

Chapter 18 - Gender

[This selected reading is from Steven Pinker's *The Blank Slate*, pages 337 to 351]

Now THAT ITS namesake year has come and gone, the movie *2001: A Space Odyssey* provides an opportunity to measure imagination against reality. Arthur C. Clarke's 1968 sci-fi classic traced out the destiny of our species from ape-men on the savanna to a transcendence of time, space, and bodies that we can only dimly comprehend. Clarke and the director, Stanley Kubrick, contrived a radical vision of life in the third millennium, and in some ways it has come to pass. A permanent space station is being built, and voice mail and the Internet are a routine part of our lives. In other regards Clarke and Kubrick were overoptimistic about the march of progress. We still don't have suspended animation, missions to Jupiter, or computers that read lips and plot mutinies. And in still other regards they missed the boat completely. In their vision of the year 2001, people recorded their words on typewriters; Clarke and Kubrick did not anticipate word processors or laptop computers. And in their depiction of the new millennium, the American women were "girl assistants": secretaries, receptionists, and flight attendants.

That these visionaries did not anticipate the revolution in women's status of the 1970s is a pointed reminder of how quickly social arrangements can change. It was not so long ago that women were seen as fit only to be housewives, mothers, and sexual partners, were discouraged from entering the professions because they would be taking the place of a man, and were routinely subjected to discrimination, condescension, and sexual extortion. The ongoing liberation of women after millennia of oppression is one of the great moral achievements of our species, and I consider myself fortunate to have lived through some of its major victories.

The change in the status of women has several causes. One is the inexorable logic of the expanding moral circle, which led also to the abolition of despotism, slavery, feudalism, and racial segregation.¹ In the midst of the Enlightenment, the early feminist Mary Astell (1688-1731) wrote:

If absolute Sovereignty be not necessary in a State how comes it to be so in a Family? or if in a Family why not in a State? since no reason can be alleg'd for the one that will not hold more strongly for the other.

If *all Men are born free*, how is it that all Women are born slaves? As they must be if the being subjected to the *inconstant, uncertain, unknown, arbitrary Will of Men*, be the perfect Condition of Slavery?²

Another cause is the technological and economic progress that made it possible for couples to have sex and raise children without a pitiless division of labor in which a mother had to devote every waking moment to keeping the children alive. Clean water, sanitation, and modern medicine lowered infant mortality and reduced the desire for large broods of children. Baby bottles and pasteurized cow's milk, and then breast pumps and freezers, made it possible to feed babies without their mothers being chained to them around the clock. Mass production made it cheaper to buy things than to make them by hand, and plumbing, electricity, and appliances reduced the domestic workload even more. The increased value of brains over brawn

in the economy, the extension of the human lifespan (with the prospect of decades of life after childrearing), and the affordability of extended education changed the values of women's options in life. Contraception, amniocentesis, ultrasound, and reproductive technologies made it possible for women to defer childbearing to the optimal points in their lives.

And of course the other major cause of women's progress is feminism: the political, literary, and academic movements that channeled these advances into tangible changes in policies and attitudes. The first wave of feminism, bookended in the United States by the Seneca Falls convention of 1848 and the ratification of the Nineteenth Amendment to the Constitution in 1920, gave women the right to vote, to serve as jurors, to hold property in marriage, to divorce, and to receive an education. The second wave, flowering in the 1970s, brought women into the professions, changed the division of labor in the home, exposed sexist biases in business, government, and other institutions, and threw a spotlight on women's interests in all walks of life. The recent progress in women's rights has not drained feminism of its *raison d'être*. In much of the Third World, women's position has not improved since the Middle Ages, and in our own society women are still subjected to discrimination, harassment, and violence.

Feminism is widely seen as being opposed to the sciences of human nature. Many of those scientists believe that the minds of the two sexes differ at birth, and feminists have pointed out that such beliefs have long been used to justify the unequal treatment of women. Women were thought to be designed for childrearing and home life and to be incapable of the reason necessary for politics and the professions. Men were believed to harbor irresistible urges that made them harass and rape women, and that belief served to excuse the perpetrators and to license fathers and husbands to control women in the guise of protecting them. Therefore, it might seem, the theories that are most friendly to women are the Blank Slate—if nothing is innate, differences between the sexes cannot be innate—and the Noble Savage—if we harbor no ignoble urges, sexual exploitation can be eliminated by changing our institutions.

The belief that feminism requires a blank slate and a noble savage has become a powerful impetus for spreading disinformation. A 1994 headline in the *New York Times* science section, for example, proclaimed, "Sexes Equal on South Sea Isle."³ It was based on the work of the anthropologist Maria Lepowsky, who (perhaps channeling the ghost of Margaret Mead) said that gender relations on the island of Vanatinai prove that "the subjugation of women by men is not a human universal, and it is not inevitable." Only late in the story do we learn what this supposed "equality" amounts to: that men must do bride service to pay for wives, that warfare had been waged exclusively by men (who raided neighboring islands for brides), that women spend more time caring for children and sweeping up pig excrement, and that men spend more time building their reputations and hunting wild boar (which is accorded more prestige by both sexes). A similar disconnect between headline and fact appeared in a 1998 *Boston Globe* story entitled "Girls Appear to Be Closing Aggression Gap with Boys." How much have they "closed this gap"? According to the story, they now commit murder at *one-tenth* the rate of boys.⁴ And in a 1998 op-ed, the co-producer of Ms. magazine's "Take Our Daughters to Work Day" explained recent high school shootings with the remarkable assertion that boys in America "are being trained by their parents, other adults, and our culture and media to harass, assault, rape, and murder girls."⁵

On the other side, some conservatives are confirming feminists' worst fears by invoking dubious sex differences to condemn the choices of women. In a *Wall Street Journal* editorial, the political scientist Harvey Mansfield wrote that "the protective element of manliness is endangered by women having equal access to jobs outside the home."⁶ A book by F. Carolyn Graglia called *Domestic Tranquility: A Brief Against Feminism* theorized that women's maternal and sexual instincts are being distorted by the assertiveness and analytical mind demanded by a career. The journalists Wendy Shalit and Danielle Crittenden recently advised women to marry young, postpone their careers, and care for children in traditional marriages, even though they could not have written their books if they had followed their own advice.⁷ Leon Kass has taken it upon himself to inform young women what they want: "For the first time in human history, mature women by the tens of thousands live the entire decade of their twenties—their most fertile years—neither in the homes of their fathers nor in the homes of their husbands; unprotected, lonely, and out of sync with their inborn nature. Some women positively welcome this state of affairs, but most do not."⁸

There is, in fact, no incompatibility between the principles of feminism and the possibility that men and women are not psychologically identical. To repeat: equality is not the empirical claim that all groups of humans are interchangeable; it is the moral principle that individuals should not be judged or constrained by the average properties of their group. In the case of gender, the barely defeated Equal Rights Amendment put it succinctly: "Equality of Rights under the law shall not be denied or abridged by the United States or any state on account of sex." If we recognize this principle, no one has to spin myths about the indistinguishability of the sexes to justify equality. Nor should anyone invoke sex differences to justify discriminatory policies or to hector women into doing what they don't want to do.

In any case, what we do know about the sexes does not call for any action that would penalize or constrain one sex or the other. Many psychological traits relevant to the public sphere, such as general intelligence, are the same on average for men and women, and virtually all psychological traits may be found in varying degrees among the members of each sex. No sex difference yet discovered applies to every last man compared with every last woman, so generalizations about a sex will always be untrue of many individuals. And notions like "proper role" and "natural place" are scientifically meaningless and give no grounds for restricting freedom.

Despite these principles, many feminists vehemently attack research on sexuality and sex differences. The politics of gender is a major reason that the application of evolution, genetics, and neuroscience to the human mind is bitterly resisted in modern intellectual life. But unlike other human divisions such as race and ethnicity, where any biological differences are minor at most and scientifically uninteresting, gender cannot possibly be ignored in the science of human beings. The sexes are as old as complex life and are a fundamental topic in evolutionary biology, genetics, and behavioral ecology. To disregard them in the case of our own species would be to make a hash of our understanding of our place in the cosmos. And of course differences between men and women affect every aspect of our lives. We all have a mother and a father, are attracted to members of the opposite sex (or notice our contrast with the people who are), and are never unaware of the sex of our siblings, children, and friends. To ignore gender would be to ignore a major part of the human condition.

The goal of this chapter is to clarify the relation between the biology of human nature and current controversies on the sexes, including the two most incendiary, the gender gap and sexual assault. With both of these hot buttons, I will argue against the conventional wisdom associated with certain people who claim to speak on behalf of feminism. That may create an illusion that the arguments go against feminism in general, or even against the interests of women. They don't in the least, and I must begin by showing why.

FEMINISM IS OFTEN derided because of the arguments of its lunatic fringe—for example, that all intercourse is rape, that all women should be lesbians, or that only 10 percent of the population should be allowed to be male.⁹ Feminists reply that proponents of women's rights do not speak with one voice, and that feminist thought comprises many positions, which have to be evaluated independently.¹⁰ That is completely legitimate, but it cuts both ways. To criticize a *particular* feminist proposal is not to attack feminism in general.

Anyone familiar with academia knows that it breeds ideological cults that are prone to dogma and resistant to criticism. Many women believe that this has now happened to feminism. In her book *Who Stole Feminism?* the philosopher Christina Hoff Sommers draws a useful distinction between two schools of thought.¹¹ *Equity feminism* opposes sex discrimination and other forms of unfairness to women. It is part of the classical liberal and humanistic tradition that grew out of the Enlightenment, and it guided the first wave of feminism and launched the second wave. *Gender feminism* holds that women continue to be enslaved by a pervasive system of male dominance, the gender system, in which "bi-sexual infants are transformed into male and female gender personalities, the one destined to command, the other to obey."¹² It is opposed to the classical liberal tradition and allied instead with Marxism, postmodernism, social constructionism, and radical science. It has become the credo of some women's studies programs, feminist organizations, and spokespeople for the women's movement.

Equity feminism is a moral doctrine about equal treatment that makes no commitments regarding open empirical issues in psychology or biology. Gender feminism is an empirical doctrine committed to three claims about human nature. The first is that the differences between men and women have nothing to do with biology but are socially constructed in their entirety. The second is that humans possess a single social motive—power—and that social life can be understood only in terms of how it is exercised. The third is that human interactions arise not from the motives of people dealing with each other as individuals but from the motives of *groups* dealing with other groups—in this case, the male gender dominating the female gender.

In embracing these doctrines, the genderists are handcuffing feminism to railroad tracks on which a train is bearing down. As we shall see, neuroscience, genetics, psychology, and ethnography are documenting sex differences that almost certainly originate in human biology. And evolutionary psychology is documenting a web of motives other than group-against-group dominance (such as love, sex, family, and beauty) that entangle us in many conflicts and confluences of interest with members of the same sex and of the opposite sex.

Gender feminists want either to derail the train or to have other women join them in martyrdom, but the other women are not cooperating. Despite their visibility, gender feminists do not speak for all feminists, let alone for all women.

To begin with, research on the biological basis of sex differences has been led by women. Because it is so often said that this research is a plot to keep women down, I will have to name names. Researchers on the biology of sex differences include the neuroscientists Raquel Gur, Melissa Hines, Doreen Kimura, Jerre Levy, Martha McClintock, Sally Shaywitz, and Sandra Witelson and the psychologists Camille Benbow, Linda Gottfredson, Diane Halpern, Judith Kleinfeld, and Diane McGuinness. Sociobiology and evolutionary psychology, sometimes stereotyped as a "sexist discipline," is perhaps the most bi-gendered academic field I am familiar with. Its major figures include Laura Betzig, Elizabeth Cashdan, Leda Cosmides, Helena Cronin, Mildred Dickeman, Helen Fisher, Patricia Gowaty, Kristen Hawkes, Sarah Blaffer Hrdy, Magdalena Hurtado, Bobbie Low, Linda Mealey, Felicia Pratto, Marnie Rice, Catherine Salmon, Joan Silk, Meredith Small, Barbara Smuts, Nancy Wilmsen Thornhill, and Margo Wilson.

It is not just gender feminism's collision with science that repels many feminists. Like other inbred ideologies, it has produced strange excrescences, like the offshoot known as difference feminism. Carol Gilligan has become a gender-feminist icon because of her claim that men and women guide their moral reasoning by different principles: men think about rights and justice; women have feelings of compassion, nurturing, and peaceful accommodation.¹³ If true, it would disqualify women from becoming constitutional lawyers, Supreme Court justices, and moral philosophers, who make their living by reasoning about rights and justice. But it is not true. Many studies have tested Gilligan's hypothesis and found that men and women differ little or not at all in their moral reasoning.¹⁴ So difference feminism offers women the worst of both worlds: invidious claims without scientific support. Similarly, the gender-feminist classic called *Women's Ways of Knowing* claims that the sexes differ in their styles of reasoning. Men value excellence and mastery in intellectual matters and skeptically evaluate arguments in terms of logic and evidence; women are spiritual, relational, inclusive, and credulous.¹⁵ With sisters like these, who needs male chauvinists?

Gender feminism's disdain for analytical rigor and classical liberal principles has recently been excoriated by equity feminists, among them Jean Bethke Elshtain, Elizabeth Fox-Genovese, Wendy Kaminer, Noretta Koertge, Donna Laframboise, Mary Lefkowitz, Wendy McElroy, Camille Paglia, Daphne Patai, Virginia Postrel, Alice Rossi, Sally Satel, Christina Hoff Sommers, Nadine Strossen, Joan Kennedy Taylor, and Cathy Young.¹⁶ Well before them, prominent women writers demurred from gender-feminist ideology, including Joan Didion, Doris Lessing, Iris Murdoch, Cynthia Ozick, and Susan Sontag.¹⁷ And ominously for the movement, a younger generation has rejected the gender feminists' claims that love, beauty, flirtation, erotica, art, and heterosexuality are pernicious social constructs. The title of the book *The New Victorians: A Young Woman's Challenge to the Old Feminist Order* captures the revolt of such writers as Rene Denfeld, Karen Lehrman, Katie Roiphe, and Rebecca Walker, and of the movements called Third Wave, Riot Grrrl Movement, Pro-Sex Feminism, Lipstick Lesbians, Girl Power, and Feminists for Free Expression.¹⁸

The difference between gender feminism and equity feminism accounts for the oft-reported paradox that most women do not consider themselves feminists (about 70 percent in

1997, up from about 60 percent a decade before), yet they agree with every major feminist position.¹⁹ The explanation is simple: the word "feminist" is often associated with gender feminism, but the positions in the polls are those of equity feminism. Faced with these signs of slipping support, gender feminists have tried to stipulate that only they can be considered the true advocates of women's rights. For example, in 1992 Gloria Steinem said of Paglia, "Her calling herself a feminist is sort of like a Nazi saying they're not anti-Semitic."²⁰ And they have invented a lexicon of epithets for what in any other area would be called disagreement: "backlash," "not getting it," "silencing women," "intellectual harassment."²¹

All this is an essential background to the discussions to come. To say that women and men do not have interchangeable minds, that people have desires other than power, and that motives belong to individual people and not just to entire genders is not to attack feminism or to compromise the interests of women, despite the misconception that gender feminism speaks in their name. All the arguments in the remainder of this chapter have been advanced most forcefully by women.

WHY ARE PEOPLE so afraid of the idea that the minds of men and women are not identical in every respect? Would we really be better off if everyone were like Pat, the androgynous nerd from *Saturday Night Live*? The fear, of course, is that different implies unequal—that if the sexes differed in any way, then men would have to be better, or more dominant, or have all the fun.

Nothing could be farther from biological thinking. Trivers alluded to a "symmetry in human relationships," which embraced a "genetic equality of the sexes."²² From a gene's point of view, being in the body of a male and being in the body of a female are equally good strategies, at least on average (circumstances can nudge the advantage somewhat in either direction).²³ Natural selection thus tends toward an equal investment in the two sexes: equal numbers, an equal complexity of bodies and brains, and equally effective designs for survival. Is it better to be the size of a male baboon and have six-inch canine teeth or to be the size of a female baboon and not have them? Merely to ask the question is to reveal its pointlessness. A biologist would say that it's better to have the male adaptations to deal with male problems and the female adaptations to deal with female problems.

So men are not from Mars, nor are women from Venus. Men and women are from Africa, the cradle of our evolution, where they evolved together as a single species. Men and women have all the same genes except for a handful on the Y chromosome, and their brains are so similar that it takes an eagle-eyed neuroanatomist to find the small differences between them. Their average levels of general intelligence are the same, according to the best psychometric estimates,²⁴ and they use language and think about the physical and living world in the same general way. They feel the same basic emotions, and both enjoy sex, seek intelligent and kind marriage partners, get jealous, make sacrifices for their children, compete for status and mates, and sometimes commit aggression in pursuit of their interests.

But of course the minds of men and women are not identical, and recent reviews of sex differences have converged on some reliable differences.²⁵ Sometimes the differences are large, with only slight overlap in the bell curves. Men have a much stronger taste for no-strings sex

with multiple or anonymous partners, as we see in the almost all-male consumer base for prostitution and visual pornography.²⁶ Men are far more likely to compete violently, sometimes lethally, with one another over stakes great and small (as in the recent case of a surgeon and an anesthesiologist who came to blows in the operating room while a patient lay on the table waiting to have her gall bladder removed).²⁷ Among children, boys spend far more time practicing for violent conflict in the form of what psychologists genteelly call "rough-and-tumble play."²⁸ The ability to manipulate three-dimensional objects and space in the mind also shows a large difference in favor of men.²⁹

With some other traits the differences are small on average but can be large at the extremes. That happens for two reasons. When two bell curves partly overlap, the farther out along the tail you go, the larger the discrepancies between the groups. For example, men on average are taller than women, and the discrepancy is greater for more extreme values. At a height of five foot ten, men outnumber women by a ratio of thirty to one; at a height of six feet, men outnumber women by a ratio of two thousand to one. Also, confirming an expectation from evolutionary psychology, for many traits the bell curve for males is flatter and wider than the curve for females. That is, there are proportionally more males at the extremes. Along the left tail of the curve, one finds that boys are far more likely to be dyslexic, learning disabled, attention deficient, emotionally disturbed, and mentally retarded (at least for some types of retardation).³⁰ At the right tail, one finds that in a sample of talented students who score above 700 (out of 800) on the mathematics section of the Scholastic Assessment Test, boys outnumber girls by thirteen to one, even though the scores of boys and girls are similar within the bulk of the curve.³¹

With still other traits, the average values for the two sexes differ by smaller amounts and in different directions for different traits.³² Though men, on average, are better at mentally rotating objects and maps, women are better at remembering landmarks and the positions of objects. Men are better throwers; women are more dexterous. Men are better at solving mathematical word problems, women at mathematical calculation. Women are more sensitive to sounds and smells, have better depth perception, match shapes faster, and are much better at reading facial expressions and body language. Women are better spellers, retrieve words more fluently, and have a better memory for verbal material.

Women experience basic emotions more intensely, except perhaps anger.³³ Women have more intimate social relationships, are more concerned about them, and feel more empathy toward their friends, though not toward strangers. (The common view that women are more empathic toward everyone is both evolutionarily unlikely and untrue.) They maintain more eye contact, and smile and laugh far more often.³⁴ Men are more likely to compete with one another for status using violence or occupational achievement, women more likely to use derogation and other forms of verbal aggression.

Men have a higher tolerance for pain and a greater willingness to risk life and limb for status, attention, and other dubious rewards. The Darwin Awards, given annually to "the individuals who ensure the long-term survival of our species by removing themselves from the gene pool in a sublimely idiotic fashion," almost always go to men. Recent honorees include the man who squashed himself under a Coke machine after tipping it forward to get a free can, three men who competed over who could stomp the hardest on an antitank mine, and the would-be

pilot who tied weather balloons to his lawn chair, shot two miles into the air, and drifted out to sea (earning just an Honorable Mention because he was rescued by helicopter).

Women are more attentive to their infants' everyday cries (though both sexes respond equally to cries of extreme distress) and are more solicitous toward their children in general.³⁵ Girls play more at parenting and trying on social roles, boys more at fighting, chasing, and manipulating objects. And men and women differ in their patterns of sexual jealousy, their mate preferences, and their incentives to philander.

Many sex differences, of course, have nothing to do with biology. Hairstyles and dress vary capriciously across centuries and cultures, and in recent decades participation in universities, professions, and sports has switched from mostly male to fifty-fifty or mostly female. For all we know, some of the current sex differences may be just as ephemeral. But gender feminists argue that all sex differences, other than the anatomical ones, come from the expectations of parents, playmates, and society. The radical scientist Anne Fausto-Sterling wrote:

The key biological fact is that boys and girls have different genitalia, and it is this biological difference that leads adults to interact differently with different babies whom we conveniently color-code in pink or blue to make it unnecessary to go peering into their diapers for information about gender.³⁶

But the pink-and-blue theory is becoming less and less credible. Here are a dozen kinds of evidence that suggest that the difference between men and women is more than genitalia-deep.

- Sex differences are not an arbitrary feature of Western culture, like the decision to drive on the left or on the right. In all human cultures, men and women are seen as having different natures. All cultures divide their labor by sex, with more responsibility for childrearing by women and more control of the public and political realms by men. (The division of labor emerged even in a culture where everyone had been committed to stamping it out, the Israeli kibbutz.) In all cultures men are more aggressive, more prone to stealing, more prone to lethal violence (including war), and more likely to woo, seduce, and trade favors for sex. And in all cultures one finds rape, as well as proscriptions against rape.³⁷
- Many of the psychological differences between the sexes are exactly what an evolutionary biologist who knew only their physical differences would predict.³⁸ Throughout the animal kingdom, when the female has to invest more calories and risk in each offspring (in the case of mammals, through pregnancy and nursing), she also invests more in nurturing the offspring after birth, since it is more costly for a female to replace a child than for a male to replace one. The difference in investment is accompanied by a greater competition among males over opportunities to mate, since mating with many partners is more likely to multiply the number of offspring of a male than the number of offspring of a female. When the average male is larger than the average female (as is true of men and women), it bespeaks an evolutionary history of greater violent competition by males over mating opportunities. Other physical traits of men, such as later puberty, greater adult strength, and shorter lives, also indicate a history of selection for high-stakes competition.

- Many of the sex differences are found widely in other primates, indeed, throughout the mammalian class.³⁹ The males tend to compete more aggressively and to be more polygamous; the females tend to invest more in parenting. In many mammals a greater territorial range is accompanied by an enhanced ability to navigate using the geometry of the spatial layout (as opposed to remembering individual landmarks). More often it is the male who has the greater range, and that is true of human hunter-gatherers. Men's advantage in using mental maps and performing 3-D mental rotation may not be a coincidence.⁴⁰
- Geneticists have found that the diversity of the DNA in the mitochondria of different people (which men and women inherit from their mothers) is far greater than the diversity of the DNA in Y chromosomes (which men inherit from their fathers). This suggests that for tens of millennia men had greater variation in their reproductive success than women. Some men had many descendants and others had none (leaving us with a small number of distinct Y chromosomes), whereas a larger number of women had a more evenly distributed number of descendants (leaving us with a larger number of distinct mitochondrial genomes). These are precisely the conditions that cause sexual selection, in which males compete for opportunities to mate and females choose the best-quality males.⁴¹
- The human body contains a mechanism that causes the brains of boys and the brains of girls to diverge during development.⁴² The Y chromosome triggers the growth of testes in a male fetus, which secrete androgens, the characteristically male hormones (including testosterone). Androgens have lasting effects on the brain during fetal development, in the months after birth, and during puberty, and they have transient effects at other times. Estrogens, the characteristically female sex hormones, also affect the brain throughout life. Receptors for the sex hormones are found in the hypothalamus, the hippocampus, and the amygdala in the limbic system of the brain, as well as in the cerebral cortex.
- The brains of men differ visibly from the brains of women in several ways.⁴³ Men have larger brains with more neurons (even correcting for body size), though women have a higher percentage of gray matter. (Since men and women are equally intelligent overall, the significance of these differences is unknown.) The interstitial nuclei in the anterior hypothalamus, and a nucleus of the stria terminalis, also in the hypothalamus, are larger in men; they have been implicated in sexual behavior and aggression. Portions of the cerebral commissures, which link the left and right hemispheres, appear to be larger in women, and their brains may function in a less lopsided manner than men's. Learning and socialization can affect the microstructure and functioning of the human brain, of course, but probably not the size of its visible anatomical structures.
- Variation in the level of testosterone among different men, and in the same man in different seasons or at different times of day, correlates with libido, self-confidence, and the drive for dominance.⁴⁴ Violent criminals have higher levels than nonviolent criminals; trial lawyers have higher levels than those who push paper. The relations are complicated for a number of reasons. Over a broad range of values, the concentration of testosterone in the bloodstream doesn't matter. Some traits, such as spatial abilities, peak at moderate rather than high levels. The effects of testosterone depend on the number and distribution of receptors for the molecule, not just on its concentration. And one's psychological state can affect testosterone levels as well as the other way around. But there is a causal relation, albeit a complicated

one. When women preparing for a sex-change operation are given androgens, they improve on tests of mental rotation and get worse on tests of verbal fluency. The journalist Andrew Sullivan, whose medical condition had lowered his testosterone levels, describes the effects of injecting it: "The rush of a T shot is not unlike the rush of going on a first date or speaking before an audience. I feel braced. After one injection, I almost got in a public brawl for the first time in my life. There is always a lust peak—every time it takes me unaware."⁴⁵ Though testosterone levels in men and women do not overlap, variations in level have similar kinds of effects in the two sexes. High-testosterone women smile less often and have more extramarital affairs, a stronger social presence, and even a stronger handshake.

- Women's cognitive strengths and weaknesses vary with the phase of their menstrual cycle.⁴⁶ When estrogen levels are high, women get even better at tasks on which they typically do better than men, such as verbal fluency. When the levels are low, women get better at tasks on which men typically do better, such as mental rotation. A variety of sexual motives, including their taste in men, vary with the menstrual cycle as well.⁴⁷
- Androgens have permanent effects on the developing brain, not just transient effects on the adult brain.⁴⁸ Girls with congenital adrenal hyperplasia overproduce androstenedione, the androgen hormone made famous by the baseball slugger Mark McGwire. Though their hormone levels are brought to normal soon after birth, the girls grow into tomboys, with more rough-and-tumble play, a greater interest in trucks than dolls, better spatial abilities, and, when they get older, more sexual fantasies and attractions involving other girls. Those who are treated with hormones only later in childhood show male patterns of sexuality when they become young adults, including quick arousal by pornographic images, an autonomous sex drive centered on genital stimulation, and the equivalent of wet dreams.⁴⁹
- The ultimate fantasy experiment to separate biology from socialization would be to take a baby boy, give him a sex-change operation, and have his parents raise him as a girl and other people treat him as one. If gender is socially constructed, the child should have the mind of a normal girl; if it depends on prenatal hormones, the child should feel like a boy trapped in a girl's body. Remarkably, the experiment has been done in real life—not out of scientific curiosity, of course, but as a result of disease and accidents. One study looked at twenty-five boys who were born without a penis (a birth defect known as cloacal exstrophy) and who were then castrated and raised as girls. All of them showed male patterns of rough-and-tumble play and had typically male attitudes and interests. More than half of them spontaneously declared they were boys, one when he was just five years old.⁵⁰

In a famous case study, an eight-month-old boy lost his penis in a botched circumcision (not by a mohel, I was relieved to learn, but by a bungling doctor). His parents consulted the famous sex researcher John Money, who had maintained that "Nature is a political strategy of those committed to maintaining the status quo of sex differences." He advised them to let the doctors castrate the baby and build him an artificial vagina, and they raised him as a girl without telling him what had happened.⁵¹ I learned about the case as an undergraduate in the 1970s, when it was offered as proof that babies are born neuter and acquire a gender from the way they are raised. A New York Times article from the era reported that Brenda (née Bruce) "has been sailing contentedly through childhood as a genuine girl."⁵² The facts were suppressed until 1997, when it was revealed that from a young age Brenda felt she was a boy

trapped in a girl's body and gender role.⁵³ She ripped off frilly dresses, rejected dolls in favor of guns, preferred to play with boys, and even insisted on urinating standing up. At fourteen she was so miserable that she decided either to live her life as a male or to end it, and her father finally told her the truth. She underwent a new set of operations, assumed a male identity, and today is happily married to a woman.

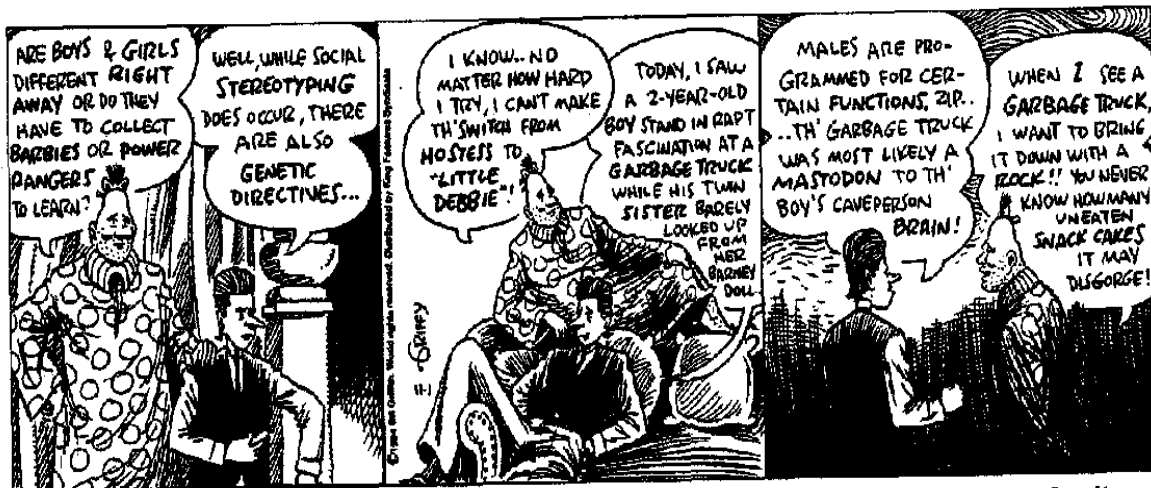
- Children with Turner's syndrome are genetically neuter. They have a single X chromosome, inherited from either their mother or their father, instead of the usual two X chromosomes of a girl (one from her mother, the other from her father) or the X and Y of a boy (the X from his mother, the Y from his father). Since a female body plan is the default among mammals, they look and act like girls. Geneticists have discovered that parents' bodies can-molecularly imprint genes on the X chromosome so they become more or less active in the developing bodies and brains of their children. A Turner's syndrome girl who gets her X chromosome from her father may have genes that are evolutionarily optimized for girls (since a paternal X always ends up in a daughter). A Turner's girl who gets her X from her mother may have genes that are evolutionarily optimized for boys (since a maternal X, though it can end up in either sex, will act unopposed only in a son, who has no counterpart to the X genes on his puny Y chromosome). And in fact Turner's girls do differ psychologically depending on which parent gave them their X. The ones with an X from their father (which is destined for a girl) were better at interpreting body language, reading emotions, recognizing faces, handling words, and getting along with other people compared to the ones with an X from their mother (which is fully active only in a boy).⁵⁴
- Contrary to popular belief, parents in contemporary America do not treat their sons and daughters very differently.⁵⁵ A recent assessment of 172 studies involving 28,000 children found that boys and girls are given similar amounts of encouragement, warmth, nurturance, restrictiveness, discipline, and clarity of communication. The only substantial difference was that about two-thirds of the boys were discouraged from playing with dolls, especially by their fathers, out of a fear that they would become gay. (Boys who prefer girls' toys often do turn out gay, but forbidding them the toys does not change the outcome.) Nor do differences between boys and girls depend on their observing masculine behavior in their fathers and feminine behavior in their mothers. When Hunter has two mommies, he acts just as much like a boy as if he had a mommy and a daddy.

Things are not looking good for the theory that boys and girls are born identical except for their genitalia, with all other differences coming from the way society treats them. If that were true, it would be an amazing coincidence that in every society the coin flip that assigns each sex to one set of roles would land the same way (or that one fateful flip at the dawn of the species should have been maintained without interruption across all the upheavals of the past hundred thousand years). It would be just as amazing that, time and again, society's arbitrary assignments matched the predictions that a Martian biologist would make for our species based on our anatomy and the distribution of our genes. It would seem odd that the hormones that make us male and female in the first place also modulate the characteristically male and female mental traits, both decisively in early brain development and in smaller degrees throughout our lives. It would be all the more odd that a second genetic mechanism differentiating the sexes (genomic imprinting) also installs characteristic male and female talents. Finally, two key predictions of the social construction theory—that boys treated as girls will grow up with girls' minds, and that

differences between boys and girls can be traced to differences in how their parents treat them—have gone down in flames.

Of course, just because many sex differences are rooted in biology does not mean that one sex is superior, that the differences will emerge for all people in all circumstances, that discrimination against a person based on sex is justified, or that people should be coerced into doing things typical of their sex. But neither are the differences without consequences.

BY NOW MANY people are happy to say what was unsayable in polite company a few years ago: that males and females do not have interchangeable minds. Even the comic pages have commented on the shift in the debate, as we see in this dialogue between the free-associating, junkfood-loving Zippy and the cartoonist's alter ego Griffy:



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[Production Note on three-frame Zippy cartoon strip.]

First Frame:

Zippy: Are boys and girls different right away or do they have to collect *Barbies* or *Power Rangers* to learn?

Griffy: Well, while social stereotyping does occur, there are also genetic differences...

Second Frame:

Zippy: I know. No matter how hard I try, I can't make th' switch from *Hostess* to "*Little Debbie*"!

Griffy: Today I saw a two-year old boy stand in rapt fascination at a garbage truck while his twin sister barely looked up from her *Barney* doll.

Third Frame:

Griffy: (*continues*) Males are programmed for certain functions, Zip...Th' garbage truck was most likely a mastodon to th' boy's caveperson brain!

Zippy: When I see a garbage truck, I want to bring it down with a rock!! You never know how many uneaten snack cakes it may disgorge!