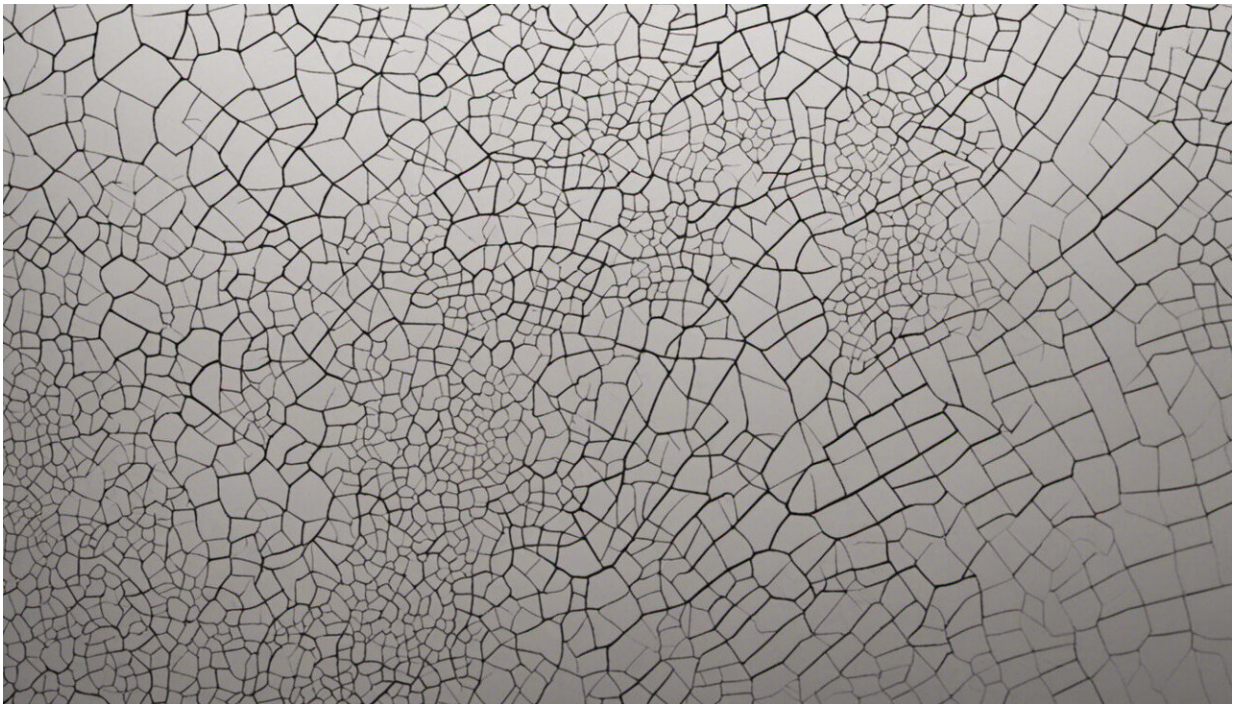


What neuroscience can tell us about the Google diversity memo

August 15 2017, by Gina Rippon



Credit: AI-generated image ([disclaimer](#))

Everybody seems to have an opinion about Google's [recent sacking](#) of its malware software engineer James Damore for circulating [a memo](#) arguing that women and men are suitable for different roles because they are intrinsically different. The debate so far has centred mainly on the pros and cons of [diversity programmes](#), which partly sparked Damore to

construct his document, and whether Google was right to fire Damore.

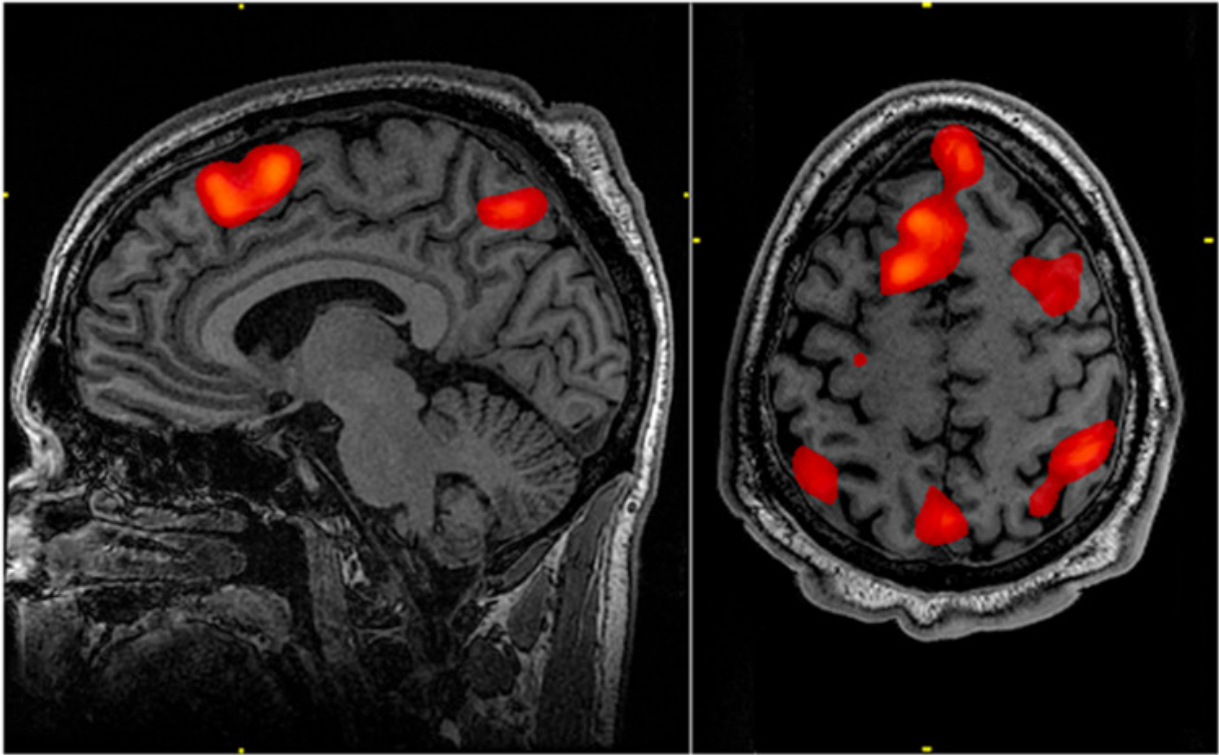
While there have been some less vocal comments about the biological differences Damore referred to – ranging from finding them "[spot on](#)" to "[wrong](#)" – his assertions haven't been challenged much on the actual neuroscience behind his basic assumptions. Is there any truth to the idea that we are all destined by our biology? To understand this, let's take a look at the most recent advances in the field.

The memo, titled "[Google's Ideological Echo Chamber](#)", was sent to an internal company network and criticised the company's diversity initiatives. It quoted psychological studies, Wikipedia entries and media reports to argue its case.

It claimed women are underrepresented in the tech industry because of biological differences, arguing that women have a "stronger interest in people rather than things", and that they are prone to neuroticism and anxiety. Men, on the other hand, have a higher drive for status, according to the document. While the memo stopped short of actually spelling it out, it certainly implied that these differences are innate, fixed and unchangeable.

But this kind of thinking is changing at every level. Psychology's go-to list of cognitive differences between males and females has been dismantled, with overwhelming evidence that women and men are more similar than they are different. Many alleged sex differences in skills, aptitudes and personality – including science-based interests – have been shown not to fall into two neat categories, [but rather exist on a spectrum](#).

At the level of the [brain](#), the concept of a male or a female brain has been challenged – supported by evidence indicating that brains [are a mosaic](#) of both male and female characteristics.



FMRI scan during working memory tasks. Credit: John Graner/wikipedia

Our changeable brains

One breakthrough in our 21st-century understanding of the brain is that the brain is "plastic", which means that [it can change depending on the experiences](#) it is exposed to. This was clearly demonstrated in the well-known "[taxi-driver studies](#)" – which showed that acquiring expertise is associated with significant brain changes – and many others. If brain characteristics can be altered by experience, then it certainly seems wrong to argue that [sex differences](#) are innate.

Take, for instance, the [gender gap](#) in STEM subjects (science,

technology, engineering and maths), which is presumably something Google is looking to address. It is often argued that this is associated with men having better spatial cognition – it isn't. There is actually clear evidence that spatial cognition training [can change the brain](#), boosting its performance. What's more, the gender gap in spatial skills [has been shown to be diminishing](#) over time, even disappearing. In certain cultures, the situation is actually reversed.

The brain is also porous or permeable and will respond to and change as a function of attitudes and expectations, both external and internal. "Stereotype threat" is a well-known process in which people feel anxiety connected with particular skills perceived to be associated with members of another group. This can affect their performance and their brain activity. For example, girls may feel this way about maths – thinking it's a "boy thing". Sadly, this mechanism [has been shown to be real](#) – for example [affecting girls' performance on maths tasks](#).

It also changes [brain activity](#). One study showed that people who perceived themselves as being of lower status than others [had different volumes of grey matter](#) in brain regions involved in experiencing emotions and reacting to stress than those who did not. We have also [shown this to be true in our lab](#) when it comes to taking a negative, self-critical view of events in your life.

So if you are in an environment where there are stereotypical views that, as a member of a particular group, you're unlikely to succeed, this may indeed make you anxious and self-critical. And that will actually affect the way your brain works, meaning it is not necessarily something you were born with. And of course, this holds true for men's brains as well.

Damore strongly opposed certain "social engineering" activities to make the [tech industry](#) more welcoming to women. But actually, research shows that empowerment techniques [can alter brain activity](#) and

overcome the negative effects on performance of [stereotype threat](#) and performance anxiety. Importantly, altering a self-critical mindset will actually make the brain process information differently.

So even if biology could be blamed for the problems Damore identified they could also arise from the very environment he appears to be channelling – with stereotypical, deterministic thinking about aptitudes and abilities. I don't know the details of the diversity training he was so clearly uncomfortable with, but if it involves changing this environment and offering forms of training and empowerment to their employees, then they are doing exactly the right thing to alter what Damore wrongly assumed to be fixed and unchangeable.

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