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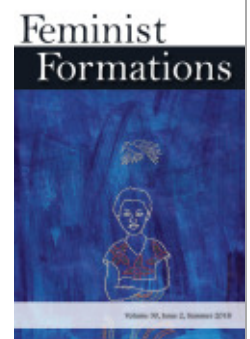
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Katrina Karkazis, Rebecca M. Jordan-Young

Feminist Formations, Volume 30, Issue 2, Summer 2018, pp. 1-39 (Article)

Published by Johns Hopkins University Press

DOI: <https://doi.org/10.1353/ff.2018.0017>



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# The Powers of Testosterone: Obscuring Race and Regional Bias in the Regulation of Women Athletes

Katrina Karkazis and Rebecca M. Jordan-Young\*

*\* Both authors contributed equally to this manuscript.*

*Using strategies from critical race studies and feminist studies of science, medicine, and the body, we examine the covert operation of race and region in a regulation restricting the natural levels of testosterone in women athletes. Sport organizations claim the rule promotes fair competition and benefits the health of women athletes. Intersectional and postcolonial analyses have shown that “gender challenges” of specific women athletes engage racialized judgments about sex atypicality that emerged in the context of Western colonialism and are at the heart of Western modernity. Here, we introduce the concept of “T talk” to refer to the web of direct claims and indirect associations that circulate around testosterone as a material substance and a multivalent cultural symbol. In the case we discuss, T talk naturalizes the idea of sport as a masculine domain while deflecting attention from the racial politics of intrasex competition. Using regulation documents, scientific publications, media coverage, in-depth interviews, and sport officials’ public presentations, we show how this supposedly neutral and scientific regulation targets women of color from the Global South. Contrary to claims that the rule is beneficent, both racialization and medically-authorized harms are inherent to the regulation.*

**Keywords:** health / hyperandrogenism / racialization / sex and gender / science / sport / T talk / violence

## **Prelude 1: Olympic Summer Games, Rio de Janeiro, 2016**

Long after the last competitor left Rio, a decidedly un-Olympic image haunted our memories.<sup>1</sup> At the finish line of the women’s 800-meter final, South African runner Caster Semenya extends her arms to fellow competitors Melissa

Bishop of Canada and Lynsey Sharp of Great Britain, who are locked in a tight embrace. Semenya has just won the gold; Sharp has placed sixth and Bishop has taken fourth. The two disregard Semenya's gesture, remaining closed in one another's arms.

The photo was a sad endnote to a vitriolic media uproar that had raged intermittently for years and especially during the month leading up to the race, sounding unfairly on Semenya's right to compete. For the seven years since the International Association of Athletics Federations (IAAF) broke their own confidentiality policy and confirmed it was investigating her under its ad hoc "gender verification" policy, Semenya has endured relentless hostility and a deluge of cruel harassment from both traditional and online media. Of the investigation, she has said, "I have been subjected to unwarranted and invasive scrutiny of the most intimate and private details of my being" (Associated Press 2010). In intervening years, the extraordinary scrutiny from journalists and the public has persisted. A security team was reportedly provided for her in Rio due to concerns the hostility might turn violent (Brook 2016). South Africa as a nation pushed back with #handsoffcaster and a petition to stop bullying created by "People against racist bullies" (Amandla Awethu 2016).

Semenya is the world's most scrutinized and violated athlete despite having done nothing wrong. She has neither doped nor cheated. She also had the support of the Court of Arbitration for Sport (CAS), the world's highest adjudicating body for sport (CAS 2015). A year earlier, CAS slapped a two-year suspension on the IAAF regulation that, along with an analogous regulation adopted by the International Olympic Committee (IOC), places a ceiling on a woman athlete's natural testosterone (T) level (IAAF 2011; IOC 2012).<sup>2</sup> IAAF and IOC officials claim that high T is a "male" trait, that T is the "main reason" men generally outperform women in tests of strength and speed, and that women with high T (whom they call "hyperandrogenic") therefore have an "unfair" advantage over their competitors.<sup>3</sup> Under the regulation, if a woman athlete's natural T level is deemed by the IAAF to give her "unfair" advantage, she must lower it through surgery or drugs, or forego competing forever.

But when teenaged Indian sprinter Dutee Chand challenged the same IAAF regulation in 2015, the arbitrators at CAS ruled in her favor. They found that the IAAF had failed to demonstrate that the policy was scientifically justified. The IAAF had not provided sufficient evidence that female athletes with T levels in the "male range" have a performance advantage over their peers with lower T levels that is comparable to the 10–12 percent advantage that men typically have over women. The arbitrators suspended the regulation for two years, allowing the IAAF this period to return to CAS with sufficient scientific evidence, or else the policy would be void.

Semenya was first targeted in fall 2009, fifteen months before this T regulation took effect. The agreement between Semenya and the IAAF that allowed

her to return to competition in 2010 has never been released. Nevertheless, the ire of those unhappy with the suspension of the regulations has been focused squarely on Semenya. She is the athlete they single out as supposedly proving not only the need for a regulation, but T's unparalleled role in athletic performance (e.g., McRae 2016; O'Sullivan 2016). Observers have attributed her athleticism to a single molecule—testosterone—as though it alone earned her the gold, undermining at once her skill, preparation, and achievement.

In writing of Semenya, we risk repeating the problems raised so eloquently by Neville Hoad and Keguro Macharia including our own “participat[ion] in an ongoing spectacularization” (Macharia 2009). Hoad questions

broaching the topic at all. Caught in a double demand to resist spectacularizing Semenya in the long and intractable representational history of racialized and sexualized African bodies, and a participation in a LGBTQ praxis of freedom that wants to render visible and celebrate gender variance (here the speed, grace, power and beautiful butchness of Semenya), finding an ethical entry into the question of Caster Semenya becomes difficult. (2010, 398)

Feeling this double bind, in an earlier piece, we included a discussion of Semenya that soon thereafter filled us with deep regret for our complicity in this spectacularization (Karkazis et al. 2012). Among other harms, we made repeated references to her “case”—a distancing, medicalizing and, ultimately, dehumanizing way to refer to her. In this paper, we felt that no mention of her might serve as a cultural lobotomy that was equally distancing. We thus decided to do so in a way that resists the dominant story with counternarratives, details, and context that seek to underscore the human(s) at the core of this regulation without recapitulating harm and without erasing what is ugly and painful here that requires daylight.

On the eve of the 2016 Summer Olympics, IAAF president Sebastian Coe announced that the organization would challenge the suspension of the regulation (Guardian Sport 2016), repeating this avowal just before the 800-meter finals with a timing that seemed specifically aimed to cast doubt on Semenya's right to compete. “We were surprised by the CAS decision, and I think the IOC was too,” Coe said after a meeting of the IAAF Council. “We are looking again at this issue and will be talking to CAS at some time over the next year” (Rowbottom 2016). Coe immediately followed this statement with a half-hearted reminder that “these are human beings,” likely knowing that his comments would throw into question not only Semenya's participation but possibly others' too. With a tinderbox left smoldering, one breath of accusation was all that was needed to reignite the “debate.” As if determined to maintain a veil of suspicion over these athletes, Coe subsequently made similar pronouncements during both the 2017 Asian Athletics Championships held in Chand's hometown of Bhubaneswar, India and the 2017 World Championships in Athletics held in London.

It is no surprise, then, that athletes such as Sharp, who have also worked hard and sacrificed for their sport, seemed to feel frustrated and usurped even though they were not. Or that in their anger, grace failed them. Poland's Joanna Jozwik, who finished fifth between Bishop and Sharp, bitterly called into question the three black medalists, saying, "I'm glad I'm the first European, the second white." It is impossible to miss the optics of this controversy—the three black women from sub-Saharan Africa ebullient on the podium and the three white Global North women feeling they should be there instead. These polarized perspectives reflect the racial politics that shape the T regulation and its asymmetrical burdens and benefits.

## **Prelude 2: Marseilles, France, IAAF Specialist Reference Center**

The scrutiny aimed at Semenya was achingly personal for her, but not unique. Other women from the Global South have also been subject to physical and psychological invasions under this regulation. In 2013, doctors affiliated with the IAAF published a report that gives insight into what happens when women are investigated under this regulation.

Four young women, aged 18–21 and from “rural and mountainous regions of developing countries,” were identified through various means as having high T, and were each sent to the IAAF-approved specialist reference center in southern France for a workup to see whether they have an intersex variation (Fénichel et al. 2013).<sup>4</sup> A large, multidisciplinary team of clinicians conducted extensive investigations aimed at assessing sex-linked biology, beginning with endocrine, karyotype, and genetic analyses. They also inspected the women's breasts, genitals, body hair patterns, internal reproductive organs, and basic body morphology in detail, and interviewed them as to gender identity, behavior, and sexuality. From these exams, the doctors determined that these women had testes and high functional testosterone levels. By using the term “functional,” the authors signal that the women's bodily tissues respond to T and thus that they do not have a diagnosis that renders them completely insensitive to the hormone. Although the doctors acknowledged that leaving the women's testes intact “carries no health risk,” they also told the women that gonadectomy would “allow them to continue elite sport in the female category.” But the medical team aimed for more than lowering T. The doctors’ “proposed” the surgical and medical interventions long practiced for gender normalization of people with atypical sex-linked biology (intersex), including “a partial clitoridectomy with a bilateral gonadectomy, followed by a deferred feminizing vaginoplasty and estrogen replacement therapy” (Fénichel et al. 2013, E1057).

The genital surgeries described in the report suggest that something beyond T and athletic performance motivates the regulation, and indicate that it is not just compliance with the T regulation that drives the interventions. Martin Ritzén, a pediatric endocrinologist specializing in children with atypical

sex-linked biology, who was a key architect of the IAAF regulation, was reportedly “furious” about the genital surgeries, declaring that they were “against the rules of the IAAF” (de Visser 2013).<sup>5</sup> Although the report on the four women was coauthored by Stéphane Bermon of the the IAAF medical commission, it’s publication nevertheless angered other IAAF officials. Interviewed for a Dutch newspaper, an unnamed IAAF official said of the publication, “This is a flagrant violation of professional secrecy” (de Visser 2013), indicating that the IAAF had violated its own “principle” of “respect for confidentiality in the medical process and the need to avoid public exposure of young females with hyperandrogenism who may be psychologically vulnerable” (IAAF 2011, 1). An IAAF official interviewed by Lisa Bavington in 2013 called the publication “unfortunate” and said that he did not know about its existence “until it was too late for the authors to withdraw the paper,” adding that “[s]o far, you seem to be the only one to pick up this issue, and I hope that no media will try to identify them” (2016, 154).

The paper violates the athletes’ privacy and confidentiality and should not have been published. It sheds light, however, on an implementation process that is otherwise kept under wraps, and further highlights whom this regulation burdens. Sport authorities, through public talks, publications, and interviews, have consistently indicated that the women investigated for high levels of naturally occurring T are exclusively from the Global South, and all indications are that they are black and brown women.<sup>6</sup> Because race is not a biological category, a biological criterion such as T levels should be race-neutral, applying to women irrespective of ethnoracial categorization. So why is there racial and regional bias in the regulation’s effects? How are race and region connected to the problem of “unfair advantage” that this regulation is purportedly designed to prevent?

## Framework

We use critical race theories and feminist studies of science, medicine, and the body to examine the covert operation of race and region in the putatively neutral T regulation. Following scholars such as Holloway (2011) and Ticktin (2011), who combine critical race studies with feminist intersectional studies of medicine, we show how this supposedly neutral and scientific regulation targets women of color from the Global South. Contrary to claims that the rule is beneficial, both racialization and medically authorized harms are inherent to the regulation.

We and others have previously demonstrated that the anxieties about “unfair advantage” codified in this regulation and rehearsed through its application are blatant conflicts over the boundaries between women and men (Karkazis et al. 2012; Cooky and Dworkin 2013; Karkazis and Jordan-Young 2015; Henne 2015; Bavington 2016; Browning 2016; Pieper 2016). Sport officials insist that the T regulation is not “sex testing,” and some of the public controversy

over the regulation has focused on resolving the question of whether it is or is not.<sup>7</sup> Here we are primarily concerned with showing that the regulation is indeed yet another version of “sex testing,” accomplished by racializing sex and associating “failures” of dichotomous sex with failures of modernity, characteristic of countries or regions outside the industrialized West. Other scholars have drawn on intersectional and postcolonial analyses to show how discourses on Semenya’s eligibility engage racialized judgments regarding sex atypicality and nonconformity that emerged in the context of Western colonialism and that are at the heart of Western modernity (Nyong’o 2010; Hoad 2010; Munro 2010; Schuhmann 2010; Schultz 2011; Cooky, Dycus, and Dworkin 2013; Doyle 2013; Adjepong and Carrington 2014; Magubane 2014).

Many of these scholars have noted that “sex testing” of women athletes has rested on invasive genital and physical inspections that are both hauntingly reminiscent and a continuation of the prurient European gaze directed at black women’s bodies. The experience of Saartjie Baartman, a black South African Khoikhoi woman, is the quintessential example of European exploitation and commodification of African women, often enacted under the guise of scientific progress. Brought to Europe in the early 1880s under false pretenses by a British doctor, Baartman was displayed mostly naked and often caged before huge crowds in London and Paris, and in private homes where observers could touch her. In a stunning example of dehumanization, the renowned naturalist Georges Cuvier arranged for Baartman to be studied by zoologists and other scientists, and he pronounced her to be “a link between animals and humans.” After her death, her preserved body parts including her genitals remained on display in Paris’ *Musée de l’Homme* until 1974 (SAHO 2017).

Munro traces the inspections of women athletes to a “familiar prurient/Enlightenment will-to-know” which, she notes, works in tandem with racialized ideals about women’s bodies to construct women who do not fit the ideal as “pre-modern” and “reinforce a post-imperial sense of the ‘natural’ global order.” Munro argues that in this context “the untamed, ‘simple’ African body is one that has not yet been streamlined into ‘modern’ norms” (2010, 391). Locating the problem not in the women’s bodies, but in systems that figure their bodies as problematic or unintelligible, Doyle observes, “What makes their stories catastrophic are the terrorizing systems that take the fact of these women’s existences—rather than racism, sexism, or homophobia—as a conflict that must be resolved” (2013, 423).<sup>8</sup>

While the racial politics of “sex testing” in sport have been critiqued extensively, the question of how and why black and brown women from the Global South come to be the exclusive targets of the supposedly new, neutral, and scientific T regulation remains unanswered.<sup>9</sup> Scholars calling attention to the racial and regional politics of this regulation have pointed out how historic associations of hegemonic femininity with whiteness continue to bring women of color under particular scrutiny (Karkazis et al. 2012; Cooky and Dworkin 2013;

Pieper 2014). Lisa Bavington (2016) has shed light on the racist and nationalist concerns that animated earlier forms of sex-testing and fueled the morphing of sex testing into its current testosterone-based version. Here, we examine in detail the systems this regulation participates in and concretely show how the racialization of gender and national or regional tropes of “the modern West” are operationalized via this regulation.

“T talk” is a term we developed to signal a web of direct claims and indirect associations that circulate around testosterone both as a material substance and as a multivalent cultural symbol. T talk seamlessly weaves together folklore and science, as scientific claims about T seemingly validate cultural beliefs about the structure of masculinity and the “natural” relationship between women and men. T talk includes and goes beyond the “sex hormone” concept, which has been extensively critiqued by biologists and other feminist scholars for both shaping the way that scientific information is gathered and interpreted about T, and also actively blocking the recognition and acceptance of scientific evidence that does not fit the model of “male” and “female” hormones (Oudshoorn 1994; van den Wijngaard 1997; Fausto-Sterling 2000; Nehm and Young 2008). One indication that the sex hormone concept is still powerful is that T is constantly coded as “the male sex hormone,” which invites multiple inaccurate assumptions. For example, tagging T as male signals that T is restricted to men and is dangerous or a “foreign substance” in women’s bodies, though women also produce T and require it for healthy functioning. Tagging T as a “sex hormone” signals that T’s functions are restricted to sex and sex differences, though T is required for a broad range of functions that are common to all humans and are unrelated to reproductive structures and physiology, such as liver function. With the sex hormone concept, T and its “partner” estrogen have been framed as a heteronormative pair: binary, dichotomous, and exclusive, with each “belonging” to one sex or the other. They are viewed as both complementary and antagonistic, locked into an inevitable and natural “war of the sexes.”

T talk goes beyond the sex hormone concept in at least two ways. First, as a domain of folklore, T talk is not bound by formal logics or demands for consistency. “T makes men athletically superior to women” feels like a truth, despite the fact that millions of men the world over have vastly more T than do 95 percent of elite women athletes, yet are not as fast or as strong as those women. While we have the semijoking language of “testosterone poisoning” to naturalize bad behavior in men, testosterone is viewed as actually poisonous only to women. “Too much T,” medicalized as “hyperandrogenism,” is a concept that does not apply to men, whereas women whose T values fall outside the typical range are by default assumed to have a medical problem (even if the woman has no known functional problems).

Second, while T is a synecdoche for masculinity, T can also symbolize biology or nature in general, as well as science and the associated values of precision and objectivity. Because T is coded as natural and in the realm of



biology, T talk fundamentally serves scientism, which elevates scientific values, evidence, and authority above all others, even as it paradoxically obviates the need for evidence. Scientism equates scientific knowledge with knowledge itself, especially valorizing the natural sciences. Scientism thus lends added weight and substance to the scientific arguments about the regulation. For example, in the CAS decision, the arbitrators read a 2012 paper in which we criticized the regulation on both ethical and scientific grounds. They judged our analysis of ethical principles (e.g., fairness, eligibility and notions of normal; health treatment and the question of medical need; confidentiality leaks and whisper triggers) not only to be utterly outside the relevant evidence for judging the regulation, but as outside the purview of “knowledge” itself, calling it “sociological opinion, which does not equate to scientific and clinical knowledge and evidence” (CAS 2015, 134).

Following Stephen Colbert, we might say that T lends truthiness to the rationale for the regulation: unburdened by the factual, the ubiquitous common-sense notion of T as an overwhelming “super substance” not only substitutes for evidence, but makes calling for concrete, empirical details about what T actually does for women athletes seem puzzling or obtuse. In the same 2012 paper that CAS dismissed as irrelevant, we pointed out the lack of reliable and pertinent data to support the regulation’s grandiose claims about what high T does to and for women athletes. This paper led to numerous media interviews, many of which were perplexing to us because interviewers had a difficult time grasping, or perhaps believing, that there was so little evidence linking high T to exceptional athleticism. Short of repeating our full critique of the evidence on T and athleticism here, a few key points merit attention. Studies in sports science overwhelmingly confirm that T, while relevant to athleticism, is far from determinative: T levels cannot predict athletic performance; better-performing athletes do not have higher T levels (baseline or pre-competition); individual variability in response to T is enormous. While higher T has been linked to greater strength, speed, and muscle size at the *group* level, at the *individual* level these relationships are inconsistent. Some athletes get little or no benefit from increased levels of T, while others get considerable benefits. These facts fly in the face of received wisdom, while the IAAF’s and IOC’s claims fit T folklore neatly. As a result, interviewers often had a hard time accepting our arguments, even when they were accompanied by concrete scientific references. As a consequence, several interviewers repeatedly questioned why T is not a good proxy for athleticism.

T talk has both enabled this regulation and has been increasingly elaborated as a post hoc justification for it. T talk obscures the fact that this regulation is still “sex testing.” T talk also deflects attention away from the racial politics of intrasex competition in women’s sport and diverts attention from structural arrangements and how the regulation under question is about power asymmetries not only between athletes, but between nations. It is difficult to frame

the harms of the regulation in terms of T: invasion of athletes' privacy, humiliation, loss of career, and medically unnecessary surgeries must be discussed on other grounds. Thus, in relation to the regulation, T talk succeeds in a range of obfuscations and distortions.

T talk is rarely directly about race or global power relations, which makes this story challenging to tell. The gender politics of this regulation can be read directly from the texts that introduce, explain, and justify it, but identifying its co-occurring politics of race and region requires a different sort of work. Logic and rationality are inadequate guides. Moreover, racial hierarchies are often not explicit nor are they rational and ordered; they are chaotic and camouflaged, but operate foundationally. Thus, we must look to the way that the T regulation and its enforcement alchemizes ideas about gender, race, and "advantage" through sideways moves, indirect logics, resonances, reinforcements, and disavowals, relying on images and aesthetics as much as words, and on the wide circulation of unspoken tropes of gender, race, and modernity or civilization (barely hidden within references to nation or region), especially as they are entangled.

There is not just one story here, but a linked and enmeshed series of distinct and related narratives. There's a story about T and advantage, a story about health, a story about ethnic and regional variations in hyperandrogenism, among others. One common thread in all these stories is a scientific rationale for and driver of the regulation. Sport officials and other proponents of the regulation insist that it is only and thoroughly a scientific matter, a domain in which only explicit language, direct logic, scientific evidence, and deliberate and intended meanings register as "real." This piece works in a different register—one of affect, of images, of slips in logic, of how stories brush up against each other and generate new meanings. Together, the narratives activate offstage relationships and assumptions that create strong but implicit associations with race, a relationship we've referred to elsewhere as "race as a ghost variable" (Jordan-Young and Karkazis 2017).

Two recent feminist studies (Holloway 2011; Ticktin 2011) offer further insight into how we can understand medically authorized harms of this regulation as the predictable effect of power relations, rather than as "accidental" or "incidental" failures of the regulation that ironically has been promoted as a vehicle for fairness and health. Specific harms are *inherent* to the regulation, which was developed within and amplifies the "matrix of domination" (Collins 1990) that distributes power hierarchically along axes of race, sex/gender, and geopolitical region. In this paper, we show that what happened to the young women described in Prelude 2 is what Karla Holloway (2011) would call a "predictable failure," a concept she uses to analyze medical and legal scenarios where, despite a formal right to privacy, particular people are systematically subject to humiliations and intrusions. These "failures" of privacy are utterly predictable in light of the specific social location of the individuals involved and the material scaffolding that supports the supposedly generalized right to

privacy. Privacy is not, then, a general right, but a specific form of privilege that is reserved for those with favored racial, gender, sexual, class, or national status. This regulation makes some women athletes' bodies permanently available for surveillance and public "reading," probing, and coercion. Our analysis of this regulation shows that the concept of "predictable failures" applies to other protections, such as fairness or health, which are constructed around the needs of those who already enjoy privilege.

To understand how the language of medical benevolence is used to justify surveilling and intervening on women athletes who have high T, we also draw on Miriam Ticktin's (2011) critique of humanitarianism, which perversely enables the harsh, anti-immigrant policies of contemporary France. While France generally blocks legal status for refugees, migrant laborers, and other immigrants, humanitarian "exceptions" are extended to those who are recognized as having undergone "exceptional" suffering, which is medicalized. For example, scars may be examined and validated by medical personnel as being consistent with having endured torture; the absence of such scars may make it difficult to be taken seriously as a refugee from violence. The context of the T regulation is different from the situation Ticktin analyzes in important ways. Notably, women athletes do not actively seek to be seen as "sick," but resist it. Nevertheless, several elements of her analysis serve as a guide for seeing the effects of invoking "care" for the same people who are targeted with special surveillance and intervention, such as the claim that "suffering" is an objective matter to be judged by medical science, the coupling of bodily pathology with cultural pathology, and the way in which what she calls "regimes of care" depend upon a toggling of perspective, such that "suffering victims" are rapidly refigured as dangerous or delinquent.

The T regulation can be understood as similar to other "regimes of care" in that those who are targeted for "care" are "visible as victims . . . and hence in need of help, rescue—not equal rights" (Ticktin 2011, 4–5). As we show, women athletes with high T are not considered to be part of the group of athletes whose need for "fairness" is supposedly served by this regulation. Framing interventions to lower T as medical need activates what Ticktin calls a "moral imperative to act" that justifies practices that can be read as violence done in the name of care. Consequently, "regimes of care end up reproducing inequalities and racial, gendered, and geopolitical hierarchies" (Ticktin 2011, 5).

For our larger project, we draw on regulation documents, scientific publications in which officials describe and defend the regulation, media coverage, and in-depth interviews with policymakers, athletes, and scientists from 2012 through 2016. Our analysis here leans heavily on two presentations made by sport officials about this regulation at the 2012 International Convention on Science, Education and Medicine in Sport (ICSEMIS), the official scientific conference that accompanies the Olympic Games (Ljungqvist 2012, Bermon 2012). We quote extensively from these presentations below; unless a specific

document is cited, the quotations in the text are from unpublished recordings of their respective ICSEMIS presentations. Unlike the relatively terse text of the IOC regulation and the IAAF's regulation and explanatory notes, the presentations were expansive, including both images and information about regulation development and implementation that has never been published. Thus, these presentations make the “ghost connections” among the regulation, gender, race, and region explicit in a way that documents alone do not, and show how they exist not in the abstract as formal rules, but how they intersect with material conditions to produce distinctive effects on specific people.

In the sections that follow, we show how, via T talk, sex biology is reshaped from messy distributions into clean dimorphism, which is reintroduced as the natural state of human biology; a racialized aesthetic of gender is made to appear “normal/natural” and biological, not cultural; “sex testing” is disavowed and repackaged as a health intervention “for the good of the athlete”; and the operations of power and harm in the regulation are inverted—the least advantaged are figured as “unfairly advantaged,” and the extraordinary harms of interventions are framed as beneficial.

### **Perfect and Modified Phenotypes: T Is the Key**

The T regulation was officially unveiled a week prior to the 2012 London Olympics just four hundred miles north in Glasgow at the ICSEMIS conference. ICSEMIS is an international sport science conference that stemmed from a 2006 agreement between the IOC and the International Federation of Sports Medicine (FIMS) among other organizations to put on “one large multi-disciplinary, professional conference” around the Olympics (ICSEMIS 2016). Designed to bring together international experts “in professional and academic sectors linked to sports science and education,” the unveiling of the regulation here, of all places, lent it a scientific air, even if what followed was far from scientific.

One of the two presenters, Stéphane Bermon, a member of the IAAF Medical and Anti-Doping Commission since 2006, has been the IAAF's lead player in developing, promoting, and implementing the regulation. Bermon presented the rationale for banning women with high T, and in his presentation, we saw T talk in action, especially the opening segment that relied on a visual argument about male and female forms.

He began with a slide entitled “Men and Women: Different Phenotypes” consisting of two side-by-side images. On the left was Francisco Goya's late 18th-century masterpiece *La Maja Desnuda*, an idealized Venus of a woman: sensual, curved, nude, her opaline skin lustrous [see figure 1].<sup>10</sup> In contrast to that milky complexion is a small thatch of dark pubic hair. Her cheeks are rosy and her brown hair falls in curly tendrils. She reclines, arms raised behind her



Figure 1. *La Maja Desnuda* by Francisco Goya (c. 1797–1800)

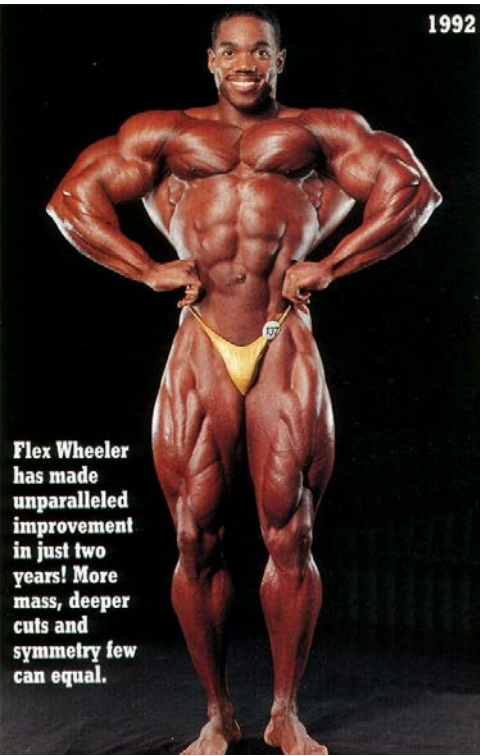


Figure 2. Flex Wheeler from *Joe Weider's Muscle & Fitness* (1992)

head, eyes looking straight at the viewer: she is so luxuriously sedentary, she looks as though she may never move from her velvet divan.

The photo on the right could not present a starker contrast. With his oiled, dark brown skin stretched tight over superhumanly developed muscles, Kenneth “Flex” Wheeler smiles at the viewer [see figure 2]. The bodybuilder, whom Arnold Schwarzenegger called “one of the greatest,” stands in a “front lat spread,” a banana-colored Speedo just covering his genitals: fists on his narrow waist, arms bent at a right angle, pectorals pushed up and protruding out, elbows pivoting forward, thighs and biceps bulging, with stomach sucked in. Every inch of him is dense, striated, and rippled. A sculpted, comic book hero with approximately zero body fat, Wheeler is the very image of power.

We do not think we were alone in our surprise when *La Maja Desnuda* was the image Bermon displayed as “the female phenotype” in a talk about elite women athletes, nor that he paired it with that of a twentieth-century ‘roided out male bodybuilder. Though Bermon acknowledged that he “took some extreme examples,” even alluding to Wheeler’s myostatin-inhibiting gene mutation (which allows for nearly unlimited muscle growth), he hewed closely to these two images as evidence of what should be considered “normal male and female.” Meanwhile, the ideal female phenotype Bermon presented was not a woman *per se*, but an artistic interpretation of one. His choice of Wheeler as the archetypal normal male was also ironic given that Wheeler is widely known to have doped for nearly two decades, but hardly surprising since a photo of a pot-bellied man would not have served his visual argument.

Sweeping his own disclaimer aside, Bermon plowed on. “This difference in phenotype of course explains the difference in performances, because as you know, men are much more slender, tall, and strength [*sic*] than female and it’s very easy to be convinced about that.” With a brisk review of sex differentials in various world records in track and field, Bermon offered an explanation for men’s consistent dominance: “androgenic levels,” which he explained are ten times higher in males than females. “So, you clearly see that what we call normal male and female, we should not have any overlap in testosterone concentration, as well as you do not have any overlap in world best performances, whatever the event considered.”

Reference to testosterone is all it took to transform a conversation about stereotyped cultural images into a supposedly scientific presentation. In a series of moves so familiar they can be hard to see, Bermon built up an argument about sexual dimorphism—the idea that the sexes represent two distinct, non-overlapping forms—and the possibility of reading not just athleticism but T from the body’s superficial appearance. If high T is what causes Flex Wheeler’s muscles to bulge and strain, low T must be responsible for *La Maja*’s lack of muscular definition, her eroticized softness, her pose that relishes in its own idleness. But what does T have to do with her whiteness?

Bermon did not make the explicit claim that T is what caused Flex's darkness, nor lack of T *La Maja's* lightness. But insisting that T is what drives the difference in the male and female phenotype, and presenting these as black and white, respectively, nonetheless attaches T to a package of existing associations about race and gender. While Bermon probably did not consciously or deliberately choose the image of a white woman for this presentation, it could hardly have been an accident, either: whiteness is an essential part of the traditional image of ideal femininity in the West. Similarly, the choice of a black male bodybuilder to show the "extreme phenotype" of masculinity ties into longstanding associations of black men with hypermasculinity, and blackness in general with athleticism. Keep these pictures in mind as we follow the rest of Bermon's presentation.

The next section of Bermon's talk was an argument about sex dimorphism. To start, he said that women and men are dimorphic not just in phenotype, but also in sport performance and in T levels. To make this argument, he began with a table comparing women's and men's world records in track and field events, showing that these differed by ten to fifteen percent "in favor of the male of course," and then extending this difference to all other sports. Second, he painted T as the "fundamental" dimorphism, the characteristic that causes both sex-specific phenotypes and sport performances. The message he drove home was that there was a "lack of overlap" in females and males: in testosterone, in sport performances, and in "normal" phenotype. It was the lack of overlap in T, he said, that is "one of the main explanations" for the lack of overlap in "world best performances." This sounds simple, but dimorphism in athletes' T levels is contested, and relies on manipulating which women and men are included in analysis (Healy et al. 2014; Karkazis and Jordan-Young 2015).

From there, Bermon's presentation took an odd turn as he created potent associations between doping and naturally occurring high T. Implicitly referring to the hyper-distinct "male" and "female" phenotypes he had just shown, he said these phenotypes can be "modified" by "exogenous administration of androgen or anabolic hormones." In other words, doping. As he spoke, he showed a slide featuring the same photo of Flex Wheeler, but this time paired with a female bodybuilder with remarkably bulging and striated muscles under taut skin, her right arm curled for maximum definition of her biceps and upper pecs, her right leg extended to show off her magnificent quadriceps. Compared with *La Maja Desnuda*, this steroid-pumped woman bodybuilder, like Flex, may as well have been not only from a different century and context but of a different species. The visual argument this slide offered was that the normal dimorphism had been breached. Her slicked back, bleached blond hair and light eyes notwithstanding, the overall impression given by her physique and her deeply bronzed skin was not so different from that of Flex.

Bermon's only other comment on this slide was to say that the only time you see "overlap" in women's and men's T levels is in doping and in naturally



high T, calling both “hyperandrogenism (HA).” Calling doping “exogenous hyperandrogenism” (meaning high T from an external source) was idiosyncratic in the extreme; the term “hyperandrogenism” is never used for doping. Bermon immediately reiterated this opportunistic usage by heading another slide with the text “Exogenous HA: Doping.”

The viewer not only compares the woman bodybuilder to her fellow bodybuilder, Flex, but also to *La Maja*, whose image she has replaced on one half of the slide. The bodybuilder is not only abnormally “masculinized”—pictured as both a hormonal and an aesthetic problem in contrast with *La Maja*—she is a cheat.

Beyond linking naturally high T and doping, Bermon’s sequence of slides strategically triggered a series of associations that would resonate through the rest of the presentation. Combining cultural tropes of masculinity, femininity, power, fairness, and race, Bermon set up a link between feminine, natural/honest, weak, and pale, on the one hand, and masculine, unnatural/cheating, powerful, and dark, on the other. There are several senses in which the female bodybuilder is not, like *La Maja*, the “fair” member of the pair. She has “modified” her phenotype with banned substances (unfair), while *La Maja* is the stand-in for the universal, “natural” woman. Neither the body nor the pose of the bodybuilder channel any of the attributes of the “fair sex” that are evident in the feminine *La Maja* (delicacy, availability, softness, sensuality). Finally, the bodybuilder’s skin is dark, like Flex, not light, like *La Maja*. The double comparison of the woman bodybuilder to Flex (alike) and to *La Maja* (different) makes an obvious argument about the breach of sexual dimorphism, but it also extends the association of masculinity with dark, muscular power that was invoked by Flex’s image in the first place. These slides build up associations by using words and images that have powerful “offstage” meanings. Alone, the images of Flex, *La Maja Desnuda*, and the woman bodybuilder do not constitute an argument about race and hyperandrogenism. But they put in play elements that would be available to increase the resonance of other words and images that followed and that also have racial associations.

### The Rebranding of “Sex Testing”

Bermon, the IAAF’s point person on the regulation, was followed by Arne Ljungqvist, who has strong ties both to the IAAF and the IOC. He spoke that morning from his position as chair of the IOC Medical Commission, the body long charged with the creation and enforcement of “sex testing” of women Olympians.

Ljungqvist began by giving a brief, editorialized history of “gender verification” in sport. Before we turn to his narrative, it is helpful to know some history. Women’s entry into elite sport nearly a century ago was accompanied by regulations variously called gender verification, “sex testing,” and other terms,



all of which had the same goal: to verify that those in the female category are really women. An early iteration of these eligibility regulations involved physical exams, which garnered intense criticism. Starting in 1967, based on the assumption that chromosomes are adequate proxies for sex, the IOC and the IAAF embraced chromosomal testing as a less intrusive and scientifically objective method (de la Chapelle 1986). Struggles over whether and which chromosomal or genetic tests could distinguish men from women, however, caused decades of infighting among athletes, medical commission members, and even professional medical societies. The main problem with all “sex testing” is not with the tests per se, but with the assumption that any singular marker of sex is adequate to classify people into a two-sex system. Sex is complex, comprising at least five core elements (karyotype, genitals, gonads, hormones, and secondary sex characteristics). None of these are dimorphic; all of them can vary independently of the others. Nor is there an objective way to choose which criterion or criteria “determines” sex: the decisions are made differently in different contexts (e.g., medicine, law, and the social sciences).

The case of Olympian Maria José Martínez-Patiño is crucial to this history; at ICSEMIS, Ljungqvist rehashed the official claim that her story ushered in the end of “sex testing.” In the mid-1980s, the IOC disqualified the Spanish hurdler from competitions and withdrew her medals and records because she was “chromosomally male” (Martínez-Patiño 2005). Martínez-Patiño has complete androgen insensitivity syndrome, which is characterized by a 46, XY karyotype and high levels of circulating T, but her tissues are unable to respond to T and other androgens. After “failing” the sex chromatin test owing to XY chromosomes, Martínez-Patiño challenged her exclusion and won (Martínez-Patiño 2005).

Martínez-Patiño’s victory needs to be reread not for how it killed “sex testing,” but for how it ushered in a focus on T. She and her advocates, including Ljungqvist, successfully argued that her *insensitivity* to T should be the deciding factor in the case. In 1992 and 2000, both the IAAF and the IOC, respectively, cited her challenge as a key rationale in their choice to “abandon” sex testing.

The IAAF and IOC have repeatedly insisted that “sex testing” is over, to the extent that we initially repeated their claim as fact (Karkazis et al. 2012). Ljungqvist’s talk at ICSEMIS, though, gave the lie to their abandonment narrative. Sport governing bodies, he said, always retained the authority to take “proper measures for the determination of the gender of the competitor” through ad hoc investigations of targeted athletes. “Sex testing” never stopped; it just was not mandatory for all women. And then he went one important step further: the T regulation “is a still existing regulation to which has now been added some further elements.” Female athletes have long been subject to T testing. The central element of the “new” regulation is to make the focus on T transparent. A second element has to do with providing legal cover. Earlier regulations aimed at actually determining athletes’ sex, potentially going against athletes’ social

and legal documents, and left the sports organizations open to legal challenge for exceeding their authority.

Ljungqvist revealed that underneath the T talk, sport regulators are still interested in sex determination. He bemoaned “cases that were doubtful in terms of whether particular athletes were actually men or women.” The concern, he said, was “intersex people—of course most of them are women—but what to do with those cases.” Toggling between confirmation that governing bodies still engage in “sex testing,” and insistence that they do not, he explained that if an athlete’s gender is questioned, “the relevant sporting body shall have the authority to take proper measures *for the determination of the gender of the competitor*” (emphasis added). Again, though, he insisted that this new elaboration of the ad hoc rule is “not a sex test or a gender test.” The IOC policy likewise notes that “nothing in these Regulations is intended to make any determination of sex” (IOC 2012, 1), revealing the disavowal of “sex testing” to be a legal disclaimer intended to protect sport authorities from challenge rather than a meaningful description of the regulation.

T talk seems to make this disavowal appear more plausible, perhaps because the T criterion appears to be scientific, objective, and narrow. As a singular chemical, T is simpler than sex, and common wisdom holds that T is both sex dimorphic and the driver of athleticism. T talk thus offers scientized cover for a regulation that looks new, but continues many of the same problems as the earlier policies. For example, focusing on T deflects attention from the fact that the current regulation also entails intrusive physical exams such as those that Ljungqvist had just denounced.

T talk is fork tongued: not only does high T supposedly provide an “unfair advantage” to women athletes; it also makes them sick. After framing naturally high T in women as a health problem, Ljungqvist asserted that sport authorities have “a duty within the context of medical ethics” to identify women with high T and direct them into treatment “to protect the health of the athlete.” The health justification is embedded in the regulation texts: the IAAF claims the regulation is for “the early prevention of problems associated with hyperandrogenism” (IAAF 2011, 1) and an IOC press release for the regulation reads, “In order to protect the health of the athlete, sport authorities should have the responsibility to make sure that any case of female hyperandrogenism that arises under their jurisdiction receives adequate medical follow-up” (IOC 2011; cf. Karkazis et al. 2012; Karkazis and Jordan-Young 2013; Jordan-Young, Sönksen, and Karkazis 2014).

This appeal to medical ethics vacates the power, which is to say the politics, of the situation. Ticktin’s critique of humanitarian “regimes of care” as “politics based on care and produced as a moral imperative” is instructive (2011, 16). Sport authorities appeal to the notion of a sick or “suffering” body, as do humanitarians seeking to provide some refuge within restrictive immigration laws, and in both cases, medical science is the arbiter of suffering. With the regulation, experts

operating in the name of medical science can designate bodies as “suffering” and in need of intervention even when this designation runs contrary to subjective experience and desires, and even as they acknowledge that this intervention is medically unnecessary (e.g., Fénelichel et al. 2013, E1057).

The idea that high T is dangerous to women is one of the oldest staples of sex hormone ideology (Oudshoorn 1994), a kind of T talk that appears self-evident. But high T in and of itself is not a health problem (Jordan-Young, Sönksen, and Karkazis 2014). Moreover, when Ljungqvist and other proponents of the regulation argue that concerns about the risks of high T are behind their efforts to identify women athletes “affected” by hyperandrogenism, they are inverting the story. Health worries about high T are a post hoc justification for continuing concerns about how to “deal” with “ambiguous gender cases.” In 2010, just months after targeting Semenya, the IOC organized a medical conference in Miami “to look at the state-of-the-art science and see what we should recommend to sport” for “ambiguous gender cases” (Foxsports 2009). At the time, Ljungqvist said, “The general recommendation is obvious: they should be treated as medical cases in compliance with up-to-date procedures. But we have to be more specific in telling the sports people what that actually means and what they should do” (Wells 2010, 303). While health was supposedly the core focus, the IOC also sought advice on which sex variations among women ostensibly confer athletic advantage. But panelists observed that extensive research on intersex variations would be necessary to map any ostensible “advantages” they might confer, “a complex and perhaps impossible task” (Wells 2010, 306).

T talk offered a bridge between the considerable complexity acknowledged at the Miami meeting and the confident and streamlined assertions that emerged in the regulation itself. In Miami, “None of the presenters attempted to link athleticism with particular disorders or conditions studied, nor did they relate their research directly or indirectly to the issues of athletic advantage of intersex athletes, gender verification policy,” or particular athletes (Wells 2010, 305). Later, when the regulation was announced with a narrow focus on T levels, it was taken as obvious that high T provides an athletic advantage to women. Bermon even closed his ICSEMIS presentation by showing a table purporting to parse the clinical conditions associated with high T that do and do not provide athletic “advantage.”

In the rebranding of sex testing, high T was doubly framed as both an advantage and a health problem, giving a new health-based rationale for intervention and transforming an issue that had previously caused public relations problems for sport authorities into an unequivocal good. Think back to Prelude 2, in which we describe the four young athletes who were intervened upon in the “specialist reference center” in France. None of those interventions were medically necessary. But as the athletes were told, “gonadectomy would most likely decrease their performance level but allow them to continue elite sport in the female category” (Fénelichel et al. 2013, E1057). In Glasgow, Ljungqvist even

suggested that the new regulation benefits women who are specifically disadvantaged: “These cases . . . are pretty rare. The competence is not found all over the world.” With this sentence, Ljungqvist revealed the geographical focus of his concerns: the Global South. Humanitarian “regimes of care” have routinely figured women and children of the Global South as the prototypical “suffering body,” which entails a coupling of bodily pathology with cultural pathology (Ticktin 2011). In the domain we analyze, the cultural pathology implicitly entails incompetent or uncivilized “neglect” of bodies figured as damaged or ill. “The competence is not there,” Ljungqvist stated in Glasgow, thereby invoking a progress narrative that links the West with science, modernity, a privileged insight into biological “truth,” and the obligation to “perfect” bodies that do not fit aesthetic and cultural norms.<sup>11</sup> This narrative mandates intervention from a supposedly beneficent position, erasing power differentials and echoing colonial rationales for bringing less “developed” people under control.

### Breaking the Code of Hyperandrogenism

To understand who the regulation affects, it is crucial to take apart the coded work that is accomplished by the idiosyncratic and strategic way that sport authorities use the word “hyperandrogenism.” Hyperandrogenism, defined generally as “excess androgen in women,” is a medical concept with no analogue in men. In practice, it nearly always refers to polycystic ovary syndrome (PCOS). PCOS affects up to 20 percent of women worldwide, and “ethnic and racial variation is remarkably low” (Azziz et al. 2016, 16057), so regulation of hyperandrogenism-qua-PCOS should be largely race and region neutral.

Sport authorities have introduced an entirely new usage for the term hyperandrogenism, giving a new twist to T talk. The 2012 Olympic regulation reads, “Intersex female athletes with elevated androgen production give rise to a particular concern in the context of competitive sports, which is referred to as ‘female hyperandrogenism.’” Thus, the IOC is concerned specifically with high T in the context of intersex variations. With the latest iteration of the regulation, released in 2018, this was made explicit when the IAAF dropped the language of hyperandrogenism and directly named that their concern is women with intersex variations, what they refer to as “differences of sex development” or DSD. This does not mean that all the women surveilled or investigated under this regulation have intersex variations, especially given the IOC’s chillingly broad mandate to surveil gender nonconformity, directing National Olympic Committees to “actively investigate any perceived deviation in sex characteristics” (IOC 2012, 2).

Bermon opportunistically departed from conventional usage of the terms hyperandrogenism and DSD in two ways. First, Bermon paired the image of the woman bodybuilder with a neologism for doping, “exogenous hyperandrogenism,” aligning hyperandrogenism with cheating. He immediately followed with

a reference to “endogenous hyperandrogenism, what we call DSD.” DSD, a medicalized term for intersex, and hyperandrogenism are medically distinct.<sup>12</sup> None of the medical descriptions of hyperandrogenism that we have found mentions DSD/intersex, nor did the hyperandrogenism clinical guidelines Bermon mentioned (Goodman et al. 2001). Hyperandrogenism typically refers to PCOS, but the regulation has been crafted specifically to *exclude* women with PCOS. Bermon explained that they set the eligibility threshold for naturally occurring T much higher than levels observed in women with PCOS. If any more confirmation were needed indicating that for sport regulators hyperandrogenism is code for intersex, there is the report of the four athletes “treated” at the IAAF reference center describing the focus of the T regulation as “detecting those athletes who are competing unknowingly with a disorder of sex differentiation (DSD)” (Fénichel et al., 2013, E1056).

Three linked claims apparent in the Glasgow presentations collectively explain the racial and geographic effects of the regulation, that is, why it overwhelmingly if not exclusively targets black and brown women from the Global South. First, Bermon claimed there is “huge ethnic and area variation” in prevalence of intersex, with the suggestion that there is higher prevalence in the Global South. Second, he showed a slide claiming to sort intersex variations according to whether they provide “athletic advantage,” which he implicitly linked to ethnic and area variation by repeatedly discussing the two points in direct succession, without transition. This created the impression that the people with the most advantage are clustered in the Global South. Third, he repeated Ljungqvist’s point that “local expertise” to diagnose and treat intersex variations is not common outside of Western industrialized states:

[A]s I told you before, a lot of these cases arise in poor countries or developing countries where diagnosis is not done at birth like is the case in Western countries at least. Diagnosis is not done and you realize that you have a 16 or 18 years old very well-performing athlete with an intersex condition who’s going to enter into a major championship, and here probably [would be] stopped.

With the “here” in that last sentence, Bermon anchored himself and his listeners in the “rich” and “developed” countries of the Global North, referring in the same breath to both the literal space in which the talk was delivered, and the typical referential space of his audience who, though scant in number, were overwhelmingly from Western industrialized nations. In the context of repeated assertions that “cases” have typically surfaced in poor, developing nations, the vague statement about “ethnic and area variation” is automatically interpreted as meaning that intersex variations are themselves more common in poor regions (Magubane 2014). There is no evidence that this is so. The major point of geographic variation is not in the *prevalence* of intersex, but in medical *responses* to intersex. Specifically, the standard protocol in the Global North has, for more than five decades, been characterized by an urgency to identify

and “normalize” people with intersex variations at the earliest possible stage of life, which includes modifying atypical genitals and controlling hormone levels by surgery or pharmacological intervention (Karkazis 2008; Davis 2015). For a variety of reasons that might include cultural differences, general infrastructure, medical resources, and others, early medical intervention has never been routinized outside the Global North.

The point is not to argue whether women targeted by the regulation “really” have intersex variations or whether there are “really” more women with such variations in the Global South, and it is certainly not an argument about whether anyone “should” identify as intersex. The point is instead to attend to the politics of race and nation that shape the search for and perception of sexual difference. Magubane has demonstrated that the relevant histories go well beyond the racist display of Saartjie Baartman and the pathologization of black women’s bodies more generally, and has suggested that we must ask “what role race and imperial history have played in rendering intersex visible or invisible” (2014, 768).

This helps us to decode Bermon’s claim in Glasgow that there is “huge ethnic and area variation” in the incidence of intersex. Bermon padded this idea with references to “poor countries or developing countries” and to Africa, Asia, and South America. In the context of Western racial ideology, these ideas in close proximity fill in the mental blank of “ethnic” with brown/black and with race. It is accurate to say that there is ethnic variation in specific kinds of intersex variations, but the ethnic variations in prevalence do not map onto racial categories (e.g., Boudon et al. 1995; Maimoun et al. 2011). Nonetheless, a regulation that is about atypically high T in women, through a variety of *conceptual* associations with race and the explicit *material* focus on regions where women with intersex variations are not routinely subject to early intervention, manifests in targeted concern about black and brown women from the Global South.

### **Emergence and Emergencies: “A Lot of People Coming from Africa, Asia”**

For all the talk of a duty to treat athletes, and concerns about where there is “competence” to do so, the overall framing of the regulation indicates that health talk is highly strategic. T talk does a lot of things, but one of the most important is to keep certain kernels of received wisdom readily available to make the regulation seem rational. These self-evident claims, sometimes implicit but often explicit, include the idea that T is male, and renders women with high T masculine; that women with high T have an “advantage” in sport; and that T is a foreign substance to women, its presence akin to doping and therefore unfair. It’s important to read all the different threads concurrently to see how the issue becomes racial and regional. Who has high T? Untreated intersex women. And where are they found? In the Global South. The regulation was released within this assemblage of claims, revealing seemingly abstract, neutral concerns about

women with “masculine traits” and “uncommon athletic capacity” to be far from abstract or neutral. This provides an important backdrop for understanding the regulation itself, and who it targets: “Despite the rarity of such cases, their emergence from time to time at the highest level of women’s competition in Athletics has proved to be controversial since the individuals concerned often display masculine traits and have an uncommon athletic capacity in relation to their fellow female competitors” (IAAF 2011, 1).

This brings us to one of the most direct articulations of how concerns about race and region drive this regulation, again from Bermon’s talk:

First, HA, especially DSD, is not so rare in female sports, at least athletics. I say “at least athletics” because as you probably know athletics is a whole world sports, it’s not purely the Caucasian sports. We have a lot of people coming from Africa, Asia and we have a lot of these cases coming from these countries. So, of course, there is a kind of recruitment bias, a double one. One because they have an unfair advantage, some of them, so of course they compete better and they reach more easily the higher level. And the other one is I would say an ethnic or local area recruitment bias, because they are undiagnosed at birth, so they are raised with this condition, and they arrive at the highest level with this condition, which is quite seldom in rich countries where they are treated just after birth.<sup>13</sup>

According to Bermon, women from Africa and Asia are “arriving” at the highest level because of unfair advantage owing to not having been “treated.” The repetition of the word “bias” and the explicit reference to cheating indicates that their very presence in competition is unfair. The idea that these women “reach more easily the higher level” signals that they have not worked hard, that they have just magically jumped the line. Likewise, Bermon’s explanation of “biases” that enable the success of some women is a breathtaking inversion of the biases that work *against* any athlete from the Global South, including challenges of inadequate nutrition, lack of access to specialized equipment and excellent training facilities, and the enormous risk of pouring time and energy into sport instead of more secure income generation. This claim of “unfair advantage” forcefully reverberates with the “racialist logic that presents the black body especially as vitality, as raw force, as athleticism itself” (Doyle 2013, 420).

World-record-holding marathoner Paula Radcliffe, a white runner from the UK, demonstrated the interlocking assumptions driving the targeting of women from the Global South in a recent interview (5 Live Sport 2016). In a quote that resonates with our opening image of the disappointed white runners at the Rio Olympics, Radcliffe said that when “we fully expect no other result than Caster Semenya” winning at the Olympics, “then it’s no longer sport.” Blind to her own privilege and dominance and the politics that shape them, she said she feared that people would go to “certain villages in South Africa” where she claimed hyperandrogenism is more prevalent and “seek out girls who look like they’re



going to be able to go out and perform and to run fast.” Bavington (2016) drew attention to earlier organizing among white athletes that frame white athletes as deserving of fairness and “protection” from global south athletes who simply “arrive” on the scene with all the goods, and are therefore “advantaged.”

In a 2013 defense of the regulation, Bermon and colleagues explained the regulation as grounded in “concerns for fairness for women athletes,” and referred to “concerns among women athletes that they should not be compelled to compete against other athletes who may have a massive androgenic advantage” (Bermon et al. 2013, 63). This supposedly universalizing statement about “women athletes” explicitly excludes women with high T from this category and favors a construction of fairness that benefits both women with “typical” T levels and women from the Global North (Jordan-Young and Karkazis 2012; Bavington 2016). T talk obfuscates this bias, but reading the narratives of health, of the lack of medical competence in the Global South, regional and ethnic variations, and advantage together makes this bias impossible to miss, as Bermon again illustrated in Glasgow: “And we have a lack of local suitable testing facilities . . . you can easily understand that when such cases arise in Africa, South America, Asia, it’s very complicated to get local expertise there. And as they have a very clear advantage, they were pushed to compete at the highest level.” He elaborated: “this is a way of cheating.”

How, then, would this unfair emergence of women with an “advantage” from high T be prevented? In short, by pushing the investigations down to lower levels of competition. In the 2012 Olympic policy, the National Olympic Committees were mandated to look for “any perceived deviation in sex characteristics” (IOC 2012). The Olympic regulation was modified in 2014 to offload the obligation to investigate women to the specific international federations for individual sports (IOC 2014). The IAAF, in turn, has stipulated that the national athletics federations should enforce the regulations. This multipronged attempt to stop women from competing in international competitions involves a decentralization of tasks and diffusion of responsibility: scrutiny will not look the same in all contexts. For example, while race is a powerful presence in the designation of normative femininity, race might not be especially salient at every local or national level. But the discourses of “advantage” and “sex deviation” that circulate around this regulation make available an enormous array of signs and signals that can be attached to particular bodies in particular circumstances and used strategically.

How exactly is this mandate operationalized? To investigate any perceived deviation, you first have to understand the perceived norm.

### Looking at the Clitoris, Seeing “Advantage”

Like his earlier presentation of *La Maja*, Bermon’s description of the protocol for investigating suspected hyperandrogenism resonated with broad cultural



ideas about the aesthetics of T. Midway through his ICSEMIS presentation, he showed a spreadsheet with what he described as the most frequent types of intersex variations that IAAF sees in investigations, indicating which ones they believe convey advantage in sport, and notably, one they believe does not. Recalling Ljungqvist's discussion of Martínez-Patiño, Bermon said that complete androgen insensitivity syndrome (CAIS), in which women have high T but their bodies do not respond to it,

is not a problem at all, because as Arne has told you before, there are females with a high level of testosterone but with perfect female, at least external perfect female phenotype. And they have no advantage at all, since they don't have any functional testosterone receptors. By the way, most of the time these are very beautiful females, and you can find them as models.

If the "perfect female phenotype" signals "no advantage at all" (think of Goya's prone and inert *La Maja*), how does a female body display an "advantage" stemming from T? It is difficult to measure androgen receptor function directly, so sport investigations draw on protocols developed by doctors specializing in intersex variations, who infer the function of androgen receptors from the body's surface. The IAAF regulation lists the following indicators of high functional T (2011, 20):

- Deep voice
- Breast atrophy
- Never menstruation (or loss of menses for several months)
- Increased muscle mass
- Body hair of male type (vertex alopecia, >17 years)
- Tanner score low (I / II) [see figure 3]
- F&G score (>6 / ! minimized by the beauty) [sic] [see figure 4]
- No uterus
- Clitoromegaly [larger than typical clitoris]

Many of these features are deeply subjective, drawing on aesthetic judgments about femininity and masculinity; several are also a common result of extreme athletic training in women. It is crucial here to understand that this list is not used alongside some objective medical test for a woman's physical sensitivity to T: it is the test.

At ICSEMIS, Bermon stressed one trait above all others as the most important for determining whether an athlete under investigation for high T has unfair advantage: the size of her clitoris. The IAAF investigations follow "three levels of medical assessment": an initial clinical examination, preliminary endocrine assessment, and a full examination and diagnosis. Bermon clarified that a gynecological exam should be included in the first level, emphasizing its importance by using bold font, all caps, and three plus signs. Bermon claimed that clitoral size "gives you very good information about the level of

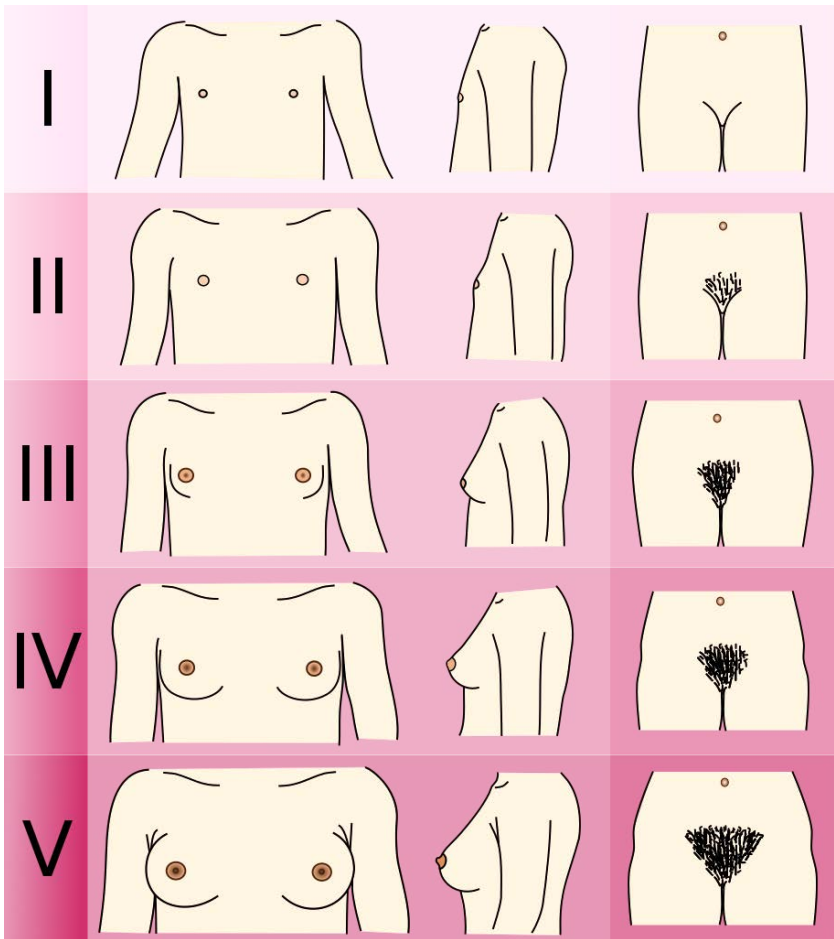


Figure 3. The Tanner Scale-Female (1969) schematic used to assess pubertal development. Image reproduced with permission from Michal Komorniczak (Poland) under creative commons license (CC BY-SA 3.0).

virilization”—that is, whether someone has been “masculinized” by T. The clitoris is the *sine qua non* for divining so-called advantage.<sup>12</sup>

Bermon made a series of inferences: a large clitoris indicates both high T and functional receptors; high T and functional receptors indicate athletic advantage. But these indicators have no predictive capabilities regarding athleticism. In his testimony during the CAS hearing, Ljungqvist acknowledged that “it [i]s not possible to quantify the magnitude of athletic advantage enjoyed by a particular athlete based on assessment of physical virilisation” (CAS 2015, 64).

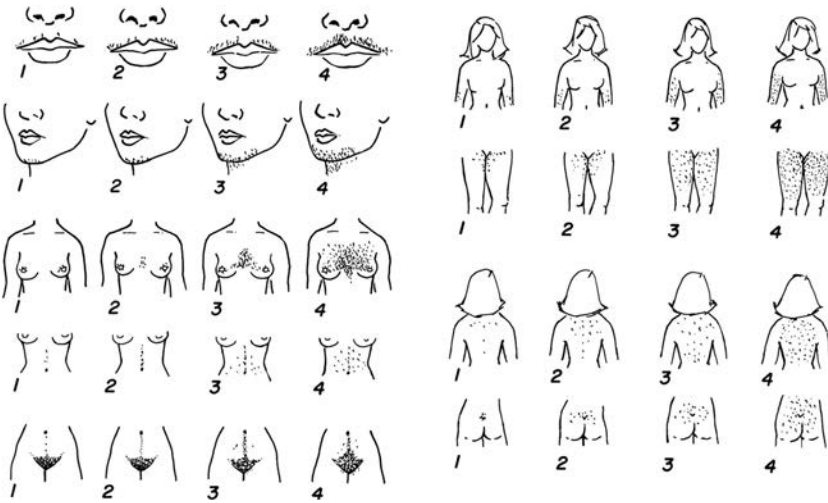


Figure 4. Ferriman-Gallwey Scale (1961). Reproduced with permission from Martin, Kathryn and Jeffrey Chang. 2008. "Evaluation and Treatment of Hirsutism in Premenopausal Women: An Endocrine Society Clinical Practice Guideline." *The Journal of Clinical Endocrinology & Metabolism*. © Oxford University Press

Beyond its use in investigations, the list plays a role in marking some women as suspicious, which brings all women athletes under scrutiny. The IAAF guideline is "scientific" insofar as these are the elements endocrinologists look for when assessing high T in women, but the logics and aesthetics of this list boil down to common ideas of what T does to women's bodies, and the idea that evidence of high T can be gleaned from the body's surface characteristics. But while this list is used clinically as if it were objective, judgments about masculinity in women vary by historical period, place, racial ideologies, and individual situation. How deep is too deep for a woman's voice, and in which contexts is it considered normal for a woman to speak "roughly" versus cultivating a soft and quiet voice? Is body hair feminine, or is it suspiciously masculine? Measures of the patterns and density of hair growth were developed in the context of racial science, and anthropologists used these as "a principal method of defining race" (Yildiz et al. 2010, 53). The Ferriman-Gallwey scale for assessing a so-called male pattern of body and facial hair (hirsutism) is profoundly subjective, and the literature on hirsutism reveals an ongoing obsession with racial and ethnic variations (see, e.g., Yildiz et al. 2010; Goodman et al. 2001). Several listed traits are also common results of intensive athletic training in women. How small must breasts be to show "atrophy"? Small breasts might be interpreted as the result of high T, rather than a result of the demands and effects of training in a specific sport. How much muscle mass indicates *increased* muscle mass in a woman? Muscle mass is a particularly fraught characteristic for elite women

athletes, because even in some sports where larger muscles could benefit performance, some elite women athletes (and notably their coaches) strive to avoid “bulking up” (Dworkin 2001; Krane et al. 2004; Rothenberg 2015). T talk erases the subjectivity from these judgments, certifying the list as scientifically valid, universal effects of high T on women, and thus signs of advantage.

Bermon ended his talk with a slide carrying five take-home messages, one of which was in all caps: “Importance of GYNAECOLOGICAL EXAMINATION: PPHE.” In other words, not only is a genital exam the first step in investigating women under the T regulation, but he called for *all women athletes* to have one as part of a preparticipation health exam (PPHE). He called the PPHE “very, very, very important,” but noted with regret that it “is not very much popular [sic] in poor countries, as you can imagine.” With that reference to poor countries, he made the slip from supposedly looking for athletic advantage to claims that the process is in the service of women’s health: “It’s very easy to detect a labial fusion, clitoral enlargement, or very small vagina, or very short,” he said. “Once you detect this, you can help the athlete for diagnosis and treatment.” Not twenty minutes before Bermon described these assessments, Arne Ljungqvist had bemoaned the “humiliation” involved in the physical exams of “sex testing,” and had assured the audience that “sex testing” was over.

Multiple analyses of the genital inspections associated with “sex testing” in sport have pointed out the resonance of these exams with the historical pathologization of black women’s genitals (Nyong’o 2010; Munro 2010; Merck 2010; Jordan-Young and Karkazis 2012; Doyle 2013; Dworkin, Swarr, and Cooky 2013; Adjepong and Carrington 2014). Writing about how shifting racial and national contexts affect perceptions of sexual (a)typicality, Magubane has observed that “one thing that South African, US, and European medical texts from the seventeenth century through the twentieth seem to agree on was the fact that malformed or ambiguous genitalia, especially an enlarged clitoris or overdeveloped labia, were particularly common among women of African descent” (2014, 769). As Adjepong and Carrington note, “Colonial myths around black women’s bodies are reproduced even after the formal dismantling of western colonial regimes” (2014, 173). Colonial myths concern “pathological cultures” as well as pathological bodies, recasting violent colonial interventions as “saving” women from their own (violent and misogynist) communities. We see here a double parallel to what Ticktin documents in her critique of humanitarianism, where “both NGOs and the French state give attention to women who are subject to exceptionally violent or exoticized practices, such as excision or modern slavery, but this renders them visible as victims of cultural pathologies and hence in need of help, rescue—not equal rights” (2011, 4–5). In the instance we examine, the exoticized practice is not excision, but *failure* to excise. The women targeted for the “help” of IAAF and IOC medical teams are not thereby included as equals among other women athletes, as the official aim of intervention is to reduce athleticism among the former for the benefit of the latter.

## T as the Great Distraction

Returning to that striking image taken minutes after the 800-meter women's final ended, we can understand it within a more complex web of context. The image is more than a representation of multiple discourses circulating around the women on the podium and those at its periphery. It is also a snapshot of particular people with material lives and specific histories and locations in the intersecting orders of privilege and "rights" to winning, to privacy, to respect. In a context in which T alone is deemed to determine advantage and disadvantage, what makes sense and is valued as legitimate in this scene is the sense of injustice expressed acutely by the women who did not win the race. But women investigated for possible high T face harms that are nowhere in the picture: having their identity publicly questioned, their genitals scrutinized, the most private details of their lives subject to "assessment" for masculinity, their careers and livelihoods threatened, and being subject to pressure for medically unnecessary interventions with lifelong consequences. The narrative of harm is inverted: how does the putative advantage conferred by T matter more than concrete and demonstrable harms to people?

The stories emerging from development and implementation of this regulation are "predictable failures," which Holloway describes as "instances where medical issues and information that would usually be seen as intimate, private matters are forced into the public sphere" (2011, back cover). The intrusions are predictable precisely because hierarchies of race, gender, and nation place these women athletes far from power, and the policy-making process instrumentalizes these very hierarchies by constructing "fairness" as an objective phenomenon that could therefore be defined absent consideration of its meaning to women who would be excluded by the regulation. A regulation aimed at ensuring fairness "for all female athletes" fails to take into account the perspective of women directly affected: "None of the female athletes disqualified by prior policies were invited to attend the meetings that were held to formulate the new policies" (Viloria and Martínez-Patiño 2012, 17). Far from being objective or universal, this regulation mobilizes a version of "fairness" that is a privilege reserved for those with favored racial, gender, sexual, class, or national status. This exclusion from the purview of "fairness" is occluded by magnanimous claims of protecting health. Sport officials opportunistically move between two platforms of justification for the regulation: protecting health and protecting fairness. The women being "protected" in these two different justifications are mutually exclusive. Women with high T are not "visible" in the fairness portion of this regulation except as a threat; the "help" offered requires that they submit to the designation of "ill" despite having no health complaints (Jordan-Young, Sönksen, and Karkazis 2014). T talk thus obscures how the regulation benefits those with more power and privilege, making it look like defense against unfairness rather than the exercise of power.

T talk deflects attention from social structures and institutions, attributing the result of competitions completely to individual bodies, as though these bodies have developed, trained, and ultimately competed in some socially-neutral vacuum. At one level, the regulation harms all women athletes. It is built upon the premise that sport is a masculine domain and it is a distortion of nature for women to enter it in a serious, competitive way (Kahn 1998, Krane et al. 2004). “Sex testing” is the traditional way of policing this line, and reframing this as a rule about T obscures the fact that this regulation is still “sex testing.” The regulation has even provided a fresh occasion for an IOC policymaker to argue with a straight face that barriers to equality in sport are gone (CAS 2015).

At another level, some women are harmed in a much more direct, material, and significant way. The premise that women are a vulnerable class that needs protection is readily endorsed in this domain even by some who are otherwise champions of gender equity (e.g., Dreger, quoted in Epstein 2014), but history is full of examples of how the “female vulnerability” argument has consistently valued more privileged women (whether by class, race, gender presentation, or region) over less privileged women, who are ironically but systematically seen as less vulnerable. T talk deflects attention from the racial and regional politics of intrasex competition in women’s sport.

The IOC and IAAF frame interventions as an unmitigated good, especially because they target women from the Global South, coming from situations that Bermon and Ljungqvist have described as “lacking competence” for dealing with the conditions that are “revealed” through investigations. We must, however, attend to resonances, co-occurring narratives, and indirect logic. The designated “Centers of Excellence” are in Sweden, France, Australia, Japan, Brazil, and the United States; the athletes are repeatedly described as coming from “Africa, South America, Asia” and from “poor countries or developing countries” as opposed to the “western countries” where medical diagnosis and intervention for intersex happens at or near birth. A high-ranking IOC official told us in an interview that “these women have dangerous diseases,” underscoring the way that sport authorities frame untreated intersex variations as a seriously harmful problem. Together with the refrain that outside the West there is not the “competence” to deal with such conditions, the picture that assembles is that of a missionary relationship, and certainly resonates with a long legacy of colonialist ideologies. Emphasizing the delivery of scientific and medical prowess to women in need obscures the extremely asymmetrical power relations involved.

The interventions on athletes are not directed by their goals and needs, but by the goals of sport organizations. Neither the regulations nor any sport officials’ publications or presentations that we have encountered acknowledge the now decades-old controversies that have raged over genital surgeries and other medical interventions for intersex. The interventions performed on women in order to comply with the regulation are the same ones that adults

with intersex variations have argued against for decades, pointing out that they are driven by gender ideologies that pathologize sex atypical bodies and gender atypical behavior, and cause irreparable harm to sexual sensation and function (Karkazis 2008, Davis 2015). These complaints, delivered forcefully from individuals in countries around the world, have caught the attention of national legislative bodies and human rights organizations (Carpenter 2016, OII Australia n.d.). Moreover, high T may *signal* a medical problem but it does not *constitute* a medical problem (Karkazis et al. 2012, Jordan-Young, Sönksen, and Karkazis 2014). Physicians do not lower T in the absence of patient complaints or functional impairments. Lowering T can cause significant health problems, which can include depression, fatigue, osteoporosis, muscle weakness, low libido, and metabolic problems; these may be life-long problems, and may require hormone replacement treatments, which are both costly and often difficult to calibrate (Jordan-Young, Sönksen, and Karkazis 2014).

Beyond performing unnecessary medical interventions and violating IAAF rules, the report on the four women raises serious ethical concerns about coercion and violations of confidentiality and privacy (Jordan-Young, Sönksen, and Karkazis 2014; Sönksen et al. 2015). Implicitly addressing concerns about coercion, the IAAF regulation states that no woman is required to undergo medical intervention, but this claim is deeply misleading. The regulation applies to women in the category of elite athletes. If a woman with hyperandrogenism wishes to continue her career as an athlete, she is required to lower her T levels. If she does not, then she can no longer be in the category. Since sport authorities have no grounds to make rules about people who are not in that category, it is meaningless for them to say that women athletes do not need to have medical interventions.

Because the IOC and IAAF have delegated the obligation to investigate women to the lower-level sport authorities, when predictable failures occur, the IOC/IAAF frame these as “implementation problems” that happen under the aegis of the national federations or National Olympic Committees. For example, in Dutee Chand’s successful challenge to the IAAF regulation, any problems Chand had encountered—medical harm, violations of privacy, discrimination, psychological distress, and wrongful suspension of her career—were not inherent to the regulation itself, but to how it was implemented. Any problems could be attributed to the ineptitude and bungling of the national officials, Athletics Federation of India (AFI), and the doctors that AFI chose to examine her. This is yet another resonance with colonial ideas of the backwardness of those in the Global South.

A month before the photo that opens this essay was taken, a debate erupted on Twitter about the T regulation. Shannon Rowbury, a middle-distance runner who was goaded into speaking about the issue immediately after a race commented that “it challenges and threatens the integrity of women’s sports to have intersex athletes competing against . . . genetic women” (Rowbury 2016). Justifiably angry that Rowbury had excised women with intersex variations



from the category of women, several advocates asked her to apologize for her statement. The debate torqued and turned picking up more interlocutors until it included a sports scientist known for his spirited defenses of the regulation. One participant argued the regulation cannot be isolated from questions of race, “Even if it makes dialogue YOU want to have about it more difficult. I dont [sic] think it’s good science to isolate physiology from history + politics and race plays direct role if it contributes to who does/doesn’t get tested” (Eisenberg-Guyot 2016). The sport scientist rejected the idea and replied dismissively that race “is irrelevant to the science and so to me, the introduction of race is an intellectually lazy approach” (Tucker 2016).

No one had to introduce race; it was there all along. M’charek, Schramm, and Skinner (2014) argue that in contemporary European discourses race is an “absent presence” both normatively and methodologically. Normatively, race is “a tabooed object often removed and excluded from discourse and viewed as something that belongs to the problematic past.” Methodologically, the obfuscation of race engenders a “slippery-ness”; race “come(s) in many different guises.” The analyst’s task, then, is “to attend to things that are othered (silenced and excluded): such things do not fully go away, but might give rise to things that are (made) present” (2014, 462). Similarly, sociologist Avery F. Gordon writes of being haunted by a photograph while immersed in a project as she kept “looking for the language that could render what wasn’t easily or normally seen, what was in the blind field, what was in the shadows, what only crazy people or powerless people saw.” She struggled “to conjure, to present, to bring back to a different life what was living and breathing in the place blinded from view” (2007, 9). We have aimed here to bring forth what others do not see, cannot see, refuse to see. Foregrounding the intertwined workings of colonialism, race, and modernity reveal race as central to, not apart from, this regulation. Exposing and centering these relationships, the regulation and its effects can only be understood as intentional and as a predictable outcome of legacies that not only continue to haunt, but to harm.

**Katrina Karkazis**, a cultural anthropologist and a biomedical ethicist, is the Carol Zicklin Chair at Brooklyn College, CUNY in addition to being a senior visiting fellow at the Global Health Justice Partnership at Yale University. The author of *Fixing Sex: Intersex, Medical Authority, and Lived Experience* (Duke University Press 2008), she also served as an expert witness in Dutee Chand’s appeal at CAS.

**Rebecca Jordan-Young**, a sociomedical scientist who specializes in analysis of gender, sexuality, and race in science, is an associate professor of women’s, gender, and sexuality studies at Barnard College. She is the author of *Brain Storm: The Flaws in the Science of Sex Differences* (Harvard University Press, 2010). She and Katrina Karkazis have written extensively about the regulation of women athlete’s testosterone levels. In 2016, they were awarded collaborative Fellowships from ACLS and the Guggenheim Foundation for their forthcoming book on testosterone.



## Key

CAIS	Complete androgen insensitivity syndrome
CAS	Court of Arbitration for Sport
IAAF	International Association of Athletics Federations
ICSEMIS	International Convention on Science, Education and Medicine in Sport
IOC	International Olympic Committee
PCOS	Polycystic Ovarian Syndrome

## Acknowledgments

This paper was supported by a grant from the National Science Foundation (SES 1331123 and 1331123), a Presidential Research Award from Barnard College, and fellowships from the American Council of Learned Societies and the Guggenheim Foundation. Karkazis: This paper was written while cloaked in sadness from the death of Cedric J. Robinson. Revealing “the nastiness” here, as he called it, has been a way to grieve through writing, to write through grief, and to awaken the possibility for justice.

## Notes

1. This prelude draws on the previously published article (Karkazis 2016).

2. Here, we focus on the IAAF and the IOC regulations issued prior to 2018. The analysis applies to the IAAF’s revised regulation released in 2018, and we expect it will apply to any similar regulations targeting naturally high T in women. Likewise, because the IOC and IAAF developed their respective regulations together, are materially similar, and involve many of the same institutional actors, we use the singular noun “regulation” in this piece.

3. The T regulation concerns only higher natural levels of testosterone and not higher levels due to doping. With doping, which is regulated by the World Anti-Doping Agency, the hormones are external to the athlete’s body. The women targeted by this regulation have not introduced testosterone into their bodies.

4. “Intersex” is a term long used to refer to individuals born with atypical sex traits. In 2006, participants at a medical conference updated treatment guidelines agreed to change the nomenclature from intersex to Disorder of Sex Development (DSD) (Lee et al. 2006). Others, including IAAF and IOC officials, have sometimes used the alternative phrase “disorders of sex differentiation” for the same DSD concept. DSD has been controversial among many intersex individuals, advocates, activists, and community organizations owing to its use of “disorders,” which pathologizes atypically sexed bodies prompting imperatives for medical intervention. Many thus reject the term DSD, preferring instead intersex. In this paper, we use intersex except when quoting or referencing the regulations themselves or addressing policymakers’ use of the term DSD.

5. We are grateful to Lisa Bavington for bringing the publication by de Visser to our attention.

6. This has been confirmed through several sources including a talk given in 2012 by Stéphane Bermon, a key IAAF policymaker, at the International Convention on Science, Education and Medicine in Sport (ICSEMIS) and interviews with other policymakers.

7. Sport policymakers have variably and interchangeably used the terms “sex testing” or “sex tests,” and “gender tests” or “gender verification” to refer to the vetting of women athletes for eligibility in the female category. In this paper, unless we are directly quoting a source, we use “sex testing.” One of the key points of this paper is to show how gender ideologies are embedded in assessments of sex, including those that are thought to be “purely” biological (Kessler and McKenna 1978). Drawing on Kessler and McKenna, Westbrook and Schilt use “‘determining gender’ as an umbrella term for these diverse practices of placing a person in a gender category” (2014, 34). We are sympathetic to that usage, which points to the social nature of these processes. We opt for different usage here to clearly spotlight the fact that official regulations have aimed to link eligibility to biological criteria, in this case testosterone, and at the same time to show in detail how the assessment of testosterone and testosterone function are social phenomena.

8. We have written extensively, both separately and together, about how scientific notions of “normal” and “atypical” sex are always deeply entangled with commitments to heteronormative relationships among sex, gender, and sexuality (e.g., Karkazis 2008; Jordan-Young 2010; Karkazis et al. 2012). In this piece, we do not deal in any detail with the operations of homophobia, primarily because the techniques for assessing sexuality among women who are identified as having high T via this regulation are the most opaque of the assessments. The IAAF regulation includes six mentions of “anamnestic” data as an important element of assessing the degree of virilization. Anamnesis typically means an interview on a “patient’s” subjective medical and psychiatric history, but the term has a particularly strong history of use in sexology, where it specifically indicates an interview on the subjective experiences of gender and sexuality. The only direct indication of the content of anamnestic interviews or how they should be used to assess virilization is found in Fénelich et al., where the authors report that none of the four young women athletes “reported male sex behavior” (2013, E1056)—a confused and confusing locution that we presume means that the women did not have women sex partners. The lack of specific direction in terms of how to interpret anamnestic data is a signal that regulators believe “virilized” sexuality can simply be recognized by anyone who looks, an assumption that closely conforms to our prior observations of heteronormativity in medical science (Karkazis 2008; Jordan-Young 2010).

9. The IAAF and IOC regulation and much discussion about it use the terminology “female athletes” or “female hyperandrogenism.” The term “female” has strong biological connotations, and this may indeed be the reason that the term is preferred by sport regulators. We understand that many women athletes also refer to themselves and their competitive category as comprising “females” rather than women. Nonetheless, in this paper, we have opted to use the words “woman” or “women” rather than “female(s)” in order to highlight the fact that we are interested in social operations of gender.

10. Goya also painted a nearly identical work titled *La Maja Vestida*—the clothed maja—which portrays the same woman draped over a green divan and propped up by pillows, but this time clad in a clinging, transparent white dress. Bermon not only chose one of Goya’s *La Maja* paintings for his presentation; he chose the naked one.

11. Showing that similar progress narratives operate across political lines and domains of discourse, Magubane has offered a sustained analysis of feminist scholarship on Caster Semenya, showing that feminist and queer scholars have often perpetuated the association of modernity, knowledge, and the West.

12. Here's a sleight of hand that we do not have room to address fully in this paper: the regulation and official statements related to it not only merge high T with intersex, but flatten intersex into a singular thing. This flattening obscures a great deal of empirical and logical slippage in their rationale for the regulation.

13. Bavington notes that the IAAF regulation specifically stipulates that the "burden of proof" for partial androgen insensitivity is "put on the athlete precisely because it is so difficult to prove" (2016, 124).

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