

# Researchers analyze connections between competitiveness, aggression and hormone levels

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Feelings can run high in competitive situations and lead to heated arguments and disputes. But not everyone reacts in the same way—men react differently to women and the reactions of individuals are dissimilar to those of groups of persons. This has been demonstrated scientifically by psychologists at Friedrich-Alexander-Universität Erlangen-Nürnberg (FAU) who examined the correlations between competitiveness, aggression and hormones. The researchers recently published their findings in the eminent journal *PLOS ONE*.

Participants in a laboratory study were required to master competitive tasks over 10 rounds. They competed against each other either as individuals or as teams, whereby one side lost the competition and the other side won. Participants were allowed to give full rein to their [aggressive impulses](#) during the competition. For this purpose, at the beginning of each round, they were asked to specify the volume of an unpleasant noise that the opponent would be exposed to through headphones if they lost the round. The researchers collected saliva samples from the participants prior to and after the competition in order to document [hormone](#) level changes.

Prof. Dr. Oliver Schultheiss and Dr. Jonathan Oxford from the Chair of General Psychology II at FAU found that men tended to behave more aggressively than [women](#), that losers were more aggressive than winners and that teams were more aggressive than individuals. Furthermore, the

researchers also detected a correlation between aggression and levels of the [stress hormone cortisol](#); the more aggressively a person behaved, the lower their [cortisol level](#) was. "Our results show that the usual suspects are the ones who become aggressive—namely participants who are male and frustrated. But our analysis also revealed that it was easier for participants who were part of a team to attack others than it was for individuals. At the same time, elevation of [stress hormones](#) when encountering a threat that cannot be mastered is in actual fact associated with less aggression," explains Schultheiss.

The researchers placed a particular emphasis on the female subjects. They discovered that the hormonal [reaction](#) to victory or defeat that occurred in women or female teams was significantly dependent on their personal thirst for power. Women with a particularly marked thirst for power had higher levels of the sex hormones testosterone and oestradiol after a victory than after a defeat. This reaction was not observed in women with a less pronounced power-orientated outlook. This hormonal reaction is the reason why dominant behaviour in women is intensified by a victory and subdued by a defeat.

**More information:** Jon K. Oxford et al, Endocrine and aggressive responses to competition are moderated by contest outcome, gender, individual versus team competition, and implicit motives, *PLOS ONE* (2017). [DOI: 10.1371/journal.pone.0181610](https://doi.org/10.1371/journal.pone.0181610)

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