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Biology is not Destiny

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What determines intelligence? A short and simple question, yet so hard to answer. Many people will tend to go towards IQ testing, if they can solve certain problems, or the size of their brains to reason why certain people are more intelligent. All of these are inaccurate measures; however, today we will only bust one of these, which is the belief that the size of one's brain is a direct correlation to one's intelligence. There is this widely known fact that men tend to have bigger brains than most women. Because of this people now believe that a man is smarter/more intelligent than a woman. This belief is not only harmful but it is simply not the case for multiple reasons in which I will be discussing throughout this paper.

What is the purpose of looking at one certain body part and not the others when discussing size? Ordinarily men tend to be bigger than women thus they have bigger organs. In an article *Sex-based differences in physiology: what should we teach in the medical curriculum?*, it states, "Men have larger lungs, wider airways, and greater lung diffusion capacity than women... men have significantly greater left ventricular mass and chamber size than women," in a paper titled *Forum* it states "On average, men have physiological advantages (including bigger and stronger muscles and bones, and more hemoglobin) that give them an insurmountable performance advantage over women" If you look at an average man and woman and put them side by side the man

will be bigger and taller than the women. Because women are usually smaller their organs will also be smaller. It would be unusual for a 5'2 female to have the brain size of a 6'2 male.

If the size of the brain truly played a role in how smart one is then I'd assume that animals then outrank humans in intellect. In an article written by Suzana Herculano-Houzel it states, "because brains are made of neurons, it seems reasonable to expect larger brains to be made of larger numbers of neurons; if neurons are the computational units of the brain, then larger brains, made of larger numbers of neurons, should have larger computational abilities than smaller brains. By this logic, humans should not rank even an honorable second in cognitive abilities among animals: at about 1.5 kg, the human brain is two- to threefold smaller than the elephant brain and four- to sixfold smaller than the brains of several cetaceans (Tower, 1954; Marino, 1998)," In other words if intelligence is solely based off of the size of the size of our brains or its mass then contrary to popular belief humans are not the smartest creatures out there as multiple other animals outrank the human brain (both men and women). What most people fail to realize is the usage of the brain and how each part of the brain works is what makes humans more intelligent. This can be taken into account with women and men. Take for example a man that has never read a single book his entire life vs a woman who has read multiple books throughout her life. Who's vocabulary is better? Who can comprehend text better? Who is smarter? Most would say the woman even though she has a smaller brain. That is because the way she utilized her brain led her to having the upper hand here not because of the brain size. Fuentes states in his book "the fact that females' brains stop growing earlier than males (as with every other

part of their respective physical bodies), there are no consistent and replicated reliable differences in the male and female brain; it is a human brain.” There is no real difference between the brains within genders. Their ability to do certain things and their efficacy is dependent on the individual.

Albert Einstein, the man who developed the theory of relativity, probably one of the smartest humans that's ever walked on earth and widely acknowledged to be one of the greatest and most influential physicists of all time, had a smaller brain than your average male. In an article written by Debosree Ghosh and Pratap Parida in which they talk about the research of Harvey and Anderson it states “Their study showed that there was no difference between Einstein’s cortex and that of control subjects in respect to the number of neurons under 1 mm² in cerebral cortex or in mean neuronal size. The cortex of Einstein’s brain was, however, found to be thinner². Witelson et al.⁶ reported that the weight of his brain (1230 g) was different from the ordinary brain of an adult human male of his age, i.e. a man of 76 years. Surprisingly, Einstein’s brain was 8.61% smaller in size than that of a normal adult human.” To summarize what's being said, Einstein, a male, had a brain size that was smaller than your average man as a fully grown adult. Shouldn't the smartest man to exist have a brain bigger than your average male or at least the same size? This also comes into play when talking about influential women who have done huge amounts of extraordinary things. Do the same people believe these women have bigger brains or does it not matter?

Numerous people would however say that Einstein is just an odd one out because the majority of the smartest people to walk on earth are male. And that is true, there is a high number of men who are amazingly intelligent, however the same people

tend to forget that men also have an alarmingly large number of low intelligence. In a study done by *Intelligence*, the journal of the International Society for Intelligence Research their final results showed, "The mean IQ score, based on the total score of the Picture and Moray House Tests, was 100.64 for girls and 100.48 for boys. This difference of 0.16 (95% CI = 0.037 to 0.367) was nonsignificant, despite the massive numbers tested, $t(79,374) = 1.6$, $P = .11$. The standard deviation was 14.1 for girls and 14.9 for boys. Levene's test for comparing variances was significant, $P < .001$, i.e., boys and girls differed significantly in variability." To simplify what is being said, no major differences between the abilities of men and women however men were found to have more of those who were at the highest spectrum of intelligence and also had extreme lows of cognitive abilities. This then refutes the claims that brain size even correlates with the high numbers of intelligent men in the world. Because if it did, how are the extreme lows of intelligence then explained? Provided that the brain size of all of these top individuals is the reason they excel then it would be safe to assume that big brains are the cause of all of those individuals who are ranked below women.

Continuing on, many believe that the STEM field is heavily male dominated because women fail to have the abilities to succeed in the field unlike men, however, that is far from the truth. There are far too many problems within the stem industry that are the biggest contributors to why women tend to avoid stem, such as pay difference, but also the fact that many women are steered towards "female jobs" such as teachers, nurses, etc by the previous gender because of their sexist beliefs. Ironically the first ever algorithm for a machine was created by Ada Lovelace. She is recognized as a pioneering figure and the first ever programmer by the Computer Science community.

She now represents the achievement and success of women in STEM. So the field where men are dominating was first started by a female (Carlucci Aiello). In the medical field women tend to perform better than men even if by a small margin. In a study done it showed that female doctors had a lower patient death rate compared to male doctors. "4.8% of patients treated by the female physicians died in the hospital, compared with 5.2% of the patients of male physicians. The difference was 0.47%, similar to the 0.43% difference found in the American study involving Medicare patients." (*Do Women or Men Make the Best Doctors?*, 2021). There are far too many intelligent women whose brains are smaller than your average male that excel.

In conclusion there are too many blind spots and inconsistencies with the belief of bigger brains correlating to intelligence. There have been little to no studies showing that a female and male brains are different nor is one gender smarter than the other.

CITATION

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