The Sex Difference Evangelists
Unpacking the Science of Sex Difference
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Meet the Believers

If there's one question we never tire of, it's whether men and women speak or feel or think in fundamentally different ways. Do women talk more than men? Are their brains hard-wired for empathy? Can innate differences explain men's and women's career choices? This is today's iteration of Mars and Venus, and it's everywhere.

The preoccupation plays out in marketing to women and tips on dating, like products designed to "attract women by GETTING THEM TO TRUST YOU." It infiltrates magazine stories, TV, and radio. Grounding the trend and giving it traction are a handful of scientists and clinicians who have made themselves over into sex-difference evangelists. Two women in particular exemplify this move, and as self-described feminists, their work is often accorded special credence. Louann Brizendine, a psychiatrist at U.C.-San Francisco, hit the best-seller list in 2006 with *The Female Brain*, a book that could "change the conversation at any social gathering," as *New York Times* columnist David Brooks put it. Brizendine argues that "outstanding verbal agility" and "a nearly psychic capacity to read faces and tone of voice for emotions and states of mind" are "hardwired into the brains of women." Canadian psychologist Susan Pinker drove home similar claims this spring with *The Sexual Paradox*, which argues that innate psychological differences between men and women are vitally important and too often underestimated. These writers cast themselves as reluctant truth-tellers: "I have chosen to emphasize scientific truth over political correctness," Brizendine writes.

But are she and Pinker, in fact, fearlessly revealing? Do they show us a deep mental chasm between the sexes?

The bottom line from the science should really be this: Some differences between the minds of men and women exist. But in most areas, they are small and dwarfed by the variability within each gender. To be fair, Brizendine and Pinker intermittently acknowledge this point, and they translate complex material for a wide audience, which necessarily involves simplification. They get credit for trying.

But in the end they don't leave their readers with the correct, if unsensational, impression, which is that men and women's minds are highly similar.

Both authors push the science further than it really goes, often brushing past uncertainties or making confused evidence appear clear-cut. Even on the most hotly contested questions—like whether women have better verbal skills, or are hard-wired for empathy, or have cognitive differences that limit their advancement in math and science—the case for large, innate

disparities is messy and, for the most part, underwhelming. This is especially true when it comes to neural and hormonal claims, which tend to be controversial. These writers offer canny caveats about culture and its role in gender difference. But they tend to imply that if a difference has innate roots, it's likely to be relatively fixed. And that's not necessarily so. In crucial ways, the mind is malleable. Ultimately, the evangelists aren't really daring to be politically incorrect. They're peddling one-sidedness, sprinkled with scientific hyperbole.

Pick a Little, Talk a Little

In analyzing the sex-difference claims of authors Susan Pinker and Louann Brizendine, let's start with language. Who hasn't heard that women are naturally more verbal than men—better at expressing themselves, better at reading and writing, chattier? These clichés crop up in various forms. In her book, for instance, Pinker emphasizes that girls speak earlier, outperform boys on various measures of verbal skill when they're young, and are less likely to be dyslexic. She notes that women have an advantage in verbal fluency. And in an interview, she told me that "huge differences in literacy" exist between college-age men and women. Meanwhile, Brizendine casts women as virtual talkaholics. The hardcover edition of her book asserts that "girls speak faster on average—250 words per minute versus 125 for typical males." It also claims that females use an average of 20,000 words per day compared to males' 7,000.

What is the scientific basis for these claims? Well-established literature suggests that girls tend to acquire language earlier than boys and are less likely to develop dyslexia (though the sex difference in dyslexia is less striking than some older research would suggest). But while adolescent girls may perform better on some tests of verbal ability, the gender gap is not large, according to meta-analyses assessed here. In the past couple of years, scores on the critical reading section of the SAT essentially show a dead heat for boys and girls: In 2007, they averaged 504 and 502, respectively. The new writing test on the SAT shows an advantage for girls, but it's small: In 2007, those male and female averages were 489 and 500. Sex differences on reading comprehension and vocabulary tests also appear to be small or close to zero, when all ages are taken into account. To some degree, differences in verbal ability in children or adolescents may reflect different paces of development that even out later on.

Some differences—for instance, on tests of verbal fluency—do appear in adults. (A typical verbal fluency test might ask people to list as many words as possible beginning, say, with the letter B.) But the differences between average men and women are small compared with the variation within each gender. For instance, if we take an average measure of verbal fluency for men, about 50 percent of men will score higher that that mark, and about 60 percent of women will. Which means that you'd do pretty badly if you tried to predict a person's gender from his or her verbal fluency score. What's more, these tests may have little to do with real-life communication. "When does any conversation call upon you to produce as many words as you can think of starting with B?" asks Deborah Cameron, a professor of language and communication at Oxford and author of *The Myth of Mars and Venus*. People may assume that "verbal fluency" means that women are more articulate or can find the words to express themselves better, she says, but that leap has not been substantiated.

Meanwhile, Brizendine's claim that women talk faster than men is unfounded, as linguist Mark Liberman has pointed out. Brizendine told me she omitted the two-to-one speed ratio from her paperback edition because she discovered that no primary sources verified it. Similarly, her assertion that women utter more words a day than men is bunk. Thanks in part to Liberman's provocation, last year University of Arizona psychologist Matthias Mehl conducted a new analysis of daily word budgets. He and his colleagues sampled speech from male and female college students, who wore recording devices that turned on every 12½ minutes throughout the day. The findings, published in *Science*, show that on average women use about 16,000 words per day. And so do men. (Brizendine says that this study convinced her to drop the 20,000-to-7,000-words-per-day claim. But her paperback still says that "on average girls speak two to three times more words per day than boys"—an assertion that is just as flimsy. Here's her explanation, and a critical response from the scientist she relies on.)

What makes the claims of a stark male-female split sexy, of course, is the appeal to neuroscience. Pinker, for instance, highlights a study of brain cell density, which suggests that female brains are more densely packed with neurons in an area called the posterior temporal cortex, which is associated with language. This "might explain the general female advantage in language fluency and spelling," among other things, she writes. Brizendine cites the same paper, asserting that in the "brain centers for language and hearing … women have eleven percent more neurons than men." But this paper looked at four men and five women—hardly a sample size to inspire grand claims. Neither Brizendine nor Pinker mentions this crucial caveat. And even if a difference in neuron density for that area were to be established, it's not at all clear what that would mean, if anything, given the complex circuitry that language involves.

These writers also home in on the structure that connects the brain's left and right hemispheres. Some research suggests that part of this structure, which is called the corpus callosum, is thicker in women than in men. This could mean that women have a "faster superhighway for neural messages" (Pinker) and therefore an advantage when it comes to language (as well as emotional processing). But that claim is tricky to make, and the significance of any purported size difference is deeply unclear.

Finally, Pinker argues that men "are simply less versatile when it comes to language." At first she seems to mean that they are more vulnerable to language-related problems like dyslexia, but in the paragraphs that follow, she slips from dyslexia to general measures like language fluency (and then back to dyslexia). So "less versatile" becomes a broader comment on ability, too. She suggests that men may rely more heavily on one brain hemisphere—the left—while women are more likely to use both. In particular, Pinker cites a 1995 study that asked men and women to answer questions about words and nonsense words, like whether they belonged to the same category or rhymed. Using fMRI images of the subjects' brains, the researchers found that men and women both relied on areas of the left hemisphere when answering questions. But women also used areas of the right hemisphere while men tended not to. According to Pinker, this means that if a problem occurred in the left hemisphere, "women would simply

access the right hemisphere instead. Under normal circumstances sex differences would be subtle, but when things went wrong, sex differences would be extreme."

But since 1995 and the study that Pinker cites, a more complex picture has emerged, with some researchers finding that women are more likely to draw on both sides of the brain for certain language tasks, and others finding no sex difference. Maybe that's because of the types of tasks involved, but Pinker doesn't really discuss the controversy. Also, even if, on average, men and women used different neural strategies for playing certain word games, that doesn't necessarily mean one sex will perform better overall. This study, for instance, which asked subjects to put real and nonsense verbs in the past tense, found that women did tend to rely more on both brain hemispheres while men tended to rely more asymmetrically on the left hemisphere. But it made no difference in how quickly or accurately they performed.

Subtle differences could turn out to matter for men and women with specific clinical conditions. Pinker likes to say that the extremes tell us something about the rest of us. But the relevance is hard to see. (And, as it turns out, the connection between these gender-related brain findings and dyslexia is not well-established, either, however logical the connection seems.) All told, what's striking about the evidence on language is not so much a profound gap between the sexes, but the large gaps in our understanding of the brain.

Empathy Queens

In an over-the-top riff on womanly feeling in her book on sex differences, psychiatrist Louann Brizendine introduces Sarah, an icon of female empathy: "Maneuvering like an F-15, Sarah's female brain is a high-performance emotion machine—geared to tracking, moment by moment, the nonverbal signals of the innermost feeling of others." In sussing out emotion, Sarah is "just doing what the female brain is expert at," Brizendine concludes.

This is a core tenet of sex-difference evangelism. In 2003, British psychologist Simon Baron-Cohen made the case that "The female brain is predominantly hard-wired for empathy." Brizendine has run with that assertion, and author and psychologist Susan Pinker has jumped on the F-15 bandwagon as well, arguing that women have a powerful "empathy advantage." Culture may modify or amplify it, but this edge, these authors claim, is rooted in innate difference.

Take a closer look and you find that indeed some studies, which ask men and women about empathy, find higher-on-average scores for women (albeit with plenty of overlap between the sexes). But other research complicates the picture. To claim that any differences are innate is to descend into a rabbit hole of partial, flickering findings on infants and twins, hormones, and neural mechanisms. Brizendine and Pinker tend to downplay the complications. This makes the case that women are innately more empathetic than men seem stronger than it really is.

The simplest way to gather data on empathy is to get men and women to fill out questionnaires. Baron-Cohen's asks respondents whether they agree or disagree with

statements like "I can easily tell if someone else wants to enter a conversation"; "I really enjoy caring for other people"; "When I was a child, I enjoyed cutting up worms to see what would happen." Baron-Cohen finds that women give themselves higher marks for empathizing. Further evidence comes from work by psychologist Alan Feingold, whose cross-cultural research Pinker cites. In the 1990s, Feingold reported that women in countries including the United States, Canada, Poland, Russia, and Germany (but not China) scored higher on average than men on questionnaires designed to measure how tender-minded and nurturing people are.

These studies get us only so far. Baron-Cohen calls the empathizing brain type E, or "the female brain," and contrasts it with systematizing brain type S, or "the male brain." But only 44 percent of women are type E—not even a majority. Which makes the labeling seem odd. When I asked him about this, Baron-Cohen admitted that he's thought twice about his male brain/female brain terminology, but he didn't disavow it.

What's most striking about Feingold's work, for its part, are the dates of the U.S. studies. When it comes to tender-mindedness, the largest differences between males and females come from work published between 1958 and 1962 and in 1968. The smallest differences appear in the most recent research listed, from 1985 and 1987. And the sex differences in the later studies are indeed small—the ones from 1987 are comparable to the difference in average height between 15- and 16-year-old girls.

Why did the gap narrow so dramatically? Feingold says that the later studies tended to omit items that were found to be " 'biased' against women." That might make comparisons among the studies tricky, but it also might mean that the recent numbers are more revealing. It's also worth noting that the male-female difference shrank over the very years in which second-wave feminism pushed for changes in traditional roles—and men began to spend more time with their children. Tender-mindedness, it would seem, is malleable.

Of course, what people say about themselves on questionnaires tells a limited story in any case. Psychologist Nancy Eisenberg made this point most dramatically in the 1980s, when she demonstrated that the empathy gap, which appeared in studies that relied on self-reporting, all but vanished when other measures like physiological responses or changes in facial expression were considered. Men and women differ in "how empathetic they would like to appear to others (and, perhaps, to themselves)," she wrote—and that's not the same thing as real underlying sex differences in empathy.

In the years since, the picture has only gotten cloudier. Some research finds associations between self-reporting and other measures, and other research suggests divergence, Eisenberg says. Other studies look at how well men and women discern emotion in photographs of faces or eyes. Sometimes they find a female advantage, and sometimes they don't, as Baron-Cohen told me.

But reading Brizendine and Pinker, you'd never know how muddled this literature is. And that's a problem, because the mess is central to the story.

Mars, Venus, Babies, and Hormones

According to sex-difference evangelist Louann Brizendine, women are like emotion-seeking F-15's, deciphering and responding to other people's feelings and needs. By contrast, it's "only when men actually see tears that they realize, viscerally, that something's wrong," she writes. Brizendine and Susan Pinker not only argue that women are more empathetic than men, a claim that is dicey to begin with. They also say that the gap springs from innate difference.

To make that case, these authors look to studies of infants, children, and twins. Pinker writes that girls not only "show more empathy toward friends and family" but "remarkably, demonstrate signs of these skills from early infancy, well before any cultural expectations about women as nurturers can be absorbed." Newborn girls "respond more to the cries of another baby—and to human faces—than do boys," Brizendine says. Pinker also argues that newborn girls show greater interest in looking at faces. And she hangs her hat on twin research, writing: "Studies of twins show that the ability to understand social situations—which requires empathy—is largely inherited, and that there are large differences between boys and girls that are most noticeable when children are young."

What's at play here are leaps between early rudimentary behavior and complex behavior later on. It's true, for instance, that girls tend to make more eye contact and cry more easily in response to another infant's cry, according to some research. But why is it particularly clear that these measures are relevant to empathy, which emerges later in development and involves a far more sophisticated set of responses? If baby girls are, in fact, more strongly drawn to some displays of faces than to objects, is that because they have a categorical preference for people versus objects, asks Harvard psychologist Elizabeth Spelke? Or because they're responding to some other contrast between the two presentations, like "their rate of motion or distribution or color or contrast"? These data can be hard to interpret. In an interview, even Simon Baron-Cohen, another doyen of sex-difference claims, offered up some caution.

Caveats are also in order for the length of time infant girls gaze at faces and what to conclude from that. In one of his more controversial studies, Baron-Cohen found that 1-day-old girls were more inclined to look at a human face, while 1-day-old boys were more inclined to look at a mechanical mobile. But that work has not been replicated. Brizendine cites psychologist Erin McClure, but this reference is also problematic, as McClure herself pointed out to me. Meanwhile, an older body of research suggests that "male and female infants are equally interested in people and objects," as Spelke puts it.

Pinker tops the slippery charts when she buttresses the case for innate difference with twin research. She cites a study that looks at twins and suggests a difference between boys' and girls' social understandings—which includes, say, the ability to pick up on body language or not

to interrupt when other people are talking. Contrary to her explicit claim of "large differences," when I calculated the gap between average measures for boys and girls, it turned out to be small—comparable, again, to the difference in average height between 15- and 16-year-old girls. Also, while the twin study Pinker likes does find that social cognition, or the ability to infer what others are feeling, is largely inherited (as Pinker correctly claims), its authors conclude that the disparity they observe between boys and girls cannot be attributed to genetic difference. Pinker, amazingly, fails to mention that the authors on whom she's relying for proof of relevant genetic difference disavow that explanation of their findings. This is precisely the sort of selective reporting that makes her book misleading.

To shore up their claims that sex difference is innate, Pinker and Brizendine also fetishize hormones like testosterone and oxytocin, which they say may underlie crucial sex differences in empathy. For instance, they rely on Baron-Cohen's argument that higher levels of prenatal testosterone diminish boys' drives to empathize later on. His team is tracking a group of children born around Cambridge, England, some from birth through early childhood, and writes that, in general, fetal testosterone "predicts how sociable a child will be," with higher levels of the hormone linked to lower scores on social measures.

But the evidence for that should be qualified. Baron-Cohen finds that at age 1, boys with higher levels of fetal testosterone appear to make less eye contact with their parents (usually their mothers). The ranges for boys and girls, however, overlapped significantly. (In the course of 20 minutes, the boys looked at the parent's face between 3.0 and 46.2 times, the girls between 3.8 and 55 times.) At age 4, children with higher testosterone tended to have lower "quality of social relationships," according to questionnaires their parents filled out. But that was only true when data for boys and girls were pooled. No relationship between fetal testosterone and the quality of social relationships was found among boys as a separate group. And none was found among girls, either.

For children between the ages of 6 and 8, the links between fetal testosterone and two measures of empathy were somewhat more convincing. Children with higher testosterone tended to score lower on a questionnaire and on a test in which they tried to discern emotion from pictures of eyes. And this association held when boys were considered alone. But, confusingly, on the eye-reading test, there was no overall difference in how well the boys and the girls performed. This work has not been replicated, either. Since Baron-Cohen's results come from a nonrepresentative sample from one geographic area, his findings should not be treated as the final word.

Then there is oxytocin, which Susan Pinker calls "the hormone that greases the wheels of attachment" and "a feel-good, nurturing drug that happens to be homegrown." Brizendine describes it rhapsodically in her "cast of neuro-hormone characters" as "fluffy, purring kitty; cuddly, nurturing, earth mother; the good witch Glinda in *The Wizard of Oz*; finds pleasure in helping and serving."

Here's what we actually know about oxytocin: The hormone is important to childbirth and lactation. It may also contribute to mother-child bonding and possibly to feelings of calm in breast-feeding mothers. Yet it is also linked to feelings of social distress. One theory is that the body releases oxytocin to promote social connection, and if that connection is positive, the hormone may help to reduce stress. If it's negative, however, oxytocin may actually make stress worse. In other words, the hormone's effects are apparently paradoxical—it is not simply a "feel-good" drug.

At the moment, research that includes a control group (and is therefore more rigorous) doesn't tell us much about empathy and gender. Pinker emphasizes two studies: One finds that subjects who received intranasal puffs of the hormone were more trusting of other players in an investment game; the other shows that those who got oxytocin were better able to discern emotions in photographs of faces. Crucially, though, both these studies were conducted in *men*, as Pinker acknowledges. So far, for the most part, women haven't been in the research pool, according to social psychologist Jennifer Bartz of Mount Sinai. This is starting to change, but the bottom line for now, she says, is that "we can't say oxytocin makes women more empathetic." Finally, Brizendine and Pinker lean on neuroimaging studies, which compare male and female responses to stimuli like pictures of sad and happy faces or other imagery. But this kind of data is notoriously hard to interpret. Consider this meta-anlysis by psychologist Tor Wager, who looked at 65 functional MRI and PET studies of gender and emotion. Wager found some differences in the brain activity patterns of men and women in response, say, to films or pictures meant to elicit emotion. The differences were subtle, however, compared to the similarities.

And the kicker is that these studies don't tell us whether differences are innate. Brizendine moves seamlessly from references to fMRI studies to phrases like "distinct female and male brain operating systems." (She also jumps off the deep end with a claim about male and female mirror neurons.) Pinker suggests that fMRI studies can show how women's "neural hardware" gives them an edge in discerning emotion. But our brains change in response to how we use them—what we think, see, feel, and practice doing over a lifetime. This is the plasticity of the brain, demonstrated most colorfully in this famous study of London cabbies. With its potential connection to a person's response to the culture he or she lives in, plasticity could explain much—or potentially all—of the difference between brain scans of men and women responding to emotional stimuli. Pinker knows this and says she does not suggest otherwise. "You can't look at a brain scan and say therefore we know the cause," she told me. But because she and Brizendine largely devote their books to excavating innate difference, they should write that caveat in red.

The Ghost of Larry Summers

No discussion of how men and women think can avoid a mention of Harvard's ex-president Larry Summers. When he speculated in 2005 that intrinsic cognitive differences might partly account for women's underrepresentation in the top tiers of math and science, Summers fanned a national debate that continues to fuel sex-difference evangelism.

Susan Pinker treads lightly in Summersville, casting herself as a baffled bystander who couldn't understand the fuss. Still, she describes Summers' critics with subtle condescension. One of Summers' most ardent defenders was Steven Pinker, Susan's brother, who championed the case that intrinsic sex differences in aptitude and motivation may play a role in women's lesser representation. In a "showdown of the sexes" at the school's Science Center, Harvard psychologist Elizabeth Spelke bested Steven Pinker, in my view, with the case that social and cultural forces are the crucial ones. Still, Susan Pinker reprises several of the arguments that swirled in the Spelke-Steven Pinker debate, and these are worth revisiting because they still linger.

Summers argued, in part, that men vary more on cognitive measures than women—they're more likely to be at the high and low points on the relevant graphs or charts. He suggested this means that more men fall at the very high end of cognitive ability, from which top researchers are likely drawn. Steven Pinker defended this argument. And Susan Pinker takes it as a given: "Males are simply more variable," she writes. And: "The bell curve simply looks different for males, with more men at the tail ends of the distribution."

But that is not the whole story. In much of the pertinent research, male scores on cognitive measures do appear to spread more than female ones. But there are counterexamples. For instance, this cross-cultural analysis from 1994 suggests that in some countries, males' math scores are more variable, while in other countries, women's are. Strikingly, a new analysis of math data from 22 countries (not yet published but presented at several conferences) finds men with the expected spread in scores in many countries—but not in Lithuania, Germany, the Netherlands, Slovenia, or Denmark. In these places, female variability is either greater, or there's little difference between the sexes.

This analysis has statistical advantages over some older work, which makes it tough to dismiss, according to psychologist Steve Ceci, who has done an exhaustive review of the literature. Differences among countries shout out the role of social and cultural forces. These vary from place to place and seem to matter a lot in terms of shaping variability in math scores. Another recent analysis, in *Science*, also suggests that the math gap tends to narrow, or even disappear, in countries with more equality between men and women. This is true both for average scores and top-tier ones. More evidence for the importance of culture.

In the United States, much of the debate over whether boys have a high-end edge has focused on math SAT scores. For instance, widely cited research on mathematically precocious students found that more boys than girls tended to score in the very top tiers on the math SAT. But as Spelke points out, SAT scores may underpredict girls' academic math performance later on and should be viewed more critically than Steven Pinker and others do. Girls' academic success should not be discounted, either.

Susan Pinker also revisits the claim that males tend to perform better on certain tests of spatial reasoning. But even if that were so, a growing body of evidence suggests that spatial reasoning skills are malleable: the plasticity point again.

Spatial advantage is often cast as the smoking gun of cognitive sex difference. It's true that men tend to perform better on some tests, including those on which they must mentally rotate one object in space to see whether it resembles another. This is an area with a sizeable gender gap (though, if I need to say it, plenty of women excel at mental rotation, and women tend to perform better on some tests of spatial memory). Spelke suggests that men and women tend to approach certain spatial questions in subtly different ways, meaning that differences in strategy, rather than overall aptitude, may be what's really at play.

Some evidence suggests that innate factors like testosterone levels could help explain spatial reasoning differences. But the key point is that for both men and women, these skills can improve a lot with training. Researchers from the Spatial Intelligence and Learning Center, which brings together scientists from several universities, conducted a meta-analysis of more than 100 studies that have examined the effects on men and women's spatial-reasoning scores of everything from a few hours with a spatially oriented video game to weeks or months in a classroom to projects like dressmaking. Crunching numbers across the studies, the group found that training was associated with a substantial gain in spatial reasoning—comparable in size to almost a 10-point boost in IQ, according to Northwestern University researcher David Uttal.

These are not just weedy lab results—the gains may boost some women's careers. Consider a program at Michigan Tech University. Since the 1990s, incoming engineering students have taken a test of spatial reasoning during freshman orientation. Students who score poorly are encouraged to attend sessions and do sample exercises to prepare them for an introductory graphics class in which they must visualize and mentally rotate objects. According to a longitudinal study, men and women who received the extra training got better grades in graphics compared with classmates who also did badly on the diagnostic test but did not get further help. What's more, women who got the extra teaching and encouragement were more likely to remain engineering majors: more than 75 percent, compared with less than 50 percent for women who didn't do the training. (For men, for some reason, the extra teaching didn't have this retention yield.)

Of course, when it comes to the diverse precincts of high-level science, spatial reasoning only gets you so far. Rock-star academics don't necessarily spend their days turning geometric figures around in their minds. Subfields of biology, chemistry, physics, and engineering vary in terms of the skills they require. And plenty of hard problems can be solved in multiple ways. Ultimately, no one really knows what makes a successful scientist. "Sure, mathematical and spatial ability may play a role, but so may creativity, diligence, communication skills, and intellectual risk-taking," says Ceci. Teaching spatial reasoning is a good thing. But overplaying its importance sells a lot of great scientists short.

The Next Best-Seller

In talking about sex differences, it's easy to assume that what you see is what you get—on average, women are better listeners, men are better navigators, and those patterns of thinking and motivation are relatively fixed. But this isn't necessarily so.

Consider this famous example from the 1990s: Before taking a math exam, some women were told that the results had "shown gender differences in the past." These women performed worse on the test than other women with comparable math backgrounds. This is the famous concept of stereotype threat, introduced by psychologists Claude Steele and Joshua Aaronson and studied by scores of others. In one case, watching a set of TV ads, including one with a woman " 'drooling' with anticipation to try a new brownie mix," seemed to affect how female students answered questions about their educational and career interests. Women who saw the caricaturing ads were less likely to express interest in quantitative pursuits. The ads didn't seem to affect men, presumably because they didn't feel subtly associated with the shallow brownie maven. On the other hand, stereotype threat may kick some men in the teeth when it comes to social sensitivity—an area in which they're widely stereotyped as dolts.

The point is that playing up sex differences can be subtly toxic. At its worst, it risks turning stereotypes into self-fulfilling prophecies. The better news is that stereotype threat can be disarmed. One striking example is a 2007 study of a top-track calculus class, designed for science and engineering majors, at the University of Texas. This is a pool from which top math and science professionals would be drawn—"the group Larry Summers was talking about," as Aronson puts it. At the beginning of a calculus exam, he gave some of the women in the class a statement that the test had "not shown any gender differences in performance or mathematical ability." These women scored substantially higher on average than their female classmates. They also performed better on average than their *male* classmates.

Despite such striking findings, stereotype threat is simply missing from Susan Pinker's picture. She acknowledges that discrimination held women back in the past but thinks we've gotten largely beyond this. After "four decades of trying to stamp out gender differences," today's male prevalence among top scientists largely reflects essentialist sex differences, she thinks—in abilities and also, especially, in men and women's interests and motivations. She believes we'd be happier if we just accepted our differing tendencies and moved on. Pinker wants us to give traditionally female fields more respect. (She also sensibly urges that a "vanilla male" model of work—long hours, heavy travel, little time with family—isn't necessarily right for women. I won't tackle those structural questions here, except to say that the "male vanilla" model isn't necessarily great for men, either.) More problematically, Pinker takes unfair aim at programs to attract women to math and science, arguing that they "reinforce the cachet of fields that appeal more to men."

But how much sense does it make to downplay current discrimination to the point of sweeping by it altogether? The evidence tells us of the effects of disparities in how boys and girls are perceived and in the pressures they face throughout their lives. We can't know whether biological differences steer fewer women to the top of math and science unless we first address

the myriad factors that hold them back. As Spelke puts it: "We should allow all of the evidence that men and women have equal cognitive capacity to permeate through society. We should allow people to evaluate children in relation to their actual capacities." Then we would see whether boys and girls are drawn in different directions.

Maybe they would be. Maybe Pinker has jumped the gun, and the evidence will someday bear her out. And yet if history is any guide, today's gender breakdowns are likely to keep changing. What's so magical, after all, about the current numbers? A few decades ago, most biology and math majors were men. So were most doctors. Now math undergraduate majors split close to 50/50. In 1976, only 8 percent of Ph.D.s in biology went to women; by 2004, 44 percent did. Today, half of M.D.s go to women. Even in engineering, physics, chemistry, and math, the number of women receiving doctorates tripled or quadrupled between 1976 and 2001. Why assume that we have just now reached some natural limit?

Brizendine and Pinker both avoid saying that biology is destiny, and in an interview, Pinker was adamant that she should not be read this way. She is too sophisticated to argue that cognitive differences are entirely intrinsic—she knows the old nature-versus-nurture dichotomy is dead. But her book's emphasis on developmental evidence and hormones—and her one-sided treatment of key areas of research—steers readers to the conclusion that innate differences, perhaps modified or amplified by culture, are vitally important. And to a large extent, intractable. Brizendine manipulates readers in the same way, less subtly (and to the tune of higher sales).

Why does the evangelists' vision of polarized and relatively fixed sex difference have so much traction right now? Why are they the crowd pleasers? As Deborah Cameron points out in *The Myth of Mars and Venus*, which reads as a helpful antidote to the evangelists: "No group of men and women in history have ever been less different, or less at the mercy of their biology, than those living in Western society today." And maybe, paradoxically, this explains the evangelists' tenacious hold. Having more women in the workplace and more men involved in child care and household work has produced a lot of friction and enormous cultural anxiety. Mars-and-Venus-style books can be hugely reassuring, telling people that their struggles and doubts are rooted in age-old biology. Cameron adds dryly: "I would argue that they displace the anxieties rather than having anything very useful to say about them."

Useful, however, isn't the only measure of success. Brizendine's book has now been translated into 21 languages. Surely that was not lost on Susan Pinker, who came next. Other writers will surely follow them. But we don't have to fall for what they're selling. It's time to stop buying the line that it's radical to speculate about innate differences. And to stop accepting, when the evidence is thin, that innate difference is the unrelenting cause of gender gaps in ability or potential or the courses our lives take. Look closely at the science, and what becomes clear is that the question worth a raft of best-sellers is not how we could be limited by traditional assumptions. It's how we could not be.