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News

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****Physical difference between male and female brains found by UTHSCD researcher.**

DALLAS--A physical difference between the male and female brain has been discovered by a physical anthropologist working at The University of Texas Health Science Center at Dallas.

The corpus callosum, a bundle of fibers connecting the right brain with the left brain, is larger in human females than in males even in the fetus, says Dr. Christine de Lacoste, instructor of Cell Biology. She has found a larger corpus callosum in females in studies of human adults, human fetuses at 26 weeks and older and adult nonhuman primates from gorillas to prosimians (small primates related to monkeys).

The corpus callosum is involved in communications between the hemispheres of the brain although its specific function is unknown.

"We do know some things that happen if a person doesn't have a corpus callosum. It is sometimes severed to control epilepsy," said de Lacoste. "The left hemisphere is responsible for verbal ability, and the right has minimum language ability. The two sides of the brain must communicate.

"For example, if a person has a severed corpus callosum, you can blindfold him and put a pencil in his left hand, which is controlled by the right hemisphere. He knows in the right side of the brain that he is holding a pencil and how to use it, but he can't verbally tell you that it's a pencil. If he holds the pencil so that he can't see it and you show him slides of objects, he can point to a pencil and thus identify the object. He just can't say that he is holding a pencil. It's the corpus callosum that makes consciousness into one."

De Lacoste began her research with the idea of finding out what makes the human brain unique. "There are no obvious differences in structures from other species. The human brain may be unique because of the proportions of different parts."

(over)

In fact, she was simply taking physical measurements of a collection of human corpora callosa to describe the structure when she observed that the 14 corpora callosa contained five that were larger and had a "bulb" on the posterior end. She soon found that those five had come from women and the other nine were from men.

Since that study, published in Science in 1982, she has found the same difference in human fetuses and nonhuman primates. She will present the primate study at the Society for Neuroscience national meeting in Boston in November.

The researcher does not know what the brain difference may mean in behavior. "Anatomy is fact. However, at this point we can only speculate on the functional implications of these findings. They may mean that the two hemispheres interact differently in males and females. But I'm just reporting the fact of a physical difference," she said.

She is also interested in the evolution of the brain. The female brain is, on the average, smaller than the male, but that difference is relative to height, not to sex. "In the hunting and gathering days, there may have been a selection pressure for a larger male. But with women providing 80 percent of the food and nurturing the kids, it doesn't make sense to select for less intelligent women. It's possible that with hunting skills needed, men's visuospatial function improved while women evolved better verbal and symbolic skills."

Asymmetry between the right and left brain is more pronounced in humans than in any other species. De Lacoste believes this may be the basis of "humanness."

"Asymmetry may be connected with human higher cognitive function," she said. So far in her studies of asymmetry, she has reported significant asymmetries in human male and female brains.

De Lacoste's work on the corpus callosum was done here with Dr. Elliott D. Ross, associate professor of Neurology and Psychiatry, for her Ph.D. thesis at Columbia University, "Anatomical and morphological aspects of human corpus callosum."

Since receiving her degree, she has joined Dr. Donald Woodward in the Department of Cell Biology for work on asymmetry and sex differences in adult and fetal humans and nonhuman primates. Her current research is supported by Biological Humanities Foundation.

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