

## **<arttitle> Testosterone and mate competition among human males**

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<p> Across nearly all vertebrate species, males who are the most dominant often have the greatest success in mating with physically attractive and fertile females<sup>1-3</sup>. Non-human animal studies have shown that dominant behaviours exhibited by males in their competition for mates—such as territoriality, mate guarding, heightened aggression, and display behaviours—are modulated by naturally circulating levels of the androgen testosterone<sup>4,5</sup>. Here we show that the associations between testosterone and dominant behaviours that non-human males display during mate competitions extend to humans.

<p> Heterosexual men exhibit a variety of dominant behaviors when they vie for the attention of women. Generally, they exert dominance in this context through either overt behaviors (e.g., acting assertive, flirting) or covert ones (e.g., derogating one's competitors)<sup>6,7</sup>. We examined whether such dominant behaviors displayed by men during mate competitions vary as a function of naturally circulating levels of testosterone.

<p> This study involved two phases of data collection. In the first phase, unacquainted pairs of men provided saliva samples—which later were assayed for testosterone—and took part in a 7-minute videotaped competition for the attention of a young, attractive woman. The men were asked to imagine that woman was a potential dating partner and were told that she would later indicate who of the two men she would prefer to date. After the competition, the men were asked how likeable (or unlikable)

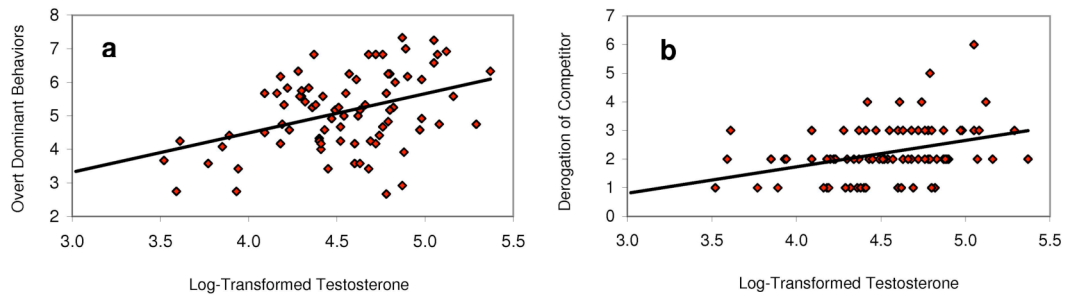
they found their opponent to be; this served as a measure of competitor derogation. In the second phase, trained judges reviewed the videotapes and rated the extent to which the men had engaged in overt dominant behaviors (e.g., aggression, assertiveness, taking control of the interaction) during the competitions.

<p> If naturally circulating testosterone is associated with dominance during human mate competitions, then there should be a positive correlation between testosterone and a variety of dominant behaviors when men attempt to woo women. We found that testosterone was positively correlated with overt displays of dominance during the mate competitions ( $r = .32$ ,  $d.f. = 79$ ,  $P = .003$ ; Fig. 1a), as well as with derogation of competitors following the competitions ( $r = .31$ ,  $d.f. = 79$ ,  $P = .005$ ; Fig. 1b.). Hence, the higher men's testosterone levels were, the more likely they were to exert dominance when attempting to attract women.

<p> Previous studies have shown robust links between testosterone and social dominance in humans<sup>8-10</sup>. But past research has not examined testosterone's role in predicting how people compete for mates—arguably the most evolutionarily important context in which humans assert dominance. Books, film and television often portray men who are bold and self-assured with members of the opposite sex as being high in testosterone. Our results offer evidence that there is a kernel of truth to this stereotype, that naturally circulating testosterone indeed is associated with how dominant men are when they try to attract women.

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<supp> **Supplementary Information** accompanies this communication on *Nature's* website.



<LEGEND> **Figure 1 – Association between men’s testosterone and behavior during a laboratory mate competition. a, b,** Association between circulating testosterone levels and **(a)** overt dominant behaviors (e.g., assertiveness, flirtatiousness, aggression) displayed during the competition and **(b)** derogation of competitors after the competition. Testosterone log-transformed to remove skew in the distribution. For details of data collection and analyses, see supplementary information.