



# The testosterone barrier in sport

## *La barrera de la testosterona en el deporte*

Raúl Sánchez-García

Universidad Politécnica de Madrid- INEF

Departamento Ciencias Sociales

[raul.sanchezg@upm.es](mailto:raul.sanchezg@upm.es)

ORCID id: 0000-0003-1230-0951



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### Abstract

World Athletics (formerly known as IAAF) has recently published the eligibility regulations for female classification that apply to running events from 400 meters up to the mile. The regulations have prevented some elite women athletes with DSD (Difference of Sexual Development) to compete or have made some of them to change their preferred running event in the 2020 Tokyo Olympics. According to World Athletics, female hyperandrogenism (a biological anomaly that naturally produces a high level of testosterone) must be in some way “compensated” to respect the fair play of the competition. Nonetheless, such argument rests upon a problematic assumption: hyperandrogenic women are not “natural” women—at least when it comes to compete in sports—so their “not-normal” condition must be fixed to meet the standards. Norbert Elias’s process-sociology helps to place the case of hyperandrogenic sportswomen within a broader context of power relations. In this fashion, we see that the case becomes problematic because these women athletes are perceived as a threat/disruption of one of the vertebral categories of sport: sex/gender. The testosterone barrier is to sex/gender what the colour barrier was to race in sports: a disciplinary strategy to maintain what is considered the “natural” sports categories of a certain era.

### Resumen

World Athletics (anteriormente conocido como IAAF) ha publicado recientemente las normas de elegibilidad para la clasificación femenina que se aplican a las pruebas de carrera desde 400 metros hasta la milla. Esta normativa ha impedido que algunas atletas de élite con DSD (Diferencia de Desarrollo Sexual) compitan o que hayan tenido que variar su prueba preferida en los Juegos Olímpicos de Tokio 2020. Según World Athletics, el hiperandro-

*genismo femenino (una anomalía biológica que naturalmente produce un alto nivel de testosterona) debe ser "compensado" de alguna manera para respetar el juego limpio de la competencia. Sin embargo, tal argumento se basa en una suposición problemática: las mujeres hiperandrogénicas no son mujeres "naturales", al menos cuando se trata de competir en deportes, por lo que su condición "anormal" debe arreglarse para cumplir con los estándares. La sociología procesual de Norbert Elias ayuda a situar el caso de las deportistas hiperandrogénicas dentro de un contexto más amplio de relaciones de poder. De esta manera, vemos que el caso se vuelve problemático porque estas mujeres deportistas son percibidas como una amenaza/disrupción de una de las categorías vertebrales del deporte: sexo/género. La barrera de la testosterona es para el sexo/género lo que la barrera del color fue para la raza en lo deportivo: una estrategia disciplinaria para mantener las que se consideran como categorías deportivas "naturales" en una época determinada.*

## Introduction

World Athletics (formerly known as IAAF) published in 2018 the eligibility regulations for female classification that apply to running events from 400 meters up to 1 mile (World Athletics 2019). The regulations have prevented some elite women athletes with DSD (Difference of Sexual Development) to compete or have made some of them to change their preferred running event in the 2020 Tokyo Olympics. Caster Semenya, Margaret Wambui (both athletes of 800m) and Aminatou Seyni (400m athlete) did not compete. Christine Mboma and Beatrice Masilingi changed 400m for 200m and Francine Niyonsaba changed 800m for 5.000 and 10.000m.

Difference of Sexual Development (DSD) refers to women with levels of circulating testosterone (in serum) of five (5) nmol/L or above and who are androgen-sensitive. DSD term is currently used instead of hyperandrogenism, a term included in the previous 2011 Hyperandrogenism Regulations of the IAAF and IOC (World Athletics 2011). According to World Athletics, female hyperandrogenism boost performance and must be in some way compensated to level the playing field for women athletes, respecting the fair play of the competition. Such compensation implies lowering the testosterone levels (e.g., using birth control pills). As those women athletes refused to lower their testosterone levels, World Athletics denied their right to participate in certain events of the Games.

Nonetheless, we could problematize World Athletics' regulation and ask a provocative question: Does the case of Caster Semenya and other DSD athletes disclose a testosterone barrier for women akin to the colour barrier for the black athletes of the first half of the 20thC? Apparently, the colour barrier was based on commonsensical assumptions about race and the ban on Semenya and DSD athletes is scientifically based. However, is it that simple? Is it not the case that the case of DSD athletes is also full of commonsensical assumptions affecting the scientific research that informs the making of a discriminatory policy? To answer such questions, the paper applies Norbert Elias's process-sociology to place the case of DSD sportswomen within a broader context of shifting power relations.

## Testosterone and performance controversies: a recent chronology

As the International Federation for our sport, we have a responsibility to ensure a level playing field for athletes. Like many other sports we choose to have two classifications for our competition – men's events and women's events. This means we need to be clear about the competition criteria for these two categories. Our evidence and data show that testosterone, either naturally produced or artificial-

ly inserted into the body, provides significant performance advantages in female athletes. The revised rules are not about cheating, no athlete with a DSD has cheated, they are about levelling the playing field to ensure fair and meaningful competition in the sport of athletics where success is determined by talent, dedication and hard work rather than other contributing factors. (World Athletics 2018)

This statement from Sebastian Coe (World Athletics president) implies a tension between inclusion and discrimination that brings to the fore unsolvable cases. If they are women and they are not cheating, why they are not allowed to compete in women's category?

During and after Tokyo Olympics several controversies surrounding this topic emerged. For instance, Sebastian Coe defended that DSD regulation worked because Mboma (who was prevented from competing in 400m) had just won the silver medal in 200m (Ingle 2021b). Even then, former Polish sprinter, Martin Urbaś claimed: "I would like to request a test on Christine Mboma to find out if she is a woman. The testosterone advantage of Mboma over other participants is seen with the naked eye." (quoted in Muñoz Fernández 2021). Nonetheless, other athletes as elite sprinter Shelly-Ann Fraser-Pryce (who competed against Mboma in the race) commented: "They were denied in the specific event they wanted to run and they were given another event and they were still excellent in that event." (quoted in Gleeson 2021). The same kind of controversies appeared already when Semenya won the 800m race during the World Championships of 2009. Fellow competitors Elias Cusma and Mariya Savinova publicly questioned Semenya's femininity, a common interpretation by many athletes as well. Madeleine Pape (another competitor athlete at that race) currently acknowledges her faulty view on the topic: "It was by far the easier option for me to join the chorus of voices condemning her performance. It was just convenient to go along with what most of my colleagues and coaches were saying." (quoted in Duarte 2020).

In fact, it was Semenya's case that fuelled the recent changes in the World Athletics regulation, first in 2011 and then in 2018. After Caster Semenya won the

World Championship in 2009, a temporary suspension upon Caster befell (although she competed again in 2010). In 2011 IAAF and IOC passed the Hyperandrogenism Regulations which alleged that women with naturally elevated testosterone were technically not cheating but were prevented from competing as they gained an unfair advantage from having a masculine physiology. In 2014, Indian sprinter Dutee Chand was banned from competition due to the 2011 regulation but in 2015, appealed to CAS about the 2011 regulation (Pape 2019). As a result, the IAAF was granted a two years period to produce further evidence about the non-conclusive results of three facts: 1. Testosterone is a significant factor affecting performance.<sup>1</sup> 2. Testosterone ranges for men and women are clearly differentiated. 3. Hyperandrogenic women have a significant advantage due to their high levels of testosterone.

Then, the IAAF presented the Bermon and Garnier's (2017) study, an in-house research which measured statistical correlation between podium and levels of testosterone in 2011 and 2013 World Championships. The authors found a recruitment bias of DSD women athletes in specific athletic events (e.g., 400m to 1 mile) because, even though there were not so many women in the general population presenting DSD, an overrepresentation of DSD women in those events occurred. Therefore, they concluded that a causal relationship between testosterone levels and athletic performance among women existed in those events.

Nonetheless, Pielke, Tucker and Boye (2019) pointed towards problematic issues in that research. When they asked for the data to replicate the results, they were only granted 25% of the sample. Despite the lack of the complete set of data, Pielke et al. (2019) concluded that Bermon and Garnier's study was based on "significant flaws leading to unreliable results" and that "scientific integrity" was compromised. In fact, on 17 august 2021 (after the conclusion of the Tokyo Olympics), a correction paper by Bermon and Garnier (2021) was published. In the correction paper, the researchers now admitted that the claims of a causal relationship between testosterone levels and athletic performance among female athletes in the restricted events was incorrect and based on a causal inference.

<sup>1</sup> Testosterone increases two key attributes: strength and aerobic capacity (i.e. your body's ability to get oxygen to your muscles). Nonetheless, it is always problematic to associate isolated factors to performance in a very complex activity such as sport. According to Richard Holt, a professor of endocrinology at the University of Southampton: "you can't predict their performance based on their testosterone levels." (quoted in Chodosh 2019).

### Sports categories and power relations

Interesting as it is, the debate over the scientific proof about the advantage of DSD women based on testosterone levels misses the whole point. Even if the research could finally find a significant advantage for DSD women, we cannot answer why some biological anomalies in sports champions are celebrated and others questioned and accused. For instance, when considering genetic anomalies, the case of Finnish cross-country skier Eero Mäntyranta is paradigmatic. He had an inherited mutation that increased his red blood cells' oxygen-carrying capacity by 25 to 50 per cent (Enriquez and Gullans 2012). He was celebrated as a champion. Nonetheless, DSD women such as Semenya, who present naturally produced high levels of testosterone, are treated as suspects and not as real champions.

In order to get a more adequate analysis of this situation, we should follow Norbert Elias's (2007) invitation to take a "detour via detachment" to get a better understanding of the topic at hand through a long-term sociological analysis. The cases of DSD women points towards a deeper constitutive of modern sport that could be expressed in the following question: what is natural and what is non-natural? This is not a philosophical question discussed by free floating minds. This is a sociological one: such discussion takes place among interdependent social groups, embedded in socio-historical power relations.

Modern sport ethos evolved from the aristocratic "myth of the given", referred to the naturally gifted selected few. It is true that bourgeoisie unfused merit to compensate birth but the myth of the naturally gifted remained at the core of the whole debate of fairness and the levelled playing field (doping being just a subcase). Athletic racing events are especially important to sustain the myth of the given; they seem to feature essential, raw biological bodies, not depending on other abilities such as wielding objects/technologies nor on team's work or socio-cultural factors. Thus, naturally athletic gifted athletes are celebrated. However, who can claim to be naturally gifted? Why some athletes as Semenya are not celebrated but prosecuted? Here, the question of nature intersects with the question of sports categories. Only those that conform the normative scheme in sport, who fit into the established sports categories, are also worth of praise.

Sports categories were socio-historically constituted among interdependent power relations. In the development of modern sport, two categories were abandoned (social class and *race*); two still hold (sex/gender and (dis)ability) and one will become more ev-

ident in the near future (the one differentiating analogical from digital as in the case of e-sports).

In the case of social class, the question of natural and non-natural was discussed around the amateur/professional debate. Professional workers were considered as cheaters, as they had an unfair advantage due to their training through manual work. For instance, the mechanics clause of the Amateur Athletic Club (founded in 1866) allowed gentlemen amateur runners to compete against each other without being compelled to mix with professional runners (Siegelbaum and Siegelbaum 2017).

In the case of race, the question of natural and non-natural was discussed around the colour divide of the black and white. The biology of black athletes represented an animalistic — almost inhumane — non-natural nature. For instance, Jesse Owens and Ralph Metcalfe were accused of cheating due to biological race advantage in 1936. Nowadays, even though the racial colour barrier that segregated athletes has disappeared, a lot of racial stereotypes still pervade the perception of sports competition (Hoberman 1997).

In the category of (Dis)ability, the question becomes: what is a natural human body and what is artificially added? The problem to discern is whether the prosthesis is levelling the playing field for the disabled athlete or providing an unfair advantage. The controversial case of Oscar Pistorius's running prosthetic blades was paradigmatic in this respect (Swartz and Watermeyer 2008).

In the case of sex/gender category the question is: Who is considered a natural woman for competing in sports? This is not something that concerns only the 2018 regulation. As Pielke (2017) remarks, such regulation is simply the latest incarnation of "sex testing" in international athletics that reinforces "the stubborn persistence of binary and biological epistemologies of sex and gender." (Pape 2019). The establishment of the sex/gender category in sport is embedded within broader gendered power relations in which expert medical discourses and practices produced a "medical normalization" of bodies and biologies through surgery and/or medical treatment (Karkazis 2009). The following section deals specifically with the controversial definition of sex/gender category in sport.

### Who is a woman in sport?

Michael Phelps's arms are wide enough for him to do whatever he wants. Swimmers' lungs are different to other people's. Basketball players like LeBron James are tall. If all the tall players

are banned from playing, will basketball be the same? Usain has amazing muscle fibres. Are they going to stop him, too? My organs may be different and I may have a deep voice, but I am a woman. (Caster Semenya quoted in Brenner 2021)

The problem to answer to the questions Semenya is asking does not dwell in the scientific measurements of testosterone, but in the category of woman itself. By narrowing the whole discussion on gender/sex towards levels of testosterone, the way male/female categories are established is unproblematized. If the whole debate is about scientific measurements of testosterone, then World Athletics has succeeded in setting the stage of discussion. As Pape (2019) claims: "sexed bodies are enacted through and as part of determinations of expertise", the World Athletics' expertise, to be more precise.

In sports matters, the public opinion is completely used to handing the last word to the bio-medical sciences as ultimate experts in the field. Social sciences seem to be out of the picture or worst, defending some ideological, political agenda. For instance, CAS discussing Dutee Chand's Case considered bioethicist Katrina Karkazis's arguments as "sociological opinion, which does not equate to scientific and clinical knowledge and evidence." (CAS 2015, 134) Nonetheless, the use of biomedical results and facts as a way to de-politicize the debate precisely supports a political standpoint that produces the sex/gender category as unproblematic. This is how World Athletics, strictly following the testosterone measurements, considers DSD women as "biological males". Nonetheless, DSD women, who produce high levels of testosterone are first and foremost women. The incongruency to exclude DSD women due to testosterone levels is rendered visible when women with polycystic ovary syndrome (PCOS), that also produce high levels of testosterone, are allowed to compete in the female category. Thus, if you rule DSD women out of the women's category, you are not preserving women's category from unfairness, you are already generating a blatant discrimination against some women.

The analysis of male category helps us also to understand that there must be something else apart from testosterone levels that makes DSD women not eligible for competing with other women. World Athletics does not consider the male category to be controversial in relation to testosterone and excludes systematically from research those males who do not conform to the "normal" levels. It is as if male category were established first and testosterone measurements came afterwards. For instance, men featuring

hypogonadism (the underproduction of testosterone) are considered as pathological and not fit for study in sport. Bermon and Garnier (2017) considered hypogonadic men as outliers and excluded them when calculating "normal" testosterone ranges for the research on participants in supporting the 2018 regulation. The study was based on data collected from the population of 2,127 elite athletes competing across the IAAF World Championships of 2011 and 2013. Such data featured a significant number of men (n ¼ 198) with testosterone below the so-called normal male range, including four whose levels were considered to fall within the female range. In fact, Sönksen et al. (2018) found that 25 per cent of elite male athletes have testosterone levels below what the IAAF considers to be the lower limit for men.

Moreover, no examination of naturally produced high testosterone in men is problematic either: during the 2011 Eurobasket, anti-doping tests found anomalous production of high testosterone in two players, but the case was dismissed as it proved to be naturally produced (Sánchez-García 2020,61).

In a nutshell, the measurement of testosterone levels itself does not specify sex/gender category. Such measurements come after the category is established. Thus, even though World Athletics tries to set the debate within scientific/objective measurements, the narrow, restricted view on testosterone levels supports a policy that produces discriminatory practices. For instance, the 2011 Regulations did not mandate the testing for all female athletes, a fact that allowed considerable room for interpretation with respect to how a 'suspect' athlete may be identified. As a consequence, commonsensical sex/gender ideas on physical appearances resulted in athletes from the Global South being more often selected for testing (Human Rights Watch 2020).

### The transgender paradox

Even though the case of DSD women is not the same as the case of transgender women athletes, oftentimes both cases are considered by the general public and athletes as part of the same "gender issues" concerning sports nowadays. For instance, Paula Rattcliffe (an acclaimed former long-distance runner from UK) linked directly Semenya's case with transgender athletes when stating:

They [World Athletics] want to see what it means for the future of female sport and also what it will do in terms of the whole transgender question. Will it open the door up there

to transgender athletes actually being able to say: "You know what, we don't need to bring our (testosterone) levels down either, we don't need to have any surgery, we can just identify how we feel and we can come in and compete in women's sport?". That would be the death of women's sport. (Quoted in Reuters Staff 2019)

Nonetheless, contrary to Ratcliffe predictions, regulations vs Semenya did not prevent transgender women athletes to compete. In fact, as regulation on DSD women athletes placed the testosterone levels as the sole gatekeeper for sex/gender categories, it indirectly supported the inclusion of transgender women athletes as eligible for Olympics as long as they fall into the acceptable testosterone levels (less than 10 nmol/L).

Contrary to DSD women who reject the idea of changing their biologies to comply with testosterone levels, transgender biologies represent "docile bodies" in the Foucauldian sense of disciplined bodies through institutional discourses and practices (Foucault 1977); in this case, the medical expert discourse in the field of elite sports. Female transgender athletes are eligible for Olympics because they have accepted the medical normalization of their bodies and biologies to lower their levels of testosterone. They do not challenge the status quo of the binary male-female classification in the sex/gender category. Thus, we get into a transgender paradox: women that were born with physiological male bodies but changed their biologies are currently considered by World Athletics as *more normal/natural* women than hyperandrogenic DSD women when it comes to compete in sports.

This is far from saying that the participation of transgender women athletes has been unproblematic. There is a heated debate on the determinants of performance, some claiming that their situation can be considered similar to doping, in which training in previous biological condition accumulated effects that affect current performance (Teetzel 2006). The controversies are already occurring, as Olympian transgender weight lifter Laurel Hubbard acknowledged during her participation at the 2020 Tokyo Olympics. In fact, after the Olympic Games, the International Olympic Committee admitted that its current guidelines for transgender athletes were not fit for purpose and a new updated version was intended to be released. Dr Richard Budgett, IOC's medical and science director, commented that a new framework for sports would focus on finding a "sweet spot" between safety, fairness, and inclusion. According to Budgett:

We have spent 100 years promoting women's sport. I think it is up to the whole international sports movement and particularly the international federations to make sure they do protect women's sport (...) The other important thing to remember is that trans women are women. You have got to include all women if you possibly can. (Quoted in Ingle 2021a)

Finally, on 16 November 2021, the IOC released the "Framework on Fairness, Inclusion and Non-discrimination on the basis of gender identity and sex variations" (IOC 2021) that spares trans-gender from being forced to reduce the testosterone levels in order to compete. Nonetheless, the framework act only as a guidance —not as a binding set of rules— and leave to the different governing bodies the criteria to decide on matters of eligibility criteria for participation.

## Conclusions

A process-sociological analysis has placed the case of DSD sportswomen within a broader context of power relations. DSD cases become problematic because these women athletes are perceived as a threat/disruption of one of the vertebral categories of current sport: sex/gender.

World Athletics' regulation relies on the discourses of medical experts to propose testosterone levels as a simplified gate-keeping mechanism. Testosterone levels offer an easy and clear measurement which (apparently) represents scientific objectivity against any ideological/political agenda. Nonetheless, these tenets are problematic, especially when the central study (Bermon and Garnier 2017) presented compromised scientific integrity and was based/reproduced stereotypical assumptions about sex/gender: women are weak and hyperandrogenic women are strong because they are biologically males. Therefore, World Athletics use of medical science to depoliticize the debate precisely supports a political agenda.

Contrasting with transgender docile bodies that do not challenge the established sex/gender binary (male and female) category in sport, DSD women resist being disciplined through the medical normalisation of their bodies and biologies. As a result, we find the "transgender paradox": transgender women are considered as more natural/normal women than DSD women when it comes to sports competition. This is not to say that transgender women athletes are not embedded within the controversy surrounding the issue of sex/gender in sports nowadays, the IOC trying to find new standards fit for purpose.

Overall, the sex/gender category in sports still constitutes a contested terrain in which the “testosterone barrier” is to sex/gender what the “colour barrier” was to race: a disciplining strategy to maintain what is considered the “natural” sports categories of a certain era.

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