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IDEAS | ESSAY

## Testosterone and the Transgender Athlete

Male and female may not always be clear-cut categories, but it's hard to preserve fair competition without them



Runners Andraya Yearwood (left) and Terry Miller (second from left) at a track meet in February. PHOTO: PAT EATON-ROBB/ASSOCIATED PRESS

*By David Epstein*

March 15, 2019 10:04 a.m. ET

Last month at the Connecticut indoor track championships, Bloomfield High junior Terry Miller vanquished the competition—and the state record—to win the girls' 55-meter dash. Afterward, she delivered the standard victor's press interview: It was good to win, but she had hoped to run a little faster; she found it difficult to balance track and school; she was proud of both the girls' and the boys' teams. The only unusual part of Ms. Miller's triumph was that some of her competitors think that she should actually be on the boys' team.

Ms. Miller is transgender, running in one of 17 states that allow high school athletes to compete as the gender they identify with, whether or not they have had medical intervention. Andraya Yearwood finished close behind Ms. Miller, and she is also transgender. It was nearly a quarter-second—an eternity in a race that lasts about

seven seconds—before the rest of the field began to cross the line.

Ms. Yearwood later told the Associated Press that she acknowledges being stronger than her competitors who are cisgender (that is, whose gender identity corresponds with their birth sex), but she pointed out that everywhere one looks in the athletic universe, athletes differ in their assets—some naturally and some from training. “One high jumper could be taller and have longer legs than another, but the other could have perfect form,” she said. “One sprinter could have parents who spend so much money on personal training for their child, which in turn would cause that child to run faster.”

All of which is perfectly true, except that the high jump isn’t divided into competitive classifications by height, nor the 55-meter dash by levels of training expenditure. Sports competitions are divided into male and female categories. The question for administrators is how to determine who belongs in which one.

This might seem like a simple biological question. Before puberty, there is no physiological reason to separate boys and girls in competition. At age 9, the fastest boys and girls in the world reach similar speeds. But for boys, the testosterone surge that comes with puberty drives a suite of athletic advantages: greater height, relatively longer limbs, more muscle mass, denser bones and a greater proportion of oxygen-carrying red blood cells. By the age of 14, the fastest high-school boys are beating women’s world records. At the elite level, there is a performance difference between the best male and female runners of about 10%, no matter the distance; in jumping events it is nearly twice that. Men’s testosterone advantage is so pronounced that anyone who cares about women’s sport recognizes the need for separate competitions by sex.

**It remains a challenge to create competition categories that preserve fair chances for all athletes.**

Elite international sport has been grappling with classification since the early 1960s, when large numbers of muscle-bound women from the Eastern bloc, many on state-sponsored doping programs, began to compete. In response, track and field’s governing body implemented sex testing to ensure that male athletes weren’t masquerading as females. (No case of this has ever been confirmed.) At first, women were made to drop their pants in front of a doctor; by the 1968 Olympics, that degrading requirement was replaced with cheek swabs that were analyzed for chromosomes. Women have XX chromosomes and men have XY—case closed.

But not always. In 1985, Spanish sprinter Maria Martínez-Patiño was stripped of a national title when she was found to have XY chromosomes. Ms. Martínez-Patiño has a condition known as androgen insensitivity, which means that her body doesn't respond to testosterone at all, so she certainly had no testosterone advantage. She was eventually reinstated, but not until after her career was ruined.

Chromosomes, as Ms. Martínez-Patiño's case shows, are merely one level of biological sex determination. In most individuals, the markers of their biological sex (genes, chromosomes, reproductive organs, hormones) line up in one direction, male or female, and this comports with their gender—the way they identify. But that is not the case for everyone.

It remains a challenge to create competition categories that preserve fair chances for all athletes. So far, testosterone has been an imperfect but useful marker. Testosterone is unlike height in that the male and female distributions mostly don't overlap: Many women are taller than many men, but a healthy man low in the male testosterone range will still have several hundred percent more circulating testosterone than a healthy woman at the top of the typical female range. When an athlete who was born male transitions to female by undergoing testosterone suppression, the change in performance is dramatic.

Joanna Harper, 62, is a medical physicist who was born male and transitioned to female. She is also a nationally accomplished age-group long-distance runner. A year after Ms. Harper started hormone therapy in 2004, she found that she was far slower than she used to be. But based on performance tables that show how fast any runner is compared to the best athletes of their sex and age, she was precisely as relatively competitive as a woman as she had been as a man.

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Ms. Harper has tracked other transgender distance runners through their transitions and found the same pattern. Her data are the best evidence available that a year of testosterone suppression is reasonable for competitive fairness among distance runners who were born male and transition to female. This finding seems to support the current NCAA and IOC regulations, which require a transitioning athlete to lower their testosterone for a year before competing.

But no one really knows just how well this rule works on a sport-by-sport basis. "For cardiovascular factors, transwomen go from typical men to typical women after

transition,” Ms. Harper says. “But with strength, they go from typical men to somewhere in between typical men and typical women, and ‘somewhere in between’ isn’t very precise. I’ve been on hormone therapy for 15 years, and I carry more muscle mass than a woman my size, absolutely.”

Even with better data, there will be no clear answer for every situation. Ms. Harper thinks the Connecticut state rules are flawed, but also points out that children aren’t supposed to start cross-sex hormones until age 16. “When we’re talking about state championships and college scholarships, I just don’t think you can let transgirls with male hormone levels compete for those prizes,” Harper says. “But it all gets very complex.” And it is likely to stay that way.

—*Mr. Epstein is the author of “The Sports Gene.” His new book, “Range: Why Generalists Triumph in a Specialized World,” will be published by Riverhead Books in May.*

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