

BRAIN SEX

ONE HOUR

The Real Difference
Between Men and Women

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INTRODUCTION

MEN ARE DIFFERENT from women. They are equal only in their common membership of the same species, humankind. To maintain that they are the same in aptitude, skill or behaviour is to build a society based on a biological and scientific lie.

The sexes are different because their brains are different. The brain, the chief administrative and emotional organ of life, is differently constructed in men and in women; it processes information in a different way, which results in different perceptions, priorities and behaviour.

In the past ten years there has been an explosion of scientific research into what makes the sexes different. Doctors, scientists, psychologists and sociologists, working apart, have produced a body of findings which, taken together, paints a remarkably consistent picture. And the picture is one of startling sexual asymmetry.

At last there is an answer to the exasperated lament 'Why *can't* a woman be more like a man?'; it is time to explode the social myth that men and women are virtually interchangeable, all things being equal. All things are not equal.

Until recently, behavioural differences between the sexes have been explained away by social conditioning – the expectations of parents, whose own attitudes, in turn, reflect the expectations of society; little boys are told that they shouldn't cry, and that the way to the top depends on masculine assertion and aggression. Scant attention was paid



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to the biological view that we may be what we are because of the way we are made. Today, there is too much new biological evidence for the sociological argument to prevail. The argument of biology at last provides a comprehensive, and scientifically provable framework within which we can begin to understand why we are who we are.

If the social explanation is inadequate, the biochemical argument seems more plausible – that it is our hormones which make us behave in specific, stereotypical ways. But, as we will discover, hormones alone do not provide the whole answer; what makes the difference is the interplay between those hormones and the male or female brains, pre-wired specifically to react with them.

What you will read in this book about the differences between men and women may make both sexes angry or smug. Both reactions are wrong. If women have reason to rage, it is not because science has set at naught their hard-won struggle towards equality; their wrath should rather be directed at those who have sought to misdirect and deny them their very essence. Many women in the last thirty or forty years have been brought up to believe that they are, or should be, 'as good as the next man', and in the process they have endured acute and unnecessary pain, frustration and disappointment. They were led to believe that once they had shaken off the shackles of male prejudice and oppression – the supposed source of their second-class status – the gates of the promised land of equal achievement would be thrown open; women would be free at last to scale and conquer the commanding heights of the professions.

Instead, in spite of greater emancipation in terms of education, opportunity, and social attitudes, women are not noticeably 'doing better' than they were thirty years ago. Mrs Thatcher is still the exception which proves the rule. There were more women in the British Cabinet in the 1930s than there are at present. There has been no significant increase in the number of female MPs over the past three decades. Some women, seeing how far their sex has fallen short of the supposed ideal of power-sharing, feel that they have failed. But they have only failed to be like men.

Men, on the other hand, should find no cause for complacent celebration, although some will inevitably find ammunition for their bar-room prejudices: it is, for instance, true that most women cannot read a map as well as a man. But women can read a character better. And people are more important than maps. (The male mind, at this point, will immediately think of exceptions to this.)

Some researchers have been frankly dismayed at what they have discovered. Some of their findings have been, if not suppressed, at least quietly shelved because of their potential social impact. But it is usually better to act on the basis of what is true, rather than to maintain, with the best will in the world, that what is true has no right to be so.

Better, too, to welcome and exploit the complementary differences between men and women. Women should contribute their specific female gifts rather than waste their energies in the pursuit of a sort of surrogate masculinity. A woman's greater imagination can solve intractable problems – be they professional or domestic – at one apparently intuitive stroke.

The best argument for the acknowledgement of differences is that doing so would probably make us happier. The appreciation, for instance, that sex has different origins, motives, and significance in the context of the male and female brains, that marriage is profoundly unnatural to the biology of the male, might make us better and more considerate husbands and wives. The understanding that the roles of father and mother are not interchangeable might make us better parents.

The biggest behavioural difference between men and women is the natural, innate aggression of men, which explains to a large degree their historical dominance of the species. Men didn't learn aggression as one of the tactics of the sex war. We do not teach our boy children to be aggressive – indeed, we try vainly to unteach it. Even researchers most hostile to the acknowledgement of sex differences agree that this is a male feature, and one which cannot be explained by social conditioning.

The writer H. H. Munro, 'Saki', wrote an instructive little story about a liberal household where the parents

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sought to suppress their son's natural male aggression by refusing him a set of tin soldiers; instead, they supplied a set of tin civil servants and teachers. All, they felt, was going well, until they sneaked into the playroom and saw that he had set out a battle royal between the regiments of the toy teachers and the model bureaucrats. The child was lucky, in that his parents in the end saw the futility of trying to make him something he wasn't, nor could ever be.

We are an arrogant species. Our superiority to other animals, in terms of our capacity to reason and discriminate, has been said to put us closer to the angels than to the chimpanzees. Perhaps that makes us, thinking of ourselves as masters of our destinies, ignore the notion that we are still subject to the biological imperatives of our bodies. We forget that, ultimately, like other animals, what we are and how we live is largely dictated by the messages that mould and inform our brains.

Men and women could live more happily, understand and love each other better, organise the world to better effect, if we acknowledged our differences. We could then build our lives on the twin pillars of our distinct sexual identities. It is time to cease the vain contention that men and women are created the same. They were not, and no amount of idealism or Utopian fantasy can alter the fact. It can only strain the relationship between the sexes.

Understanding that men are strong and weak in areas where women are weak and strong could be, in the boardroom and the bedroom, the beginning of wisdom and the start of a happier relationship between the sexes.

It's an old joke that the book 'All that Men Understand about Women' is a thin volume, and that the pages are perfectly blank.

It is time to write on those pages.

A HUNDRED YEARS ago, the observation that men were different from women, in a whole range of aptitudes, skills, and abilities, would have been a leaden truism, a statement of the yawningly obvious.

Such a remark, uttered today, would evoke very different reactions. Said by a man, it would suggest a certain social ineptitude, a *naïveté* in matters of sexual politics, a sad deficiency in conventional wisdom, or a clumsy attempt to be provocative. A woman venturing such an opinion would be scorned as a traitor to her sex, betraying the hard-fought 'victories' of recent decades as women have sought equality of status, opportunity and respect.

Yet the truth is that virtually every professional scientist and researcher into the subject has concluded that the brains of men and women are different. There has seldom been a greater divide between what intelligent, enlightened opinion presumes – that men and women have the same brain – and what science knows – that they do not.

When a Canadian psychologist entitled an academic paper 'Are men's and women's brains really different?' she acknowledged that the answer to the question was self-evident:

Yes, of course. It would be amazing if men's and women's brains were not different, given the gross morphological [structural] and often striking behavioural differences between men and women.

Most of us intuitively sense that the sexes are different. But this has become a universal, unshared, guilty secret. We have ceased to trust our common sense.

The truth is that for virtually our entire tenancy of the planet, we have been a sexist species. Our biology assigned separate functions to the male and female of *Homo sapiens*. Our evolution strengthened and refined those differences. Our civilisation reflected them. Our religion and our education reinforced them.

Yet we both fear, and defy, history; we fear it, because we are afraid of seeming to be in complicity with the centuries-old crimes of sexual prejudice. We defy it, because we want to believe that mankind has at last achieved escape velocity, released from the muddy gravity of our animal past and neanderthal assumptions.

In the last thirty years a small but influential collection of well-intentioned souls have tried to persuade us to adopt this new defiant appreciation. They have discovered that the religions and the education were a male plot to maintain the subordinate status of women. The discovery is probably correct. They have found that our so-called civilisations are founded on male aggression and dominance. That's probably true as well. So far so good.

The problem comes when you look for an explanation of why this happened. If men and women are identical, and always have been, in the degree and manner in which they use their identical brains, how did the male sex manage so successfully, in virtually every culture and society in the world, to contrive a situation where the female was subordinate? Was it just men's greater musculature and body-weight that have made the realm of womanhood an occupied country for the past scores of thousands of years? Was it the fact that until recent centuries women were pregnant most of the time? Or is it more likely – as the facts suggest – that the differences between the male and the female brain are at the root of the society we have and the people we are? There are some biological facts of life that, with the best, and most sexually liberated will in the world, we just cannot buck; would it not be better, rather than rage impotently against

the differences between the sexes, to acknowledge, understand, exploit, and even enjoy them?

For the last hundred years, scientists have tried to explain those differences – although it has to be said that the first science of brain sex differences began with a methodology as crude as its assumptions. Simple measurement of the brain apparently proved that women lacked the necessary cerebral endowment to claim an equality of intellect. The Germans were particularly obsessed with this tape-measure scholarship. Bayerthal (1911) found it a minimum requirement for a professor of surgery that he have a head circumference of 52–53 centimetres: 'Under 52 cms you cannot expect an intellectual performance of any significance, while under 50.5 cms no normal intelligence can be expected.' In this connection he also observed, 'We do not have to ask for the head circumference of women of genius – they do not exist.'

The French scientist, Gustave Le Bon, noting that many Parisian women had brains closer in size to those of gorillas than of men, concluded that female inferiority was 'so obvious that no one can contest it for a moment'. And he warned, forebodingly, of

the day when, misunderstanding the inferior occupations which nature has given her, women leave the home and take part in our battles; on that day a social revolution will begin and everything that maintains the sacred ties of the family will disappear

...

That social revolution has been with us for some time; there has also been a revolution in the science of brain differences. Many – perhaps most – of the mysteries of how the brain works have yet to be unravelled, but the differences between the brains of males and females – and the processes by which they become different – are now clear. There is more to be known, more detail and qualification perhaps to add – but the nature and cause of brain differences are now known beyond speculation, beyond prejudice, and beyond reasonable doubt.

But now, just at the very moment when science can tell us what the differences are, and where they spring from, we are asked to banish the assumption of difference as if it were a guilty thought.

Recent decades have witnessed two contradictory processes: the development of scientific research into the differences between the sexes, and the political denial that such differences exist. These two intellectual currents are, understandably, not on speaking terms. Science knows it dabbles in matters of sexual differences at its risk: at least one researcher into the field of gender differences was refused a grant on the grounds that 'this work ought not to be done'. Another told us that he had given up his work because 'the political pressure – the pressure on the truth' had become too much. On the other hand, some of those working in the field of sex differences seem to evince an almost wanton disregard for scientific findings, blinkering themselves against findings whose implications they might find too uncomfortable to recognise.

The first systematic tests to explore sex differences were conducted in 1882 by Francis Gatton at the South Kensington Museum in London. He purported to have identified significant sex differences favouring men in strength of grip, sensitivity to shrill whistle sounds, and ability to work under pressure. Women were observed to be more sensitive to pain.

Ten years later, in the United States, studies discovered that women could hear better than men, had a more conventional vocabulary, and preferred blue to red. Men preferred red to blue, used a more adventurous vocabulary, and had a preference for abstract and general thought, while women preferred practical problems, and individual tasks.

Havelock Ellis's *Man and Woman*, published in 1894, aroused immediate interest and ran into eight editions. Among the differences he chronicled were women's superiority over men in memory, cunning, dissimulation, compassion, patience, and tidiness. The work of female scientists was found to be more precise than that of men, but 'perhaps a little lacking in breadth and initiative, though admirable

within a limited range'. A woman genius seemed to need the close support of a man; Ellis gave the example of Madame Curie, who was the wife of an already distinguished scientist, and pointed out that Mrs Browning's finest poems were all written after she had the good fortune to meet Mr Browning. Ellis found that women disliked the essentially intellectual process of analysis – 'They have the instinctive feeling that analysis may possibly destroy the emotional complexes by which they are largely moved and which appeal to them.'

These observations would have remained mere curiosities of scholarship, were it not for the development, beginning in the 1960s, of new scientific research into the brain. Paradoxically, the finding of gender differences corresponded with the period when the political denial that any differences existed was at its most vocal.

Paradoxically, too, interest in these differences grew out of an original scientific motive to suppress them. The problem arose from IQ tests. Researchers noticed consistent differences favouring one sex over the other in some of the abilities tested. This did not result in a chorus of eureka from the scientific community. In fact, it was regarded as something of a nuisance, muddying the waters of accurate measurement of intelligence. In the 1950s Dr D. Wechsler, an American scientist who developed the IQ test most commonly used today, found that over thirty tests 'discriminated' in favour of one or the other sex. The very use of the word suggests that the tests themselves were somehow to blame for the fact that different sexes achieved different success rates.

Wechsler, among others, sought to resolve the problem by eliminating all those tests which resulted in findings of significant sex differences. When it still proved difficult to produce 'sex-neutral' results, they deliberately introduced 'male-slanted' or 'female-slanted' items to arrive at approximately equal scores. It is an odd way of conducting a scientific study; if you don't like the result you get from an experiment, you fix the data to produce a more palatable conclusion. The sporting equivalent would be to handicap Olympic pole-vaulters with lead weights, or poles of different length, to

ensure that the desired truth prevails: that all pole-vaulters, regardless of prowess or agility, are created equal.

Even so, sex differences stubbornly emerged, like recalcitrant dandelions in a chemically treated lawn. Wechsler even came to the conclusion from a series of sub-tests that it might be possible to demonstrate a measurable superiority of women over men in general intelligence. On the other hand, out of 105 tests assessing skills in solving maze-puzzles, involving the most heterogeneous populations throughout the world, ranging from the most primitive to the most highly civilised, 99 showed an incontrovertible male superiority. Perhaps the safest and least controversial synthesis of these findings would have been that girls are too intelligent to bother with anything as silly as a maze-puzzle test.

Preoccupied with finding sex-neutral IQ techniques, Wechsler regarded the evidence that the sexes *were* different as a mere nuisance. Rather as Columbus might have regarded his discovery of America as something of an irrelevance, since, after all, he was looking for the East Indies, Wechsler observed, almost parenthetically,

Our findings do confirm what poets and novelists have often asserted, and the average person long believed, namely, that men not only behave, but 'think' differently from women.

What an early British pioneer of sex differences has called 'a conspiracy of silence surrounding the topic of human sex differences' was soon drowned in a babble of sociological explanations. Children, it was argued, were born psycho-sexually neutral; then parents, teachers, employers, politicians, and all the wicked fairies of society get to work on the innocent virginity of the mind. The main group championing the neutrality theory was led by Dr John Money, of Johns Hopkins University in the USA.

Sexuality is undifferentiated at birth and . . . it becomes differentiated as masculine or feminine in the various experiences of growing up.

So, if men and women were different, it must be the result of social conditioning. Society was to blame, which, in the view of sociology, it usually is.

If there is still a dispute about how sex differences arise there is now no argument in the scientific community that such differences exist. It cannot be stressed often enough that this book concerns itself with the *average* man and the *average* woman. In the same way, we might say that men are taller than women. Look across any crowded room and this will be obvious. Of course some women will be taller than some men, and the tallest woman may possibly be taller than the tallest man. But statistically men are on average 7 per cent taller, and the tallest person in the world, rather than in the room, is certainly a man.

The statistical variations in sex differences which we will explore, in skills, aptitudes or abilities, are much greater than they are in relation to height; there will always be the exception to the average, the person with exceptional 'wrong-sex' skills, but the exception does not invalidate the general, average rule. These differences have a practical, social relevance. On measurements of various aptitude tests, the difference between the sexes in average scores on these tests can be as much as 25 per cent. A difference of as little as 5 per cent has been found to have a marked impact on the occupations or activities at which men or women will, on average, excel.

The area where the biggest differences have been found lies in what scientists call 'spatial ability'. That's being able to picture things, their shape, position, geography and proportion, accurately in the mind's eye – all skills that are crucial to the practical ability to work with three-dimensional objects or drawings. One scientist who has reviewed the extensive literature on the subject concludes, 'The fact of the male's superiority in spatial ability is not in dispute.' It is confirmed by literally hundreds of different scientific studies.

A typical test measures the skill of men and women in the assembly of a three-dimensional, mechanical apparatus. Only a quarter of the women could perform the task better than

the average male. At the top end of the scale of mechanical aptitude there will be twice as many men as women.

From school age onwards, boys will generally outperform girls in areas of mathematics involving abstract concepts of space, relationships, and theory. At the very highest level of mathematical excellence, according to the biggest survey ever conducted, the very best boys totally eclipse the very best girls. Dr Julian Stanley and Dr Camilla Benbow, two American psychologists, worked with highly gifted students of both sexes. Not only did they find that the best girl never beat the best boy – they also discovered a startling sex ratio of mathematical brilliance: for every exceptional girl there were more than thirteen exceptional boys.

Scientists know that they walk on social eggshells when they venture any theory about human behaviour. But researchers into sex differences are increasingly impatient with the polite attempt to find a social explanation for these differences. As Camilla Benbow now says of her studies showing a male superiority in mathematically gifted children, 'After 15 years looking for an environmental explanation and getting zero results, I gave up.' She readily admitted to us her belief that the difference in ability has a biological basis.

Boys also have the superior hand-eye co-ordination necessary for ball sports. Those same skills mean that they can more easily imagine, alter, and rotate an object in their mind's eye. Boys find it easier than girls to construct block buildings from two-dimensional blueprints, and to assess correctly how the angle of the surface level of water in a jug would change when the jug was tilted to different angles.

This male advantage in seeing patterns and abstract relationships – what could be called general strategic rather than the detailed tactical thinking – perhaps explains the male dominance of chess, even in a country like the USSR, where the game is a national sport played by both sexes. An alternative explanation, more acceptable to those who would deny the biological basis of sex differences, is that women have become so conditioned to the fact of male chess-playing superiority that they subconsciously assign themselves lower

expectations; but this is a rather wilful rejection of scientific evidence for the sake of maintaining a prejudice.

The better spatial ability of men could certainly help to explain that male superiority in map-reading we noted earlier. Here again, the prejudice of male motorists is confirmed by experiment; girls and boys were each given city street maps and, without rotating the map, asked to describe whether they would be turning left or right at particular intersections as they mentally made their way across town and back. Boys did better. More women than men like to turn the map round, physically to match the direction in which they are travelling when they are trying to find their way.

While the male brain gives men the edge in dealing with things and theorems, the female brain is organised to respond more sensitively to all sensory stimuli. Women do better than men on tests of verbal ability. Females are equipped to receive a wider range of sensory information, to connect and relate that information with greater facility, to place a primacy on personal relationships, and to communicate. Cultural influences may reinforce these strengths, but the advantages are innate.

The differences are apparent in the very first hours after birth. It has been shown that girl babies are much more interested than boys in people and faces; the boys seem just as happy with an object dangled in front of them.

Girls say their first words and learn to speak in short sentences earlier than boys, and are generally more fluent in their pre-school years. They read earlier, too, and do better in coping with the building blocks of language like grammar, punctuation and spelling. Boys outnumber girls by 4 : 1 in remedial reading classes. Later, women find it easier to master foreign languages, and are more proficient in their own, with a better command of grammar and spelling. They are also more fluent: stuttering and other speech defects occur almost exclusively among boys.

Girls and women hear better than men. When the sexes are compared, women show a greater sensitivity to sound. The dripping tap will get the woman out of bed before the man has even woken up. Six times as many girls as boys can

sing in tune. They are also much more adept at noticing small changes in volume, which goes some way to explaining women's superior sensitivity to that 'tone of voice' which their male partners are so often accused of adopting.

Men and women even see some things differently. Women see better in the dark. They are more sensitive to the red end of the spectrum, seeing more red hues there than men, and have a better visual memory.

Men see better than women in bright light. Intriguing results also show that men tend to be literally blinkered; they see in a narrow field – mild tunnel vision – with greater concentration on depth. They have a better sense of perspective than women. Women, however, quite literally take in the bigger picture. They have wider peripheral vision, because they have more of the receptor rods and cones in the retina, at the back of the eyeball, to receive a wider arc of visual input.

The differences extend to the other senses. Women react faster, and more acutely, to pain, although their overall resistance to long-term discomfort is greater than men's. In a sample of young adults, females showed 'overwhelmingly' greater sensitivity to pressure on the skin on every part of the body. In childhood and maturity, women have a tactile sensitivity so superior to men's that in some tests there is no overlap between the scores of the two sexes; in these, the least sensitive woman is more sensitive than the most sensitive man.

There is strong evidence that men and women have different senses of taste – women being more sensitive to bitter flavours like quinine, and preferring higher concentrations and greater quantities of sweet things. Men score higher in discerning salty flavours. Overall, however, the evidence strongly suggests a greater female delicacy and perception in taste. Should more great chefs be women? Or do many great male chefs have more than their share of feminine sensibilities?

Women's noses, as well as their palates, are more sensitive than men's; a case in point is their perception of exaltolide, a synthetic musk-like odour associated with men, but hardly

noticeable to them. Women found the smell attractive. Interestingly, this superior sensitivity increases just before ovulation; at a critical time of her menstrual cycle, the biology of woman makes her more sensitive to man.

This superiority in so many of the senses can be clinically measured – yet it is what accounts for women's almost supernatural 'intuition'. Women are simply better equipped to notice things to which men are comparatively blind and deaf. There is no witchcraft in this superior perception – it is extra-sensory only in terms of the blunter, male senses. Women are better at picking up social cues, picking up important nuances of meaning from tones of voice or intensity of expression. Men sometimes become exasperated at a woman's reaction to what they say. They do not realise that women are probably 'hearing' much more than what the man himself thinks he is 'saying'. Women tend to be better judges of character. Older females have a better memory for names and faces, and a greater sensitivity to other people's preferences.

Sex differences have been noted in the comparative memory of men and women. Women can store, for short periods at least, more irrelevant and random information than men; men can only manage the trick when the information is organised into some coherent form, or has a specific relevance to them.

So men are more self-centred – so what else is new? What's new is that the folklore of gender, which is always vulnerable to dismissive, politically motivated, fashionable opinion, is now shown to have a basis in scientific fact.

Many people resist the thorough-going biological explanations we will propose for so many of the differences between the sexes, but are prepared to believe, in a rather vague manner, that they probably have 'something to do with the hormones'.

That's half right. The hormones, as we will see, determine the distinct male or female organisation of the brain as it develops in the womb. We share the same sexual identity for only the first few weeks after conception. Thereafter, in the

womb, the very structure and pattern of the brain begins to take a specifically male or female form. Throughout infant, teenage, and adult life, the way the brain was forged will have, in subtle interplay with the hormones, a fundamental effect on the attitudes, behaviour, and intellectual and emotional functioning of the individual. Most neuroscientists and researchers into the mysteries of the brain are now prepared, like the American neurologist Dr Richard Restak, to make the confident assertion

It seems unrealistic to deny any longer the existence of male and female brain differences. Just as there are physical dissimilarities between males and females . . . there are equally dramatic differences in brain functioning.

The way our brains are made affects how we think, learn, see, smell, feel, communicate, love, make love, fight, succeed, or fail. Understanding how our brains, and those of others, are made is a matter of no little importance.

Infants are not blank slates, on whom we scrawl instructions for sexually-appropriate behaviour. They are born with male or female minds of their own. They have, quite literally, made up their minds in the womb, safe from the legions of social engineers who impatiently await them.

Recent years have brought us the means to build a new framework for understanding sex differences through two, independent and converging scientific advances. The first is the giant progress which has been made in understanding how the brain works; the second, the new discoveries about how, biologically and behaviourally, we are what we are – male or female.