

When It Comes to Brains, Size Matters

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Findings of a three-year study by researchers at the University of California, Riverside and the University of Florida, Gainesville run counter to the popular belief that women have better language skills than men.

In a study of 200 university students, the researchers found that women and men performed similarly on tests of language and reading skills. Differences in brain organization between men and women may be driven by sex differences in brain size, they said.

"People have said women have relatively larger language areas of the brain," said Christine Chiarello, UCR professor of psychology. "In none of our language tasks were women better than men. When you account for differences in brain size between men and women there are few differences in the relative size of areas. While there are differences between men and women, those differences are minimal compared to the wide range of individual differences in both sexes."

The study, "Size Matters: Cerebral Volume Influences Sex Differences in Neuroanatomy," was published recently in the journal Cerebral Cortex.

The researchers gathered demographic data, tested language and reading skills, and performed magnetic resonance imaging to map brain structures of 100 female students and 100 male students. The men and women were similar in age, parental education and proportion of students who were right- or left-handed.



There were great individual differences in brain organization, brain size and where language and speech are processed, Chiarello said. For most people, speech and language are processed in the left half of the brain.

Differences in brain size account for much of the variance in brain structure size that at first glance might appear to be attributable to sex, Chiarello said. On average, the brains of men in the study were 13 percent larger than the women.

Men and women "confront similar cognitive challenges using differently sized neural machinery," the researchers wrote. Their findings imply that "any sex-specific adaptations to overall brain size are not associated with large relative differences in the size of various cerebral regions. In this respect, our results suggest that brain size matters more than sex."

Study co-authors include Chiarello; Christiana M. Leonard and Stephen Towler of the Evelyn F. and William L. McKnight Brain Institute of the University of Florida; UCR graduate students Suzanne Welcome and Laura K. Halderman; Ron Otto of the Computerized Diagnostic Imaging Center, Riverside; and Mark A. Eckert of the Medical University of North Carolina.

Source: University of Florida

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