

Unnatural Selection

A broad interpretation of parental choice, indeed, is spreading throughout India—along with China, Taiwan, Vietnam, Georgia, Azerbaijan, and Albania. Preliminary results from India's 2011 census show a sex ratio of only 914 girls for every 1000 boys ages 6 and under, a decline from 2001. In some Chinese counties the sex ratio at birth has reached more than 150 boys for every 100 girls. "We are dealing with genocide," Bedi says. Sex-selective abortion, he adds, is "probably the single most important issue in the next 50 years that India and China are going to face. If you're going to wipe out 20 percent of your population, [nature](#) is not going to sit by and watch."

Bedi speaks with an immaculate British accent that hints at years spent studying at King's College London. The accent helps in this part of Delhi, where breeding can trump all else. His patients are the sort who live in spacious homes tended by gardeners, belong to bucolic country clubs, and send their children to study in the United States. India's wealthy are among the most frequent practitioners of sex selection, and in their quest to have a son Bedi is often an obstacle. His refusal to identify sex during ultrasound examinations disappoints many women, he says: "They think it's just a waste of time and money if you don't even know whether it's a boy or a girl."

India outlawed fetal sex identification and sex-selective abortion in 1994, but so many physicians and technicians break the law that women have little trouble finding one willing to scan fetal sex. Bedi says sex-selective abortion has caught on in Delhi because it bears the imprint of a scientific advance. "It's sanitized," he says. The fact that sex selection is a medical act, he adds, neatly divides the [moral](#) burden between two parties: parents tell themselves their doctor knows best, while doctors point to overwhelming patient demand for the procedure.

Hospital administrators, for their part, have little incentive to do anything about the problem because maternity wards bring in substantial business. (At Apollo, a deluxe delivery suite outfitted with a bathtub, track lighting, a flat screen television, and a large window looking out onto landscaped grounds runs to \$200 a night.) "When you confront the medical profession, there is a cowardly refusal to accept blame," Bedi says. "They say, 'We are doctors; it's a noble profession.' This is bullshit. When it comes to issues like ethics and morality, you can have an opinion, but there is a line which you do not cross. Everybody who [aborts for reasons of sex selection] knows it's unethical. It's a mass medical crime."

For as long as they have counted births, demographers have found an average of 105 boys born for every 100 girls. This is our natural sex ratio at birth. (The small gap neatly makes up for the fact that males are more likely to die early in life.) If Asia had maintained that ratio over the past few decades, the continent would today have an additional 163 million women and girls.

For Westerners, such a [gender](#) gap may be difficult to fathom: 163 million is more than the entire female population of the United States. Walk around Delhi's posh neighborhoods, or visit an elementary school in eastern China, and you can see the disparity: Boys far outnumber girls.

At first glance, the imbalance might seem to be the result of entrenched gender [discrimination](#) and local practices. Scholars and journalists typically look to the Indian convention of dowry, which makes daughters expensive, and to China's one-child policy, which makes sons precious, to explain sex selection in Asia. (Sons have long been favored in China, as in many other parts of the

world.) But this logic doesn't account for why South Koreans also aborted female fetuses in large numbers until recently, or why a sex ratio imbalance has lately spread to the Caucasus countries—Azerbaijan, Georgia, and Armenia—and the Balkans, or why sex-selective abortion occurs among some immigrant communities in the United States.

The world's missing females are an apparent paradox: Sex selection is occurring at a time when women are better off than ever before. "More and more girls are going to school and getting educated," says T.V. Sekher, a demographer at the International Institute for Population Studies in Mumbai. And in India, educated women are more likely to have a son than those with no degree. The women who select for sex include lawyers and doctors and businesspeople. Economic development has accompanied a drop in fertility rates, which decreases the chances of a couple getting the son they want without resorting to technology.

We might have seen this coming. Decades ago, Western hysteria over what many saw as an impending "population explosion" led American scholars and policymakers to scour the world for solutions to reducing the global birth rate. Studies from India and East Asia showed the major barrier to acceptance of contraception was that couples wanted at least one son. The advocates of population control saw that the barrier might be turned into an opportunity, however: If parents could be guaranteed a son the first time around, they might happily limit themselves to one or two children.

Beginning in the late 1960s, influential U.S. experts sounded their approval for sex selection everywhere from the pages of major scientific journals to the podiums at government-sponsored seminars. "[I]f a simple method could be found to guarantee that first-born children were males," Paul Ehrlich wrote in *The Population Bomb* in 1968, "then population control problems in many areas would be somewhat eased."

Meanwhile, another group of scientists was figuring out how to determine fetal sex. These scientists' efforts focused on amniocentesis, which entails inserting a needle through a pregnant woman's abdomen into the amniotic sac surrounding the fetus and removing a small amount of protective amniotic fluid, a substance rich with fetal cells that reveal its sex. They saw sex determination as a way to help women carrying sex-linked diseases like hemophilia have healthy children. But when amniocentesis, and later ultrasound, found their way to Asia decades later, it was their use as a population-control tool that stuck.

Sex selection's proponents argued that discrimination against women and girls wouldn't endure. As women became scarce, several prominent Western theorists proposed, they would also become more valuable, prompting couples to have daughters again. But in fact the opposite has happened. In their scarcity, women are being turned into commodities to be sold to and exploited by what demographers call "surplus men": the ones left over in an imagined world in which everyone who can marry does so. Scholars have begun to calculate the impact hundreds of millions of such men will have on everything from health care to crime.



SUINING COUNTY, CHINA

In a village Eastern China's agricultural belt, I meet Zhang Mei, a 37-year-old woman clad in men's pants and a black-and-white polka-dot shirt that billows around her thin frame. Zhang is from distant Yunnan province, a poor mountain region near the border with Tibet. Her neighbors say she arrived 20 years ago, after a long journey in which a trafficker took her east to deliver her into [marriage](#). She had no idea where she was headed beyond the vague promise that she would find work there, and yet she had some [faith](#) in the trafficker, for she hadn't been kidnapped. Her parents had sold her.

The man who became her husband was gentle, but 15 years her senior, undeniably ugly, and one of the poorest residents of the village. Zhang learned that she had to work hard to make ends meet, and that she could not leave, even for a short trip home. Soon after she married, she found herself under pressure to have a son. One came on the third try, after two girls. But as the children grew, her husband complained it cost too much to educate their daughters, and since it is sons that matter in Suining, he sent one of the girls back to Yunnan to be raised by Zhang's parents: a return, one generation later, of a lost girl.

Today Zhang copes with lifelong detention by gambling at raucous *majiang* games, burying herself in soap operas, and praying. (She is Christian.) "I carry some burdens," she tells me, as we sit on the couch in her one-room home. "If I didn't pray, I would keep them all in my heart."

Zhang's story is perhaps the most obvious way in which the gender imbalance is altering societies in Asia. The U.S. Department of State lists the dearth of women in Asia as one of the principal causes of sex trafficking in the region. Some of those women, like Zhang, are sold into marriage. Others become prostitutes. But what happens to the men who can't find partners is significant as well.

Nothing can fully predict the effect of gathering tens of millions of young bachelors in one place for years on end. But preliminary conclusions can be drawn from places where the first generation touched by sex selection has reached adulthood. One line of speculation centers on [testosterone](#), which occurs in high levels among young unmarried men. While testosterone does not directly cause violence in a young man, it can elevate existing aggressive tendencies, serving as a "facilitative effect" that predicts whether he will resort to violence. Gauging whether millions of high-testosterone men together spark more violence is complicated, particularly in China and India, which have experienced great social change in the past few decades. But some answers can be found through breaking down crime rates by region and time period.

In a 2007 study, Columbia University economist Lena Edlund and colleagues at Chinese University of Hong Kong used the fact that China's sex ratio at birth spiked in some provinces earlier than others to explore a link between crime rates and a surplus of men. The researchers found a clear link, concluding a mere 1 percent increase in sex ratio at birth resulted in a 5-to 6-point increase in an area's crime rate.

Other scholars speculate the gender imbalance is yielding depression and hopelessness among young men—which may explain why China has lately been hit with the sort of senseless violence that was once America's domain. In 2004 and 2010 the country saw separate waves of attacks on elementary schools and child care centers in which murderers went on rampages and bludgeoned and stabbed children to death.

Eight out of the 10 killers (all male) lived in eastern Chinese provinces with high sex ratios at birth; several were unemployed. One man told neighbors, before he was arrested and summarily executed, that he was frustrated with his life and wanted [revenge](#) on the rich and powerful. Another apparently told police he was upset because his girlfriend had left him.

LOS ANGELES, U.S.

"Be certain your next child will be the gender you're hoping for," promises the Web site of L.A.'s Fertility Institutes. Dr. Jeffrey Steinberg founded the clinic in 1986, just as in-vitro fertilization was taking off.

Today 70 percent of his patients come to select the sex of their baby. Steinberg's favored method is preimplantation genetic diagnosis, PGD, an add-on to in-vitro fertilization that allows parents to screen embryos before implanting them in the mother. Like amniocentesis and ultrasound before it, PGD was developed to test for defects or a propensity toward certain diseases.

But lab technicians working with eight-celled embryos can also separate XY embryos from XX ones, thus screening for sex—the first nonmedical condition to be turned into a choice. PGD thus attracts Americans who are perfectly capable of having babies the old-fashioned way but are hell-bent on having a child of a certain sex. So determined are they that they're willing to submit to the [diet of hormones](#) necessary to stimulate ovulation, pay a price ranging from \$12,000 to \$18,000, and live with IVF's low success rate. Decades after America's elite introduced sex selection to the developing world, they have taken it up themselves.

High-tech sex selection has its critics. They point to a litany of ethical issues: that the technology is available only to the rich, that it gives parents a degree of control over their offspring they shouldn't have, that it marks the advent of designer babies. But in surveys of prospective American parents over the past 10 years, 25 to 35 percent say they would use sex selection techniques if they were readily available; presumably that means more affordable and less invasive.

A squat, balding man who exudes a jovial confidence, Dr. Steinberg talks as if he has all the time in the world, peppering his stories with Hollywood [gossip](#). (To wit: The producers of the show *CSI* once stopped by the clinic to evaluate a sperm cryopreservation tank's potential as a weapon.) The patient response to his clinic offering sex selection, Steinberg tells me after ushering me into a spacious corner office, has been "crazy."

The fertility doctors who perform preimplantation sex selection take care to distinguish it from sex-selective abortion. In America, they point out, patriarchy is dead, at least when it comes to choosing the sex of our children. As late as the 1970s, psychologists and sociologists found that Americans were far more likely to prefer sons to daughters. Not anymore.

National figures are not available, but two of America's leading clinics—HRC Fertility in Los Angeles and [Genetics & IVF Institute](#) in Fairfax, Virginia—independently report that between 75 and 80 percent of their patients want girls. The demand for daughters may explain why at Steinberg's clinic everything from the entrance wall to the scrubs worn by the laboratory workers are pink.

For the most part, however, Americans don't talk about gender preference. We say "family balancing," a term that implies couples have an inherent right to an equal number of boys and girls. (Many patients seeking sex selection via PGD already have a child of the opposite sex.) We talk about "gender disappointment," a deep [grief](#) arising from not getting what we want. The author of the reproductive technology guide *Guarantee the Sex of Your Baby* explains: "The pain that these mothers feel when they fail to bear a child of the 'right' sex is more than just emotional angst. The longing that they hold in their hearts can translate into real physical pain."

Rhetorical differences aside, "family balancing" is not in fact all that different from what is happening in China and India. In Asia, too, most parents who select for sex do so for the second or third birth. And examining why American parents are set on girls suggests another similarity: Americans who want girls, like Asians who opt for boys, have preconceived notions of how a child of a certain gender will turn out.

Bioethicist Dena S. Davis writes that people who take pains to get a child of a certain sex "don't want just the right chromosomes and the attendant anatomical characteristics, they want a set of

characteristics that go with 'girlness' or 'boyiness.' If parents want a girl badly enough to go to all the trouble of sperm sorting and artificial insemination, they are likely to make it more difficult for the actual child to resist their expectations and follow her own bent."

When Dr. Sunita Puri surveyed Bay Area couples undergoing PGD for sex selection, most of them white, older, and affluent, 10 out of 12 wanted girls for reasons like "barrettes and pink dresses."

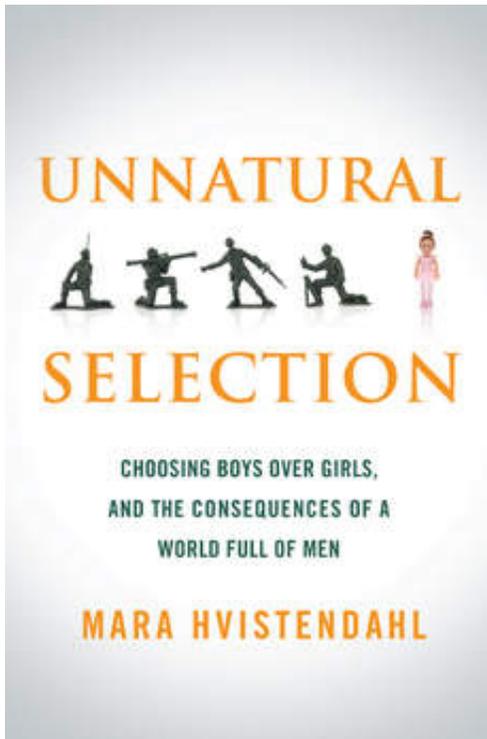
Some mention that girls do better in school, and on this point the research backs them up: Girls are more likely to perform and less likely to misbehave, while boys have lately become the source of a good deal of cultural anxiety. Others mention more noble [goals](#). They talk about raising strong daughters; women mention having the close relationship they had—or didn't have—with their own mother.

But regardless of the reason, bioethicists points out, sex selection prioritizes the needs of one generation over another, making having children more about bringing parents satisfaction than about responsibly creating an independent human being.

At stake with preimplantation sex selection is much more than the global balance of males and females, as if that weren't enough. If you believe in the slippery slope, then sex-selective embryo implantation definitely pushes us a little further down it.

In 2009 Jeffrey Steinberg announced that the clinic would soon offer selection for eye color, hair color, and skin color. The science behind [trait](#) selection is still developing, and some later doubted whether he in fact was capable of executing it. Still, Steinberg might have eventually gone through with the service had his advertisement not set off an uproar. The press descended, the Vatican issued a statement criticizing the "obsessive search for the perfect child," and couples who had used PGD for medical reasons balked, fearing frivolous use of reproductive technology would turn public sentiment against cases like theirs. For the moment, at least, Americans had problems with selecting for physical traits, and Steinberg retreated.

"The timing was off is all," he tells me. "It was just premature. We were ahead of our time. So we said, 'OK, fine. We'll put it on the back burner.'" In the meantime, he says, couples obsessed with blue or green eyes continue to call the office. He keeps their names on a mailing list.



Mara Hvistendahl is a China-based correspondent with Science magazine. She's also written for Harper's, Scientific American, and Popular Science. This piece is adapted from her new book, Unnatural Selection: Choosing Boys Over Girls, and the Consequences of a World Full of Men (PublicAffairs, 2011.)