

The battle of the sex differences

Jon Sutton interviews Cordelia Fine about neurosexism and more

For anyone who thought that the battle of the sexes was over, that any gender inequalities remaining are innate and pretty inevitable, your new book *Delusions of Gender* is pretty uncomfortable reading. Everything's not fine.

As long as there has been brain science there have been – in retrospect – misguided neurological explanations and justifications of sex inequality. Again and again, these hypotheses eventually find themselves hurled on the scientific scrap heap. But not before they become part of cultural lore, and reinforce social attitudes about men and women in ways that hinder progress towards greater sex equality. It's still happening. I think that in 50 years' time we will look back on these early 21st-century debates and claims with the same shocked bemusement with which we now view suggestions that women's spinal cord and brain stem characteristics leave them ill-equipped for voting.

To be clear from the start though, you're not denying that there are sex differences in the brain; or that there are also large sex differences in who does what; or that they could be connected.

That's right. And it's possible that our increasingly sophisticated and powerful neuroimaging techniques might reveal other, more subtle, differences. But drawing a link between brain differences and psychological or social differences between the sexes is no easy task. This

is partly because those gender gaps can close or even disappear depending on social context, place and historical period. But also, we are still at the beginning of the journey of understanding how the brain enables the mind. Even if we assume that a sex difference in the brain is reliable – generally not a safe assumption to make – what does it mean? The sheer complexity of the brain, together with our assumptions about gender, lend themselves beautifully to over-interpretation and precipitous conclusions.



One couple we encounter in your book get what they consider 'marriage saving' information from a brain scan, marvelling: 'It's hard to argue with an MRI'. Harmless placebo?

I don't think it's a harmless placebo when you have an apparently authoritative author claiming that working mothers suffer from 'overloaded brain circuits' and that only when 'the children leave home, the mommy brain circuits are finally free to be applied to new ambitions, new thoughts, new ideas.' Last year Naomi Wolf wrote an opinion piece that reported, without any apparent scepticism, Michael Gurian's suggestion that men are neurally less capable of seeing dust or laundry piling up. When a leading spokeswoman for the third-wave feminist movement falls for neurosexism, we have to start to worry.

Perhaps even more worrying is the way commentators draw on findings of sex differences in the brain to 'inform' educational practices. There are lots of good scientific reasons to worry about whether any one finding of a sex difference in the brain will withstand the tests of time, of bigger samples, and of better methodologies. Yet commentators will recommend educational strategies on the basis of what is very likely a spurious difference. Then, of course, we're a long way from being able to translate brain differences – a slightly bigger bit of the brain here, or a bit more neural activity there – into educational strategies. This is where gender stereotypes come in handy – and now you've got just about everything you need for a self-fulfilling prophecy.

Your position seems to be one of extreme social determinism. In this scientific era of 'it's a bit of both' conclusions, isn't that just as bizarre and unsustainable as an exclusively biological focus would be?

I reject all charges! To say that the difference between two schools in average maths scores might be due to differences in the school environments isn't to claim that mathematical ability is socially determined. My conception of development is one in which the developmental path is constructed, step by step, out of the continuous and dynamic interaction between brain, genes and environment. And the 'it's a bit of both' line raises an interesting point. While researching the book I struggled to reconcile a conception of brain development as the emergence of experience-dependent neural structures with the idea that prenatal hormones permanently organise a 'male type' or

'female type' brain. What, exactly, is organised? The concept of prenatal brain organisation acknowledges 'a bit of both', sure. But I'm not sure it embraces the inextricability of the two.

You mention the 'male type' and 'female type' brain there. Simon Baron-Cohen, a UK psychologist who has researched in that area, gets a particularly hard time in your book. What is it about his work you're so uncomfortable with?

Simon Baron-Cohen has done seminal work in autism. But when it comes to his research into sex differences, the care, thoughtfulness and background knowledge that the topic deserves is not in evidence – both in terms of the methods that he employs, and with regard to the conclusions he (and others) then draw from his data.

For example, there are question marks over whether he is measuring fetal testosterone, whether he is measuring 'empathising' and 'systemising', and whether males and females even differ in these skills. Even if you set all this aside, there are often question marks over whether he finds the relationships between fetal testosterone and empathising and systemising abilities that you'd expect to see if his hypothesis is right. Sometimes these relationships are pretty messy, or even missing. All in all, that's a lot of question marks over a lot of important issues.

You deconstruct one study in particular, which was led by one of Baron-Cohen's master's students. I published a fair bit of research during my PhD, and on being asked to justify it more than a decade later, I often find myself wanting to scream 'I was doing my PhD! I didn't really know what I was doing!' But you do evoke the Spiderman principle: 'with great power comes great responsibility'.

I do think neuroscientists in socially sensitive areas like gender should work under a burden of caution. Many studies are flawed, many are over-interpreted. But not many inspire in their authors and others the conclusion that innate differences in part lie behind our gender-stratified society.

Having said that, I also fully subscribe to the 'I was doing my PhD!' principle – I think the bulk of this responsibility falls on supervisors and more senior

researchers rather than inexperienced students.

Having spent my academic years struggling to find a decent measure of empathy, I have to admit I chuckled at your description of tests like Baron-Cohen's 'Reading the Mind in the Eyes' task as coming closest to assessing 'talking to a time-pressed Muslim woman in full burka'. Do you feel the field is primarily hampered by methodology, or do you just feel there's little of interest there however hard we look?

I certainly don't think there's nothing of interest to be found with regard to empathy and gender. For example, it's interesting and important that even very subtle social cues can create or obliterate a gender gap, or that a large body of research shows that

people's self-ratings of their empathic ability bear little relation to their actual ability. And of course this kind of research shows us just how careful we

have to be about our methodology when investigating gender differences.

Is part of the problem that psychologists are expected to always declare gender of participants, and then if a difference is found it is reported?

The file drawer/publication bias with regard to sex differences is a long-noted problem and – thanks to default testing for sex differences, nuisance variables, a tendency for small sample sizes, and teething problems with statistical analysis techniques – one that seems to be exacerbated in the neuroscientific literature. This is an issue that, in my view, the neuroscientific community needs to start thinking about. When I tracked down the studies cited by popular writers as evidence of hardwired sex differences, this often took me to studies with very small numbers of men and women in which brain activity in the sexes was very similar. Yet the focus of the published report was a marginal and probably spurious sex difference.

Guest questions

From Michelle Ryan, Associate Professor at the University of Exeter

What is it that turns rigorous, scientifically valid neuroscience findings into neurosexism?

I don't, of course, have any objection to rigorous, scientifically valid neuroscience! And neuroscientists don't have control over how their findings are used (or abused) by popular writers. But I would argue that, within the neuroscientific community, there are issues around how 'facts' about sex differences in the brain are sometimes (not always, of course) produced, reported, cited and interpreted. Default testing for sex differences leads to spurious results. Marginal findings of sex difference can become the main focus of a published report. Small studies that find sex differences may be cited in favour of larger studies, or even meta-analyses, that do not. Structure-function relations are assumed, rather than tested, leaving researchers with too much room for theoretical contortions when data don't fit hypotheses. These all contribute to the problem.

As a parent yourself, what are your reflections on gender-neutral parenting?

There is this popular idea that we tried gender-neutral parenting, and it failed. Yet it's impossible to parent in a gender-neutral way. Babies are born into a world in which sex is the most important and the most obvious social division, continually emphasised, and it's a world which is absolutely saturated with information about what goes with being male and what goes with being female. Babies are also born to parents who have a head full of assumptions and expectations about gender, whether consciously endorsed and acknowledged, or not. We need to take very seriously how this contributes to the really very subtle sex differences seen in infancy. But also, you can't rear children in this kind of strongly gendered environment, and not expect it to influence and motivate them quite powerfully once, at the age of about two, they know what side of this very important gender divide they belong.

Perhaps the main point I learnt from the book was how the environment makes gender salient, and the ripple effect this can have on the mind. Can you give us an example of this at work?

When we're trying to do something that's traditionally regarded as being the specialty of the other sex – for example, maths or understanding another person's thoughts and feelings – we do so under the cloud of 'stereotype threat'. Gender stereotypes are primed in our mind, and this interferes with our ability and interest in the task. There's a growing body of fascinating research into this phenomenon, trying to unravel how and why it happens. But what I find most

"these hypotheses eventually find themselves hurled on the scientific scrap heap"

interview

striking are the studies that show what happen when you blow the cloud of stereotype threat away. You can do this, for example, simply by telling women that on the maths test they're about to take, women do just as well as men. And when you do, women perform significantly better than you'd expect from their course or test scores. As Catherine Good and her colleagues have put it, dispersing stereotype threat unleashes mathematical potential in women that is usually suppressed.

So that would clearly impact upon women in their working lives?

Absolutely. This research suggests that a woman doing traditionally male work faces the same problem as the dancer Ginger Rogers, who, as it was once famously noted, 'did everything Fred Astaire did, except backwards and in high heels'. And I think it's important not to underestimate the impact of stereotype threat on people's interests too. Of course it's possible that older adults' interests don't have the same surprising malleability researchers have found in the university students with whom most of this research is done, but young adulthood is an important time of life for making career decisions that can permanently close doors.

Just how 'Western' a phenomenon is this? I believe there is more gender segregation of occupational interests in rich, advanced industrial societies

than in developing or transitional ones.

That's right. And one explanation of this is that men and women in rich, advanced industrial societies have more economic freedom to express their essentially different natures, rather than both sexes pursuing the most financially secure occupations. But occupational interests aren't carried around inside the head, impervious to outside interest. Cultural realities and beliefs about the sexes – represented in existing inequalities, in advertisements, in conversations, in the expectations of others, or primed by the environment – alter our self-perception, our interests and our behaviour. For example, it seems to be remarkably easy to adjust the shine of a career path for one sex. In lab studies, a few words to the effect that a Y chromosome will serve in your favour, or a quick makeover of the interior design of the workplace, is all that it takes to bring about surprisingly substantial changes in career interests. So are we in the West expressing our essential male and female natures – or our 'gendered selves'?

I'd be failing in my duty as a man if

I didn't respond with righteous indignation to your quote that 'behind every great academic man there is a woman, but behind every great academic woman is an unpeeled potato and a child who needs some attention'. If you're responding on behalf of your entire sex then you may have to stick to plain old indignation, I'm afraid! But if this is a personal defence then I'd point out that later in the book I do say, 'of course, there are exceptions', although I must apologise for not mentioning you by name!

Laundry and nappy-changing are much less glamorous than neuroscience, but we mustn't overlook the domestic in our search for the reasons for sex inequality. Gloria Steinem absolutely put her finger on it. This is what makes Louann Brizendine's claims in *The Female Brain*



We mustn't overlook the domestic in our search for the reasons for sex inequality

especially irksome. Overloaded brain circuits? Mommy brain circuits only free for new ideas and ambitions once the kids leave home? Oh, please! What will she tell us next? That the neural circuits for organising child care, planning the evening meal and ensuring that everyone has clean underwear crowd out the circuits for career, ambition and original thought?

Clearly your focus is on why neurosexism is bad for women, but what about the impact on men? Roy Baumeister argues that we have built our successful civilisation in part by treating men as expendable building blocks. 92 per cent of Americans who die in the line of work are men, and Baumeister argues there would be outrage if that statistic were reversed. I certainly think that neurosexism is bad for men too, and often downright insulting. But at the same time it's worth pointing out that although it's a brave boy or young man who flirts with the feminine in front of his peers, on the whole men tend to be welcomed into traditionally female occupations. By contrast, women who try to enter masculine occupations, including those more dangerous ones, often suffer very hostile treatment.

Well, I did enquire about a job in Mothercare once, and was pretty much forcibly ejected. Anyway, we're about half way through this interview now. If I were to tell you that others have described me as 'charmingly sexist', how might that frame the rest of it? Psychologist Stacey Sinclair and her

Guest question

From Melissa Hines, Professor of Psychology at the University of Cambridge

Can evidence of some inborn (say genetic or hormonal) contributions to gendered behaviour be discussed without reinforcing sex-related stereotypes?

That's an interesting question, and I think it raises the important point that to those who are interested in gender equality there's nothing at all frightening about good science. It's only carelessly done science, or poorly interpreted science, or the neurosexism it feeds that creates cause for concern. But I think what would be helpful is for us to remember that, whatever neuroscientists or neuroendocrinologists find, there's no such thing as 'biology in the pure' that socialisation either boosts up or disguises. I think if we can move away from an implicitly one-way model of development – genes to hormones to brains to behaviour – then that might help to create some distance between 'biological' research and rigid gender stereotypes. Maybe!

colleagues have found that we socially 'tune' our self-perceptions to blend with the opinion of ourselves held by the person with whom we're interacting. When women were manipulated into thinking that they were going to spend some time with someone 'charmingly sexist', obligingly, they temporarily perceived themselves as more stereotypically feminine than a control group. And remarkably, when they actually interacted with the supposed benevolent sexist, they even behaved in a more stereotypically feminine way. In short, if only you'd told me earlier that you're charmingly sexist, I might have answered the question about Simon Baron-Cohen in a more caring, socially sensitive way. This work is fascinating in its own right, but it is also a wonderful example of just how psychologically permeable is the skull that separates the mind from the sociocultural context in which it operates.

And do you think you'll get through, get into people's heads? Do you think your book will make a difference, or are neuroscientific explanations just too seductive and the stereotypes too resistant to change?

At times I did feel rather despondent while writing the book, as I came to realise that no sooner does one neuroscientific justification for sex inequality fall than another one comes to take its place. And we just don't seem to be learning from our mistakes – we are still plagued by the problem of sex and premature speculation. If I have a hope for my book making a difference, it's probably in the role it might play in drawing attention to the need to raise the bar when it comes to the topic of sex differences in the brain. To be clear, this isn't a call for political correctness, but scientific correctness. I think both neuroscientists and the popular media need to step up here. Neurosexism affects social attitudes in a harmful way, and we need to start being less casual about it.

Science clearly influences politics and vice versa. But did you ever feel you were blurring the boundaries too much?

For some reason, objection to the careless treatment of the science of sex differences is often confused with disapproval of the very idea of intrinsic sex differences. It is

dismissed as political correctness and an ideologically motivated ignoring of the scientific evidence. But my book doesn't blur the boundaries between politics and science – rather, it makes their interaction stand out more clearly.

In striving for scientific correctness, I would describe the book as relentlessly methodological. I think that's quite an inspiration to any of our readers thinking about writing a popular science book – they don't have to compromise on the science to have a hit. Was it easy to publish it in that way?

Thank you... I think! Although a tip for readers – never use the phrase 'relentlessly methodological' in a book proposal...

It can be hard to write accessibly and to get the balance right. Popular writing is a lot of fun, and it's actually surprising how having to put things in plain English can sometimes force you to clarify, rather than compromise,

scientific ideas. I also really enjoy being able to bring ideas and research out of academic journals and into the public domain. But I have to admit that sometimes it's a real relief to go back to academic work and be able to really get down to the nitty-gritty of things without having to worry about making the material funny, accessible and interesting to a general reader.

Tell me more about that academic work.

My current academic work is related to the book. At the moment, for example, I'm writing an article exploring neuroscientists' ethical responsibilities when it comes to the topic of sex differences and the brain, and how those responsibilities might best be supported and discharged.

You've got quite a pedigree – Oxford, Cambridge, UCL. Do you have fond memories of UK psychology, and do you think you'll return to our shores?

I do have fond memories of the UK. And

Guest question

From Christian Jarrett, Editor of the Society's Research Digest (www.researchdigest.org.uk/blog)

Your book is incredibly well researched so I was surprised that you didn't discuss the case of David Reimer. He lost his penis in a botched circumcision operation aged eight months and was subsequently raised as a girl (which included having his testicles removed, and female hormone treatment) on the advice of a psychologist who believed gender identity is entirely socially constructed. This proved to be a disaster and Reimer later reclaimed his male identity aged 14. Similar outcomes have been observed for boys with cloacal exstrophy (in which the penis is missing from birth) who have been treated with female hormones and raised as girls. What do you feel these cases say about the innateness of gender identity, if anything?

My book is concerned with the idea that males and females are, on average, 'hardwired' to 'systemise' versus 'empathise', which is why I focused on evidence most relevant to the question of the effects of prenatal hormones on sex-typed interests, rather than core gender identity (that is, sense of being male or female). But to answer the second part of your question, despite the huge popular impact the case of David Reimer has had, this was one individual, reared as a male until 17 months of age. And in her new book *Brain Storm* (which takes on the whole 'package' offered by brain organisation theory) Rebecca Jordan-Young points out that femininity was forced rather heavy-handedly on Reimer, and with a kind of anxious 'let's hope and pray we can turn this boy into a girl' mentality, and that we should consider what effect this might have had, especially in light of recent reviews of similar kinds of cases that conclude that rejection of a female identity is far from inevitable.

I'm open-minded about where the future will take me.

What book comes next? And can I put in a plea for one that's easier on your husband?

I do have another book in mind, but it will not be about gender. Will it be easier on my husband? I hope so. I suspect that there's nothing fun about living with someone reading up on gender inequity in household labour, primed to see the exertion of male privilege where perhaps there is nothing more than a few unwashed cups. There was also a period when our normally quiet hour of reading before bedtime became more like dinner in the pig-sty, as I contemptuously snorted my way through several popular books about gender. But having said that, living with someone writing a book is probably tiresome whatever the topic.

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