Men and Women’s Brains Aren’t Really That Different

New research is debunking centuries of myths

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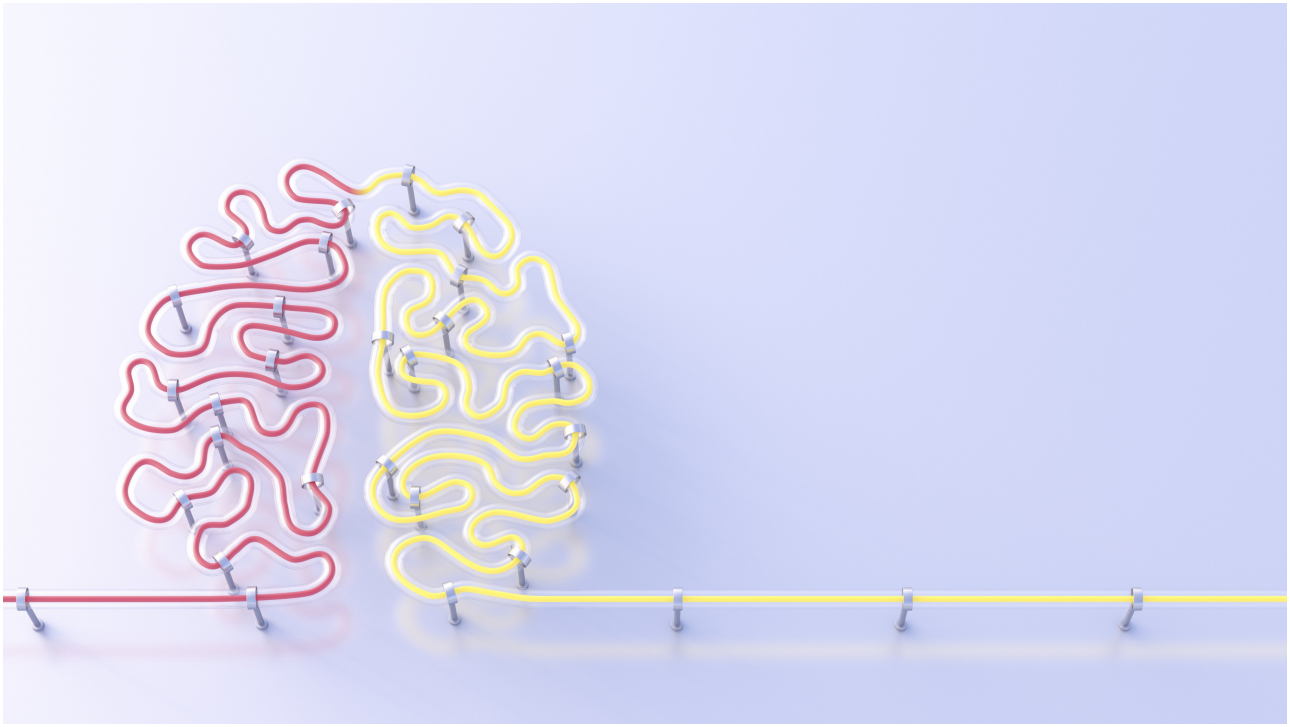

Credit: Westend61/Getty Images

The question of sex differences in the brain is one that has been debated, researched, encouraged, criticized, praised, and belittled for over 200 years, and can certainly be found in different guises for long before that. It is characterized by bizarre claims (women’s inferiority comes from their brains being five ounces lighter) which can be readily dismissed, only to pop-up again in a different guise (women’s inability to read maps comes from wiring differences in the brain). Sometimes a single claim lodges itself firmly in the public consciousness as a fact and, despite the best efforts of concerned scientists, remains a deeply entrenched belief. It will be

frequently referred to as a well-established fact and triumphantly reemerge to trump arguments about sex differences or, more worryingly, to drive policy decisions.

I think of these seemingly endlessly recurring misconceptions as whack-a-mole myths — just when you think you've dispatched them all, another pesky myth pops up elsewhere. In the context of sex differences, this might be the belief that newborn baby boys prefer to look at tractor mobiles rather than human faces (the "men are born to be scientists" mole), or that there are more male geniuses and more male idiots (the "greater male variability" mole). Inaccurate claims like these have been variously whacked over the years but can still be found in self-help manuals, how-to guides, and even in 21st century arguments about the utility or futility of diversity agendas.

Theories about women's inferior brains emerged long before we were actually able to study the human brain, other than when it was damaged or dead. Nevertheless, "blame the brain" was a consistent and persistent mantra when it came to finding explanations for how and why women were different from men. In the 18th and 19th centuries, it was generally accepted that women were socially, intellectually, and emotionally inferior; in the 19th and 20th centuries, the focus shifted to women's supposedly natural roles as carers, mothers, womanly companions of men. The message has been consistent: There are essential differences between men's and women's brains, and these will determine their different capacities and characters and their different places in society. Even though we could not test these assumptions, they remained the bedrock on which stereotypes were firmly and immutably grounded.

But, at the end of the 20th century, the advent of new forms of brain imaging technology offered the possibility that we could, at last, find out if there really were any differences between the brains of women and those of men, where they might come from, and what they might mean for the brains' owners. You might think that the possibilities offered by these new techniques would be seized on as game changers in the arena of research into sex differences and the brain. If only that were the case.

Several things went wrong in the early days of sex differences and brain imaging research. There was a frustrating backward focus on historical beliefs in stereotypes (dubbed "neurosexism" by psychologist Cordelia Fine). Studies were designed based on the go-to list of the differences between females and males, generated over the centuries, or the data were interpreted in terms of stereotypical female/male characteristics which may not have even been measured in the scanner. If a difference was found, it was much more likely to be published than a finding of no difference.

This links to the second difficulty with early brain imaging research — the images themselves. The new technology produced wonderfully color-coded brain maps that gave the illusion of a window into the brain. These images now appear frequently in the popular press and brain-based self-help books, but are considerably less frequently accompanied by any kind of explanation of what such maps are really showing.

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So the advent of brain imaging at the end of the 20th century did not do much to advance our understanding of alleged links between sex and the brain. Here in the 21st century, are we doing any better?

New ways of looking at the brain focus on connections between structures rather than just the size of the structures themselves. Neuroscientists today have started decoding the way in which different frequencies of brain activity seem to pass on messages and bring back answers. One major breakthrough in recent years has been the realization that the brain is much more proactive or forward-thinking with respect to information gathering than we had first realized. It doesn't just respond to the information when it arrives; it generates predictions about what might be coming next, based on the kind of patterns it has identified on previous occasions. We could think of the brain as some kind of predictive texter or high-end GPS, helpfully completing our words or sentences, or guiding us down the safest paths for people like us. Of course, in order to make predictions you need to learn some kind of rules about what usually happens, the normal course of events. So what our brain does with our world very much depends on what it finds in that world.

But what if the rules our brains are picking up are actually just stereotypes, those pervasive shortcuts that lump together past truths or half-truths or even untruths? This brings us into the world of self-fulfilling prophecies. The brain doesn't like making mistakes or prediction errors — if we are confronted with a situation where people like

us aren't commonly found or where we are clearly unwelcome, then our brain-based guidance system may drive us to withdraw.

We now know that, even in adulthood, our brains are continually being changed, not just by the education we receive, but also by the jobs we do, the hobbies we have, the sports we play. Supposing these brain-changing experiences are different for different people, or groups of people? If, for example, being male means that you have much greater experience of constructing things or manipulating complex 3D representations (such as playing with Lego), it is very likely that this will be shown in your brain. Brains will reflect the lives they have lived, not just the sex of their owners.

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Mapping the structures and networks of the brain has revealed how it is involved with forging our self-identity, with spotting members of our in-group (such as male and female), and with guiding our behavior to be appropriate to the social and cultural networks to which we belong (girls don't do this or that), or to which we wish to belong. This is a key process to monitor in any attempt to understand gender gaps, and it appears to be a process that starts from birth, or even before. Toys, clothes, books, parents, families, teachers, schools, universities, employers, social and cultural norms — and, of course, gender stereotypes — all can signpost different directions for different brains.

Resolving arguments about differences in the brain really matters. The outcomes of these debates are embedded in how we think about ourselves and others, and are used as yardsticks against which to measure self-identity, self-respect, and self-esteem. Beliefs about sex differences (even if ill-founded) inform stereotypes, which commonly provide just two labels — girl or boy, female or male — which in turn historically carry with them huge amounts of information and save us having to judge each individual on their own merits or idiosyncrasies.

A gendered world will produce a gendered brain. Understanding how this happens, what it means for brains and their owners is important, not just for women and girls, but for men and boys, parents and teachers, businesses and universities, and for society as a whole.

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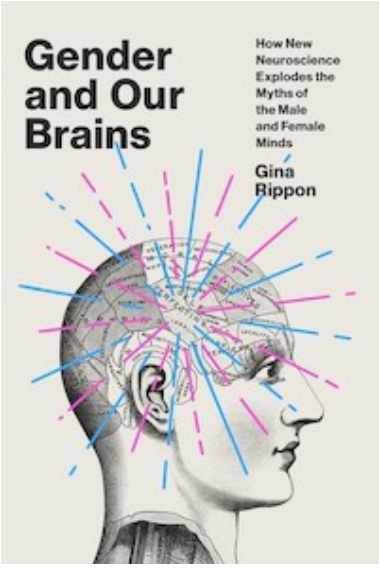

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