

# Not so fast -- sex differences in the brain are overblown

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People love to speculate about differences between the sexes, and neuroscience has brought a new technology to this pastime. Brain imaging studies are published at a great rate, and some report sex differences in brain structure or patterns of neural activity. But we should be skeptical about reports of brain differences between the sexes, writes psychological scientist Cordelia Fine in *Current Directions in Psychological Science*, a journal of the Association for Psychological Science.

The results from these studies may not necessarily withstand the tests of larger sample sizes or improved analysis techniques -- and it's too soon to know for sure what such results, even if they prove to be reliable, might mean for differences in male and female minds.

Bookstores are full of popular books on the differences between men's and women's brains. Fine, who works at Macquarie University in Australia, first became interested in the issue as a parent. She was reading a book about how the differences between boys' and girls' brains mean they should be taught differently. But as an academic, she was curious about the research on which these claims were based, and looked up the original studies.

"There were huge discrepancies between what the neuroimaging studies showed and the conclusions and claims that were being drawn from them," she says. In the article and her new book, *Delusions of Gender*, Fine dissects the ways that research goes astray between the scanning

machine and the sound bite.

Some of the problems start with the research. The studies Fine came across were often conducted with small numbers of men and women, where the differences seen could have been due to chance. It's very easy and obvious for neuroscientists to compare the sexes by default. But when neuroscientists habitually check for [sex differences](#), some researchers, just by chance, will find statistically significant differences between the two groups—even if there's no real difference between men and women overall.

This problem of false positive results is understood by the neuroscientists who do the research; they know that one study with 20-odd participants that finds some small region of difference between males and females is not the final word on the issue. But these often subtle, questionable differences are readily seized on by popular writers, Fine says.

Another problem is how to interpret sex differences in the brain. Neuroscientists are only beginning to understand how [neural activity](#) brings about complex psychological phenomena. The temptation, to which popular writers are particularly vulnerable, is to use gender stereotypes to bridge that gap in scientific knowledge.

The fact that neuroimaging studies use complex, expensive machines that seem to take pictures of the brain may also make their results seem more real, reliable, and impressive than behavioral studies. As a result, substantial behavioral evidence of gender similarity, or the sensitivity of gender differences to context, can be overshadowed by a single finding of a sex difference in the brain.

"A healthy dose of skepticism is required when it comes to reports of sex differences in the [brain](#) and what they mean," says Fine, who is

concerned that claims about differences in male and female brains are reinforcing old-fashioned gender stereotypes.

Provided by Association for Psychological Science

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