

# Going for Gold: Sex, Gender, and Competition

by

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## Part I – Rise and Fall

Caster Semenya is a South African runner who won the women’s 800-meter race at the 2009 world championship in Berlin at the age of 18. She nearly broke the world record time. Caster has a deep voice, a masculine-looking figure and face, and a female gender identity. She is also an incredibly fast runner: at the world championship she beat the second-place runner by more than two seconds. Before the race there were rumors of possible doping or other issues, and three weeks before the championship she was summoned for a random doping test by the ASA (Athletics South Africa, a South African sports governing body). She later found out that the dope test was really a gender test supposedly ordered by the International Association of Athletics Federations (IAAF). On the eve of the world championship Caster was asked for more gender verification information. There was much confusion around the situation and for some reason the IAAF made a public statement about the inquiry (doing so is not common—releasing private information about an athlete is unnecessary and invasive to that athlete’s privacy). According to leaked accounts in newspapers, Caster was found to have internal testes, no ovaries or uterus, and levels of testosterone three times higher than most women; Caster never confirmed these rumors. Newspapers subsequently began referring to her as a hermaphrodite. Caster was suspended from competition by the IAAF for her testosterone levels.

### Questions

1. Based on the above, is the term “gender test” accurate in this case? Why or why not?
2. Name four different biological characteristics that could be used to categorize an individual’s sex.
3. Based on the information presented by the news outlets, is Caster truly a hermaphrodite? Why or why not?
4. Assuming the leaked results of the test are true, what do you think is the most likely scenario to account for Caster’s condition? Describe the physiological basis for your answer and use the data provided to justify your response.
5. Setting aside the ethical issues involved, list two additional pieces of information or test results that would help you to confirm the condition you hypothesized in the above questions. For each test, explain why it would be useful.
6. If your hypothesized cause is correct, describe what you think someone with this condition is likely to have in terms of the below. Explain your answers.
  - a. Sex chromosomes
  - b. External genitalia
  - c. Male internal reproductive tract (epididymis, vas deferens, seminal vesicles)
  - d. Gamete production
  - e. Endogenous estrogen production
  - f. Breast development

## Part II – Back to Running

After being suspended due to her high testosterone levels, Caster attempted to run in a race in South Africa in March, 2010 and was turned away. The organizers said they were adhering to IAAF rules. In July, 2010, the IAAF announced that Caster was cleared to again compete against women. The IAAF gave no other details and said the 2009 processing of Caster Semenya had been completed and the case was closed. Due to IAAF rules and news reports, it is likely that Caster was forced to take testosterone-lowering medication. In September, 2011 Caster won silver in the 800 m race at the world championships in South Korea.

Caster's story led the IAAF to enact a policy in 2011 that specified the acceptable serum levels of testosterone for competition. This was specifically targeted at women with hyperandrogenism. If female athletes had serum testosterone levels above 10 nmol/L (288 ng/dl) (lower end of natural male range) then they had to take hormone-suppressing drugs or have surgery to remove the source of testosterone. Or, if they could prove they were insensitive to testosterone, they could compete without treatment.

In 2012, Caster earned a silver medal at the London games in the 800 m. Some speculated that Caster threw the race so as not to bring up the scrutiny that would come with a gold medal. Caster dismissed the ludicrous claims.

Caster continued running from 2013 to 2015 but faced an injury, coaching changes, and having to continually take testosterone-suppressing medication. Her times were about 7 seconds slower than her personal best at the 2009 world championships. She didn't qualify for the 2015 world championships.

In 2015, another female runner challenged the 2011 IAAF ruling about lowering testosterone in female athletes. Dutee Chand is a female sprinter from Odisha, India. She has hyperandrogenism and, like Caster, had an early career mired by allegations and gender tests. Dutee took her case to the Court of Arbitration for Sport (CAS), and that body sided with Chand and suspended the IAAF's 2011 ruling. Dutee found the testing unfair and in her case stated the IAAF does not set an upper limit for naturally occurring testosterone levels in male competitors. It seems only fair that women athletes be treated the same.

Specifically, the Court stated it "was unable to conclude that hyperandrogenic female athletes may benefit from such a significant performance advantage that it is necessary to exclude them from competing in the female category." It is unclear whether naturally occurring high testosterone gives women an advantage and if so, how much of one.

The arbitration panel further noted that there are not enough data to show that testosterone provided women with more of an edge than other factors, biological, or otherwise. The court gave the IAAF two years to sort out the matter.

In 2016 Caster Semenya competed in the 800 m in Monaco and ran her personal best time. She was no longer taking drugs to suppress her natural androgen production. She went on to win gold at the Olympic games in Rio. She ran the 800 m race in 1 min 55.28 sec, her personal best time, a South African record, and the 5th-fastest Olympic time. It has been circulated that, due to their masculinized appearance and stellar performance, the Rio 800 m silver and bronze medalists (Francine Niyonsaba and Margaret Nyairera Wambui) have also been subjected to the same "gender tests" that Caster had to take. Dutee Chand didn't make it to the 100 m finals. The leader of the IAAF, Sebastian Coe, says that the organization will challenge the CAS ruling that allows women with high natural testosterone to compete against other women.

### Questions

7. With your group, discuss some of the biological and practical limitations or concerns of implementing a testosterone cut-off in female athletes. Then list three of the limitations or concerns you discussed; for each one listed, explain why it is a limitation or concern.
8. Pretend the IAAF has hired you, a biologist, to collect evidence to determine if naturally occurring levels of testosterone in women improve athletic performance above and beyond other variables. Discuss this with your group and then list three types of data/evidence you would need and describe in detail why that evidence would be helpful in making this determination.

## Part III – Where Do We Go From Here?

Preparing for the 2120 Olympics, Srijana Weeks is waiting to take her eligibility test. Srijana is a competitive sprinter and she is looking forward to competing in this year's games; she really hopes she makes the cut-off when compared to all of the potential contestants. She thinks back to stories she heard from her grandmother about the needle pricks, urine samples, x-rays, and other invasive tests required in 21<sup>st</sup>-century competitions; what a relief that she can benefit from modern pico-technology! The test is a simple 3-minute scan that uses an algorithm and information about her genes, hormones, receptors, muscle composition, body proportions, and internal anatomy to determine her maximal running potential. This will determine whether she'll compete in the A, B or C groups, or whether she isn't biologically fit to compete. When Srijana sees her result is B, she knows there will be both men and women in her race, but she is confident that she is well-matched with people who share her biological potential to run fast. Srijana is confident and thinks she can win!

### *Questions*

9. Consider the above hypothetical scenario and then discuss with your group whether athletic performance is driven solely by nature (biology/psychology, etc.; e.g., anatomy, hormones, muscle fiber type proportion, pain tolerance, reaction times, motivation). Are there environmental (e.g., training plans, diet, access to coaches and competition) influences? What about nature × training interactions (e.g., individual responses to training) that might be important for athletic success?
10. What would be lost and what would be gained from instituting a gender-neutral competition that matches people on biological abilities alone, similar to the one described in the scenario above?