

# Testosterone Promotes Reciprocity in the Absence of Competition

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Boosting testosterone can promote generosity, but only when there is no threat of competition, according to new research published in [\*Psychological Science\*](#), a journal of the [Association for Psychological Science](#). The findings show that testosterone is implicated in behaviors that help to foster and maintain social relationships, indicating that its effects are more nuanced than previously thought.

“Testosterone may mediate competitive and potentially antisocial behavior when social challenges or threats need to be confronted and handled,” explains lead researcher Maarten Boksem of Rotterdam School of Management, Erasmus University (RSM) in the Netherlands. “But it can also induce prosocial behavior in the absence of these threats, when high status and good reputation are best served by positive behavior.”

Animals studies have shown that testosterone plays an important role in dominance behavior, so Boksem and colleagues reasoned that testosterone in humans would also increase a drive for social status.

“But we doubted that this drive would *automatically* result in aggressive and antisocial behaviors,” says Boksem. “We hypothesized that testosterone could perhaps also lead to prosocial behavior if such behavior would be beneficial for maintaining or obtaining social status.”

To test this hypothesis, the researchers had 54 female volunteers ingest a liquid solution several hours before participating in an investing game — some volunteers received a placebo solution, while others received a solution with added testosterone.

In the investing game, participants were given €20 (about \$27 USD) and were instructed that they could keep the amount they wanted and invest whatever remained with a trustee (another participant). The invested portion would be tripled and split by the trustee, who would keep whatever portion she wanted and return the rest to the investor.

If participants were completely trusting, they could invest all €20 and hope that the trustee would split the final €60 equally. If they wanted to play it safe, they could keep the €20 for themselves.

Each participant took turns playing both investor and trustee. When they were the trustee, they were always given €60, indicating that the investor had entrusted them with the task of splitting up the whole sum.

As investors, participants who received testosterone were, on average, stingier — they placed less trust in the trustee and kept more of their initial money. Participants who received the placebo, on the other hand, were more trusting investors, choosing to invest about €3.20 more than those who received testosterone.

Just as the researchers predicted, testosterone seemed to promote antisocial behavior in response to a potential threat — in this case, a threat to financial resources.

But the opposite effect emerged when participants played the role of trustee. In this case, participants given testosterone chose to give *more* money back to the investor than participants who had been given a placebo. The results suggest that the trustees felt a responsibility to repay the trust that the investor ostensibly placed in them.

“While we expected the decrease in trust found in the first scenario, the increase in reciprocity was surprisingly strong and robust,” Boksem notes. “Testosterone had a more pronounced effect on prosocial behavior than on antisocial behavior.”

The fact that testosterone can promote prosocial behavior, at least in certain contexts, provides a more nuanced account than the traditional view of testosterone as being involved in purely aggressive and antisocial behavior, says Boksem. The researchers hope to run a similar study in men and they are currently investigating additional types of social behavior under various conditions of social threat.