

Testosterone boost doesn't fuel risky behaviour in women

Hormones could matter less on the trading floor than suspected.

Lucas Laursen

Women given testosterone for a month were no more likely than women not receiving the hormone to engage in risky financial decisions, according to researchers in Sweden. The findings could suggest that women are a safer pair of hands on the stock-market trading floor than men — or throw into doubt earlier findings about the effect of the hormone on men.

A spate of recent studies have found correlations between testosterone levels and risky behaviour in men, including one that found that male securities traders with more testosterone in their saliva made riskier financial decisions¹.

But now a team led by Magnus Johannesson, an economist at the Stockholm School of Economics, has found no such effects in a group of 200 post-menopausal women. The women were administered testosterone, oestrogen or a placebo for four weeks and asked to play a series of economic games that measure the player's propensity to take risks, their trust and their willingness to share resources. In the 'dictator game', for example, a player can decide how much of a pot of money they will share with a charity and how much to keep for themselves.

The team thought that the testosterone-taking women would behave more like men, giving less to charity and accepting more risk in an investment game. Yet their results, which are published in the *Proceedings of the National Academy of Sciences*, revealed no meaningful differences between the women who had taken testosterone or oestrogen and the placebo group². "My assumptions have changed a lot," Johannesson says.

Stabilizing influence

Other studies have identified differences between how men and women make financial decisions, suggesting that exposure to sex hormones during prenatal and adolescent development may matter more than it does later in life.

John Coates, a neuroeconomist at the University of Cambridge, UK, was the lead author of the study of male traders. He points out that a person's sensitivity to circulating testosterone could be a function of the amount of prenatal testosterone they were exposed to. "So increasing testosterone in women might have much less effect than increasing it in men," he says. "The results are roughly what I would expect."

It would be necessary to run an experiment of a similar scale with young men, says Coates, to better understand the extent of a link between hormones and economic decisions. The results of such experiments may also depend "on whether the experiment was conducted in a lab, with low monetary rewards, or in the field, so to speak, with meaningful amounts of money and risk".

Either way, adds Coates, "Women might be a stabilizing influence on the markets."

Johannesson agrees that the impact of sex hormones on financial decision-making is "still an open question". Yet he points out that the statistical power of his study is high because it included so many individuals.

"I'm relatively pessimistic of finding an effect in men," Johannesson says. He writes in the paper that it is possible that previously published links between testosterone and risk-taking are "spurious". Studies that do not find a correlation between sex hormone levels and economic behaviour may simply have a harder time getting published. "Negative correlation results don't get published," he says.



Testosterone had no effect on women's risk taking behaviour. *Punchstock*

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References

1. Coates, J. M. & Herbert, J. *Proc. Natl Acad. Sci. USA* **105**, 6167-6172 (2008). | [Article](#) | [PubMed](#) |
2. Zethraeus, N. *et al. Proc. Natl Acad. Sci. USA* [doi:10.1073/pnas.0812757106](#) (2009).

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Until we are able to monitor the daily hormone levels of postmenopausal women, none of this anecdotal information is meaningful. When we can accurately monitor hormone levels and replace them in a physiologic manner, the postmenopausal disease state (with all of its medical and behavioral ramifications) will begin to come under control. This will give women the ability to regain their femininity and assure a healthier life style in their later years.

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Posted by: **George W. Katsilometes** | 07 Apr, 2009

One woman's risk-taking behavior is different from the next. Comparing one woman taking testosterone to another that is not, is like comparing apples to oranges. I think the study should have used the same set of women as controls (rather than other women). In other words, don't give them testosterone, evaluate their risk-taking behavior; then give them the testosterone, and do the same. This way, they are able to evaluate the effects of testosterone on each individual's risk-taking behavior. Put differently, they are able to compare apples to apples.

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Posted by: **Tochi Okwuosa-Chuke** | 07 Apr, 2009

The article Nature refers to only tests women who are post menopausal--the women are 50-65 years old. It must be understood that decision-making changes (such as increased risk-taking) occur as a result of sex hormones ONLY if the changes may increase the chance of mating--this is an evolutionary function. It is necessary to use humans who are able to conceive. I don't think it is realistic to assume that women who's reproductive cycles have already been closed permanently can be triggered to reopen for a couple of months. Because the hormones used in the experiment are associated with reproductive urges, when these hormones change naturally or artificially, then risk-taking may change as a result of the call of nature to reproduce and not "just" because the hormones were changed. In other words the hormones are responding to something. There are plenty of studies in which this is shown: men may become more aggressive in risk taking IF they have higher basal testosterone levels AND IF young and sexy females are present. If we remove the women, the stimulus for which the increase in testosterone would respond to is gone. Evolutionary hormones do not play games; they play by rules. The authors of the article Zethraeus, N. et al. Proc. Natl Acad. Sci. USA have ignored a basic scientific principle in which they should have considered "objectively" their research topic. But they wanted to prove that research findings by others in hormonal stimuli experiments are caused by what they call "publication bias" in which the researchers aim to prove their research findings by their hypotheses as much as they are proving their hypotheses with their research findings--a circular argument. However, in trying to prove this, what Zethraeus et al., have actually shown is how perfectly they themselves used the same principle by choosing only post-menopausal women, whose reproductive cycles could not possibly be affected by any amount of sex hormone, thereby guaranteeing that their results will indeed conflict with all other results! Whether this finding actually has any meaning is well overlooked by most! It is a shame that Nature editors did not notice this major error in PNAS's publication and it is a surprise that such article can pass reviewers in any scientific journal of high quality!

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Posted by: **Angela A Stanton** | 02 May, 2009

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Nature ISSN 0028-0836 EISSN 1476-4687

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