

Male/female brain differences? Big data says not so much

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A research study at Rosalind Franklin University of Medicine and Science has debunked the widely-held belief that the hippocampus, a crucial part of the brain that consolidates new memories and helps connect emotions to the senses, is larger in females than in males.

Lise Eliot, PhD, associate professor of neuroscience at the university's medical school, headed a team of students in a meta-analysis of structural MRI volumes that found no [significant difference](#) in hippocampal size between men and women. Meta-analysis is a statistical technique that allows researchers to combine the findings from many independent studies into a comprehensive review. The team examined findings from 76 published papers, involving more than 6,000 healthy individuals.

"Sex [differences](#) in the [brain](#) are irresistible to those looking to explain stereotypic differences between men and women," said Dr. Eliot. "They often make a big splash, in spite of being based on small samples. But as we explore multiple datasets and are able to coalesce very large samples of males and females, we find these differences often

disappear or are trivial."

Hippocampi are located on both sides of the brain, under the cerebral cortex. The team's findings challenge the common claim that a disproportionately larger hippocampus explains females' tendency toward greater emotional expressiveness, stronger interpersonal skills, and better verbal memory.

"Many people believe there is such a thing as a 'male brain' and a 'female brain,'" Dr. Eliot said. "But when you look beyond the popularized studies—at collections of all the data—you often find that the differences are minimal."

The study appears in the journal *NeuroImage*.

Meta-analyses by other investigators have also disproved other purported [sex differences](#) in the brain, Dr. Eliot noted. There is no difference in the size of the corpus callosum, white matter that allows the two sides of the brain to communicate, nor do men and women differ in the way their left and right hemispheres process language.

Provided by Rosalind Franklin University of Medicine and Science

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