

'Female intuition comes from lower testosterone exposure in womb'

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Intuitive thought is characterized by processing information automatically and unconsciously, requiring little cognitive effort. This way of thinking is frequently ascribed to women under the title of so-called "female intuition," and now, researchers suggest this could have a biological influence, rooted in lower prenatal exposure to testosterone in the womb.

The researchers, from the University of Granada, the Barcelona Pompeu Fabra University - both in Spain - and the Middlesex University of London in the UK, publish their study in the journal *Psychoneuroendocrinology*.

They note that previous studies have suggested prenatal exposure to [testosterone](#) influences developments in the brain, which determine behaviors and tendencies throughout an individual's life. For example, researchers have suggested that higher testosterone exposure in the womb for males influences them to take more risks than females.

Contrary to intuitive thought, reflexive thought takes greater cognitive effort and conscious analysis. But both thought processes can be useful in different contexts; for example, in some situations, allowing intuition to guide choices may be better than stopping to think, the team says.

To investigate the relationship between testosterone exposure and thought processes, the researchers carried out a study on more than 600 students from the University of Granada Faculty of Economics and Studies.

Digital ratio determines testosterone exposure

Results of their study show that men did better on the CRT test than women. However, women who showed a more "masculine" digital ratio answered equally as well as the men.

Image credit: Antonio M. Espin, et al.

The team used what is now a widely studied and accepted marker for prenatal testosterone exposure, called the second-to-fourth digit ratio, which is determined by dividing the length of the forefinger by the length of the ring finger on the same hand.

Lead author Antonio Manuel Espin, lecturer at the University of Granada, explains:

"The lower the ratio, the greater the prenatal testosterone received and, therefore, the more 'masculine' the cerebral disposition, regardless of the person's gender."

He adds that, compared with women, men naturally have a lower average digital ratio.

Study participants responded to several questionnaires, one of which contained the cognitive reflection test (CRT). This test is designed to measure the ability to override an incorrect intuitive response and further reflect, leading to the correct answer.

In short, the test measures the difference between intuition and reflection, and in order to get the right answer, subjects must stop, reflect and recognize that the first answer to jump into his or her head was incorrect.

After administering the tests, the team measured the participants' hands so they could calculate their digital ratio.

Women with more 'masculine' digital ratio did as well as men on CRT test

"What is most important here," says Espin, "is that women tend to give more intuitive answers, whilst men respond in a more reflexive way. In other words, in this specific test, which penalizes intuitive thought, men generally do better than women."

Results of their study show that - predictably - men did better on the CRT test than women. However, women who showed a more "masculine" digital ratio answered equally as well as the men.

Espin says:

"To be more specific, what we found was an indication that prenatal exposure to testosterone predisposes people to adopt a more reflexive and less intuitive mindset. Furthermore, this effect seems to be stronger among women."

Though interesting, it is important to note that the study does have some limitations. The research team admits that "trying to pin down differences in the CRT answers to one single factor, prenatal testosterone/estrogens ratio, is simplistic." They add that this simplicity could lead to "conflicting, erratic or inconclusive results."

Still, the researchers say their findings should prompt future controlled experiments to investigate why individuals exposed to larger amounts of testosterone in the womb "offer better, more reasoned, solutions in the CRT 20



years after the fact."

Medical News Today recently reported on a study that suggested [pain reduces sex drive in women](#), but not in men.

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[Can exposure to prenatal sex hormones \(2D:4D\) predict cognitive reflection?](#) , Antonio M. Espín, et al., *Psychoneuroendocrinology*, published online April 2014.

University of Granada news release, accessed 24 April 2014.

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