

More evidence that male and female brains are wired differently

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Paul Macey

While measuring brain activity with magnetic resonance imaging during blood pressure trials, UCLA researchers found that men and women had opposite responses in the right front of the insular cortex, a part of the brain integral to the experience of emotions, blood pressure control and self-awareness.

The [insular cortex](#) has five main parts called gyri serving different roles. The researchers found that the blood pressure response in the front right gyrus showed an opposite pattern in men and [women](#), with men showing a greater right-sided activation in the area while the women showed a lower response.

"This is such a critical [brain](#) area and we hadn't expected to find such strong differences between men and women's brains," said Paul Macey, the study's lead author. "This region, the front-right insula, is involved with stress and keeping heart rate and blood pressure high. It's possible the women had already activated this region because of psychological stress, so that when they did the physical test in the study, the brain region could not activate any more. However, it's also possible that this region is wired differently in men and women."

"We have always thought that the 'normal' pattern was for this right-front insula region to activate more than other areas, during a task that raises blood pressure," added Macey. "However, since most earlier studies were in men or male animals, it looks like this 'normal' response was only in men. The healthy response in women seems to be a lower right-sided activation."

Most studies on differences in brain functions between men and women have looked at psychological performance.

In previous studies, the UCLA researchers had seen differences in heart rate and blood brain flow during blood pressure changes in men and women with obstructive sleep apnea and wanted to see if cardiovascular responses in brain areas were different in healthy men and women.

In this study, researchers from the UCLA School of Nursing used the Valsalva maneuver—during which participants breathe hard out through a very small tube to raise blood pressure—to measure [brain activity](#) as it controls the [blood pressure](#) change.

"This raises several questions for us, such as why is there a difference in brain pattern and might it reflect differences in health issues for men and women, particularly in cardiovascular disease variations," Macey said.

To find the answers, further study on this difference will be needed to gain a better understanding of susceptibility to disease, efficacy of drugs and even the course of normal development among all individuals, not just between men and women.

"We believe that differences in the structure and function of the insula in [men](#) and women might contribute to different clinical symptoms in some medical disorders," Macey said.

The study was published in the journal *Frontiers in Neurology*.

More information: Paul M. Macey et al. Sex Differences in Insular Cortex Gyri Responses to the Valsalva Maneuver, *Frontiers in Neurology* (2016). [DOI: 10.3389/fneur.2016.00087](https://doi.org/10.3389/fneur.2016.00087)

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