

3. T. Friedmann et al., “Gene Doping and Sport,” *Science* 327 (2010): 647-48.

4. T. Friedmann and R. Roblin, “Gene Therapy for Human Genetic Disease?” *Science* 175 (1972): 949-55.

5. S. Hacein-Bey-Abina et al., “Sustained Correction of X-Linked Severe Combined Immunodeficiency by Ex Vivo Gene Therapy,” *New England Journal of Medicine* 346 (2002): 1185-93; A. Aiuti et al., “Gene Therapy for Immunodeficiency Due to Adenosine Deaminase Deficiency,” *New England Journal of Medicine* 360 (2009): 447-58; A.M. Maguire et al., “Safety and Efficacy of Gene Transfer for Leber’s Congenital Amaurosis,” *New England Journal of Medicine* 358 (2008): 2240-48; N. Cartier, et al., “Hematopoietic Stem Cell Gene Therapy with a Lentiviral Vector in X-Linked Adrenoleukodystrophy,” *Science* 326 (2009): 818-23.

# Sex Typing for Sport

---

BY ALICE DREGER

In January, the International Olympic Committee sponsored a meeting of medical professionals in Miami aimed at revising the “gender verification” policies of the IOC and the International Association of Athletics Federations. These are the policies that come into play when someone questions whether a particular athlete should be allowed to compete as a woman. The Miami meeting failed to produce any clear consensus and only seemed to create confusion about what is now considered fair or allowable so far as sports gender divisions go.<sup>1</sup> It’s obvious that more policy meetings are going to have to happen, with more definitive outcomes.

This policy revision is happening in the wake of the fiasco surrounding the young South African runner Caster Semenya, who, after blasting past competitors in Berlin last August, had her sex called into question on the international

stage. Semenya’s story demonstrates that a clear policy that allows for definitive, consistent, private, precompetition rulings is necessary not only to clarify what’s going to count as fair in gender-divided sports, but also to protect individual athletes at risk for challenges.<sup>2</sup> Semenya has essentially gone into hiding following her hellish media-circus experience. (Imagine finding out, by watching TV reports about yourself, that the flurry of medical exams you recently had was aimed at determining your “real” sex, as Semenya apparently did.<sup>3</sup>) Santhi Soundarajan, another runner, even attempted suicide after she “failed” a “gender test” and was stripped of her 2006 Asian games medal.<sup>4</sup> At this point, not having a policy that allows athletes to know privately, in advance, if they will be disqualified as women is like asking bobsledders to head down the track without helmets: it’s downright dangerous.

Before we get into the details of why the IOC and the IAAF continue to have a tough task before them, we need to clarify the difference between sex and gender. “Sex” refers to the conglomeration of anatomical and physiological features that differ between typical females and males. Sex is about what your body includes. “Gender,” by contrast, is about who you are. “Gender identity” refers specifically to your self identity, and “gender role” refers to your social identity.

In practice, athletes show up with genders—as men or as women—and sex becomes an issue only if (a) an athlete competing as a woman is suspected of being “really” male or (b) an athlete became a transsexual after puberty, using medical technologies to “switch” from a male-type anatomy to a more female type, or vice versa. Typically, (a) happens because an athlete was born with a disorder of sex development (DSD, sometimes called intersex, and formerly called hermaphroditisms) and (b) occurs when an athlete is transgender. The standing IOC and IAAF policies on disorders of sexual development and transgender necessarily overlap somewhat, but as we’ll see, they probably should overlap more, to be fairer.<sup>5</sup>

Gender division in sports isn’t just a quaint tradition. Gender division allows many girls and women a real shot at play in sports in which they otherwise could not compete. Gender division also probably adds a degree of pleasure for many amateur and professional athletes, in that it provides “men’s only” and “women’s only” spaces that many may enjoy. (Restriction brings privilege, and privilege brings pleasure.) Gender divisions can also benefit fans; for example, children and adults get to see powerful women more often than they otherwise would, and fans can divide themselves into the types who enjoy the differing atmospheres of, say, men’s or women’s college basketball games.

But sometimes an individual athlete’s atypical sex history forces us to ask about the basis of gender divisions. Obviously gender isn’t really the issue in cases like Semenya’s; Semenya was raised a girl and showed up in Berlin as a woman, but that stable gender history wasn’t considered good enough reason to let her just take her medal and go home happy. The suspicion was about her sex.

The fairness issue at play here, of course, is that, on average, male bodies come with competitive advantages in sports

---

Alice Dreger, “Sex Typing for Sport,” *Hastings Center Report* 40, no. 2 (2010): 22-24.

that reward speed and strength. That advantage boils down, as far as we know, to more androgens. Early in intrauterine life, soon after an SRY gene on the Y chromosome tells a fetus's protogonads to become testes, the average male starts getting washed in higher levels of androgens ("masculinizing" hormones) than the average female.

But certain medical conditions can naturally give a female a big boost of androgens. Congenital adrenal hyperplasia (CAH) and adrenal tumors both involve overactive adrenal glands, and in females, this can result in "masculinization" of tissues. Some disorders of sex development can lead to a person being raised as a girl even though internally she has male-typical traits. Women with complete androgen insensitivity syndrome (cAIS) have XY chromosomes and testes, but because they lack androgen receptors, their bodies—including their genitals—develop mostly along the female pathway. They are born looking like typical girls and are raised as such. Their brains and muscles are presumably subject to even fewer androgens than the average female, because average females make some androgens and have the receptors to respond to them. To disqualify a woman with cAIS from competition as "too male" just because she has a Y chromosome and testes would be illogical, because, theoretically, the typical female has a natural competitive advantage over the woman with cAIS. This is one reason sports officials stopped using "sex chromosomes" as a simple indicator of sex.

Like CAH and adrenal tumors, *partial* AIS (pAIS) could give a woman athlete a competitive advantage. So could some other conditions, perhaps most notably 5-alpha reductase (5- $\alpha$ ) deficiency. In this condition, the SRY gene on the Y chromosome tells the fetus's protogonads to become testes. The testes start pumping out testosterone (an androgen), but the lack of the enzyme 5- $\alpha$  means that, in the womb, the fetus's genitals develop to look fairly female-typical. The child is thus typically designated a girl and raised as such. Come puberty, the testes kick into high gear, and at this point in development the testosterone doesn't need 5- $\alpha$  to have an effect. The child undergoes a male-typical puberty: the child's muscles, hair, and voice become those typical of males, and the phallus, once more like a clitoris, grows larger, to look more like a penis.

By now it should be clear why, thanks to scientific advances, it is only getting harder to divide males from females for purposes of leveling the gendered playing field. It is only getting harder to figure out what should count as an accept-

able "natural" advantage.<sup>6</sup> Humans like their sex categories neat, but nature doesn't care. Nature doesn't actually have a line between the sexes. If we want a line, we have to draw it *on* nature.

The IAAF's current consensus states that women with CAH, adrenal tumors, and cAIS are allowed to compete as women.<sup>7</sup> But the IAAF policy doesn't specify which conditions *disqualify* an athlete from playing as a woman. So the line is essentially still missing.

The IAAF policy reasonably hints that the big issue in sex typing for sport is the level of functional testosterone—not just how much you make, but how much effect it has on your cells.<sup>8</sup> But if the IOC and the IAAF try to draw the sex-division line at some level of functional testosterone, how will they justify where they draw it? What degree of error, and how much daily and lifetime variation, should they tolerate? A more global question is whether we are comfortable publicly reducing women's sports to a sort of Special Olympics for the hormonally challenged. (Tempting, since it might be good for the public understanding of the social model of disability!) Would an individual athlete be allowed to artificially lower her androgen levels to stay in competition if a recognized anomaly, variation, or pathology put her over the top? If so, why wouldn't another athlete be allowed to artificially raise hers?

To be maximally fair, if they use a value like functional testosterone to police the "gender" division, the IOC and IAAF would also really need to consider how such a policy would affect athletes on the other side of the gender divide. Perhaps men with "women's" levels of androgens would be allowed to compete with women? Or perhaps men could be permitted to artificially boost themselves up to "manly" levels?

In fact, that last scenario is already happening. A representative of the World Anti-Doping Agency confirmed for me that men who can claim a medical "need" to push up their testosterone levels can get a "therapeutic use exemption" to use testosterone, a substance otherwise prohibited.<sup>9</sup> Thus, men diagnosed with Klinefelter Syndrome (XXY chromosomes), a disorder of sexual development that results in lower-than-average testosterone levels, can get a therapeutic use exemption to take testosterone. So, presumably, can men who have lost testicles to cancer. (We're not talking about any specific bicyclist here.) What's interesting is that there doesn't appear to be a terribly pressing medical reason for men with "low" testosterone to take more. Nevertheless, just as some

---

*Humans like their  
sex categories neat, but  
nature doesn't care. Nature  
doesn't actually have a line  
between the sexes. If we want  
a line, we have to draw it  
on nature.*

---

women may be playing the hormone game to their advantage, so are some men. The public doesn't seem to be paying any attention to medically sanctioned testosterone pumping going on among "real" men, however; fans and officials appear much more worried about the women's playing field being invaded by pretenders.

Some have suggested—and I'm strongly inclined to agree—that the "sex testing" policy should really just be a "gender verification" policy: if you really were raised as a girl, you get to play as a woman. In that case, we'd just learn to live with inevitable physiological variations among people raised as girls. That could be seen as a fair decision—and a wonderful one for DSD-affected individuals and families around the world, who don't need the IOC and IAAF adding stigma to their identities and fear to their lives<sup>10</sup>—although this option does seem to stir up in some a fear of sneaky governments raising "real" male children as girl athletes.

But having one's gender in sports be determined by one's life history would contradict the IOC/IAAF "Stockholm Consensus" on transsexualism, which allows athletes to play in their posttransition genders and requires a high-surveillance, medically managed hormonal shift.<sup>11</sup> Male-to-female transsexuals are required to have their testes removed at least two years before competition as a woman and to take "feminizing" hormones. (Meanwhile, female-to-male transsexuals presumably get therapeutic use exemptions to take testosterone.) Bizarrely, the IOC/IAAF policy also requires that "surgical anatomical changes [be] completed, including external genitalia changes," as if having a vulva reduces competitive advantage. For female-to-male transsexuals, this is an especially onerous requirement—surgically constructed penises are very expensive and come with a high risk of medical complications—that seems to have little to do with leveling the playing field. That the Stockholm Consensus also requires "legal recognition of their assigned sex" would seem to dis-

criminate against those athletes in nations with byzantine legal options for transgender people.

How to cram all these sex and gender variables into one consistent—and consistently fair—policy? I'm not sure. I do know that the IOC, the IAAF, and for that matter, WADA, too, would do well to come up with a unified philosophy of gender and sports, one that takes seriously the science of sex but isn't so beholden to that science as to treat athletes as blobs of molecules whose lives and needs end at the finish line.

1. A. Dreger, "Intersex and Sports: Back to the Same Old Game," *Bioethics Forum*, January 22, 2010, at <http://www.thehastingscenter.org/Bioethicsforum/Post.aspx?id=4426>.

2. A. Dreger, "Where's the Rulebook for Sex Verification?" *New York Times*, August 21, 2009, at <http://www.nytimes.com/2009/08/22/sports/22runner.html>.

3. A. Levy, "Either/Or: Sports, Sex, and the Case of Caster Semenya," *New Yorker*, November 30, 2009, at [http://www.newyorker.com/reporting/2009/11/30/091130fa\\_fact\\_levy](http://www.newyorker.com/reporting/2009/11/30/091130fa_fact_levy).

4. S. Busari, "Gender Row Athlete: What Is Intersexuality?" *CNN.com*, August 20, 2009, at <http://edition.cnn.com/2009/HEALTH/08/20/gender.athlete.intersex/>.

5. A. Dreger, "The Sex of Athletes: One Issue, Many Variables," *New York Times*, October 24, 2009, at <http://www.nytimes.com/2009/10/25/sports/25intersex.html>.

6. A. Dreger, "Science Is Forcing Sports to Re-Examine Their Core Principles," *New York Times*, September 12, 2009, at <http://www.nytimes.com/2009/09/13/sports/13dreger.html>.

7. International Association of Athletics Federations, *IAAF Policy on Gender Verification*, 2006, at <http://www.iaaf.org/mm/Document/imported/36983.pdf>.

8. See the comments of Eric Vilain in Dreger, "The Sex of Athletes."  
9. Dreger, "Science is Forcing Sports to Re-Examine Their Core Principles."

10. See the comments of Philip Gruppuso in Dreger, "The Sex of Athletes."

11. See Attachment B in *IAAF Policy on Gender Verification*.