

Financial risk-taking behavior is associated with higher testosterone levels

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Higher levels of testosterone are correlated with financial risk-taking behavior, according to a new study in which men's testosterone levels were assessed before participation in an investment game. The findings help to shed light on the evolutionary function and biological origins of risk taking.

The study was jointly led by Anna Dreber, of the Program in Evolutionary Dynamics at Harvard University and the Stockholm School of Economics, and Coren Apicella, of Harvard's Department of Anthropology. The results are available online in *Evolution and Human Behavior*.

"These findings help us to understand the motivations for risk-taking behavior, which is a major component of economic theory," says Dreber. "Risk preferences are one of the most important preferences in economics, and yet no one knows why they differ between men and women, why they change over age, or what makes men trade more in the financial market."

Previous studies have shown that on average, men are more likely than women to take risks, and the researchers theorized that these differences could be explained by the role of testosterone. Another recent study also demonstrated that stock market traders experienced greater profits on days their testosterone was above its median level. However, this is the first study to directly examine the relationship between testosterone and financial risk-taking.

"Although our findings do not address causality, we believe that testosterone may influence how individuals make risky financial decisions," says Apicella.

In the study, saliva samples were taken from 98 males, ages 18 to 23, who were mostly Harvard students. The samples were taken before participation in the investment game, so the researchers were certain that testosterone levels were not elevated as a result of the game. The researchers also assessed facial masculinity, associated with testosterone levels at puberty.

All of the participants were given \$250, and were asked to choose an amount between \$0 and \$250 to invest. The participants kept the money that was not invested. A coin toss determined the investment's outcome, and if the participant lost the coin toss, the money allocated to the investment was lost. However, if the coin toss was won, the participant would receive two and a half times the amount of their investment. At the end of the study, one person was selected by lottery to receive the cash amount of their investment, which created a monetary incentive for the participants.

The researchers found that a man whose testosterone levels were more than one standard deviation above the mean invested 12 percent more than the average man into the risky investment. A man with a facial masculinity score of one standard deviation higher than the mean invested 6 percent more than the average man.

The findings may help to explain the biological foundation of why some people are more inclined towards risk-taking than others.

"Financial risk might be comparable to other risky male behaviors associated with reproduction," says Apicella. "Men may be more willing to take financial risks because the payoffs, in terms of attracting mates,

could be higher for them. This is because women value wealth more than men when choosing for a mate."

Further research will examine changes in testosterone levels in response to financial wins and losses.

"This will give us some insight into how changes in the market affect hormones, and in turn, affect decision-making," says Apicella.

Finally, the researchers are also exploring the role of genetics in explaining risk preferences.

"Maybe we will be able to predict who becomes a trader," says Dreber.

Source: Harvard University

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