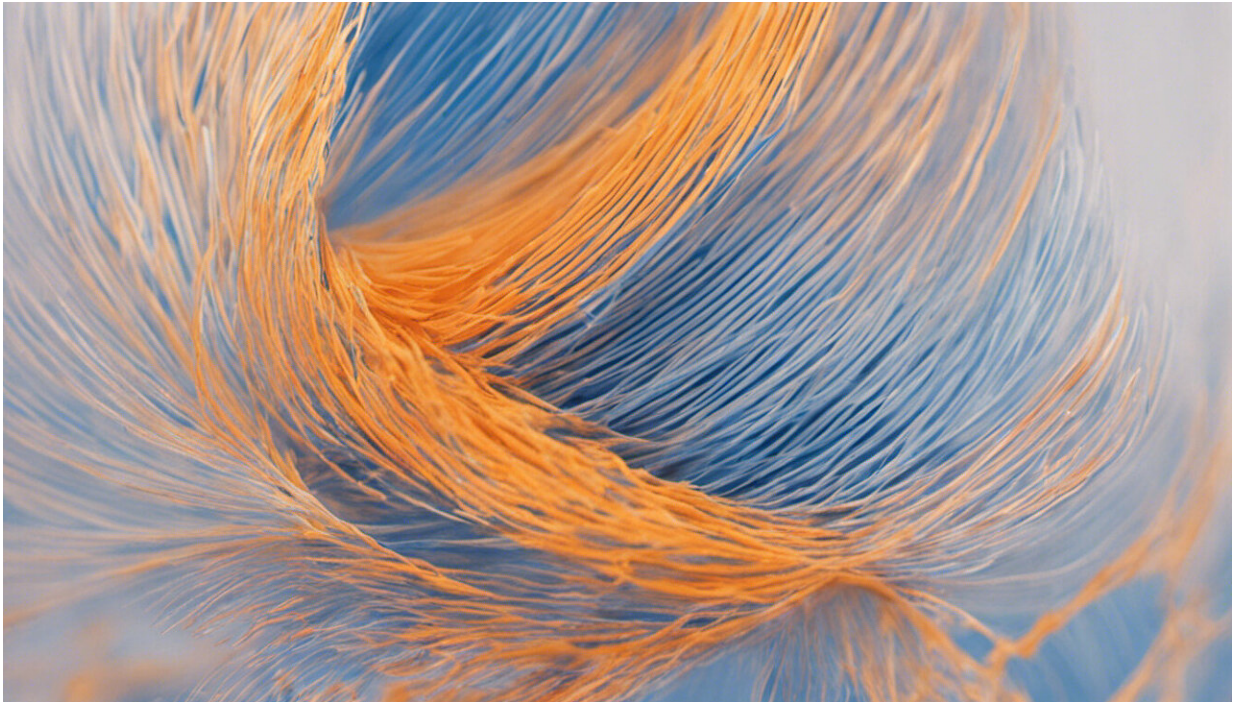


# How stress affects performance and competitiveness across gender

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Credit: AI-generated image ([disclaimer](#))

In general, both men and women perform better in competitive situations. However, when women are in a state of elevated stress, competition has the opposite effect and leads to worse performance. As a consequence, women under stress increasingly shy away from competition, according to a recently published study from economic

researchers from Germany, the Czech Republic and the United Kingdom. Their results could help explain why women are underrepresented in high-paid jobs and in leadership positions. The results also have implications for efficient management practices, including hiring and performance incentives.

The events that are most crucial for a successful career—such as job interviews, entrance exams or asking for promotion—involve [competition](#) in a stressful environment. So, understanding the effect of stress on competitive behavior is vital for designing optimal hiring and management practices in firms, and for analyzing possible sources of gender gaps in the labor market.

Jana Cahlikova from the Max Planck Institute for Tax Law and Public Finance, Lubomir Cingl from the University of Economics in Prague, and Ian Levely from King's College London conducted laboratory experiments with 190 university students (95 men and 95 women) in the Czech Republic to examine whether men and women respond differently to stress and a competitive environment. They manipulated the subjects' stress levels and then examined how they responded to competition.

## **Experiment: inducing psychosocial stress**

Half of the participants were exposed to a highly efficient procedure to induce psychosocial stress, the Trier Social Stress Test. Each participant was first asked to talk about their strengths and weaknesses and afterwards completed a relatively challenging cognitive task—all in front of an evaluation committee, trained to show no emotion or feedback, which further increases stress levels, and while being recorded on camera. A [control group](#) was asked to read a short article out loud and then perform a trivial cognitive task. To confirm that this procedure worked, the researchers measured participants' heart rate and levels of cortisol, a hormone that indicates stress. Both men and women exposed

to the stress procedure showed high levels of stress.

Next, participants were paid to solve simple arithmetic problems. In different rounds, they were either paid a piece rate or competed against another, anonymous subject. Under piece-rate payment, each correct answer was rewarded with a fixed amount. In the competitive environment, subjects received twice as much per correct answer as in the piece-rate round, but only if they outperformed the other person. If they did worse, they received nothing.

The results show that men and women, on average, respond differently to a combination of stress and the need to compete with others. Men in both the stress and control groups performed better under competition than in the piece-rate round.

## **Stressed women do worse when competing**

For women, however, there was a striking difference in reaction to competition between the stress and the control groups. In the control group, women performed significantly better under competition. But, female subjects exposed to stress did on average worse when they had to compete.

Interestingly, absent competition, women with and without stress have the same results. Thus, only the combination of stress and the need to compete negatively affects women's performance; stress itself does not affect performance and the competition itself affects it positively.

After gaining experience with both competition and piece-rate payment, subjects chose how they would be compensated in the next round. On average, those in the stress group made less competitive choices. For women, this is explained by the experienced worse performance under competition. Women, who already tend to shy away from competitive

situations more than men, are even less willing to compete under stress. For men, the researchers did not find an impact of stress on performance, even when they had to compete with others. Still, men, like women, are less willing to compete if they are exposed to psychosocial stress.

## **Firms should rethink management practices and incentives**

"Our findings can help understanding gender differences on the labor market. When hiring procedures involve both competition and stress, the results can undervalue [women](#)'s true skill level. This is especially relevant if the interviews or evaluations involve higher levels of competition and [stress](#) than the job itself, because then the selection process might not reveal the best candidate" says Jana Cahlikova.

Moreover, the results suggest that when employers attempt to increase productivity by imposing extra social pressure and giving incentives for co-workers to compete against one another, this might be counterproductive. Potentially, hiring and management policies that account for this would be beneficial for firms, while simultaneously helping to close the gender gap.

**More information:** Jana Cahlíková et al. How Stress Affects Performance and Competitiveness Across Gender, *Management Science* (2019). [DOI: 10.1287/mnsc.2019.3400](https://doi.org/10.1287/mnsc.2019.3400)

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