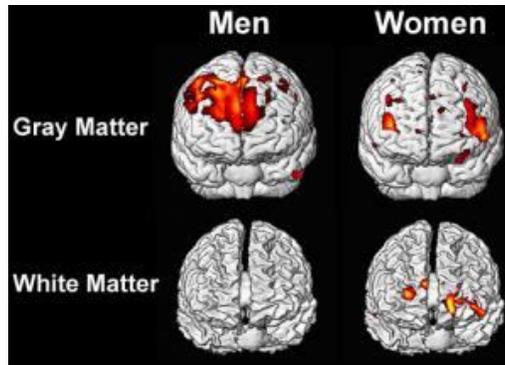


Sex Differences Gender Differences in Brains



10 February 2006

No other topic is as likely to raise blood pressures and voices in academia, than the topic of sex differences in the brains of men and women. [This newsrelease](#) from [the Society for Neuroscience](#), discusses a report on sex differences in the brains of mice. The research is published in the 1 Feb 2006 issue of the Journal of Neuroscience.

“We found unexpected differences in the white matter of male and female brains, which may have implications for the study of diseases that affect one gender more than the other, like multiple sclerosis,” says co-author and team leader Robert Skoff, PhD, of Wayne State University School of Medicine.

*Myelin, a major component of the brain’s white matter, coats nerve cells and helps conduct messages through the central nervous system. The dramatic difference was “**much greater than we anticipated**,” the team noted.*

Clarifying how sex differences in the brain are generated may provide critical insight into why disorders such as multiple sclerosis, autism, and depression have a much greater incidence in one gender over the other, says Christine Wagner, PhD, at the University at Albany, who has also reported on sex-based brain differences in rats.

Skoff’s team also discovered that the lifespan of myelin-forming cells is much shorter in female mice. Female mice produced up to twice the number of cells as males, and twice as many of these cells died in female brains. The greater turnover of cells in female brains may mean that myelin itself generates—and degenerates—at a greater rate in females, says Skoff. This finding could have implications for research on multiple sclerosis, a debilitating autoimmune disease characterized by myelin degeneration. About 400,000 Americans have multiple sclerosis, with two of three cases occurring in women.

Skoff’s team also showed that the composition of the brain’s white matter is regulated by hormones. Just like the female mice, castrated male mice showed greater turnover of myelin-forming cells. “These results show that hormones made outside the central nervous system, presumably testosterone, help regulate the number of myelin-forming cells and the amount of central nervous system myelin,” says Skoff. Recent studies show testosterone may have a protective effect in multiple sclerosis.

*“The fact that **sex hormones affect these cells and influence turnover rates** extends our notions of how and where sex hormones act in the brain well beyond where most people are aware,” says Bruce McEwen, PhD, an expert on sex hormones at Rockefeller University.*

Recent controversy over the [Lawrence Summers Affair](#), has led some people to look into a possible neurobiological basis of sex differences, and caused other people to attempt to slam the lid on the entire issue.

[A thorough look](#) into the issue of sex differences and gender differences in brain function is likely to stir up much controversy. Even if excellent scientific research demonstrated valid, meaningful, and significant sex differences and gender differences in male and female brain function, in the current atmosphere of quasi-censorship it is unlikely that the research would be financed or duplicated.

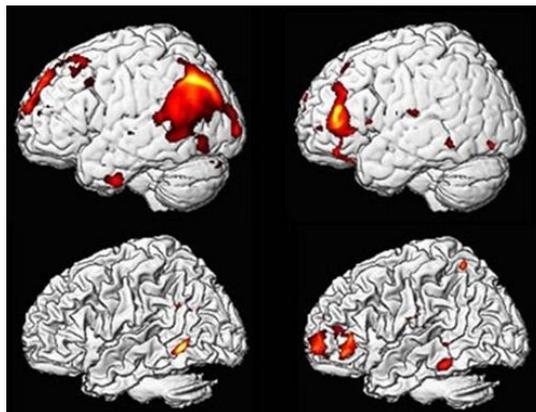
The importance of understanding sex differences and gender difference is in being able to determine whether current social policy is warranted, or perhaps misguided in emphasis.

Hunter vs. Gatherer: Gender Differences on the Mind

BY [Whitney Hopkins](#) Tue Sep 22, 2009

Recently when cooking with my boyfriend, I caught him staring at a pan--with five minutes before he had to flip anything!! So I asked him, "Why don't you empty the dishwasher while you're waiting?" He gave me a baffled look followed by, "But I'm cooking," clearly indicating he did not understand my request. Yet I was just as baffled. Can we really be that different?

Talking about gender is such a touchy subject. Most of us are only aware of obvious physical or behavioral attributes that differ between genders. But our differences run deeper--to the way we think, the way we act, and to our primitive desires.



Scientists studying dissimilarities underlying some of the most important gender distinctions are finding differences deeply rooted to the days when men were hunters on the savanna and women were gatherers rearing children near camp. These dissimilar roles and settings pushed men and women to evolve different hormonal balances and distinct brain structures.

This is how our primitive differences tend to show themselves:

My boyfriend ("Hunter") and I ("Gatherer") hop into our car. We speed off; he is driving, I am navigating. We pass a red VW bug.

Gatherer: "Awww. That kind of car sings to me."

Hunter: Looks confused. "How come?"

Gatherer: Attracted to faces in objects. A VW bug has a great face. Even more so, it looks like a baby. Oxytocin releases in gatherer's body causing "Awwwww."

Hunter: Lacking Oxytocin, obviously does not understand. Wants more “machine” (was true even as a newborn staring at mechanical mobiles rather than faces).

Gatherer: Once on the highway, starts chatting about trip, writing emails, and paying bills.

Hunter: Can't handle multitasking (remember the dishwasher?) but centralized, linear processing in brain gives advantage in focused driving...or tasks like setting up new laptop.

Gatherer: Uses travel time to get things done. Brain has more connective tissue, both hemispheres operate more evenly. Better at pulling evidence from disparate sources and more successful at multitasking.

Hunter: Progress on the journey is going well, but real navigating is needed to get to final location.

Gatherer: Traveling south, so having troubles reading a map oriented to the north. (Good thing, as an engineer, she can figure out how to read the map upside down!)

Hunter: For him map-reading is easier--geometrical and navigational abilities relate to high testosterone exposure during utero.

Gatherer: Out of luck and getting frustrated.

Hunter and Gatherer: Uh-oh...they're lost.

Gatherer: Wants to ask for directions.

Hunter: "No!" (testosterone at work). Competitive and not willing to admit navigational weakness, to woman or to his fellow hunters.

Gatherer: Convinces Hunter to pull over. Sees someone at corner. “Yes, him. He's the one. He is friendly.” (Having evolved in the socially complex camp setting where reading a fellow tribeswoman was key to success, can process the emotion shown on a face even before a man recognizes that he is looking at a face.)

Hunter and Gatherer: Success. Time to park.

Hunter: Good thing he's driving. Parallel parking favors male-oriented geometrical abilities.

Gatherer: Even though she practices a lot, Hunters, on average, are three times faster.

Hunter and Gatherer: Whew. Made it.

Back at work. Here's what I'm thinking. When designing products or services for women, and especially when designing them for both men and women, it is important to understand differences between genders. It forms the basis for how each will experience a product. Not all differences are obvious. It takes careful scientific research and observation. The payoff? Products that work for and connect with women. And this is good for the whole tribe, both hunters and gatherers.

However, here's a fun footnote: According to a [test on the BBC's website](#), my brain is about 25% female. I do well on some male tests, like mental rotation, as well as the typical female-biased tests. Everyone is a mix. Are you more male in some ways and more female in others?

The female brain, according to research, has more intercellular connections, which may be why women are twice as likely to recover the ability to speak after a stroke. The male brain has more depression-fighting serotonin, which helps explain why men are far less likely to suffer depression.

There is such resistance to gender-specific medicine, Legato says, that when she lectures, many male doctors leave the room.

"Many physicians insist that one-size medicine fits all," she said. "Many of them think that the whole idea of gender-specific medicine is nonsense."

But increasingly, hard science is proving them wrong by showing that gender is much more than just an add-on. *ABC News' Jessica Yellin filed this report for "World News Tonight."*

Even 9-Month-Olds Choose 'Gender-Specific' Toys

Study found boys went for cars and trucks, while girls chose doll, teddy bear

By Jenifer GoodwinHealthDay Reporter



THURSDAY, April 15 (HealthDay News) -- Parents may want their girls to grow up to be astronauts and their boys to one day do their fair share of child care and housework duties, but a new study suggests certain stereotypical gender preferences take root even before most kids can crawl.

When presented with seven different toys, boys as young as 9 months old went for the car, digger and soccer ball, while ignoring the teddy bears, doll and cooking set.

And the girls? You guessed it. At the same age, they were most interested in the doll, teddy bear and miniature pot, spoon and plastic vegetables.

"The boys always preferred the toys that go or move, and the girls preferred toys that promote nurturing and facial features," said study author Sara Amalie O'Toole Thommessen, an undergraduate at City University in London.

So does this mean that boys and girls have an innate preference for certain types of objects? Or does socialization -- that is, the influence of parents and the larger culture -- impact children's choice of toys very early in life?

It's too soon to rule either out, said Walter Gilliam, director of the Edward Zigler Center in Child Development and Social Policy at Yale University.

"One of the things we've learned about babies over the many years we've been studying them is that they are amazing sponges and learn an awful lot in those nine months," Gilliam said.

The study was to be presented Friday at the British Psychological Society's annual conference in Stratford-upon-Avon.

In the 1970s and 1980s, there was lots of interest in the "nature" versus "nurture" debate, and developmental researchers did plenty of research on gender differences in play. However, most studies were inconclusive and interest faded, Thommessen said.

At the same time, roles within the home were becoming more fluid, with fathers taking on more child care and women working more and at a greater variety of jobs outside the home, though the marketing of children's toys remained very stereotypical.

This latest study included 83 children aged 9 months to 3 years who were observed playing for three minutes. The time they spent touching or playing with each object was noted.

Researchers chose the toys by surveying 300 adults about the first toy that came to mind when they thought of a boy or a girl. About 90 percent said "car" for boy and "doll" for girls, with the remainder mentioning the other toys.

Children were also offered both a pink teddy bear and a blue teddy bear. "We were quite interested to see if boys had a color preference, but boys didn't show any interest in the teddy bears at all," Thommessen said.

Gender-specific preferences became even more pronounced as the children got older. By about age 27 months to 36 months, girls spent about 50 percent of their time playing with the doll, and were no longer much interested in the teddy bear, which had interested them when they were younger, or any of the other objects. The boys spent 87 percent of their time with the car and digger, ignoring even the ball.

The finding raises the possibility of a biological basis for toy choices. A study from 2001 found even 1-day-old boys spent longer looking at moving, mechanical options than 1-day-old girls, who spent more time looking at faces.

Yet the impact of socialization should never be underestimated, Gilliam said. Studies have shown parents and others interact differently with female and male babies from almost the instant they're born, Gilliam said.

Even when they're infants, fathers tend to encourage more active play with boy babies, by playfully tickling or poking them, while they tend to hold girl babies closer. Parents have also been observed spending more time talking to girls than to boys.

As they get older, studies have shown boys are encouraged to more actively explore their environment, while girls are encouraged to engage in quieter play.

"Even if your boy prefers playing with a truck, make sure you talk to him and teach him about nurturing," Gilliam said. "Even if a girl is playing with a doll, every once in a while throw her a ball or take her on a run. Expose them to all the different possibilities, and then let them choose."

And keep in mind just how much you may be dragging your own stereotypical notions into parenting.

In the study, researchers found no association between parents' reported views on gender-appropriate toys for children, or parental roles at home, and the toys children chose. In other words, dads who did their share of housework and moms who held high-level jobs outside the home were just as likely to have girls who picked dolls and boys who picked cars and trucks.

But Gilliam remembers one family who brought their young son in to see him. There was an assortment of toys scattered on the floor, from which the boy chose a plastic figurine. "The mom said, 'Oh, he wants to play with dolls.' And the father replied, 'He's not playing with dolls. Those are action figures.'"

Gender-specific lessons favored

BY JO GILBERT

Last updated 05:00 26/07/2010



Fairfax

TEACHING FRAMEWORK: Psychologist and medical doctor Leonard Sax said the single-sex schooling framework should be used to achieve "new things" and lift underachieving boys.

Education

[Force used on pupils was legal says teacher](#) [Powers of invention on the boil](#) [Breakthrough over exploding black holes](#) [Squeeze on space at quake-hit St Martins](#) [Parents 'better than childcare'](#) [Teacher pulled ears 'heaps', boy tells court](#) ['Time to take under-twos seriously': report](#) [Hope despite fall in foreign students](#) [Secondary teachers near contract resolution](#) [Teachers to vote on possible agreement in contract dispute](#)

A gender-specific curriculum is the key to transforming gangster-aspiring underachievers into academic stars, an American educationist says.

Psychologist and medical doctor Leonard Sax said the single-sex schooling framework should be used to achieve "new things" and lift underachieving boys.

As reflected in popular culture, academic success in the English-speaking world had been increasingly regarded as not masculine and "for girls", Sax said.

"No longer are songs about trying harder to get an A on a geometry quiz to attract the pretty girl, as they once were.

"Now we have Akon, 50 Cent and Eminem, who seemingly devalue education, and a culture where young men want people to think they're gangsters."

On the flipside, girls might be achieving, but not in math, computer science, physics and engineering, which they regarded as "boys' subjects".

"The differences that matter between girls and boys is not their ability – it's their motivation," Sax said.

"Girls can love subjects like computer science as much as boys, but the way to engage girls is quite different to boys."

A curriculum geared towards each gender was "a very powerful tool". However, it was not enough to just separate boys and girls into different classrooms.

"You've got to establish an alternative culture where it's cool for boys to know the answer and get good grades."

Sax is in Christchurch as a guest of Rangitapu Girls' School, delivering workshops to parents, teachers and pupils.

[Response to Stress Is Gender Specific](#)

By Rick Nauert PhD *Senior News Editor*

Reviewed by John M. Grohol, Psy.D. on November 20, 2007



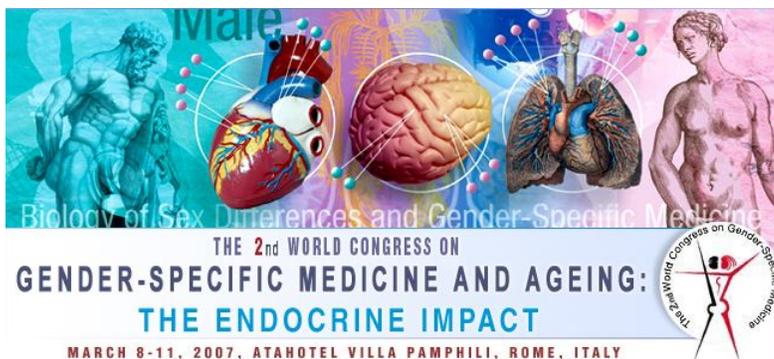
A new study finds the area of the brain that activates in response to stress varies among men and women. The inherent neurobiological difference may help explain why the incidence of mood disorders such as [anxiety](#) and [depression](#) vary among genders.

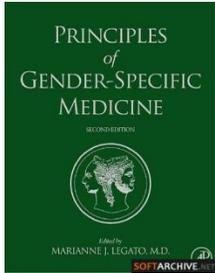
Scientists from the University of Pennsylvania School of Medicine publish their findings in the current issue of *SCAN (Social Cognitive and Affective Neuroscience)*.

"We found that different parts of the brain activate with different spatial and temporal profiles for men and women when they are faced with performance-related stress," says J.J. Wang, PhD, Assistant Professor of Radiology and Neurology, and lead author of the study.

These findings suggest that stress responses may be fundamentally different in each gender, sometimes characterized as "fight-or-flight" in men and "tend-and-befriend" in women. Evolutionarily, males may have had to confront a stressor either by overcoming or fleeing it, while women may have instead responded by nurturing offspring and affiliating with social groups that maximize the survival of the species in times of adversity.

The journal of gender-specific medicine: JGSM: the official journal of the Partnership for Women's Health at Columbia





Segregation

Many religions have traditionally practiced [sex segregation](#).

In traditional [Jewish synagogues](#), the women's section is separated from the men's' section by a wall or curtain called a [mechitza](#).^[19] Men are not permitted to pray in the presence of women, to prevent distraction.^[19] The *mechitza* shown in the picture on the right is one in a synagogue affiliated with the 'left wing' (more modern side) of [Modern Orthodox Judaism](#), which requires the *mechitza* to be of the height shown in the picture. More traditional or 'right wing' Modern Orthodox Judaism, and all forms of [Haredi Judaism](#), requires the *mechitza* to be of a type which absolutely prevents the men from seeing the women.

[Enclosed religious orders](#) are usually segregated by gender.

[Sex segregation in Islam](#) includes restrictions on interaction between men and women. Men and women also worship separately in [mosques](#).

"The sex segregation and male dominance of traditional [Buddhist](#) institutions, which also encourage belief in the reality of gender, are so well known that there is no necessity to do more than remind ourselves of their existence.

Catholics have developed an extensive system of higher education in America consisting of approximately 230 institutions within which separate education of men and women

In much of [Tamil Nadu](#) sex segregation is meant to be observed such that women and men eat separately in the home, ride on separate sides of the local bus, watch movies from different halves of the theater, and stand in different lines to pray to Hindu deities.^[14]

Paganism

Main article: [Paganism](#)

Within the African system of courtyard planning, some are adapted to provide for sex segregation.^[24]

Within the people of the [Lacandon Jungle](#), the [Sun](#) and its related attributes (heat, height, right-handedness, and light) are associated with men.^[25] Thus, men sit on the right side of a fire and women sit on the left.^[25] Further, men sit on stools placing themselves higher than women who sit on the Earth, which is considered feminine.^[25]

[\[edit\]](#) **Anuta**

Main article: [Anuta](#)

The head of the [Anutan](#) church, the [catechist](#), speaks from a [pulpit](#) in front (the eastern end) of the [church](#), while the congregation sits facing him.^[26] The men sit on the right side of the central aisle, and the women sit on the left.^[26] [Polynesian cultures](#) represent variations on a set of common themes; i.e., [social relations](#) are expressed in spatial terms and represented as an elaborately articulated, hierarchically ordered set of binary oppositions: right to left, front to back, east to west, high to low, and seaward to inland.^[26] The cosmological order underlying Polynesian notions of aristocracy apparently originated from high volcanic islands.^[26]