

do the models enact stereotypically masculine or feminine stances? To develop your essay, consult Steve Craig's "Men's Men and Women's Women" (p. 187).

4. **CONNECTING TEXTS** Devor argues that female fashion traditionally has restricted body movement while male styles of dress commonly allow freedom of movement. In class, discuss whether this claim is still true today, being sure to consider a range of clothing types (such as athletic wear, corporate dress, party fashion, and so forth). To develop your ideas, consult Mariah Burton Nelson's "I Won. I'm Sorry." (p. 569).

PERFORMING GENDER

DEBORAH BLUM

The Gender Blur: Where Does Biology End and Society Take Over?

There's an old argument over whether nature or nurture is more important in determining human behavior. Nowhere is this argument more intense than in gender studies, where proponents of the social construction of gender identities are currently exploring the many ways in which our upbringing shapes our behavior. But after watching her two-year-old son emphatically choose to play only with carnivorous dinosaur toys and disdainfully reject the "wimpy" vegetarian variety, Deborah Blum decided that nurture couldn't be all that there was to it. Exploring the role of biology in the determination of human behavior, Blum argues that both nature and nurture have to be taken into account if we are to understand gender differences. A Pulitzer Prize-winning professor of journalism at the University of Wisconsin at Madison, Blum is the author of several books, including *Sex on the Brain: The Biological Differences between Men and Women* (1997), *Ghost Hunters: William James and the Search for Scientific Proof of Life after Death* (2006), and *The Prisoner's Handbook: Murder and the Birth of Forensic Medicine in Jazz Age New York* (2010).

I was raised in one of those university-based, liberal elite families that politicians like to ridicule. In my childhood, every human being—regardless of gender—was exactly alike under the skin, and I mean exactly, barring his or her different opportunities. My parents wasted no opportunity to bring this point home. One Christmas, I received a Barbie doll and a softball glove. Another brought a green enamel stove, which baked tiny cakes by the heat of

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a lightbulb, and also a set of steel-tipped darts and competition-quality dart-board. Did I mention the year of the chemistry set and the ballerina doll?

It wasn't until I became a parent—I should say, a parent of two boys—that I realized I had been fed a line and swallowed it like a sucker (barring the part about opportunities, which I still believe). This dawned on me during my older son's dinosaur phase, which began when he was about two-and-a-half. Oh, he loved dinosaurs, all right, but only the blood-swilling carnivores. Plant-eaters were wimps and losers, and he refused to wear a T-shirt marred by a picture of a stegosaurus. I looked down at him one day, as he was snarling around my feet and doing his toddler best to gnaw off my right leg, and I thought: This goes a lot deeper than culture.

Raising children tends to bring on this kind of politically incorrect reaction. Another friend came to the same conclusion watching a son determinedly bite his breakfast toast into the shape of a pistol he hoped would blow away—or at least terrify—his younger brother. Once you get past the guilt part—Did I do this? Should I have bought him that plastic allosaur with the oversized teeth?—such revelations can lead you to consider the far more interesting field of gender biology, where the questions take a different shape: Does love of carnage begin in culture or genetics, and which drives which? Do the gender roles of our culture reflect an underlying biology, and, in turn, does the way we behave influence that biology?

The point I'm leading up to—through the example of my son's innocent love of predatory dinosaurs—is actually one of the most straightforward in this debate. One of the reasons we're so fascinated by childhood behaviors is that, as the old saying goes, the child becomes the man (or woman, of course). Most girls don't spend their preschool years snarling around the house and pretending to chew off their companion's legs. And they—mostly—don't grow up to be as aggressive as men. Do the ways that we amplify those early differences in childhood shape the adults we become? Absolutely. But it's worth exploring the starting place—the faint signal that somehow gets amplified.

"There's plenty of room in society to influence sex differences," says 5 Marc Breedlove, a behavioral endocrinologist at the University of California at Berkeley and a pioneer in defining how hormones can help build sexually different nervous systems. "Yes, we're born with predispositions, but it's society that amplifies them, exaggerates them. I believe that—except for the sex differences in aggression. Those [differences] are too massive to be explained simply by society."

Aggression does allow a straightforward look at the issue. Consider the following statistics: Crime reports in both the United States and Europe record between ten and fifteen robberies committed by men for every one by a woman. At one point, people argued that this was explained by size difference. Women weren't big enough to intimidate, but that would change, they predicted, with the availability of compact weapons. But just as little girls don't routinely make weapons out of toast, women—even criminal ones—don't

seem drawn to weaponry in the same way that men are. Almost twice as many male thieves and robbers use guns as their female counterparts do.

Or you can look at more personal crimes: domestic partner murders. Three-fourths of men use guns in those killings; 50 percent of women do. Here's more from the domestic front: In conflicts in which a woman killed a man, he tended to be the one who had started the fight—in 51.8 percent of the cases, to be exact. When the man was the killer, he again was the likely first aggressor, and by an even more dramatic margin. In fights in which women died, they had started the argument only 12.5 percent of the time.

Enough. You can parade endless similar statistics but the point is this: Males are more aggressive, not just among humans but among almost all species on earth. Male chimpanzees, for instance, declare war on neighboring troops, and one of their strategies is a warning strike: They kill females and infants to terrorize and intimidate. In terms of simple, reproductive genetics, it's an advantage of males to be aggressive: You can muscle your way into dominance, winning more sexual encounters, more offspring, more genetic future. For the female—especially in a species like ours, with time for just one successful pregnancy a year—what's the genetic advantage in brawling?

Thus the issue becomes not whether there is a biologically influenced sex difference in aggression—the answer being a solid, technical “You betcha”—but rather how rigid that difference is. The best science, in my opinion, tends to align with basic common sense. We all know that there are extraordinarily gentle men and murderous women. Sex differences are always generalizations: they refer to a behavior, with some evolutionary rationale behind it. They never define, entirely, an individual. And that fact alone should tell us that there's always—even in the most biologically dominated traits—some flexibility, an instinctive ability to respond, for better and worse, to the world around us.

This is true even with physical characteristics that we've often assumed are nailed down by genetics. Scientists now believe height, for instance, is only about 90 percent heritable. A person's genes might code for a six-foot-tall body, but malnutrition could literally cut that short. And there's also some evidence, in girls anyway, that children with stressful childhoods tend to become shorter adults. So while some factors are predetermined, there's evidence that the prototypical male/female body design can be readily altered.

It's a given that humans, like most other species—bananas, spiders, sharks, ducks, any rabbit you pull out of a hat—rely on two sexes for reproduction. So basic is that requirement that we have chromosomes whose primary purpose is to deliver the genes that order up a male or a female. All other chromosomes are numbered, but we label the sex chromosomes with the letters X and Y. We get one each from our mother and our father, and the basic combinations are these: XX makes female, XY makes male.

There are two important—and little known—points about these chromosomal matches. One is that even with this apparently precise system,

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there's nothing precise—or guaranteed—about the physical construction of male and female. The other point makes that possible. It appears that sex doesn't matter in the early stages of embryonic development. We are unisex at the point of conception.

If you examine an embryo at about six weeks, you see that it has the ability to develop in either direction. The fledgling embryo has two sets of ducts—Wolffian for male, Muellerian for female—an either/or structure, held in readiness for further development. If testosterone and other androgens are released by hormone-producing cells, then the Wolffian ducts develop into the channel that connects penis to testes, and the female ducts wither away.

Without testosterone, the embryo takes on a female form; the male ducts vanish and the Muellerian ducts expand into oviducts, uterus, and vagina. In other words, in humans, anyways (the opposite is true in birds), the female is the default sex. Back in the 1950s, the famed biologist Alfred Jost showed that if you castrate a male rabbit fetus, choking off testosterone, you produce a completely feminized rabbit.

We don't do these experiments in humans—for obvious reasons—but there are naturally occurring instances that prove the same point. For instance: In the fetal testes are a group of cells, called Leydig cells, that make testosterone. In rare cases, the fetus doesn't make enough of these cells (a defect known as Leydig cell hypoplasia). In this circumstance we see the limited power of the XY chromosome. These boys have the right chromosomes and the right genes to be boys; they just don't grow a penis. Obstetricians and parents often think they see a baby girl, and these children are routinely raised as daughters. Usually, the "mistake" is caught about the time of puberty, when menstruation doesn't start. A doctor's examination shows the child to be internally male; there are usually small testes, often tucked within the abdomen. As the researchers put it, if the condition had been known from the beginning, "the sisters would have been born as brothers."

Just to emphasize how tricky all this body-building can get, there's a peculiar genetic defect that seems to be clustered by heredity in a small group of villages in the Dominican Republic. The result of the defect is a failure to produce an enzyme that concentrates testosterone, specifically for building the genitals. One obscure little enzyme only, but here's what happens without it: You get a boy with undescended testes and a penis so short and stubby that it resembles an oversized clitoris.

In the mountain villages of this Caribbean nation, people are used to it. The children are usually raised as "conditional" girls. At puberty, the secondary tide of androgens rises and is apparently enough to finish the construction project. The scrotum suddenly descends, the phallus grows, and the child develops a distinctly male body—narrow hips, muscular build, and even slight beard growth. At that point, the family shifts the child over from daughter to son. The dresses are thrown out. He begins to wear male clothes and starts dating girls. People in the Dominican Republic are so familiar with this condition that there's a colloquial name for it: *guevedoces*, meaning "eggs (or testes) at twelve."

It's the comfort level with this slip-slide of sexual identity that's so remarkable and, I imagine, so comforting to the children involved. I'm positive that the sexual transition of these children is less traumatic than the abrupt awareness of the "sisters who would have been brothers." There's a message of tolerance there, well worth repeating, and there are some other key lessons, too.

These defects are rare and don't alter the basic male-female division of our species. They do emphasize how fragile those divisions can be. Biology allows flexibility, room to change, to vary and grow. With that comes room for error as well. That it's possible to live with these genetic defects, that they don't merely kill us off, is a reminder that we, male and female alike, exist on a continuum of biological possibilities that can overlap and sustain either sex.

Marc Breedlove points out that the most difficult task may be separating ²⁰ how the brain responds to hormones from how the brain responds to the *results* of hormones. Which brings us back, briefly, below the belt: In this context, the penis is just a result, the product of androgens at work before birth. "And after birth," says Breedlove, "virtually everyone who interacts with that individual will note that he has a penis, and will, in many instances, behave differently than if the individual was a female."

Do the ways that we amplify physical and behavioral differences in childhood shape who we become as adults? Absolutely. But to understand that, you have to understand the differences themselves—their beginning and the very real biochemistry that may lie behind them.

Here is a good place to focus on testosterone—a hormone that is both well-studied and generally underrated. First, however, I want to acknowledge that there are many other hormones and neurotransmitters that appear to influence behavior. Preliminary work shows that fetal boys are a little more active than fetal girls. It's pretty difficult to argue socialization at that point. There's a strong suspicion that testosterone may create the difference.

And there are a couple of relevant animal models to emphasize the point. Back in the 1960s, Robert Goy, a psychologist at the University of Wisconsin at Madison, first documented that young male monkeys play much more roughly than young females. Goy went on to show that if you manipulate testosterone level—raising it in females, damping it down in males—you can reverse those effects, creating sweet little male monkeys and rowdy young females.

Is testosterone the only factor at work here? I don't think so. But clearly we can argue a strong influence, and, interestingly, studies have found that girls with congenital adrenal hypoplasia—who run high in testosterone—tend to be far more fascinated by trucks and toy weaponry than most little girls are. They lean toward rough-and-tumble play, too. As it turns out, the strongest influence on this "abnormal" behavior is not parental disapproval, but the company of other little girls, who tone them down and direct them toward more routine girl games.

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Girls and moms check out an American Girl doll fashion show in Staten Island, New York.

And that reinforces an early point: If there is indeed a biology to sex differences, we amplify it. At some point—when it is still up for debate—we gain a sense of our gender, and with it a sense of “gender-appropriate” behavior. 25

Some scientists argue for some evidence of gender awareness in infancy, perhaps by the age of twelve months. The consensus seems to be that full-blown “I’m a girl” or “I’m a boy” instincts arrive between the ages of two and three. Research shows that if a family operates in a very traditional, Beaver Cleaver kind of environment, filled with awareness of and association with “proper” gender behaviors, the “boys do trucks, girls do dolls” attitude seems to come very early. If a child grows up in a less traditional family, with an emphasis on partnership and sharing—“We all do the dishes, Joshua”—children maintain a more flexible sense of gender roles until about age six.

In this period, too, relationships between boys and girls tend to fall into remarkably strict lines. Interviews with children find that three-year-olds say that about half their friendships are with the opposite sex. By the age of five, that drops to 20 percent. By seven, almost no boys or girls have, or will admit to having, best friends of the opposite sex. They still hang out on the same playground, play on the same soccer teams. They may be friendly, but the real friendships tend to be boy-to-boy or girl-to-girl.

There’s some interesting science that suggests that the space between boys and girls is a normal part of development; there are periods during which children may thrive and learn from hanging out with peers of the same sex. Do we, as parents, as a culture at large, reinforce such separations? Is the pope Catholic? One of my favorite studies looked at little boys who asked

for toys. If they asked for a heavily armed action figure, they got the soldier about 70 percent of the time. If they asked for a "girl" toy, like a baby doll or a Barbie, their parents purchased it maybe 40 percent of the time. Name a child who won't figure out how to work *that* system.

How does all this fit together—toys and testosterone, biology and behavior, the development of the child into the adult, the way that men and women relate to one another?

Let me make a cautious statement about testosterone: It not only has some body-building functions, it influences some behaviors as well. Let's make that a little less cautious: These behaviors include rowdy play, sex drive, competitiveness, and an in-your-face attitude. Males tend to have a higher baseline of testosterone than females—in our species, about seven to ten times as much—and therefore you would predict (correctly, I think) that all of those behaviors would be more generally found in men than in women.

But testosterone is also one of my favorite examples of how responsive biology is, how attuned it is to the way we live our lives. Testosterone, it turns out, rises in response to competition and threat. In the days of our ancestors, this might have been hand-to-hand combat or high-risk hunting endeavors. Today, scientists have measured testosterone rise in athletes preparing for a game, in chess players awaiting a match, in spectators following a soccer competition.

If a person—or even just a person's favored team—wins, testosterone continues to rise. It falls with a loss. (This also makes sense in an evolutionary perspective. If one was being clobbered with a club, it would be extremely unhelpful to have a hormone urging one to battle on.) Testosterone also rises in the competitive world of dating, settles down with a stable and supportive relationship, climbs again if the relationship starts to falter.

It's been known for years that men in high-stress professions—say, police work or corporate law—have higher testosterone levels than men in the ministry. It turns out that women in the same kind of strong-attitude professions have higher testosterone than women who choose to stay home. What I like about this is the chicken-or-egg aspect. If you argue that testosterone influenced the behavior of those women, which came first? Did they have high testosterone and choose the law? Or did they choose the law, and the competitive environment ratcheted them up on the androgen scale? Or could both be at work?

And, returning to children for a moment, there's an ongoing study by Pennsylvania researchers, tracking that question in adolescent girls, who are being encouraged by their parents to engage in competitive activities that were once for boys only. As they do so, the researchers are monitoring, regularly, two hormones: testosterone and cortisol, a stress hormone. Will these hormones rise in response to this new, more traditionally male environment? What if more girls choose the competitive path; more boys choose the other? Will female testosterone levels rise, male levels fall? Will that wonderful,

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1. What effect does testosterone have on the competitiveness of males?
2. What evidence does Blum provide that testosterone influences behavior naturally?
3. How does Blum's research support her argument?
4. In Blum's view, how does testosterone act as an engaging factor in balancing the scales?

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1. In your journal, write a paragraph about the appropriate use of testosterone.
2. **CONNECTING TO THE WORLD** How does testosterone influence the position of women in the workforce? (p. 672), K. Livan's "My Sister's Keeper."
3. Write an essay about the influence of testosterone on the tendencies of men and women.
4. Visit the link below to learn more about the basis for Blum's argument on testosterone orientation.

unpredictable, flexible biology that we've been given allow a shift, so that one day, we will literally be far more alike?

We may not have answers to all those questions, but we can ask them, and we can expect that the answers will come someday, because science clearly shows us that such possibilities exist. In this most important sense, sex differences offer us a paradox. It is only through exploring and understanding what makes us different that we can begin to understand what binds us together.

READING THE TEXT

1. What effect do Blum's opening personal anecdotes have on the persuasiveness of her argument?
2. What evidence does Blum offer to support her contention that males are naturally more aggressive than females?
3. How does testosterone affect human behavior, according to Blum's research?
4. In Blum's view, how do the cultural choices that humans make, such as engaging in sports or other competitive activities, affect hormone balances?

READING THE SIGNS

1. In your journal, reflect on the way your upbringing shaped your sense of appropriate gender behavior.
2. **CONNECTING TEXTS** Blum's selection challenges the common cultural studies position that gender behavior is socially constructed. Write an essay in which you defend, qualify, or reject Blum's point of view. To develop your ideas, consult Aaron Devor's "Gender Role Behaviors and Attitudes" (p. 672), Kevin Jennings's "American Dreams" (p. 686), and Andrew Sullivan's "My Big Fat Straight Wedding" (p. 691).
3. Write an essay describing how you would raise a boy to counteract his tendencies to aggressive behavior.
4. Visit the library and investigate recent research on the possible genetic basis for homosexuality. Then write an essay in which you extend Blum's argument for the biological basis of gendered behavior to sexual orientation.