

He's got a girl brain, she's got a boy brain

Understanding the 'gender' of a child's mind matters in the class, argues one scientist

MARINA JIMÉNEZ

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Body sex doesn't necessarily match brain sex, says a British scientist and author specializing in gender and the brain.

Anne Moir, who coined the term "brain sex," believes male and female brains are wired differently and that is why they learn, feel and react so differently. Now she is using her knowledge of gender differences to revolutionize the classroom and the way children are taught with a special test to determine the brain's gender.

"Our curriculum in primary school is still very feminine. We are asking boys to have fine motor skills and be verbal before their brains are ready," she said in a phone interview from London.

Dr. Moir is working with several schools in Britain to develop a teaching approach that is "less feminine." To learn and process information, students with "boy" brains need a more physical learning environment and frequent breaks, she says, advocating such activities as sumo wrestling and play-fighting with foam-tipped swords.

Pupils with male brains excel at spatial concepts and in competitive learning environments, while those with female brains are more verbal and intuitive, and have better fine motor skills, Dr. Moir says.

These differences are most pronounced until the age of 8, she says, by which time the gender gap starts to close. But it is key to motivate boys in primary school, so that they are less inclined to drop out of school later in life.

If "brain sex" sounds like gender stereotyping, Dr. Moir says there is a twist: Brain sex doesn't always match biological sex. There is a continuum, and some brain circuits are "bi-wired," she believes, thus blurring traditional gender roles.

She has developed a test to determine the sex of your brain, with a list of 20 questions about how information is processed. The male brain tilts toward a sequential approach, and the female brain toward a more scattered one. The "girl" brain is more intuitive; the "boy" brain more logical. "From analyzing the tests, my hypothesis is that an awful lot of girls have mixed brains, but boys not so often," she says. "Play fighting at school is frowned on and yet many boys fight in order to bond."

While male and female brains definitely differ, it is difficult to pinpoint how these differences translate into human behaviour, cautions Gillian Einstein, a neuroscientist with the University of Toronto.

"Some differences in the brain are genetic, some are hormonal and some cultural," says Prof. Einstein, a distant relative of Albert Einstein, who wrote a book, *Sex and the Brain*, in 2007. "There are differences in anatomical circuitry, but they are hugely overlapping."

It is well-established that girls' prefrontal cortex develops earlier, a part of the brain that relates to planning ahead and knowing the consequences of your actions. As well, boys' expertise in spatial cognition and girls' prowess in verbal ability is related to differences in their brains. Boys have more ability at three-dimensional internal visioning, Prof. Einstein says, while many girls excel at language.

Mark Lewis, a developmental neuroscientist with the Ontario Institute for Studies in Education, says that's because girls use both their right and left hemisphere to process language in certain circumstances, while boys just use one hemisphere. Girls also reach puberty two years earlier than boys, he adds, and this changes the way they process social and sexual information.

However, more research is needed to understand these differences, as well as how the female brain changes with the menstrual cycle, labour and birth, and menopause.

As for introducing "boy-centred" teaching approaches in the classroom, Prof. Einstein prefers to think of it as accommodating different temperaments and learning styles.

"A lot of feminist educators went to a lot of trouble to make schools fair for girls," she says. "And, as Dr. Moir points out, people's biological sex doesn't always match their brain sex. Changes might be helpful to all students."

Brain sex quiz

Answer Yes or No to the following questions:

1. It's easy for me to sing in tune, singing alone.
2. When I was younger, winning was really important to me.
3. It's easy for me to hear what people are saying in a crowded room.
4. As a child, I enjoyed going as high as possible when climbing trees.
5. If someone interrupts what I am doing, it's difficult to go back to it.
6. I find it easy to do more than one thing at once.
7. I find it easy to know what someone is feeling just by looking at their face.
8. I like to collect things and sort them into categories.
9. I solve problems more often with intuition than logic.
10. As a child, I loved playing games where I pretended to be someone I knew or a character I had created.

11. At school, it was easy for me to write neatly.
12. As a child, I enjoyed taking things apart to see how they work.
13. I get bored easily so I need to keep doing new things.
14. I don't like fast speeds, they make me nervous.
15. I enjoy reading novels more than non-fiction.
16. I can find my way more easily using a map rather than landmark directions.
17. I keep in regular contact with my friends and family.
18. As a child, I enjoyed physical sports.
19. Imagining things in three dimensions is easy for me. For example, I can see in my mind's eye just how an architect's drawings or plans will look once built.
20. As a child, I loved doing things like "wheelies" on my bike.

Now work out your score to see how "male" or "female" your brain is.

If you answered Yes to questions 1, 3, 6, 7, 9, 10, 11, 14, 15, 17, score one point each. (No answers to these questions receive no points.)

If you answered No to questions 2, 4, 5, 8, 12, 13, 16, 18, 19, 20, score one point each. (Yes answers to these questions receive no points.)

Total up your scores. Very male is closest to one, very female is closest to 20.

Source: Anne Moir