

SEX IN SPORT

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I

INTRODUCTION

Sex classifications that sort males from females remain pervasive even as anti-discrimination law designed to achieve equality for females has chipped away at their subordinating aspects. Thus, although employers in many countries are no longer permitted to advertise jobs for men only, or to relegate female employees to second-class status based on sex differences, doctors are still required to report the sex of infants at birth; myriad forms still require us to list our sex; public restrooms continue to sort us, or ask us to sort ourselves, according to whether we are male or female; and institutions from insurance companies to schools to hospitals to prisons can and still do take sex into account.

In institutional settings that retain the classifications, where going sex-neutral is either not possible or else a disfavored policy, there is a growing movement to replace the word and idea of “sex” with the word and idea of “gender” which is understood here to mean gender identity.¹ This effort may be based in the view that sex is not binary so that sorting people this way is bad policy. It may also reflect the sense that using the word and idea of “sex” inappropriately excludes people whose gender identity does not match their biology. The Obama Administration’s decision beginning in late 2015 to read out “sex” and read in “gender identity” in its interpretation and enforcement of United States anti-discrimination laws is illustrative of both perspectives. In making this move, the Administration defined “gender identity” as “an individual’s internal sense of

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* Professor of Law, Duke Law School. B.A. Cornell University, 1982. J.D. Georgetown University Law Center, 1988. I am grateful to endocrinologists Richard Clark and Rich Auchus, cardiologist and exercise scientist Ben Levine, and biochemist and anti-doping expert Larry Bowers for their willingness to consult with me on the scientific aspects of this paper to make sure I got those right. I am also indebted to many wonderful colleagues—Matt Adler, Kate Bartlett, Erin Buzuvis, Curt Bradley, Kathy Bradley, Mary Anne Case, Walter Dellinger, Paul Haagen, Joanna Harper, Larry Helfer, Sarah Holsapple, Kim Krawiec, Nancy Leong, Maggie Lemos, Guangya Liu, Pat Shin, Wick Shreve, and Ara Wilson—who at different points in the process gave me their time and suggestions. I come at this project wearing three hats. I was an elite athlete in the earliest years of Title IX and in the race when Jarmila Kratochvilova broke the world record in the women’s 800 meters in 1983; that record still stands today and is at the center of the controversy over intersex athletes in women’s sport. Later, as a lawyer and member of USA Track & Field’s Athletes Advisory Committee, I was part of the project to establish sport’s first rigorous anti-doping programs. I am now an academic who has focused some on doping and the spirit of sport, but mostly on unrelated issues around women, children, medicine and law, including anti-discrimination law. My approach to sex in sport and to women’s-only spaces more generally comes out of this combined experience.

1. *See, e.g.,* Franciscan Alliance, Inc. v. Burwell, 227 F. Supp. 3d 660, 668 n.25 (N.D. Tex. 2016) (reflecting on the variable use of the word “gender”).

gender, which may be male, female, neither, or a combination of male and female, and which may be different from an individual's sex assigned at birth."²

Especially among social progressives, it is often assumed that this switch is cost-free or that if there are costs, these are easily outweighed by the benefits. For example, the position of the Obama Administration was that switching out sex for gender identity only contributes to the good done by anti-discrimination law by requiring the inclusion of intersex and trans people without affecting other's legitimate rights and interests.³ This position is controversial because it rests on an as-yet unresolved legal claim about others' legitimate rights,⁴ but it is strongly held by many who believe that once opponents are properly informed—about the facts and the value of equality—they will understand that this read is right.⁵

This article uses standard anti-discrimination analysis to evaluate this assumption about costs. Specifically, it argues that the issue whether erasing sex causes harm is not automatically resolved by generalizations about equality and inclusion or religion. Rather, it depends on the much more mundane work that is assessing institutional mission and the factual relevance of inherent biological differences to that mission. The analysis focuses on competitive sport's traditional sex classifications, and particularly on its commitment to setting aside the women's category for biological females only. It returns in the end to the applicability of this methodological approach to other institutional settings in which the legal and policy question whether to erase sex also arises.

2. See, e.g., *id.* at 671 and *passim* (applying this interpretation to the prohibition against sex discrimination in the Affordable Care Act); Letter from Office of Civil Rights, Department of Education, to Emily T. Prince, Esq. 2 (Jan. 7, 2015) (taking the position that schools engage in sex discrimination under Title IX when they fail to allow students to use "toilet, locker room, and shower facilities" "consistent with their gender identity").

3. See, e.g., *Franciscan Alliance*, 227 F. Supp. 3d at 673–74, 688 n.26; see also Attorney General Loretta E. Lynch, Remarks at Press Conference Announcing Complaint Against the State of North Carolina to Stop Discrimination Against Transgender Individuals (May 9, 2016), available at <https://www.justice.gov/opa/speech/attorney-general-loretta-e-lynch-delivers-remarks-press-conference-announcing-complaint> [<https://perma.cc/4KNJ-RKZ6>] (putting the Department's position in the broader historical context of anti-discrimination law).

4. See, e.g., *Franciscan Alliance*, 227 F. Supp. 3d at 677–78, 681–84 (articulating the position of the Alliance that the switch violates religious freedom); Judith Schulevitz, *Is It Time to Desegregate the Sexes?*, N.Y. TIMES (Oct. 15, 2016), <https://www.nytimes.com/2016/10/16/opinion/sunday/is-it-time-to-desegregate-the-sexes.html> [<https://perma.cc/M9BS-637G>] (noting that the Administration's position "has produced a surprisingly broad backlash, from secular feminists as well as evangelical conservatives"). The issue whether the Obama Administration's interpretation of "sex" is consistent with the executive branch's statutory authority remains unresolved. *G.G. v. Gloucester Cty. Sch. Bd.*, 869 F.3d 286, 290–91 (4th Cir. 2017) (remanded for determination of whether the case had become moot by reason of student's graduation).

5. See, e.g., Samantha Allen, *How Obama Became the Trans-Rights President*, DAILY BEAST (May 13, 2016), <https://www.thedailybeast.com/how-obama-became-the-trans-rights-president> [<https://perma.cc/AF8D-ETZB>] (making the equality argument); Katy Steinmetz, *Why LGBT Advocates Say Bathroom 'Predators' Argument Is a Red Herring*, TIME (May 2, 2016), <http://time.com/4314896/transgender-bathroom-bill-male-predators-argument/> [<https://perma.cc/V5P9-U6CX>] (making the facts argument).

Like other societal institutions, competitive sport is being challenged to replace “sex” with “identity” and specifically to allow biological males to compete as women if that is their legal or gender identity.⁶ This includes male-to-female trans athletes and male athletes with differences or disorders of sex development (DSD) who sometimes prefer to be described as “intersex.”⁷ This effort has gained important traction of late, including with the International Olympic Committee (IOC) which, in an effort to avoid the negative publicity associated with sex testing,⁸ has at least for now decided to base eligibility for the women’s category on legal identity rather than biological sex.⁹ Although no sports organization in the United States has yet gone this far, in 2016 the Obama Administration signaled that, in its enforcement of Title IX, it was going to monitor exclusions from high school and college sports consistent with its

6. See, e.g., *Dutee Chand v. Athletics Fed’n of India*, CAS 2014/A/3759, at ¶ 4 (2015) (arguing that athlete who identifies personally and legally as female should be able to compete in the women’s category without having to transition physically from male to female); Heather Hughes, *Gender-Verification Called into Question*, W. NEWS (Apr. 14, 2016), <http://news.westernu.ca/2016/04/researcher-calls-olympic-gender-verification-policies-into-question/> [https://perma.cc/37SP-43NS] (arguing that trans and intersex athletes who identify as women are all “natural women” who should be eligible for the women’s category). Although this paper focuses on competitive sport, and specifically elite competitive sport, other sports spaces are also being challenged on this point. See generally Erin E. Buzuvis, *Challenging Gender in Single-Sex Spaces: Lessons from a Feminist Softball League*, 80 LAW & CONTEMP. PROBS., no. 4, 2017, at 155 (discussing an amateur, women-only softball league grappling with questions of inclusion based on sex and gender); Camila Domonoske, *17-Year-Old Transgender Boy Wins Texas Girls’ Wrestling Championship*, N.C. PUB. RADIO (Feb. 27, 2017), <https://www.npr.org/sections/thetwo-way/2017/02/27/517491492/17-year-old-transgender-boy-wins-texas-girls-wrestling-championship> [https://perma.cc/3QD8-94BU] (reporting on high school sports grappling with questions of inclusion based on sex and gender); Jeff Jacobs, *As We Rightfully Applaud Yearwood, We Must Acknowledge Many Questions Remain*, HARTFORD COURANT (June 1, 2017), <http://www.courant.com/sports/hc-jacobs-column-yhttp://www.pineneedles-midpines.com/news/pine-needles-mid-pines-named-top-100-courses/earwood-transgender-0531-20170530-column.html> [https://perma.cc/QOQ3-VDXV] (same).

7. See *infra* Part III (explaining the biology of sex development and differentiation, defining the terms “DSD” and “intersex,” and explaining the terminology preferences of affected individuals).

8. See, e.g., David Epstein & Alice Dreger, *Letter to the Editor, Testosterone in Sports*, N.Y. TIMES (Apr. 20, 2014), <https://www.nytimes.com/2014/04/21/opinion/testosterone-in-sports.html> [https://perma.cc/WQP5-BHJX] (clarifying the data on the variability of natural testosterone); Katrina Karkazis & Rebecca Jordan-Young, *The Trouble With Too Much T*, N.Y. TIMES (Apr. 10, 2014), <https://www.nytimes.com/2014/04/11/opinion/the-trouble-with-too-much-t.html> [https://perma.cc/2PXT-AM7Q] (summarizing the controversy).

9. *IOC Regulations on Female Hyperandrogenism*, INT’L OLYMPIC COMM. (June 22, 2012), https://stillmed.olympic.org/Documents/Commissions_PDFfiles/Medical_commission/2012-06-22-IOC-Regulations-on-Female-Hyperandrogenism-eng.pdf [https://perma.cc/D2MD-HQVK]. The entire rule is reprinted in *Dutee Chand*, CAS 2014/A/3759, at ¶¶ 40–68. The IOC qualified this move by requiring biological males who identify as women to reduce their testosterone (T) levels to below the male range. *IOC Regulations on Female Hyperandrogenism*, *supra* note 9 (setting out the hyperandrogenism rule and process). Trans athletes must demonstrate that their levels have been below that range for 12+ months. See Associated Press, *IOC Rules Transgender Athletes can Take Part in Olympics Without Surgery*, GUARDIAN (Jan. 24, 2016), <https://www.theguardian.com/sport/2016/jan/25/ioc-rules-transgender-athletes-can-take-part-in-olympics-without-surgery> [https://perma.cc/9KKT-KWF2]. This condition remains in force for trans athletes but has been suspended for males with DSD, who are currently permitted to compete without condition as “women with hyperandrogenism.” See *Dutee Chand*, CAS 2014/A/3759, at ¶ 548; *infra* notes 299–312 and accompanying text (summarizing the state of the IOC’s rule); see also *infra* note 257 and accompanying text (describing the backlash).

redefinition of “sex” as “gender identity.”¹⁰ The Trump Administration has declined to follow suit,¹¹ but individual states and the private sector remain largely free to choose their own course.

Taking into account the biology of sex and sex differentiation, its relevance to competitive sport’s mission, and the merits of the challenge from the identity movement, the article makes the case for retaining sex as the basis for classification into the women’s category. Sport is committed to this approach on the view that to ensure females’ equal opportunity to compete and the institution’s ability to promote female empowerment, it is both necessary and lawful to set aside money, coaching, facilities, and events for them only. This was and remains correct. In this particular institutional space, because introducing male bodies into the women’s category would mean that females were not competitive for the win, replacing “sex” with “gender” would “be a disaster for women’s sport . . . a sad end to what feminists have wanted for so long.”¹²

The article proceeds as follows: Part II sets out the basic elements of anti-discrimination law with a focus on the analysis that applies to evaluating sex discrimination; and it establishes this analysis as the structure for the remainder of the piece. Thus, Part III on inherent differences summarizes the biology of sex and sex differentiation, emphasizing those aspects of human development and physiology that are most relevant to the discussion of sex in sport. Part IV on institutional mission focuses on the relevance of this biology to competitive sport and its goals. These include showcasing the best athletes, producing related benefits for stakeholders, and using sport as a vehicle for social change. It recognizes that replacing sex with identity in this space could contribute to a different set of also-important goals, including the inclusion and empowerment of intersex and trans people; but because sex determines competitiveness and competition is the business of sport, policymakers must choose between the two sets of goals. Analogizing the women’s category to an affirmative action set aside, it makes the feminist and utilitarian case that preserving the category for females is the highest value choice. Part V on the means-ends nexus tackles the practical problem that is sex testing in general and for sport in particular. The article concludes with some reflections on the applicability of the analysis of sex in sport to other institutional settings in which the question whether to read out sex also arises.

10. Dear Colleague Letter on Transgender Students from Catherine E. Lhamon, Assistant Sec’y for Civil Rights, U.S. Dep’t of Educ. & Vanita Gupta, Principal Deputy Assistant Attorney Gen. for Civil Rights, U.S. Dep’t of Justice (May 13, 2016), <https://www2.ed.gov/about/offices/list/ocr/letters/colleague-201605-title-ix-transgender.pdf> [<https://perma.cc/F3N9-D6WT>].

11. Dear Colleague Letter on Transgender Students from Sandra Battle, Acting Assistant Sec’y for Civil Rights, U.S. Dep’t of Educ. & T.E. Wheeler, II, Acting Assistant Attorney Gen. for Civil Rights, U.S. Dep’t of Justice (Feb. 22, 2017), <https://www2.ed.gov/about/offices/list/ocr/letters/colleague-201702-title-ix.pdf> [<https://perma.cc/JWS4-8LG4>] (reversing Obama Administration policy).

12. Tim Layden, *Is it Fair for Caster Semenya to Compete Against Women at the Rio Olympics*, SPORTS ILLUSTRATED (Aug. 11, 2016), <https://www.si.com/olympics/2016/08/11/caster-semenya-2016-rio-olympics-track-and-field> [<http://perma.cc/25PW-XZPB>] (quoting Eric Vilain, a geneticist specializing in intersex who has consulted with the International Olympic Committee on its sex testing protocols).

Throughout, I use the word “sex” to signify biological sex and its associated primary and secondary sex characteristics. I use the words “male” and “female” also in their biological sense, to signify individuals with associated sex characteristics. The relevant biology is described in detail in Part III. Finally, I use the terms “man” and “woman” to signify individuals who identify as such regardless of their biology.

II

THE ANALYTIC RUBRIC

Governments and institutions often make policy choices that discriminate either intentionally or in effect. Discrimination is not categorically good or bad, legal or illegal. Its status depends first on institutional mission and then on the means selected to achieve it.¹³

Many discriminatory choices are affirmatively good or else not controversial because they easily satisfy this analytical methodology. The institutional mission is generally well understood and respected, and the means-ends nexus is at least rational and often quite direct. For example, a government’s justice department can discriminate against non-lawyers as it seeks to fill a law job because its valuable institutional mission is undoubtedly to retain and operate through government lawyers.¹⁴ And an organ transplant consortium can discriminate on the basis of blood type in the allocation of donor organs because its critical mission is to ensure maximum organ and patient life, and giving a recipient an unmatched organ ensures precisely the opposite.¹⁵ Different or competing institutional and societal goals such as equal access to jobs and organs are also

13. See, e.g., KATHARINE T. BARTLETT, *GENDER AND LAW: THEORY, DOCTRINE, COMMENTARY* 2 (5th ed. 2010) (“[C]ourts . . . assess[] state-created sex-based classifications by examining their purposes and requiring a reasonably close fit between those purposes and the classifications in question.”).

14. For employment discrimination standards in general, see, for example, *McDonnell Douglas Corp. v. Green*, 411 U.S. 792, 800–01 (1973). Procedural aspects of the *McDonnell Douglas* decision have been superseded so that at least in the United States, the particulars of employment discrimination litigation have changed since 1973; but the essential point for which I cite the case here, that there is a “broad, overriding interest, shared by employer, employee, and consumer” in “efficient and trustworthy workmanship assured through fair and [in this case racially] neutral employment and personnel decisions” stands. *Id.* The use of qualifications as a way to discriminate among applicants is consistently viewed both as lawful and as a good idea. *Id.*; see generally, e.g., *Ricci v. DeStafano*, 557 U.S. 557 (2009) (affirming legality of “reli[ance] on objective examinations to identify the best qualified candidates”); *Price Waterhouse v. Hopkins*, 490 U.S. 228 (1989) (legitimate job qualifications are never a “forbidden factor”).

15. See, e.g., *Organ Procurement and Transplantation Network (OPTN): Ethical Principles in the Allocation of Human Organs*, U.S. DEP’T HEALTH & HUMAN SERVS. (2015), <https://optn.transplant.hrsa.gov/resources/ethics/ethical-principles-in-the-allocation-of-human-organs/> [<https://perma.cc/WP22-6J6J>] (explaining that “an allocation policy grounded in the principle of utility requires that the various goods and harms be compared using standardized outcome measures so that at least a rough estimate can be made in determining which allocation produces the greatest good.”); *How Organs are Matched*, UNITED NETWORK FOR ORGAN SHARING (2015), <https://www.unos.org/transplantation/matching-organs/> [<https://perma.cc/EL8X-ZWAP>] (detailing matching criteria by which candidates for transplantation in the U.S. are screened in and out according to applicable ethical principles).

important, and exclusions in these areas can cause harm, but where opportunities and resources are limited, discrimination on institutionally relevant grounds among people who are not similarly situated is almost always acceptable; depending on the significance of the institutional mission at issue, such discrimination may even be preferred or required.

Discrimination on the basis of race and sex is often not based on institutionally relevant grounds but rather on subordination norms, false factual assumptions and stereotypes, or comparatively weak interests.¹⁶ Because of this, and because many societies have made an affirmative commitment to the anti-subordination project in particular, policy choices that involve race and sex classifications are singled out as categorically suspect and necessitating careful scrutiny.¹⁷ Race is the paradigmatic “suspect classification” and gets the most exacting scrutiny because claims about “inherent differences” in this category are almost always false and have traditionally been used to subordinate racial minorities.¹⁸ In contrast, sex is considered a “quasi-suspect classification” and gets what is sometimes termed “intermediate”—not as exacting—scrutiny because, unlike race differences, “[p]hysical differences between men and women . . . are enduring.”¹⁹ Although the particular language used to describe the sex discrimination standard varies by country and covenant, in general an entity seeking to uphold sex classifications is required to show “at least that the [challenged] classification serves ‘important governmental objectives and that the discriminatory means employed’ are ‘substantially related to the achievement of those objectives.’”²⁰

United States Supreme Court Justice Ruth Bader Ginsburg, who as a lawyer and jurist has been a principal architect of American anti-sex discrimination law,²¹ elaborated on this standard in her majority opinion in *United States v.*

16. See BARTLETT, *supra* note 13, at 2 (focusing on this problem in the area of sex discrimination and noting that false stereotypes and subordinating principles can be “descriptive” and “prescriptive”).

17. For evidence of this commitment outside of the United States, see, for example, *Gender Equality: Your Rights*, EUR. COMM’N, http://ec.europa.eu/justice/gender-equality/rights/index_en.htm [<https://perma.cc/YV3L-GCL2>] (last visited Oct. 3, 2017) (providing an overview of European Union law in this area); *The United Nations Convention on the Elimination of All Forms of Discrimination Against Women*, UNITED NATIONS (Sept. 3, 1981), <http://www.un.org/womenwatch/daw/cedaw/text/econvention.htm> [<https://perma.cc/K4DH-DXYX>].

18. *United States v. Virginia*, 518 U.S. 515, 533 (1996).

19. *Id.*; see also BARTLETT, *supra* note 13, at 1–2, 25 (explaining the principle of formal equality, distinguishing race from sex, and summarizing the basis for the intermediate scrutiny standard).

20. *United States v. Virginia*, 518 U.S. at 533 (quoting *Wengler v. Druggists Mut. Ins. Co.*, 446 U.S. 142, 150 (1980) (those seeking to uphold sex classifications “must show ‘at least that the [challenged] classification serves important governmental objectives and that the discriminatory means employed are substantially related to the achievement of those objectives.’”); see also U.S. CONST. amend. XIV, § 1 (including the United States Equal Protection Clause); *Gender Equality*, *supra* note 17 (EU law and policy); *The United Nations Convention on the Elimination of All Forms of Discrimination Against Women*, *supra* note 17 (UN law and policy).

21. For a summary of RBG’s work in this area, including the cases she litigated as a lawyer and the decisions she authored as a judge, see, for example, *Ruth Bader Ginsburg*, OYEZ BODY POLITIC: THE SUPREME COURT AND ABORTION LAW, https://www.oyez.org/justices/ruth_bader_ginsburg [<https://perma.cc/S3UY-TGGG>] (last visited Oct. 5, 2017).

Virginia,²² explaining that “[i]nherent differences’ between men and women . . . remain a cause for celebration, but not for denigration of the members of either sex or for artificial constraints on an individual’s opportunity.”²³ Sex classifications such as “men only” or “women only” categories are unacceptable when they serve to subordinate women in ways that are not warranted by inherent differences but acceptable when they are so justified and serve the anti-subordination project. Again, in Justice Ginsburg’s words,

Sex classifications may be used to compensate women ‘for particular economic disabilities [they have] suffered,’ to ‘promot[e] equal employment opportunity,’ [and] to advance full development of the talent and capacities of our Nation’s people. But such classifications may not be used, as they once were, to create or perpetuate the legal, social, and economic inferiority of women.²⁴

They cannot “deny to women, simply because they are women, . . . equal opportunity to aspire, achieve, participate in and contribute to society based on their individual talents and capacities.”²⁵

This standard does not require formal equality or sex-blind classifications.²⁶ Such classifications are rhetorically attractive, often effective, and may make for better policy in some circumstances, but in other circumstances justice and equality are better served by affirmative actions that set aside benefits for women only.²⁷ As with race-blindness, it is sometimes the case that sex-blindness serves merely to reinforce subordination as the status quo. For example, merely eliminating sex classifications in hiring—and “men only” references in job advertisements—does not alter the advantage that men have as a result of underlying assumptions about the differences between men’s and women’s aptitudes for the work and traditional practices associated with both employee hiring and management.²⁸

This standard also presumes that “women” means females and not individuals who, regardless of their biology, identify or are identified as women.²⁹ The

22. 518 U.S. at 533.

23. *Id.*

24. *Id.* at 532 (citations omitted). *See also* Dutee Chand v. Athletics Fed’n of India, CAS 2014/A/3759, at ¶ 500 (2015) (sex discrimination in international sport is valid if it is “a reasonable and necessary response to a legitimate need”).

25. *United States v. Virginia*, 518 U.S. at 532.

26. *See* Katharine Bartlett, *Gender Law*, 1 DUKE J. GENDER L. & POL’Y 1, 2 (1994) (summarizing the principle of formal equality and illustrating its applications).

27. As gender law expert Katharine Bartlett has explained, the competing principle of substantive equality “looks to a rule’s results or effects. . . . It points out that equal treatment leads to outcomes that are unequal because of differences between men and women.” *Id.* at 4. In some forms, it “attempts to remedy the effects of past [and ongoing] discrimination” via affirmative actions and accommodations that “boost[] women into occupational fields dominated historically by men.” *Id.*

28. Carmen Nobel, *How to Take Gender Bias Out of Your Job Ads*, FORBES (Dec. 14, 2016), <https://www.forbes.com/sites/hbsworkingknowledge/2016/12/14/how-to-take-gender-bias-out-of-your-job-ads/#5296f57e1024> [<https://perma.cc/57K5-7SKW>].

29. *See, e.g.*, 42 U.S.C. § 18116(a) (2012) (Title IX); 20 U.S.C. § 1681 (2012) (incorporating binary and biological definitions of sex into Title IX’s prohibition against sex discrimination); *see also* Franciscan Alliance, Inc. v. Burwell, 227 F. Supp. 3d 660, 687–688 (N.D. Tex. 2016) (rejecting argument that “sex” includes “gender identity” in the context of Title IX).

“inherent differences” at issue are biological sex characteristics.³⁰ The question whether identity rather than biology will come to define the category for this and other purposes has been raised but not resolved; and it remains highly controversial even in the United States.³¹ What this means is that for the moment at least, biological males who identify as women may not automatically benefit from anti-subordination set asides for women. They cannot simply read themselves into the category. Rather, they must challenge and erode the case for the set asides, and in turn, because they are based in evolving anti-subordination norms, those who would defend such measures must continue to update the case in their favor.

This rubric already governs the legal analysis of competitive sport’s sex classifications, including in domestic law and at the private Court of Arbitration for Sport (CAS).³² Because it separately provides the template for a thorough and rigorous evaluation of their policy merits and of the merits of alternative classification schemes, it is used as the structure of the remainder of this article. Thus, Part III describes the inherent biological differences between males and females relevant for competitive sport. Part IV sets out sport’s institutional mission, the link between that mission and inherent differences, and the argument that sport should be permitted to continue to set aside the women’s category exclusively for females even though this choice operates to exclude intersex and trans athletes who identify as women. Part V focuses on the means sport has and should continue to use to protect the category.

III

INHERENT DIFFERENCES

THE BIOLOGY OF SEX AND DIFFERENTIATION

Sex classifications are ubiquitous across institutions and societies. Sometimes the use of sex as a basis for classifying people is simply a matter of tradition or efficiency, without regard to whether particular sex characteristics are actually related to the institutional objectives at issue. In other instances, sex classifications are important because the particular inherent differences are clear

30. 518 U.S. at 533. *See also Gender Identity Discrimination*, WORKPLACE FAIRNESS, <https://www.workplacefairness.org/gender-identity-discrimination> [<https://perma.cc/B8B6-V42P>] (last visited Oct. 5, 2017) (providing a practical summary of gender identity discrimination law in the United States, and noting that although “[t]here is also some case law interpreting sex discrimination laws to encompass gender identity in certain circumstances” it remains the case that “[d]iscrimination based on gender identity is not specifically prohibited under federal law”). *Id.* (noting that federal courts have generally held that “Congress did not intend for the word ‘sex’ to include being transgender”). *See also infra* note 56 and accompanying text (summarizing the state of the literature on the point that gender dysphoria is biologically based).

31. *G.G. v. Gloucester Cty. Sch. Bd.*, 822 F.3d 709, 731 (4th Cir. 2016) (exploring the issue whether “sex” in American federal law means just “sex,” “sex and gender,” or just “gender identity”; and noting the Obama Administration’s position that “‘sex’ means a person’s gender identity, not the person’s biological status as male or female”); *see also, generally, Franciscan Alliance*, 227 F. Supp. 3d 660 (rejecting this as a legitimate reading of “sex” in Title IX).

32. *See Dutee Chand v. Athletics Fed’n of India*, CAS 2014/A/3759, at ¶ 500 (2015).

and the institution's objectives cannot be met easily or at all without them. Understanding the biology of sex and sex differentiation is essential to being able to sort among competing claims about inherent sex differences and the relevance of sex in particular contexts, and to drawing good lines between the sexes when necessary.

* * *

The biology of sex and sex differentiation is well understood. It has a genetic basis including genetic norms and genetic anomalies, and this genetic basis influences human development, which likewise includes norms and anomalies.³³ Finally, we know that testosterone (T) is a significant player in this biological story.

Most females have a matching XX pair of chromosomes and most males have an unmatched XY pair.³⁴ According to the World Health Organization, this genetic standard is the case in all but “a few births per thousand.”³⁵ The “normal human fetus of either sex has the potential to develop either male or female organs, depending on genetic and hormonal influences.”³⁶ Specifically, “all developing embryos become feminized unless masculinizing influences [androgens] come into play at key times during gestation.”³⁷ Sex differentiation, defined in the first instance as the development of the testes, is triggered by the SRY gene which is present on the Y chromosome.³⁸

Androgens, primarily testosterone, are first produced in the undifferentiated gonadal ridge³⁹ and later mainly “by the testes and in lesser amounts by the

33. In this article I use the words “norm” and “normal” in their statistical and scientific sense.

34. *SRY Gene: Sex Determining Region Y*, U.S. NAT'L LIBR. MED., GENETICS HOME REFERENCE, <https://ghr.nlm.nih.gov/gene/SRY> [<https://perma.cc/LMW3-HL8C>] (last visited Oct. 5, 2017).

35. *Genetic Components of Sex and Gender*, WORLD HEALTH ORG., GENOMIC RES. CTR., <http://www.who.int/genomics/gender/en/index1.html> [<https://perma.cc/HW9S-JJSZ>] (last visited Oct. 5, 2017).

36. Robert D. Utiger, *Sexual Differentiation: Embryology*, ENCYCLOPEDIA BRITANNICA, <https://www.britannica.com/science/sexual-differentiation> [<https://perma.cc/GFT6-7HST>] (last visited Oct. 5, 2017).

37. *Id.* Specifically, “[b]y the sixth week of development, all embryos have both Wolffian ducts and Müllerian ducts. In this stage, the internal organs are bipotential, meaning they have the potential to develop into both male and female sex organs. The way they develop is influenced by hormones, and each fetus will have only one pair of these ducts by the end of differentiation.” *Sex Determination and Differentiation*, SEXINFO ONLINE, <http://www.soc.ucsb.edu/sexinfo/article/sex-determination-and-differentiation> [<https://perma.cc/8TXG-J653>] (last visited Oct. 5, 2017).

38. See ANTHONY S. FAUCI ET AL., HARRISON'S PRINCIPLES OF INTERNAL MEDICINE 2339–46 (17th ed. 2008). Specifically, “[t]he sex-determining region Y protein produced from this gene acts as a transcription factor” which “starts processes that cause a fetus to develop male gonads (testes) and prevent the development of female reproductive structures (uterus and fallopian tubes).” *SRY: Sex Determining Region Y*, *supra* note 34; see also FAUCI ET AL., *supra* note 38 (“The critical role of the Y chromosome and of male hormones in male orientation is well documented, the development of the female sexual differentiation occurring in the absence of male genetic determinants.”). In very rare cases, the SRY gene may present on the X chromosome, but its expression is consistent. See, e.g., Kamila Kusz et al., *Incomplete Masculinization of XX Subjects Carrying the SRY Gene on an Inactive X Chromosome*, 36 J. MED. GENETICS 452, 452 (1999) (noting that “46,XX subjects carrying the testis determining SRY gene usually have a complete male phenotype”).

39. P.C. Sizonenko, *Human Sexual Differentiation*, GENEVA FOUND. FOR MED. EDUC. & RES.,

adrenal cortex and (in women) by the ovaries.”⁴⁰ Testicular production of testosterone is primarily responsible for the difference in male and female testosterone levels, both during development and throughout the individual’s lifetime. That is, although males and females both produce testosterone, males have a lot more because the testes produce more than ovaries, adrenal glands, and cysts or tumors.⁴¹ The degree of difference is affected by developmental period, age, time of day, exertion, and other factors⁴²; as Figure 1 below reflects, the normal adult female reference range is between 12 and 61 ng/dl, and the normal adult male reference range is between 295 and 1150 ng/dl.⁴³ Depending upon the study or source, the gap between the top of the female range and the bottom of the male range is between 234 and 256 ng/dl. Note that sport has chosen to convert these numbers to nanomoles per liter. In those units, the female range is from 0.4 to 2.1 nmol/l. The male range is from 10.2 to 39.9 nmol/l. The gap is 8.1 nmol/l.⁴⁴

https://www.gfmer.ch/Books/Reproductive_health/Human_sexual_differentiation.html
[<https://perma.cc/R9MD-MMQN>] (last visited Oct. 5, 2017).

40. *Steroid Hormone: Chemical Compound*, ENCYCLOPEDIA BRITANNICA, <https://www.britannica.com/science/steroid-hormone> [<https://perma.cc/GWK9-3CMH>] (last visited Oct 5, 2017).

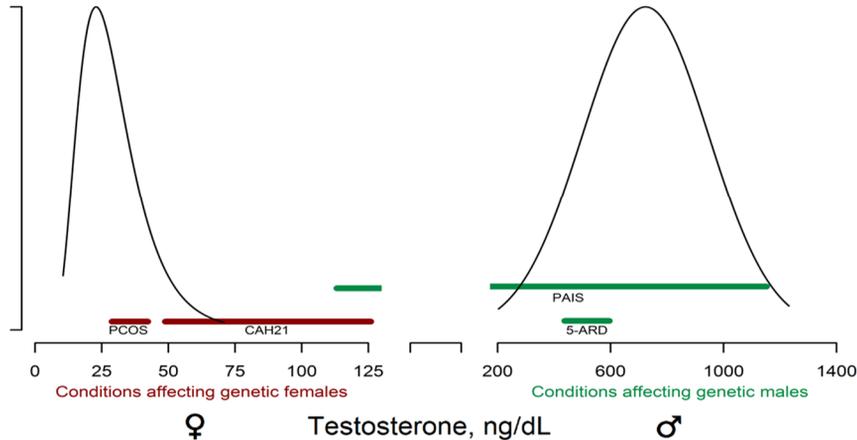
41. *See id.*; *see also infra* note 45 and accompanying text.

42. Epstein & Dreger, *supra* note 8 (noting that male T levels drop after vigorous exercise so that data from doping tests post-competition typically represent the low end of the range); *Pathology Handbook Review*, U. MICH. SCH. MED., <https://www.pathology.med.umich.edu/handbook/details.php?testID=889> [<https://perma.cc/N8UE-KTPH>] (last visited Oct. 25, 2017) (noting that there is “diurnal variation in testosterone levels in both males and females).

43. *See infra* notes 78–80 and accompanying text (discussing polycystic ovarian syndrome).

44. *Testosterone Conversion Slider*, NEBIDO, <https://www.nebido.com/en/hcp/research/testosterone-tools/conversion-tool.php> [<https://perma.cc/V52T-XUF2>] (last visited Oct. 25, 2017).

Figure 1⁴⁵
 Testosterone (T) Reference Ranges
 Sex Typical and Atypical (Intersex)



Testosterone is responsible for the development of both primary (reproductive) and secondary (phenotypic) male characteristics.⁴⁶ Primary male characteristics include the testes and penis.⁴⁷ Secondary characteristics include the “deepening of the voice and growth of facial, armpit, chest and pubic hair.”⁴⁸ They also include the effects of testosterone’s “anabolic (synthesizing and constructive, rather than degradative) function in stimulating the production of

45. Richard V. Clark et al., Post-pubertal Hormone Levels in Individuals with DSD (unpublished manuscript) (on file with author); see also Bhasin et al., *Reference Ranges for Testosterone in Men Generated Using Liquid Chromatography Tandem Mass Spectrometry in a Community-Based Sample of Healthy Nonobese Young Men in the Framingham Heart Study and Applied to Three Geographically Distinct Cohorts*, 96 J. CLIN. ENDOCRINOL. METAB. 2430, 2434–36 (2011) (plotting the normal reference range for men under 40); Haring et al., *Age-Specific Reference Ranges for Serum Testosterone and Androstenedione Concentrations in Women Measured by Liquid Chromatography-Tandem Mass Spectrometry*, 97 J. CLIN. ENDOCRINOL. METAB. 408, 408–15 (2012) (plotting the normal reference range for females under 40). Others put the top of the women’s range lower, at less than 49 ng/dl, and the bottom of the male range higher, at 305 ng/dl. Neale et al., *Adult Testosterone and Calculated Free Testosterone Reference Ranges by Tandem Mass Spectrometry*, 50 ANNALS CLIN. BIOCHEM. 159, 159–60 (2013) (going up to age 45). PCOS is not considered a DSD or intersex condition, but it is often included among those that are relevant to sport because it is the most common form of hyperandrogenemia. See Richard J. Auchus, *Endocrinology and Women’s Sports: The Diagnosis Matters*, 80 LAW & CONTEMP. PROBS., no. 4, 2017, at 130.

46. Ananya Mandal, *Testosterone Physiological Effects*, NEWS MED. LIFE SCI. (Jan. 14, 2014), <https://www.news-medical.net/health/Testosterone-Physiological-Effects.aspx> [https://perma.cc/5Q2A-6EKD].

47. *Id.*

48. *Id.*

skeletal muscles and bone as well as red blood cells.”⁴⁹ Sex differentiation in this anabolic respect occurs first in puberty where, in addition to these effects, the male heart and lungs increase in volume compared to the female heart and lungs, which in turn differentially affects maximal oxygen uptake (VO₂max⁵⁰) and thus aerobic performance.⁵¹ Testosterone also differentially effects male and female hemoglobin levels, body fat content, “the absolute ability to store and use carbohydrate,” and the development of “Type 2 muscle fibers, which are used to generate speed and power.”⁵²

Although other factors are influential, the average 10–12% performance gap between non-doped elite male and elite female athletes is almost entirely attributable to the bimodal and non-overlapping production of testosterone, including to these testosterone-driven attributes.⁵³ T levels do not correlate with

49. *Steroid Hormone*, ENCYCLOPEDIA BRITANNICA, *supra* note 40; *see also* Neel Burton, *The Battle of the Sexes*, PSYCHOL. TODAY (July 2, 2012), <https://www.psychologytoday.com/blog/hide-and-seek/201207/the-battle-the-sexes> [<https://perma.cc/7LMC-S675>] (noting that “[m]en also have denser, stronger bones, tendons, and ligaments” and “greater cardiovascular reserve, with larger hearts, greater lung volume per body mass, a higher red blood cell count, and higher haemoglobin.”).

50. VO₂ max is the common acronym for volume per time, oxygen, and maximum. There is an important sex-based difference in VO₂ max in both comparatively sedentary and comparatively trained males and females that is generally attributed to the difference in relative percentages of hemoglobin, heart size, and body fat. *See, e.g.*, Greg Crowther, *Gender and Endurance Performance*, U. WASH., <http://faculty.washington.edu/crowther/Misc/RBC/gender.shtml> [<https://perma.cc/72V4-DBYE>] (last visited Oct. 26, 2017) (summarizing the studies).

51. *See* David J. Handelsman, *Sex Differences in Athletic Performance Emerge Coinciding with the Onset of Male Puberty*, 87 CLIN. ENDOCRINOL. 68, 70–71 (2017); *see also* Rita Baron-Faust, *A Woman’s Heart: A Mystery of Science*, MEDSCAPE (July 28, 2000), <http://www.medscape.com/viewarticle/782902> [<https://perma.cc/AZM5-VEEJ>]; P. L. Hutchinson et al., *Relationship of Cardiac Size to Maximal Oxygen Uptake and Body Size in Men and Women*, 12 INT’L J. SPORTS MED. 369, 371–73 (1991); Christine L. Wells, *The Limits of Female Performance*, NAT’L ACADEMY OF KINESIOLOGY: ACAD. PAPERS (1985), http://nationalacademyofkinesiology.org/AcuCustom/Sitename/DAM/129/TAP_18_LimitsofHumanPerformance_09.pdf [<https://perma.cc/3JCW-7AWV>]; Crowther, *supra* note 50 (discussing the bases for the differential between male and female long distance runners including VO₂max, the lactate threshold, and running economy); *Physical Development in Adolescence*, LUMEN, <https://courses.lumenlearning.com/boundless-psychology/chapter/adolescence/> [<https://perma.cc/C8Z6-TQHV>] (last visited Oct. 6, 2017); Thomas Oben, *Exercise for Men and Women—How Gender Affects Results*, SHAPEFIT, <http://www.shapefit.com/exercise/men-vs-women-exercising.html> [<https://perma.cc/HQP5-D2FK>] (last visited Oct. 6, 2017) (attributing the standard 10% gap between absolute male and female performance primarily to difference in VO₂ max, including to women’s lower hemoglobin count).

52. Gina Kolata, *Men, Women and Speed. 2 Words: Got Testosterone?*, N.Y. TIMES (Aug. 21, 2008), <http://www.nytimes.com/2008/08/22/sports/olympics/22women.html?mtrref=search.yahoo.com&gwh=11D9D5F1916BBE78BCC06F74E3FF59A0&gwt=pay> [<https://perma.cc/PRG6-CB57>] (citing geneticist and exercise scientist on the point that “for a variety of intrinsic biological reasons” including these, “the best women can never run as fast as the best men”).

53. Some social scientists have argued that the reference ranges do overlap and also that testosterone is unrelated to performance. *See, e.g.*, Hughes, *supra* note 6 (quoting Janice Forsyth to this effect); Karkazis & Jordan-Young, *supra* note 8 (making the T level argument). To make the case that testosterone is unrelated to performance, they ignore the large body of experiential and empirical evidence on the constructive qualities of testosterone. *See, e.g.*, Dutee Chand v. Athletics Fed’n of India, CAS 2014/A/3759, at ¶ 463 (2015) (“The argument . . . presents a sociological opinion, which does not equate to scientific and clinical knowledge and evidence.”); Epstein & Dreger, *supra* note 8. And to make the case for overlapping reference ranges, they ignore their design and functionality. That is, they reject

performance in the formal mathematical sense; that is, having a particular T level does not guarantee that a given individual will be “x” seconds faster than if she had less T, or that she will outperform another individual also with less T. For example, some individuals with high T are not athletes and so are unlikely to outperform trained athletes with lower T. This is evident in mixed and open road races, when some elite females run faster than some non-elite males. Even among athletes, better training and preparation can ensure that individuals with relatively low T can outperform relatively high T individuals who train and prepare differently. But there is no scientific doubt that testosterone is the reason that men as a group perform better than women in sports. Indeed, this is why men and women dope with androgens.⁵⁴

Finally, although there is some disagreement about whether brain differences are best viewed as primary or secondary sex characteristics,⁵⁵ it is understood that testosterone “influences the brain via organizational and activational effects.”⁵⁶

the premise that the ranges should be based on “normal” readings so that T levels may be used for diagnostic and treatment purposes, and propose instead that they ought to reflect all “naturally occurring” readings; and they include in this category readings from individuals who are healthy and who have medical conditions requiring treatment. These arguments have gotten no traction except in circles where the science and its implications for medicine and doping are not well understood. *See, e.g., Dutee Chand*, CAS 2014/A/3759, at ¶ 497 (rejecting both arguments on the ground that they are “based on hypotheses and sociological explanation and deductions . . . not scientific or clinical data”).

54. Endocrinologists and anti-doping experts understand this point well. Their clinical experience is that the physiological effects of endogenous and exogenous testosterone match. The best-studied evidence for this point is probably a comparison of the effects of PCOS, in which ovarian tumors naturally produce excess endogenous testosterone, and the effects of exogenous testosterone ingestion by females. *See generally, e.g., E. Alexiou et al., Hyperandrogenemia in Women with Polycystic Ovary Syndrome: Prevalence, Characteristics and Association with Body Mass Index*, 29 HORMONE MOLECULAR BIOLOGY & CLINICAL INVESTIGATION 105 (2017); Grace Huang et al., *Testosterone Dose-Response Relationships in Hysterectomized Women with and without Oophorectomy: Effects on Sexual Function, Body Composition, Muscle Performance and Physical Function in a Randomized Trial*, 21 MENOPAUSE 612 (2014) (comparing effects of exogenous T use with placebo group with endogenous T); S. Livadas et al., *Prevalence and Impact of Hyperandrogenemia in 1,218 Women with Polycystic Ovary Syndrome*, 47 ENDOCRINE 631 (2014). The Court of Arbitration for Sport declined to credit this clinical experience in its consideration of the IOC’s hyperandrogenism rule. But it also found that the athlete had not met her burden of proving her hypothesis that the body responds differently to endogenous testosterone. *See Dutee Chand*, CAS 2014/A/3759, at ¶¶ 473–88.

55. *See generally, e.g., Gregory F. Ball et al., Is it Useful to View the Brain as a Secondary Sexual Characteristic?*, 46 NEUROSCIENCE & BIOBEHAVIORAL REV. 628 (2014).

56. Peter Celec et al., *On the Effects of Testosterone on Brain Behavioral Functions*, FRONTIERS (Feb. 17, 2015), <https://www.frontiersin.org/articles/10.3389/fnins.2015.00012/full> [<https://perma.cc/TS4J-J9NQ>]. As Gregory Ball et al. explain, “[t]he scientific investigation of sex differences in brain and behavior is a contentious topic. Most of the controversy relates to the occurrence of such sex differences in humans. . . . Parsing out the impact of hormones, genetics and environment on sex differences in brain and behavior is challenging even in controlled studies of inbred laboratory strains, and may be impossible to achieve with complete confidence in humans.” *Supra* note 55, at 628. Nevertheless, knowledge about the science continues to accumulate. *See also, e.g., Nick Neave & Daryl B. O’Connor, Testosterone and Male Behaviours*, 22 PSYCHOL. 28, 28–31 (2009) (explaining that “[t]he effects of any hormones on behaviour are normally described in terms of ‘organisational’ versus ‘activational’ effects” and that in the case of testosterone, these effects include “sculpt[ing] the body and the brain in a male-typical direction, and at the same time suppress[ing] female-typical development”); Olaf Hiort, *The Differential Role of Androgens in Early Human Sex Development*, BMC MED. (June 24, 2013), <https://bmccmedicine.biomedcentral.com/articles/10.1186/1741-7015-11-152> [<https://perma.cc/936U->

Specifically, “[g]onadal hormone exposure in males during early development and again from puberty onward plays a prominent role in sexually dimorphic brain formation.”⁵⁷ And exposure to testosterone has been shown to play a role in cognitive,⁵⁸ affective,⁵⁹ and behavioral⁶⁰ function. The precise mechanisms underlying these effects are complex and their details are the subject of ongoing research. Nevertheless, it is clear from the researchers’ baselines that sex imprints and is imprinted on the biology of the brain.⁶¹

Of course, testosterone is not determinative of cognition, affect, or behavior: “[H]ormones interact with social environments, and both the affective and strategic behaviors they facilitate can only be understood in terms of hormone-environmental interactions.”⁶² Thus, the point is not that sex differences in brain structure and activity are biologically fixed—as one neuroscientist put it, “You can’t pick up a brain and say, ‘that’s a girl’s brain’ or ‘that’s a boy’s brain’”⁶³—but

LTHD] (“Postnatally, both organizational (permanent) as well as activational (temporary) effects of sex steroids are seen on sexual organ function including brain structure and behavior.”); Francine Russo, *Is There Something Unique about the Transgender Brain?*, SCI. AM. (Jan. 1, 2016), <https://www.scientificamerican.com/article/is-there-something-unique-about-the-transgender-brain/> [<https://perma.cc/Y8KM-MP3Z>] (summarizing the state of the neuroscience and concluding that “[o]verall the weight of these studies and others points strongly toward a biological basis for gender dysphoria”).

57. Nirupa Goel & Tracy L. Bale, *Organizational and Activational Effects of Testosterone on Masculinization of Female Physiological and Behavioral Stress Responses*, 149 *ENDOCRINOLOGY* 6399, 6399 (2008); see also Sarah J. Heany et al., *A Quantitative Review of the Effects of Testosterone on the Function and Structure of the Human Social-Emotional Brain*, 31 *METABOLIC BRAIN DISEASE* 157, 157–67 (2015) (describing gray matter volumes in eight- to eleven-year-olds that were positively predicted by fetal testosterone levels, and in eight- to fifteen-year-olds by pre-adolescent and pubertal testosterone levels).

58. See, e.g., Daryl B. O’Connor et al., *Activational Effects of Testosterone on Cognitive Function in Men*, 39 *NEUROPSYCHOLOGIA* 1385, 1385–94 (2001) (reporting on effects of testosterone on some aspects of cognitive function in men); Neave & O’Connor, *supra* note 56, at 28–29 (summarizing the evidence on the connection between endogenous sex hormones and cognitive function).

59. See, e.g., Heany et al., *supra* note 57, at 164–65 (describing results of meta-analysis of studies examining how testosterone influences neural processes related to psychological processes including affect).

60. See generally Neave & O’Connor, *supra* note 56 (summarizing the state of the evidence on the behavioral effects of testosterone).

61. See, e.g., Hüseyin Özbey & Seref Etker, *Disorders of Sexual Development in a Cultural Context*, 11 *ARAB J. UROL.* 33, 38 (2013) (noting that “[t]he development of gender-role behaviour (complementary self-image) is influenced by the effects of the sex hormonal milieu before and during birth in the sexual differentiation of the brain, and by environmental learning” but also that “the effects of the prenatal endocrine milieu on the development of sexually dimorphic human brain is a novel field of research”); Heany et al., *supra* note 57, at 164 (“[W]hen assessing the effects of testosterone on neural activity, structure and behavior, many variables need to be considered in order to appreciate the subtleties of the effects. It is vital to consider, for example, male and female populations separately, given their non-overlapping ranges in normal testosterone levels, as well as the different levels of other hormones between men and women (e.g. estrogen, cortisol, etc.).”). See also *id.* at 157 (describing ongoing work using functional magnetic resonance imaging (fMRI) to establish the relationship between sex hormones and both organizational and activational brain activity).

62. Heany et al., *supra* note 57, at 157–58; see also Ball et al., *supra* note 55, at 628 (noting the difficulty of “parsing out the impact of hormones, genetics and environment on sex differences in brain and behavior”).

63. This quote comes from a wonderful editorial written by Elinor Burkett in response to Bruce

rather simply that these differences do exist, and if the point is to know and understand them thoroughly, hormones—which are fixed absent clinical intervention—cannot be ignored on the basis that they compromise a particular political strategy or because we worry that recognizing them will provide false support for longstanding deleterious stereotypes.⁶⁴ Indeed, the strategy in the context of competitive sport, at least so long as sex categories are used as an organizing principle, should be to understand the scope and effect of the relevant biology as best as possible so that, in turn, we can understand the extent to which the performance gap between male and female athletes is itself also fixed.

Genetic and developmental anomalies can alter individual development in all of these respects.⁶⁵ These anomalies were historically known as “hermaphroditism,” a word which comes from the Greek “Hermaphroditos” after “the son of Hermes and Aphrodite, who . . . was loved by the nymph Salmacis so ardently that she prayed for complete union with him and as a result they were united bodily, combining male and female characteristics.”⁶⁶ The term encompassed both so-called “true” and “pseudo” hermaphrodites, that is, in the former instance individuals “in which reproductive organs of both sexes are present”⁶⁷ and in the latter “having internal reproductive organs of one sex and external sexual characteristics resembling those of the other sex or being ambiguous in nature.”⁶⁸ Medical experts in the modern era have traditionally used the term “disorders of sex development” or, more recently, “differences of

Jenner’s pre-transition declaration that “he knew he was transgender” because “My brain is much more female than it is male.” Elinor Burkett, *What Makes a Woman?*, N.Y. TIMES (June 6, 2015), <https://www.nytimes.com/2015/06/07/opinion/sunday/what-makes-a-woman.html> [<https://perma.cc/TSL6-KUAE>] (quoting Gina Rippon (“The differences between male and female brains are caused by the ‘drip, drip, drip’ of the gendered environment.”)).

64. Compare *id.* with Doriane Lambelet Coleman, *The Alchemy of a Moral Discourse on the Biology of Gender: Historical Sensitivity, Genetic Literacy, and the Will to Imagine a Different Equality*, 11 CARDOZO WOMEN’S L.J. 543, 546, 548–51 (2005) (response to Harvard University President Lawrence Summers’s suggestion that “intrinsic aptitude” is a partial explanation for the dearth of women in science and engineering departments). In her piece, Burkett reacts to Jenner’s reference to her “female brain”: “I have fought for many of my 68 years against efforts to put women—our brains, our hearts, our bodies, even our moods—into tidy boxes, to reduce us to hoary stereotypes.” Burkett, *supra* note 63. I agree with Burkett that it can be risky to acknowledge sex differences including perhaps especially brain differences, but the fact that it may be risky does not change the underlying biology. And if understanding that is relevant to making good policy, in my view it ought to be on the table.

65. Although this article examines the case for including intersex and trans athletes in the women’s category in competitive sport, in this summary of the biology of sex, I focus on intersex conditions because these have been the focus of ongoing study for over a century, whereas the biology of gender dysphoria is not yet well understood. See *supra* note 56 (summarizing the current state of the biological evidence). I also focus on intersex because apart from any differences in brain development between males and trans women, the latter are otherwise biologically male.

66. *Hermaphrodite*, BRITISH DICTIONARY (2017).

67. *Id.*

68. *Pseudohermaphrodite*, DICTIONARY.COM, <http://www.dictionary.com/browse/pseudohermaphrodite> [<https://perma.cc/2U4C-TY2K?type=image>] (last visited Oct. 26, 2017). For a history of the early medical treatment of hermaphrodites in England and France, see ALICE DOMURAT DREGER, *HERMAPHRODITES AND THE MEDICAL INVENTION OF SEX* (1998).

sex development” (DSD).⁶⁹ Many individuals with DSD prefer to describe themselves as “intersex” in recognition of the facts that aspects of their bodies are neither normally male nor female but rather “in between”; some DSDs have no adverse physiological effects and have been unnecessarily medicalized; and they may not identify in a binary way as male or female.⁷⁰ Others prefer the term DSD, for example because their condition requires treatment or because they do identify as male or female.⁷¹ Although it is potentially misleading in a biological sense—with the extremely rare exception of so-called “true hermaphrodites” or “ovo-testicular disorder” everyone with a DSD is either male or female—at the request of a particular group of advocates, sport began to use the term “intersex” in 2010.⁷²

There are many different intersex conditions, but as provided in Figure 1 above, four are of particular concern for sport.⁷³ Two of these, congenital adrenal hyperplasia (CAH) and polycystic ovarian syndrome (PCOS), can cause hyperandrogenism—T levels above the top of the female reference range—in

69. See John C. Achermann & J. Larry Jameson, *Disorders of Sexual Development*, in HARRISON'S PRINCIPLES OF INTERNAL MEDICINE 2339, 2339–45 (17th ed. 2008) (medical text explaining normal sexual development and ways this development can go awry, including descriptions of disorders of chromosomal, gonadal, and phenotypic sex); *Why is ISNA using “DSD”?*, INTERSEX SOCIETY N. AM. (May 24, 2006), <http://www.isna.org/node/1066> [<https://perma.cc/D72X-GMJL>] (discussing the different terminology including in its medical and social contexts).

70. *Why is ISNA using “DSD”?*, *supra* note 69; see also DREGER, *supra* note 68, *passim*; KATRINA KARKAZIS, *FIXING SEX: INTERSEX, MEDICAL AUTHORITY, AND LIVED EXPERIENCE* 1–14, *passim* (2008) (summarizing this important claim and its grounds); Hida Vilorio & Dana Zzyym, *How Intersex People Identify*, ORG. INTERSEX INT'L U.S. (July 10, 2015), <http://oii-usa.org/2719/how-intersex-people-identify/> [<https://perma.cc/5J47-BVVQ>] (noting that “some of us who were born intersex also identify as such” because we don't have “binary gender identities”; and also that intersex people are not necessarily given the choice to identify as gender fluid: “Given the limited options, and the fact that many intersex children are even more pressured to identify as either boys or girls than their non-intersex peers, it's easy to see why many of us would do so as adults.”).

71. See, e.g., *What is Useful About the Terminology of DSD? What is Unhelpful?*, ACCORD ALLIANCE, www.accordalliance.org/learn-about-dsd/faqs/ [<https://perma.cc/5DWA-C8MN>] (last visited Oct. 26, 2017) (The terms “intersex” and “hermaphrodite” are problematic because “they seem[] to imply a specific type of identity . . . when, in fact, often the condition did not form a critical aspect of a patient's identity. By contrast to these older terms, the term DSD refers to a condition that a person *has*, not who the person *is*. It seeks to put the person first.”); *Explaining Disorders of Sex Development and Intersexuality*, AM. ACAD. PEDIATRICS, <https://www.healthychildren.org/English/health-issues/conditions/genitourinary-tract/Pages/Explaining-Disorders-of-Sex-Development-Intersexuality.aspx> [<https://perma.cc/PR8C-AXYW>] (last visited Oct. 26, 2017) (noting that “previously, DSDs were called ‘intersex’ conditions. This means ‘between the sexes.’ However, this term felt uncomfortable to some people who identified themselves as strongly male or strongly female.”).

72. See KARKAZIS, *FIXING SEX*, *supra* note 70, at 11 (explaining that it is not “natural” to treat intersex as a separate category); Kelly O'Mara, *Who Gets to be a Woman in the Olympics?*, CAL. MAG. (Aug. 11, 2016), <https://alumni.berkeley.edu/california-magazine/just-in/2016-08-11/who-gets-be-woman-olympics> [<https://perma.cc/QGF2-AU3Q>] (“At a 2010 International Olympic Committee (IOC) meeting on the topic, [Hida] Vilorio [of the Organization of Intersex International] lobbied for [Caster] Semenya's right to compete without altering her body and petitioned the IOC not to refer to intersex athletes, or athletes with hyperandrogenism, as ‘people with sex disorders.’”).

73. See generally JOHN C. ACHERMANN & IEUAN A. HUGHES, *PEDATRIC DISORDERS OF SEX DEVELOPMENT*, WILLIAMS TEXTBOOK OF ENDOCRINOLOGY 893–963 (2016) (detailing pediatric disorders of sex development); Auchus, *supra* note 45, at 128–31.

46,XX females. Although PCOS is not the result of a developmental difference, it is grouped with CAH in this context because it affects 46,XX females and for its hyperandrogenic effects. Two other conditions, 5-alpha reductase deficiency (5-ARD) and androgen insensitivity syndrome (AIS), can cause undervirilization—T levels at the lower end or below the bottom of the male reference range—in 46,XY males.

Congenital adrenal hyperplasia (CAH) “is the most common condition in newborns with DSD, accounting for 60–70% of all cases.”⁷⁴ CAH is “a group of disorders . . . that affect the adrenal glands” causing them to “produce excess androgens” as a result of a deficiency in the hydroxylase enzyme.⁷⁵ As a result, 46,XX females with CAH can have T levels above the female reference range—“hyperandrogenism”—which can in turn trigger doping positives under elite sport protocols.⁷⁶ However, because the condition is also associated with important health effects including, depending on the type, cortisol deficiency, hypertension, and salt wasting, affected individuals are unlikely to be significantly represented in the elite athlete population.⁷⁷

Polycystic ovarian syndrome (PCOS) affects approximately 4% of genetic females. Like CAH, PCOS can cause hyperandrogenism and thus trigger doping positives under competitive sport protocols.⁷⁸ In this instance, ovarian cysts rather than the adrenal glands are responsible for producing the excess androgens.⁷⁹ But because PCOS is also associated with important health effects, including low VO₂ max, obesity, and metabolic abnormalities, individuals with the condition are again unlikely to be significantly represented in the elite athlete population.⁸⁰

In contrast with CAH and PCOS, both 5-ARD and AIS involve individuals who are genetically and gonadally male—46,XY with functioning testes—but who have either ambiguous or phenotypically female external genitalia and thus are often identified at birth and raised as girls. Whether their endogenous androgens are bioavailable determines, among other things, whether their secondary sex characteristics are male or female. Regardless, because their T

74. Özbey & Etker, *supra* note 61, at 34.

75. *Congenital Adrenal Hyperplasia due to 11-beta Hydroxylase Deficiency*, U.S. NAT'L LIBR. MED., GENETICS HOME REF., <https://ghr.nlm.nih.gov/condition/congenital-adrenal-hyperplasia-due-to-11-beta-hydroxylase-deficiency> [<https://perma.cc/9Z44-BCDQ>] (last visited Oct. 26, 2017).

76. See *supra* note 45 and *infra* notes 299–302 and accompanying text (setting out these boundaries).

77. *Congenital Adrenal Hyperplasia*, *supra* note 75; see Auchus, *supra* note 45, at 135–36; see also *21 Hydroxylase Deficiency*, U.S. NAT'L LIBR. MED., GENETICS HOME REF., <https://ghr.nlm.nih.gov/condition/21-hydroxylase-deficiency> [<https://perma.cc/QM3Q-YWH8>] (last visited Oct. 26, 2017) (describing CAH due to 21-hydroxylase deficiency).

78. See *supra* note 45 and *infra* notes 299–302 and accompanying text.

79. See *Polycystic Ovary Syndrome*, U.S. NAT'L LIBR. MED., MEDLINE PLUS <https://medlineplus.gov/polycysticovarysyndrome.html> [<https://perma.cc/H4R9-4QUW>] (last visited Oct. 26, 2017).

80. *Id.*; see also Auchus, *supra* note 45, at 130, 135; *Disorders of Sexual Differentiation: A Consensus Statement*, WOMEN'S SPORT INT'L (June 2010), http://www.sportsbiz.bz/womensportinternational/conferences/documents/2010_June_Baltimore_DSD.pdf [<https://perma.cc/L6G3-6B6H>].

levels are in the male range, individuals with these conditions who seek to compete in the women's category will trigger positives under doping and sex testing protocols.⁸¹ Because their principal health effect is infertility, which is not athletically debilitating, individuals with these conditions may be significantly represented in elite sport.

5-ARD is caused by a genetic mutation in the SRD5A2 gene, which in turn causes a deficiency in the enzyme 5-alpha reductase.⁸² 5-alpha reductase is necessary for the conversion of testosterone to dihydrotestosterone.⁸³ Dihydrotestosterone "has a critical role in male sexual development, and a shortage of this hormone disrupts the formation of the external sex organs before birth."⁸⁴ Individuals with this condition:

classically present with striking ambiguity of the genitalia, with a clitoral-like phallus, markedly bifid scrotum, pseudovaginal perineoscrotal hypospadias, and a rudimentary prostate. Occasionally, patients can appear more masculinized; they may lack a separate vaginal opening, and have isolated penile hypospadias or even a penile urethra. The uterus and fallopian tubes are absent because of the normal secretion of the müllerian-inhibiting factor. Testes are intact and are usually found in the inguinal canal or scrotum; however, cryptorchidism is frequently described with testes occasionally located in the abdomen.⁸⁵

81. At least one early paper suggested the view that "individuals raised as females" with these conditions were believed to have "no unfair physical advantage and should not be unfairly excluded [from elite sports competitions] or stigmatized." Louis J. Elsas et al., *Gender Verification of Female Athletes*, 2 GENETICS MED. 249, 250 (2000). It is unclear from the available record what led to this sense, although one may speculate that it was based on the fact that the DSD experts consulted were not familiar with sport, the field of exercise science, and in particular the causes of the performance gap. It may also have been the case that by "raised as females" they understood that the affected individuals would already have had gonadectomies, since this was mostly the authors' and the Western experience. See, e.g., *id.* at 251, Table 1 (reflecting this fact as late as 1996). Finally, it is possible that the authors knew that these conditions confer unusual performance advantages but held the normative position they were not "unfair" from a policy perspective because the affected individuals had been raised as females. In any event, today it is well understood that unless they have had gonadectomies, individuals with 5-ARD and partial AIS have T levels in the male range and these levels confer the anabolic and performance advantages enjoyed by biological males without DSD. P Fénichel et al., *Molecular Diagnosis of 5-Alpha-Reductase Deficiency in 4 Elite Young Female Athletes through Hormonal Screening for Hyperandrogenism*, 98 J. CLIN. ENDOCRINOL. METAB. 1055, 1055–59 (2013); see also *supra* note 45 and *infra* notes 299–302 and accompanying text (describing these protocols). Thus, the fairness of including them in the women's category is very much in contention.

82. *5-Alpha Reductase Deficiency*, U.S. NAT'L LIBR. MED., GENETICS HOME REF., <https://ghr.nlm.nih.gov/condition/5-alpha-reductase-deficiency> [<https://perma.cc/7CAB-VFFF>] (last visited Oct. 26, 2017). One study has pegged the overall incidence at one per 100,000. Fénichel et al., *supra* note 81, at 1058. According to the Genetics Home Reference, "[l]arge families with affected members have been found in several countries, including the Dominican Republic [DR], Papua New Guinea, Turkey, and Egypt." *5-Alpha Reductase Deficiency*, *supra* note 82; see also Haley Pollock, *Why are so Many Boys in this Small Town Raised as Girls? The Intersex Children of Salinas*, SECOND NEXUS (Oct. 29, 2015), <http://secondnexus.com/social-commentary-and-trends/the-intersex-children-of-salinas/> [<https://perma.cc/WD89-HRY8>] (reporting on the DR town's 5-ARD incidence rate of 1:9).

83. *5-Alpha Reductase Deficiency*, *supra* note 82.

84. *Id.*

85. Anna H. Isfort et al., *5-Alpha-Reductase Deficiency*, MEDSCAPE (Nov. 11, 2016), <https://emedicine.medscape.com/article/924291-overview>; see also *5-Alpha Reductase Deficiency*, *supra* note 82 [<https://perma.cc/4N6E-873T>] (summarizing the structural effects of 5-ARD).

Both because their external genitalia may be deceiving and for cultural reasons, primarily the view that males with unusually small penises are unlikely to be socially successful,⁸⁶ “[c]hildren with 5-alpha reductase deficiency are often raised as girls.”⁸⁷ However, because they are otherwise biologically male—their testes produce endogenous, bioavailable testosterone—they typically experience normal development of secondary male sex characteristics in puberty.⁸⁸ Moreover, “exposure of the brain to testosterone *in utero* and postnatally appears to contribute substantially to the formation of male-gender identity, despite the effect of a female sex of rearing.”⁸⁹ As a result, “[a]bout half of these individuals adopt a male gender role in adolescence or early adulthood.”⁹⁰

AIS is caused by a genetic mutation in the AR gene which in turn causes androgen insensitivity; affected individuals present with either complete or partial feminization despite functioning testes and male levels of circulating testosterone.⁹¹ According to the United States Library of Medicine’s Genetics Home Reference, “complete” AIS

86. KARKAZIS, FIXING SEX, *supra* note 70, at 9 (noting that “the treatment for intersexuality exemplifies attempts to codify normality and abnormality” and providing as an example the question “[a]re some penises too small for a male gender assignment?”); *id.* at 100 (explaining that the decision to identify boys with small penises as girls at birth is based in “stigma attached to bodies that fail to measure up to social criteria defining a virile male and the limited possibilities for ‘correcting’ such an abnormality”); Perri Klass, *As Boys Get Fatter, Parents Worry one Body Part is too Small*, N.Y. TIMES (Aug. 29, 2016), <https://well.blogs.nytimes.com/2016/08/29/as-boys-get-fatter-parents-worry-one-body-part-is-too-small/?mtref=search.yahoo.com&gwh=0168BCC12AFC6912F5165ED79C0C6869&gwt=pay> [<https://perma.cc/UED4-NWC9>] (discussing typical reactions to micropenis); *cf.* Özbey & Etker, *supra* note 61, at 36 (explaining that “Eastern societies are different from those in Europe” with respect to the treatment of DSDs, and specifically that in the former, “a parental preference for the male gender is as, if not more, important than the individual’s sexual potential” and thus there is a tendency to assign the male sex at birth regardless of the child’s genital ambiguities); Shoshana Tell, *Intersex Management in the United States and Non-Western Cultures*, 30 EINSTEIN J. BIOL. MED. 6, 9–11 (2015) (describing the range of approaches worldwide).

87. *5-Alpha Reductase Deficiency*, *supra* note 82; *see also* Özbey & Etker, *supra* note 61, at 36 (“5-AR deficiency is another example of 46,XY DSD, in which patients are born with female-appearing external genitalia and raised as girls. Pubertal virilisation occurs secondary to the increased production of other isoenzymes, allowing the conversion of testosterone to dihydrotestosterone.”); Pollock, *supra* note 82 (describing this choice and transition as it occurs in the town of Salinas in the Dominican Republic, which has a particularly high incidence of 5-ARD).

88. According to the Genetics Home Reference, “[d]uring puberty, the testes produce more testosterone. Researchers believe that people with 5-alpha reductase deficiency develop secondary male sex characteristics in response to higher levels of this hormone.” *5-Alpha Reductase Deficiency*, *supra* note 82.

89. Özbey & Etker, *supra* note 61, at 36.

90. *5-Alpha Reductase Deficiency*, *supra* note 82.

91. Genetics Home Reference says that “[m]utations in the AR gene cause androgen insensitivity syndrome. This gene provides instructions for making a protein called an androgen receptor. Androgen receptors allow cells to respond to androgens, which are hormones (such as testosterone) that direct male sexual development. Androgens and androgen receptors also have other important functions in both males and females, such as regulating hair growth and sex drive. Mutations in the AR gene prevent androgen receptors from working properly, which makes cells less responsive to androgens or prevents cells from using these hormones at all.” *Androgen Insensitivity Syndrome*, U.S. NAT’L LIBR. MED., GENETICS HOME REF., <https://ghr.nlm.nih.gov/condition/androgen-insensitivity-syndrome> [<https://perma.cc/6X6J-2B93>] (last visited Oct. 26, 2017).

occurs when the body cannot use androgens at all. People with this form of the condition have the external sex characteristics of females, but do not have a uterus and therefore do not menstruate and are unable to conceive a child (infertile). They are typically raised as females and have a female gender identity. Affected individuals have male internal sex organs (testes) that are undescended, which means they are abnormally located in the pelvis or abdomen.⁹²

In contrast, “mild” and “partial” AIS “result when the body’s tissues are partially sensitive to the effects of androgens.”⁹³ Individuals with the mild or “minimal” form “are phenotypically male; the most common symptom is infertility. Mild gynecomastia or mild impairment of virilization may be present.”⁹⁴ Individuals with the partial form (PAIS) “can have normal female sex characteristics, both male and female sex characteristics, or normal male sex characteristics. They may be raised as males or as females, and may have a male or a female gender identity.”⁹⁵

In social settings where intersex conditions are identified at birth and parental counseling on the social sex assignment takes place,

[m]ost multidisciplinary treatment teams for DSD currently recommend a male sex of rearing in under-androgenised 46,XY males with ambiguous genitalia due to 5-AR deficiency, and . . . partial AIS, because there is growing evidence for increased gender dysphoria and gender change in these conditions. More than 60% of 5-AR-deficient patients and half of 17BHS-3-deficient patients assigned as females in infancy ultimately change their gender role at puberty, due to virilisation and associated problems.⁹⁶

In the past, especially in the West, the standard of care in such settings was generally to remove the testes surgically to facilitate the child’s development as a female.⁹⁷ If those individuals ultimately became elite athletes, they would test positive for male chromosomal sex but not for T levels in the male range.⁹⁸ Of course in many locales around the world, intersex conditions are not identified at birth or, because of cultural accommodations or resources, are not medicalized.⁹⁹

Although there is some dispute at the margins, it is generally accepted that anomalies arise in one per 1,500 births¹⁰⁰; in other words, more than 99% of the

92. *Id.*

93. *Id.* (the combined frequency of both complete and partial AIS is approximately one per 10,000).

94. *Mild, Partial or Complete Androgen Insensitivity Syndrome*, UROLOGY TEXTBOOK, <http://urology-textbook.com/androgen-insensitivity.html> [<https://perma.cc/JA8H-KE2A>] (last visited Oct. 26, 2017).

95. *Androgen Insensitivity Syndrome*, *supra* note 91.

96. Özbey & Etker, *supra* note 61, at 37–38.

97. See KARKAZIS, *FIXING SEX*, *supra* note 70, at 7–11; Özbey & Etker, *supra* note 61, at 36; Tell, *supra* note 86, at 6–7.

98. See generally Elsas et al., *supra* note 81 (describing the results at the 1996 Games).

99. Tell, *supra* note 86, at 9–11.

100. Depending on the source and how the numbers are derived, the range seems to be from .05% to 2% of the population. See *How Common is Intersex, An Explanation of the Stats*, ORG. INTERSEX INT’L: U.S. (Apr. 1, 2015), <http://oii-usa.org/2563/how-common-is-intersex-in-humans/> [<https://perma.cc/6UJV-HWFW?type=image>] (the standard estimation is approximately “1 in 1500 to 1 in 2000 births”); see also Alice Domurat Dreger, “*Ambiguous Sex*”—or *Ambivalent Medicine?*, 28 HASTINGS CTR. REP. 24, 26 (1998) (citing the figure 1 in 1500 births and explaining the issues involved in the calculations). Of course, the incidence rate for purposes of this article and sex in sport is a lot lower

time, an individual's biological sex traits are fully concordant: their genetic sex (XX or XY), gonadal sex (hormonal activity), and phenotypic sex (external genitalia) are all either typically male or typically female, and the individual is identified accordingly at birth. Consistent with "their non-overlapping ranges in normal testosterone levels"¹⁰¹—12 to 61 ng/dl for females and 295 to 1150 ng/dl for males¹⁰²—graphing these data results in a distinct bimodal distribution. Almost all data points on that distribution represent individuals who fit neatly into one of two categories: male or female. A relative few—between .1 and 1%—do not fit so neatly and are distributed in between, or, intersex.

The incidence of intersex conditions most relevant for sport—5-ARD and PAIS—is much lower, and thus taking only these into account would make the bimodal distribution clearer. On the other hand, adding individuals with gender dysphoria¹⁰³ to intersex would grow the incidence of sex atypical individuals. Their particular incidence is not yet well understood; for example, about one half of one percent (.6%) of Americans are said to identify as trans, but because of the stigma still associated with the condition, this percentage likely reflects a degree of underreporting.¹⁰⁴ Nevertheless, even if it eventually doubles so that the combined incidence of intersex and trans is approximately 1–2%, the bimodal distribution remains distinct.

This biology, including the bimodal distribution, is the basis for the ubiquity of sex as a societal taxonomy, including in sport, and also of the widely-held view that sex is binary. It is also the basis for the assumption that sport has traditionally made, that line drawing for its particular purposes is scientifically clean and easy work: individuals either have testes and bioavailable testosterone outside of the

since only four and primarily two conditions are at issue. Indeed, removing CAH from the calculus more than halves the population incidence rate. *See supra* notes 74–77 and accompanying text.

101. Heany et al., *supra* note 57, at 165.

102. *See supra* note 45 and accompanying text.

103. *What is Gender Dysphoria?* AM. PSYCHIATRIC ASS'N (Feb. 2016), <https://www.psychiatry.org/patients-families/gender-dysphoria> [<https://perma.cc/AX7F-ZLAD>]. Gender dysphoria "involves a conflict between a person's physical or assigned gender and the gender with which he/she/they identify." As the American Psychiatric Association (APA) explains, "[t]he gender conflict affects people in different ways. It can change the way a person wants to express their gender and can influence behavior, dress and self-image. Some people may cross-dress, some may want to socially transition, others may want to medically transition with sex-change surgery and/or hormone treatment. Socially transitioning primarily involves transitioning into the affirmed gender's pronouns and bathrooms." *Id.* Importantly, "[g]ender dysphoria is not the same as gender nonconformity, which refers to behaviors not matching the gender norms or stereotypes of the gender assigned at birth." *Id.* Although a biological basis for gender dysphoria has not yet been established, the evidence for this is accumulating. *See, e.g.,* Russo, *supra* note 56 (discussing brain sex). The condition is included here because if it is established that gender dysphoria is biologically-based, trans people will likely contribute to a recalculation upwards of the incidence of intersex.

104. Jan Hoffman, *Estimate of U.S. Transgender Population Doubles to 1.4 Million Adults*, N.Y. TIMES (June 30, 2016), <https://www.nytimes.com/2016/07/01/health/transgender-population.html> [<https://perma.cc/UU6F-HXJJ>] (reporting on "an analysis based on new federal and state data"); *see also* Andrew R. Flores et al., *How Many Adults Identify as Transgender in the United States*, WILLIAMS INST. (June 2016), <https://williamsinstitute.law.ucla.edu/wp-content/uploads/How-Many-Adults-Identify-as-Transgender-in-the-United-States.pdf> [<https://perma.cc/5Y3E-FZTJ>] (providing the original analysis).

female range that build a male body, or they don't. Parts III and IV below elaborate on the relevance of these inherent differences.

IV INSTITUTIONAL MISSION

Like many other societal institutions, competitive sport has long used sex as a taxonomy, classifying individuals as either male or female. In the beginning females were classified out of sport—that is, they were excluded entirely because of sex. When they were finally included, it was in separate segregated events. Despite the proliferation of open competitions and the advent of some mixed events, sex segregation remains the approach today.¹⁰⁵ The early history reflected a combination of antiquated gender norms and a sometimes-erroneous sense of the physical capacities of the female body.¹⁰⁶ The modern approach may continue to incorporate traditional norms, especially in international competition which necessarily contemplates the kaleidoscope of cultural and religious perspectives of the Olympic Movement's member states. But it is mostly rationalized on the basis of sport's institutional goals which include providing equal opportunity for females in and lifting females up through sport, and on the fact that because of inherent differences, this goal cannot be met without continuing to separate the sexes. Replacing sex with gender identity across all institutions would satisfy a different set of also-important goals, but these are in tension with sport's institutional mission: in sport, you cannot simply make this switch or get rid of classifications altogether and arrive at the same ends. Institutional acts of sex segregation and discrimination should always be viewed with suspicion and subject to rigorous challenge, but where these are necessary to the attainment of valuable institutional goals, as the women's category is in sport, they are lawful and should be affirmed.

105. Open competitions are those in which males and females compete at the same time—for example, in a road race—but results are classified according to sex. Mixed competitions are those in which males and females compete directly; for example, in a tennis mixed doubles match in which each doubles team has one male and one female.

106. See Richard C. Bell, *A History of Women in Sport Prior to Title IX*, SPORT J. (Mar. 14, 2008), thesportjournal.org/article/a-history-of-women-in-sport-prior-to-title-ix/ [https://perma.cc/CAA5-4SQT] (detailing this history in the U.S.); *Key Dates in the History of Women in the Olympic Movement*, INT'L OLYMPIC COMM., <https://www.olympic.org/women-in-sport/background/key-dates> [https://perma.cc/2NKC-76K8] (last visited Oct. 26, 2017); see also Roger Robinson, *The Legacy of Joan Benoit Samuelson's Olympic Marathon Win*, RUNNER'S WORLD (Aug. 5, 2014), <http://www.runnersworld.com/print/newswire/the-legacy-of-joan-benoit-samuels-olympic-marathon-win> [https://perma.cc/992N-E7C5] (noting the historical significance and implications of the first women's Olympic marathon at the 1984 Los Angeles Games); see also Mary Anne Case, *Heterosexuality as a Factor in the Long History of Women's Sports*, 80 LAW & CONTEMP. PROBS., no. 4, 2017, at 25, 28 (making clear that while the focus of histories of women's inclusion in competitive sport typically begin in the late 1800s-early 1900s, there is a longer, interesting story).

A. The Goals of Competitive Sport

Competitive sport's institutional goals are to showcase the best athletes, to produce related benefits for stakeholders, and to use sport as a means to spread certain values throughout society. In all three respects, sport seeks specifically to reverse societies' traditional subordination of women by providing females with opportunities for equal treatment and empowerment. It has chosen to fulfill this mission by classifying athletes according to their sex and setting aside the women's category for females only.

1. Showcasing the Best Athletes

American jurist, academic, and public intellectual Richard Posner captured competitive sport's original goal perfectly when he wrote that the institution was "designed to highlight, isolate, and display one or more" of the "hierarchies of height, strength . . . agility, physical coordination, beauty, [and] brilliance . . . and to invite our admiration for the athletes who occupy the highest rungs."¹⁰⁷ This original design focused on promoting individual competitors and on facilitating society's admiration for the best among them. In particular, the design focused both on competitors' athletic performance and on the aesthetics of the perfected human body. Thus, athletes in Ancient Greece competed for laurels in footraces, field events, and contact sports, and "were naked when they [did], to display their physical prowess and also to pay homage to Zeus by showing him how they had trained their bodies to their physical peak."¹⁰⁸ The emphasis on the perfection of the body related to its capacities for performance, but it was more than that: "[E]xternal beauty represented each competitor's internal beauty and demonstrated their desire for a balance between body and mind."¹⁰⁹

Although featuring the aesthetics of the perfected human form is no longer a consistent or explicit goal for sports' governing bodies, as Posner's encapsulation suggests, for athletes and those who would market and admire them, "athletic prowess" and "external beauty" often continue to go in tandem.¹¹⁰ Indeed, as sculpture and painting across the centuries and the modern focus on athletes' bodies demonstrates, striving toward and admiring physical perfection—however that is defined in any given period and place—seems either to be a natural and adaptive human trait or at least a more-or-less constant norm. Posner himself argues that "human delight" in "hierarchies" is "innate" and that "[t]he origins of this innate delight are, plausibly, evolutionary."¹¹¹ He also argues that this

107. Richard A. Posner, *In Defense of Prometheus: Some Ethical, Economic, and Regulatory Issues of Sports Doping*, 57 DUKE L.J. 1725, 1729 (2008).

108. *Ancient Olympia History: Athletic Contests, Olympia Greece Online City Guide*, OLYMPIA, GREECE, <http://www.olympia-greece.org/contests.html> [<https://perma.cc/MW8E-42BW>] (last visited Dec. 1, 2016).

109. *Id.*

110. See also, e.g., *Bodies We Want 2016*, ESPN, http://www.espn.com/espn/photos/gallery/_id/16797886/image/1/bodies-want-2016-bodies-want-2016 [<https://perma.cc/4LPM-8YRQ>] (last visited Oct. 26, 2017) (featuring male and female athletes in motion in the nude).

111. Posner, *supra* note 107, at 1729.

tendency is “not only natural in a Darwinian sense but compellingly sensible from a social perspective” because, among other things, hierarchies in sport as in art are “a test of biological potential.”¹¹²

In the beginning sport sought only to display male bodies and hierarchies and to invite admiration for the best among men.¹¹³ Today sport seeks also to display female bodies and hierarchies, and to invite admiration for those who occupy their highest rungs.¹¹⁴ Because male athletes in almost all modern sports and events go significantly faster and higher and are significantly stronger than female athletes,¹¹⁵ the only way to accomplish these ends is to segregate athletes on the basis of biological sex. Any other option that has males and females competing together works mainly to highlight, isolate, and display male bodies and hierarchies. As sports scientist Ross Tucker and other relevant experts have emphasized, “[w]ithout a women’s category, elite sport would be exclusively male.”¹¹⁶

As Part III details, testes and bioavailable testosterone in the male range build and sustain the male body, first in utero and then in puberty. The male body is different from the female body in many respects, but the differences that matter

112. *Id.* (internal citation omitted).

113. *See supra* note 106 and *infra* note 165 and accompanying text.

114. *See supra* note 106 and *infra* note 165 and accompanying text.

115. *See* Robinson Meyer, *We Thought Female Athletes Were Catching Up to Men but They’re Not*, ATLANTIC (Aug. 10, 2012), <http://www.theatlantic.com/technology/archive/2012/08/we-thought-female-athletes-were-catching-up-to-men-but-theyre-not/260927/> [<https://perma.cc/2WKP-EKWF>] (detailing the performance gap); *supra* Part III (explaining underlying biology).

116. Ross Tucker, *The Caster Semenya Debate*, SCI. SPORT (July 16, 2016), <http://sportsscientists.com/2016/07/caster-semenya-debate/> [<https://perma.cc/5A8Z-7W56>]; *see also* Kolata, *supra* note 52 (citing cardiologist and exercise scientist Ben Levine); Layden, *supra* note 12 (quoting geneticist Eric Vilain). Nancy Leong and others disagree that sex classifications are the only solution to the performance gap. For example, Leong argues that sports and events could be re-designed so that women’s sports de-emphasize physical attributes like power, strength, and speed—traditionally male sex traits. Nancy Leong, *Against Women’s Sports*, WASH. U. L. REV. (forthcoming 2018), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2923503 [<https://perma.cc/SY24-XRKZ>] (“[S]ex segregation uncritically prioritizes athletic activities involving strengths typically associated with male bodies, without forcing us to ask why we view these strengths as the most important in the first place.”). It is absolutely right that modern sports and events were designed with the male body in mind and that elite female athletes mostly compete in those same sports and events. *See* Posner *supra* note 107, at 1729 (“[S]ports . . . isolate and exhibit innate hierarchies, most of which are closely related to the hierarchies that fascinated primitive man—hierarchies of the traits that promote success in hunting and fighting.”). It is also possible that the best females could be competitive for the win if, for example, the focus in swimming competitions was not on the pool but on longer, open water events where female-friendly physical attributes like endurance and buoyancy are privileged over strength and speed. *See FINA Open Water Swimming Grand Prix 2017*, FED’N INT’L DE NATATION (Sept. 3, 2017), <http://www.fina.org/competition-detailed-results/136224/24441> [<https://perma.cc/JX7A-RSDP>] (providing results of men’s and women’s 16 kilometer races). Because of this sexist history and the possibilities, as well as the goods that could flow from integrated events where females could compete for the win, elite sport should be creative and continually seek to develop and promote such events. At the same time, it is the case today and likely for the foreseeable future that society will continue to invest most heavily in traditional sports and events where the performance gap is largely immutable. It is also possible that females could not be competitive for the win even in redesigned events unless these completely eliminate strength, speed, and power as relevant attributes. Because of this, a continued focus on assuring equal opportunity for females in traditional arenas is essential.

for sport go to power, speed, and endurance. They include skeletal structure, muscle composition, heart and lung capacity including VO₂ max, red blood cell count, body fat, and the absolute ability to process carbohydrates.¹¹⁷ Although some social scientists and athletes argue otherwise,¹¹⁸ these sex characteristics are the biological basis for the average 10–12% performance gap between elite male and elite female athletes.¹¹⁹ Stereotype and discrimination certainly affect some female athletes' results, but not the baseline differential.¹²⁰

For example, no matter how great the great Katie Ledecky gets—and she is said to be “better at swimming than anyone is at anything”¹²¹—she will never beat Michael Phelps or his endurance counterparts in the pool.¹²² Ledecky's

117. See *supra* notes 49–53 and accompanying text.

118. See generally, e.g., Erin Buzuvis, *Hormone Check: Critique of Olympic Rules on Sex and Gender*, 31 WIS. J. L. GENDER & SOC'Y 29 (2016) (arguing that the performance gap is a social construct and citing colleagues in the academy who have taken this position); Eve Simmons, *These Women Say They Were Kicked Out of Sports Because of Their Gender*, VICE: BROADLY (Dec. 18, 2015), https://broadly.vice.com/en_us/article/9ae4ne/trans-and-intersex-women-kicked-out-of-sports [<https://perma.cc/M6P2-UWAJ>] (quoting trans athlete Kristen Worley who insists that sex classifications “exist without any scientific reasoning” and are simply “a socially constructed model to suggest that women cannot compete with men”). Katrina Karkazis, in particular, makes this argument and provides as evidence the fact that some event times at the 2009 World Championships in athletics overlapped. See Katrina Karkazis et al., *Out of Bounds: A Critique of the New Policies on Hyperandrogenism in Elite Female Athletes*, 12 AM. J. BIOETHICS 3, 7–8 (2012). This reflects a lack of relevant knowledge. Men's middle and long distance events in championship races tend to be highly tactical and as such finish times are often very slow. What matters here is the medal, not the time. This is in contrast with events on the professional circuit. For instance, in Diamond League races, where personal bests and world records are rewarded in addition to the win. The men's 1500 Meters Final at the Rio Games exemplifies this tendency. See, e.g., Sarah Lorge Butler, *Men's 1500: Matthew Centrowitz Gets First U.S. Gold Since 1908*, RUNNER'S WORLD (Aug. 20, 2016), <http://www.runnersworld.com/print/olympics/mens-1500-matthew-centrowitz-gets-first-us-gold-since-1908> [<https://perma.cc/2K7V-C4J7>] (noting that split times until the final 400 meters were slow even in comparison to non-elite women's times). Because females don't have the same explosive power and speed as men, they don't have the luxury of running so tactically, and so championship times in the women's category tend to be fast. No female could have been competitive over the final lap of the 2016 Olympic Men's 1500 Meters Final, which Centrowitz completed in 50.62 seconds, a competitive women's 400 meters time. Jeré Longman, *How Matt Centrowitz Won a Historic 1,500 Meters*, N.Y. TIMES (Aug. 21, 2016), <https://www.nytimes.com/2016/08/22/sports/olympics/matt-centrowitz-won-1500-meters-metric-mile.html> [<https://perma.cc/C3HT-MBY7>]; INT'L ASS'N OF ATHLETICS FED'NS, IAAF 2016 TOP LIST WOMEN'S 400 METERS, IAAF.org <https://perma.cc/T5RL-G7UE?type=image>] (last visited Oct. 26, 2017).

119. See *Dutee Chand v. Athletics Fed'n of India*, CAS 2014/A/3759, at ¶ 518 (2015) (“The difference in athletic performance between males and females is known to be predominantly due to higher levels of androgenic hormones in males.”); Kolata, *supra* note 52 (citing geneticist and exercise scientist Ben Levine on the point that “for a variety of intrinsic biological reasons, the best women can never run as fast as the best men”); Meyer, *supra* note 115 (detailing the performance gap).

120. See, e.g., Ben Rothenberg, *Tennis's Top Women Balance Body Image With Ambition*, N.Y. TIMES (July 10, 2015), <http://www.nytimes.com/2015/07/11/sports/tennis/tennis-top-women-balance-body-image-with-quest-for-success.html> [<https://perma.cc/FZT3-ESH3>] (examining the reluctance of some players to lift weights, how this choice may affect performance, and using Serena Williams, Angelique Kerber, and Sabine Lisicki as examples of women who do).

121. Dave Sheinin, *Opinion: How Katie Ledecky Became Better at Swimming than Anyone is at Anything*, WASH. POST (June 24, 2016), https://www.washingtonpost.com/sports/olympics/how-katie-ledecky-became-better-at-swimming-than-anyone-is-at-anything/2016/06/23/01933534-2f31-11e6-9b37-42985f6a265c_story.html?utm_term=.9d56f1a28337 [<https://perma.cc/3FU3-YL35>].

122. Kevin Loria, *Katie Ledecky is Redefining the Limits of Athletic Performance*, BUS. INSIDER

celebrated world record in the 800 meters freestyle is 8:04.79—more than thirty-two seconds slower than the men’s world record by Zhang Lin at 7:32.12.¹²³ Lin would be finishing when Ledecky was making the turn into the final lap.¹²⁴ Critics of the sex categories are correct, of course, that there is no level playing field within them¹²⁵; indeed, as Posner’s statement of sport’s design indicates, competition is meant precisely to showcase “*hierarchies* of . . . talents and abilities.”¹²⁶ But the critics are wrong that it does not exist as between males and females. In this context, what is level or even is that everyone is the same sex: they either have testes and bioavailable testosterone outside of the female range or they don’t. Elite sport set out purposefully to compare like to like in that respect, and then to establish and showcase the hierarchies within the category.¹²⁷ That is when Katie Ledecky shines. That is when she is a lap ahead rather than a lap behind the nearest competition.¹²⁸

These same sex characteristics also explain why many non-elite males are competitive with and often better than elite females. For example, “[m]ost of the women’s world records [in athletics], even doped, lie outside the top 5000 times run by men. [Paula] Radcliffe’s marathon WR [2:15:25] . . . is beaten by between 250 and 300 men per year.”¹²⁹ In 2016, 470 men but no women ran faster, and the best time of the year by a woman—2:19:41—was surpassed by over 800 men.¹³⁰

(Aug. 12, 2016), <http://www.businessinsider.com/katie-ledecky-olympics-swimming-swimmer-2016-8> [<https://perma.cc/7YQ3-9WY8>].

123. *FINA 50-m pool World Records*, FED’N INT’L DE NATATION (Aug. 3, 2016), https://www.fina.org/sites/default/files/wr_50m_aug_3_2016.pdf [<https://perma.cc/4KEW-AHMX>].

124. For a graphic example of this distance difference from within the women’s category, see Larry Buchanan et al., *Katie Ledecky and the Eternity of 11 Seconds*, N.Y. TIMES (Aug. 12, 2016), <https://www.nytimes.com/interactive/2016/08/12/sports/olympics/katie-ledecky-winning-swims.html> [<https://perma.cc/J9H6-99RH>].

125. The argument that the level playing field is “illusory” is ubiquitous in the statements and writings of social scientists and advocates working in this area, all of whom use as support the fact that athletes differ in their biological and environmental strengths and weaknesses aside from sex. *See, e.g.*, Dutee Chand v. Athletics Fed’n of India, CAS 2014/A/3759, at ¶ 503 (2015) (anthropologist and bioethicist Katrina Karkazis using this particular expression in her argument on Dutee Chand’s behalf at CAS); Cheryl Cooky et al., “*What Makes a Woman a Woman?*” *Versus “Our First Lady of Sport”: A Comparative Analysis of the United States and the South African Media Coverage of Caster Semenya*, 37 J. SPORT & SOC. ISSUES 31, 39 (2013) (academic in sociology and gender studies arguing that “sport is not a level playing field”); Ruth Padawer, *The Humiliating Practice of Sex-Testing Female Athletes*, N.Y. TIMES MAG. (June 28, 2016), <http://www.nytimes.com/2016/07/03/magazine/the-humiliating-practice-of-sex-testing-female-athletes.html> [<https://perma.cc/5K5B-ZVJR>] (journalist specializing in gender and society making a version of the same argument and suggesting that allowing relatively poor intersex athletes with high T levels to compete in the women’s category might compensate for their poverty).

126. Posner, *supra* note 107, at 1729–30 (emphasis added); *see also* Doriane Lambelet Coleman & James E. Coleman, Jr., *The Problem of Doping*, 57 DUKE L.J. 1743, 1768 (2008) (discussing this aspect of Posner’s analysis).

127. *See Dutee Chand*, CAS 2014/A/3759, at ¶¶ 35, 508, 510, 514, 533; Elsas et al., *supra* note 81, at 250–53 (setting out the history of Olympic sport and this intentional division to assure “fair play”). Sport could make a different policy choice, of course. But as I argue below, simply switching out sex for identity without more would do serious damage to societies’ different anti-discrimination goals.

128. *See* Buchanan et al., *supra* note 124.

129. Tucker, *supra* note 116 (emphasis added).

130. *Compare* INT’L ASS’N OF ATHLETICS FED’NS, IAAF 2016 TOP LIST MEN’S SENIOR OUTDOOR

The women's 100, 400, and 800 meters records, which—unlike the marathon record—are widely considered to be the product of doping,¹³¹ are beaten by literally hundreds of men each year, including by many high school boys.¹³²

Importantly, the performance gap holds even when we adjust for the fact that the best elite athletes are “freaks of nature”¹³³ and that their success can be

MARATHON, <https://www.iaaf.org/records/toplists/road-running/marathon/outdoor/men/senior/2016> [https://perma.cc/2QVL-JMED] (last visited Oct. 26, 2017) with INT'L ASS'N OF ATHLETICS FED'NS, IAAF 2016 TOP LIST WOMEN'S SENIOR OUTDOOR MARATHON, <https://www.iaaf.org/records/toplists/road-running/marathon/outdoor/women/senior/2016> [https://perma.cc/6UBG-M6CR] (last visited Oct. 26, 2017).

131. It is widely accepted that in women's track events, “the world record ledger . . . is shut tight. From 100m to 800m it has been a closed book since the 1980s.” Simon Turnbull, *After a Quarter of a Century, Koch Remains Untouchable*, INDEPENDENT (Sept. 4, 2010), <http://www.independent.co.uk/sport/general/athletics/after-a-quarter-of-a-century-koch-remains-untouchable-2070743.html> [https://perma.cc/5CL4-7WKK] (focusing on these three events). It is also widely accepted that the reason the “ledger is shut tight” is that records at issue were the product of doping. *Id.* Sport did not begin drug testing seriously and systematically until after the Ben Johnson scandal at the 1988 Olympics in Seoul; until then, the governing bodies were happy to turn a blind eye to the pervasive problem. Jeré Longman, *Unbelievable Performances: A Special Report; Widening Drug Use Compromises Faith in Sports*, N.Y. TIMES (Dec. 26, 1998), <http://www.nytimes.com/1998/12/26/sports/unbelievable-performances-special-report-widening-drug-use-compromises-faith.html> [https://perma.cc/M7PN-FJF8] (setting out the history of drug use and testing). Athletes in that period “never failed a drug test” because doping control was first non-existent and later circumvented. *See id.* (providing this caveat); *see also* Matt Lawton, *How Athletics is Still Scarred by the Reign of the Chemical Sisters*, DAILY MAIL (Aug. 6, 2012), <http://www.dailymail.co.uk/sport/olympics/article-2184608/How-athletics-scarred-reign-chemical-sisters.html> [https://perma.cc/6HPU-4K9Y] (same); Turnbull, *supra* note 132 (same).

132. The women's 100, 400, and 800 meters records are 10.49, 47.60, and 1:53.28, respectively. INT'L ASS'N OF ATHLETICS FED'NS, IAAF 2017 TOP LIST WOMEN'S SENIOR OUTDOOR 100 METERS, <https://www.iaaf.org/records/toplists/sprints/100-metres/outdoor/women/senior/2017> [https://perma.cc/4EHS-EPLF]

(last visited Oct. 30, 2017); INT'L ASS'N OF ATHLETICS FED'NS, IAAF 2017 TOP LIST WOMEN'S SENIOR OUTDOOR 400 METERS, <https://www.iaaf.org/records/toplists/sprints/400-metres/outdoor/women/senior/2017> [https://perma.cc/E4PR-LVKP] (last visited Oct. 30, 2017); INT'L ASS'N OF ATHLETICS FED'NS, IAAF 2017 TOP LIST WOMEN'S SENIOR OUTDOOR 800 METERS, <https://www.iaaf.org/records/toplists/middlelong/800-metres/outdoor/women/senior/2017> [https://perma.cc/97G3-MYG9] (last visited Oct. 30, 2017).

Just in the U.S. and just in 2016, ten high school boys ran faster than 10.41; ten high school boys ran faster than 46.36; and ten high school boys ran faster than 1:49.76. TRACK & FIELD NEWS, TRACK & FIELD NEWS 2016 HIGH SCHOOL ABSOLUTE LIST – MEN, https://trackandfieldnews.com/index.php/tafn-lists?list_id=6&sex_id=M&year=2016 [https://perma.cc/WM42-UF8H] (last visited Oct. 26, 2017). Internationally, twenty boys under eighteen ran faster than 10.47 in the 100 meters, thirty ran faster than 47.51 in the 400 meters, and thirty ran faster than 1:51.75 in the 800 meters.

INT'L ASS'N OF ATHLETICS FED'NS, IAAF 2016 TOP LIST MEN'S U18 OUTDOOR 100 METERS, <https://www.iaaf.org/records/toplists/sprints/100-metres/outdoor/men/u18/2017> [https://perma.cc/LW8D-BKCG] (last visited Oct 30, 2017); INT'L ASS'N OF ATHLETICS FED'NS, IAAF 2016 TOP LIST MEN'S U18 OUTDOOR 400 METERS, <https://www.iaaf.org/records/toplists/sprints/400-metres/outdoor/men/u18/2017> [https://perma.cc/DNH5-STTQ] (last visited Oct 30, 2017); INT'L ASS'N OF ATHLETICS FED'NS, IAAF 2016 TOP LIST MEN'S U18 OUTDOOR 800 METERS, <https://www.iaaf.org/records/toplists/middlelong/800-metres/outdoor/men/u18/2017> [https://perma.cc/V58Z-EE64] (last visited Oct. 30, 2017).

No elite females came close. (100 Meters Women #1 ranking 10.70, 400 Meters Women #1 ranking 49.44, 800 Meters Women #1, #2, and #3 ranking held by athletes assumed to be intersex at 1:55.28 to 1:56.92, #4 ranking 1:57.43). For further discussion of the controversy over the 800 meters in particular see *infra* notes 232–236 and accompanying text.

133. Lindsay Gibbs, *The Importance of Cheering for Caster Semenya*, THINK PROGRESS (Aug. 18, 2016), <https://thinkprogress.org/caster-semenya-rio-olympics-intersex-9c5ffe659946/>

largely attributed to their unusual physical traits. Sex, specifically testes and their effects, matter in ways that other biological differences among athletes do not.¹³⁴ For example, swimmer and multiple Gold Medalist Missy Franklin is six feet two inches tall¹³⁵ with a wingspan of six feet four inches.¹³⁶ Her world record in the 200 meters backstroke, set at the 2012 Summer Olympics in London, is 2:04.06. Ryan Lochte's world record, set at the 2008 Olympics in Beijing, was a full nine seconds faster at 1:53.94.¹³⁷ If Franklin had been in that race, at her best she would have been about half a lap behind Lochte when he finished, even though they are the same height and have just about the same wingspan.¹³⁸ In a world in which competitors were categorized by height and wingspan—or just height or just wingspan—instead of sex, Franklin would not have had a world record; she would not have been on the podium; in fact, she would not have made the team. In those circumstances, we might not even know her name.¹³⁹

[<https://perma.cc/TS94-R6SP>].

134. This point is not legitimately in dispute. *See supra* notes 53–54 and 115–143 (detailing the biological basis for the performance gap). I address it here because some social scientists and advocates have analogized sex to other biological traits and this has gotten some traction amongst those who do not know or reject the associated biology. *See, e.g.*, J. Michael Bostwick & Michael J. Joyner, *The Limits of Acceptable Biological Variation in Elite Athletes: Should Sex Ambiguity Be Treated Differently From Other Advantageous Genetic Traits?*, 87 MAYO CLINIC PROC. 508, 508–12 (2012) (starting with the premise that an intersex athlete who identifies as female is female, and then on that basis arguing that her higher testosterone levels are no different from other genetic advantages; Padawer, *supra* note 125 (comparing T levels to, among other things, “exceptionally long limbs, flexible joints, large hands and feet”); *see also supra* note 125 (using the fact of these other biological variations to support the argument that the level playing field in sport is illusory)).

135. *See Missy Franklin Biography*, PLAYERS WIKI, <https://playerswiki.com/missy-franklin> [<https://perma.cc/5D58-MJV8>] (last visited Oct. 26, 2017).

136. Amy Shipley, *Missy Franklin*, WASH. POST (Mar. 22, 2012), https://www.washingtonpost.com/sports/olympics/missy-franklin-has-body-built-for-speed/2012/02/15/gIQAAtHT7RS_story.html?utm_term=.4100d735deca [<https://perma.cc/3S3M-XNZ5>]; *see also* Sean Kernan & Brent Wornoff, *Lochte Facing Duel in Gene Pool*, GAINSVILLE SUN (July 28, 2012), <http://www.gainesville.com/news/20120727/lochte-facing-duel-in-gene-pool> [<https://perma.cc/7QNN-9CH7>] (explaining the significance of height and wingspan to the sport of swimming).

137. *Ryan Lochte Shatters World Record in 200m Backstroke*, OLYMPIC COMM., <https://www.olympic.org/videos/ryan-lochte-shatters-world-record-in-200m-backstroke> [<https://perma.cc/689K-XCHH>] (last visited Oct. 26, 2017). Lochte's textile best is even faster, at 1:52.96. *See* John Craig, *A Comparison of Textile Bests to World Records*, SWIMMING WORLD (Apr. 10, 2012), <https://www.swimmingworldmagazine.com/news/a-comparison-of-textile-bests-to-world-records/> [<https://perma.cc/T6C7-RSY2>] (explaining the difference between unofficial textile records and official tech-suit records and putting Lochte's textile record in context).

138. Steve Lochte, Ryan's father and longtime coach, puts Ryan's wingspan under 6'4", that is, shorter than Franklin's. *See* Kernan & Wornoff, *supra* note 136 (Steve Lochte estimating that Ryan Lochte's wingspan is “somewhere in the low 70-inch range”). Another source (a tailor via an entertainment news website) puts Lochte's wingspan at 78 inches, which would be slightly longer than Franklin's at 6'5". Andy Neuenschwander, *WWRLD Sneak Peek: Ryan Lochte's Big Speech and Bigger Wingspan*, ENEWS (Apr. 23, 2013), http://www.eonline.com/shows/what_would_ryan_lochte_do/news/410913/wwrld-sneak-peek-ryan-lochte-s-big-speech-and-bigger-wingspanMOREha [<https://perma.cc/27DD-9KPJ>].

139. *See* Ben Fischer, *Marketing Missy Franklin*, SPORTS BUS. DAILY (Apr. 25, 2016), <http://www.sportsbusinessdaily.com/Journal/Issues/2016/04/25/Olympics/Missy-Franklin.aspx> [<https://perma.cc/G4D7-NP4T>].

Although this point is easiest to prove in the case of sports with finite and definitive metrics like swimming and running, it is well understood within sport that a version of this story can be told across the board, almost no matter the event.¹⁴⁰ This is why, “even though some scientists once predicted that women would eventually close the gender gap in elite performances—it was proposed that all they needed was more experience, better training and stronger coaching—that idea is now largely discredited, at least for Olympic events.”¹⁴¹ As geneticist and IOC consultant Eric Vilain has emphasized, it is why “[w]e separate men and women into categories . . . we want women to be able to win some competitions. There is a 10–12% difference between [elite] male and [elite] female athletic performance.¹⁴² We need to categorize with criteria that are relevant to performance.”¹⁴³

Competitive sport’s goal of isolating and displaying female bodies and hierarchies, and inviting admiration for the athletes who occupy their highest rungs, has been challenged by some opponents of the sex categories who suggest that it is a pretext for policing femininity.¹⁴⁴ This is a legitimate critique if by

140. See Meyer, *supra* note 115.

141. Kolata, *supra* note 52; see also Meyer, *supra* note 115 (“Training, talent and a competitive drive can take women only so far . . . there are some biological factors that cannot be overcome.”) (quoting Dr. Benjamin Levine); Wells, *supra* note 51, at 81 (making the point that these intrinsic differences are “impossible to totally avoid” at the outset of a study focusing on the limits of female aerobic and anaerobic performance); cf. Janet S. Fink et al., *Challenging the Gender Binary? Male Basketball Practice Players’ Views of Female Athletes and Women’s Sports*, 19 *SPORT SOC’Y* 1316, 1324–29 (2016) (representing a failed attempt from social science to debunk this biology).

142. See Part III and notes 115–132 and accompanying text (explaining the biological basis for this gap and discussing the false claim from the social sciences that it is a social construct). The average difference between non-elite males and elite females will be smaller than 10–12%, but as provided above, a relevant performance gap will remain. See *supra* notes 129–132 and accompanying text (explaining that non-elite males can consistently beat elite females) and *infra* notes 227–229 and 237–238 and accompanying text (discussing the size of the performance gap in cases involving non-elite males competing against elite females).

143. Layden, *supra* note 12.

144. Critics have also charged that this goal is racist. See, e.g., Katrina Karkazis, *One-Track Minds: Semenya, Chand & the Violence of Public Scrutiny*, *MEDIUM* (July 19, 2016), <https://medium.com/@Karkazis/medias-one-track-mind-semenya-chand-the-violence-of-public-scrutiny-1aa6d1a08454> [<https://perma.cc/K6JP-FRQC>]; David Smith, *Caster Semenya Row: Who are White People to Question the Makeup of an African Girl?: It is Racism*, *GUARDIAN* (Aug. 22, 2009), <https://www.theguardian.com/sport/2009/aug/23/caster-semenya-athletics-gender> [<https://perma.cc/S8BP-KWJT>]; *World Champion Caster Semenya ‘is a Hermaphrodite with no Womb or Ovaries’ – Australian Newspaper’s Shock Claims over Gender-Row Runner*, *DAILY MAIL* (Sept. 13, 2009), <http://www.dailymail.co.uk/sport/othersports/article-1212568/World-champion-Caster-Semenya-hermaphrodite-womb-ovaries-Australian-newspapers-shock-claims-gender-row-runner.html> [<https://perma.cc/N9RR-RSGS>] (publishing the results of Semenya’s leaked sex test). This criticism is strategic and also disingenuous, as black and brown females are pervasive and celebrated throughout competitive sport, including in the West. Tori Bowie, Michelle Carter, Simone Manuel, and Ibtihaj Muhammad of the United States are just a few recent examples from the American experience and across the tonal spectrum. Track and Field Athletes Bowie and Carter, swimmer Manuel, and fencer Muhammad were all on the 2016 U.S. Olympic Team. U.S. OLYMPIC COMM., 2016 U.S. OLYMPIC TEAM, <http://www.teamusa.org/road-to-rio-2016/team-usa/athletes> [<https://perma.cc/ZW56-RWUZ>]

(last visited Oct. 30, 2017). All won Gold and are celebrated as role models. The suggestion that athletes with male bodies who identify as female are “masculine” not “feminine” is made regardless of race and

“policing femininity” we mean reserving the women’s category only for females and then inviting particular admiration for those stars whose bodies have “feminine” cultural cache: fit and strong but also pretty, or sexy, or maternal, or—depending on the audience and its cultural preferences—modest.¹⁴⁵ This focus tends by definition to exclude or minimize the exposure of stars who do not fit these models and, in the view of some critics, at least implicitly to denigrate or shame other bodies.¹⁴⁶ Commentators have also criticized the ways in and extent

ethnicity. See, e.g., Lauren Johnston, *German Player Sarah Gronert Embroiled in Gender Controversy*, N.Y. DAILY NEWS (Mar. 20, 2009), <http://www.nydailynews.com/sports/german-tennis-player-sarah-gronert-embroiled-gender-controversy-article-1.370527> [<https://perma.cc/8WKN-KB7Z>] (reporting on the reaction to white, blond, German tennis player Sarah Gronert, who was challenged by her competitors in the same year as Semenya).

145. See JR Thorpe, *Is the Focus on ‘Body-Baring’ Sports at the Olympics Sexist?*, BUSTLE (Aug. 10, 2016), <https://www.bustle.com/articles/177855-is-the-focus-on-body-baring-sports-at-the-olympics-sexist> [<https://perma.cc/NY57-L37J>] (exploring the idea of “an ‘acceptable’ female body” in sport, noting that it tends to favor “feminine” forms, and critiquing that tendency on the basis that it “ignores the diversity of both sport and the possibilities of female excellence”). Again, Bowie, Carter, Manuel, and Muhammad are illustrative, as are the perennial favorites of modern sport and its promoter partners—the gymnasts and, increasingly, the beach volleyball players. Michelle Carter, the first U.S. woman to win Gold in the shot put, is simultaneously celebrated for her victory and her femininity—her nickname is “Shot Diva”—and criticized for her weight. She has seized the opportunity to be a role model for “different bodies” and the press and sponsors have embraced her in return. See, e.g., Julie Mazziotta, *Hillary Clinton Shares Body Positive Message from USA’s First Shot Put Gold Medalist*, PEOPLE (Aug. 15, 2016), <http://people.com/sports/hillary-clinton-shares-body-positive-message-from-usa-shot-put-gold-medalist/> [<https://perma.cc/5GV9-EPST>]; Mary Pilon, *You Throw, Girl: An Olympic Shot-Putter’s Feminist Mission*, NEW YORKER (Aug. 11, 2016), <https://www.newyorker.com/news/sporting-scene/you-throw-girl-an-olympic-shot-putters-feminist-mission> [<https://perma.cc/CQ6H-H56S>]; Anna Swartz, *Olympic Medalist Michelle Carter Has a Powerful Message about Celebrating Different Bodies*, MIC (Aug. 15, 2016), <https://mic.com/articles/151603/olympic-medalist-michelle-carter-has-a-powerful-message-about-celebrating-different-bodies#.lsmafday> [<https://perma.cc/KH7A-9MNT>]; see also, e.g., Chloe Angyal, *Here are the 5 Superhumans Who Just Made the U.S. Olympic Gymnastics Team: Say Hello to your Majority-Minority, Probably Gonna-Win-Gold Gymnastics Team, America!*, HUFFINGTON POST (July 11, 2016), http://www.huffingtonpost.com/entry/us-womens-gymnastics-team_us_5782703ae4b0c590f7e9cb9b [<http://perma.cc/Z8Z8-556N>]; Jeff Eisenberg, *As Final Five’s Popularity Soars, America’s Male Gymnasts Compete in Obscurity*, YAHOO! SPORTS (Aug. 10, 2016), <https://sports.yahoo.com/news/as-final-fives-popularity-soars-americas-male-gymnasts-compete-in-obscurity-011400873.html> [<https://perma.cc/KL6C-XLW7>]. Multiple-time Olympic Champion Kerri Walsh Jennings, who often prefers to compete in a sports bikini and has said that she was “born to have babies and to play [beach] volleyball” exemplifies the complicated conversation that tends to follow female athletes who either make a point of, or at least don’t avoid, their cache. Compare Lauren Leamanczyk, *Controversy over Women’s Beach Volleyball Bikinis*, KARE 11 (Aug. 17, 2016), <http://www.kare11.com/sports/olympics/controversy-over-womens-beach-volleyball-bikinis/300079896> [<https://perma.cc/W6DX-UEBE>], with Paul Bois, *Feminists Heckle Kerri Walsh Jennings for Being a Proud Mom*, TRUTH REVOLT (Aug. 11, 2016), <http://www.truthrevolt.org/news/feminists-heckle-kerri-walsh-jennings-being-proud-mom> [<https://perma.cc/N8SS-MJ9H>].

146. See Sarah J. Jackson, *What’s Wrong with Media Coverage of Women Olympians?*, HUFFINGTON POST (Aug. 3, 2012), https://www.huffingtonpost.com/sarah-j-jackson/olympics-2012_b_1736415.html [<https://perma.cc/4CF3-WMK3>]; see also Julie Zellinger, *Billy Jean King: Stop Focusing on Female Athletes’ Bodies, Focus on Our Accomplishments*, MIC (Sept. 11, 2015), <https://mic.com/articles/125177/billie-jean-king-stop-focusing-on-female-athletes-bodies-focus-on-our-accomplishments#.xqRUtrrY1> [<https://perma.cc/Q9N6-VURP>]. The attacks on Serena Williams’s body are exemplary in this respect, as are the differences between her marketability and that of Maria Sharapova, an excellent but clearly lesser performer. See, e.g., Zeba Blay, *When We Attack Serena Williams’ Body, it’s Really about Her Blackness*, HUFFINGTON POST (July 13, 2015),

to which especially the sports media tends to focus more and differently on females in a way that “contribute[s] to a culture that tells women of all ages, but especially young women, that they should not aspire too high or fight too hard and that their primary value rests in how others perceive their bodies.”¹⁴⁷

To the extent that these critiques are designed to ensure that sport is sensitized to its disparate treatment of male and female bodies and is pushed to “get it right,” they have the potential to reinforce the institution’s equality and anti-subordination goals.¹⁴⁸ In contrast, if they are designed to suggest that sport should showcase only performances and not bodies, or else only the performance-related aspects of bodies, history and the economics of sport tell us that they are likely to fail. And they ought to fail. The human tendency to search for perfection in sport is the same tendency that leads sculptors and musicians, scientists and writers, all of us, to search for perfection in our respective spheres. It is not an egalitarian trait by any means, but it has yielded significant value for societies in which it is nurtured.¹⁴⁹ Thus, sport incentivizes the perfection of the athletic female body in its performance and aesthetic aspects, and when this is done right, including without erasing differences in form and function or “sexualizing female existence,” the institution celebrates and allows societies to “celebrate[] female strength, skill and excellence.”¹⁵⁰

2. Producing Benefits for Stakeholders and Society

Competitive sport also has as its goal producing a variety of highly prized benefits for its stakeholders and for society. In this respect, competitive sport is also a system designed to create a set of synergistic goods. Like showcasing

http://www.huffingtonpost.com/entry/serena-williams-policing-of-black-bodies_us_55a3bef4e4b0a47ac15ccc00 [<https://perma.cc/8NZG-5E3U>] (linking the critique to racism); Erika Nicole Kendall, *Female Athletes Often Face the Femininity Police – Especially Serena Williams*, GUARDIAN (July 14, 2015), <https://www.theguardian.com/commentisfree/2015/jul/14/serena-williams-female-athletes-femininity-police> [<https://perma.cc/Y4YR-TSTQ>] (reporting on body shaming in sport and of Williams); Daniel Roberts, *U.S. Open Marketability Debate: Serena vs. Sharapova*, FORTUNE (Dec. 14, 2015), <http://fortune.com/2015/09/11/tennis-serena-sharapova/> [<https://perma.cc/JU8W-N6CA>] (noting that Williams and Sharapova are the two highest paid female athletes in the world, that Sharapova makes significantly more in endorsements despite Williams’s superiority on court, and discussing the reasons usually cited for the difference including companies’ and consumers’ racism and sexism, and the athletes’ public personalities).

147. Jackson, *supra* note 146; *see also supra* note 145 (citing to the controversy around Walsh-Jennings in this respect).

148. Jackson, *supra* note 146 (critiquing the media for “focusing on the supposed ‘diva’ behavior, outfits, hair and parenting of women athletes” but adding that “some media are trying to get it right” including by “featur[ing] nude female and male athletes and depict[ing] women athletes of all body types (including paralympians!) in generally active, gender-neutral poses”).

149. Posner, *supra* note 107, at 1729.

150. Lindy West, *How to Talk about Female Olympians without Being a Regressive Creep – A Handy Guide*, GUARDIAN (Aug. 9, 2016), <https://www.theguardian.com/commentisfree/2016/aug/09/female-olympians-guide-gaffes-athletes-sports-makeup-shorts-marital-status-lindy-west> [<https://perma.cc/B7NV-ASR2>]; *see also* Jackson, *supra* note 146. The point that optics matter a lot to this mission has been developed more seriously and especially well in the volume of essays that comprises BUILT TO WIN: THE FEMALE ATHLETE AS CULTURAL ICON (Leslie Heywood & Shari L. Dworkin eds., 2003).

performances and bodies, this goal also has its origins in Ancient Greece, where the best athletes were “considered heroes and were presented with [a lifetime of] gifts and honors” and “[t]he glory of the victorious athlete brought reflected glory to all the inhabitants of his home town.”¹⁵¹ It is remarkably intact in these respects; indeed, the difference today is that competitive sport has grown exponentially as a result of its full internationalization and its commercialization, to the point that the institution is now also an important economic force.¹⁵²

Benefits for individual champions come from governments, leagues, companies, teams, and communities and include “prize money, sponsorships, and [the] long-term career opportunities that flow from athletic success.”¹⁵³ For example, the World Champion boxer Manny Pacquiano, an “avatar of national pride,”¹⁵⁴ has parlayed his highly visible and lucrative athletic career into a life in politics first as a congressman and now as a senator.¹⁵⁵ It is assumed he will “make a run for the Philippine presidency someday.”¹⁵⁶ And four-time Olympic Gold Medalist Donna de Verona has parlayed her swimming success into several pioneering roles including as long-time, Emmy Award-winning sportscaster and co-founder, with Billie Jean King, of the politically and culturally influential Women’s Sports Foundation.¹⁵⁷

In turn, governments, leagues, companies, teams, and communities benefit politically, economically, and psychologically from their close association with individual winners.¹⁵⁸ For example, countries compete against one another for top ranking in the medal count on the view that it is “indicative of their status in

151. See *Ancient Olympia History*, *supra* note 108.

152. See generally, e.g., ANDREW C. BILLINGS ET AL., OLYMPIC TELEVISION: BROADCASTING THE BIGGEST SHOW ON EARTH (2017); EUR. COMM., DIRECTORATE-GENERAL EDUCATION AND CULTURE, STUDY ON THE CONTRIBUTION OF SPORT TO ECONOMIC GROWTH AND EMPLOYMENT IN THE EU (Nov. 2012), available at <http://ec.europa.eu/assets/eac/sport/library/studies/study-contribution-sports-economic-growth-final-rpt.pdf> [<https://perma.cc/8KD4-3YYJ>].

153. Coleman & Coleman, *supra* note 126, at 1783.

154. Mike McPhate, *Manny Pacquiano Apologizes for Calling Gays ‘Worse Than Animals’*, N.Y. TIMES (Feb. 16, 2016), <https://www.nytimes.com/2016/02/17/sports/manny-pacquiao-apologizes-for-calling-gays-worse-than-animals.html> [<https://perma.cc/32UN-XNCP>].

155. *Id.*; see also Laura Wagner, *Boxing Great Manny Pacquiano Wins Senate Seat in the Philippines*, NAT’L PUB. RADIO (May 19, 2016), <http://www.npr.org/sections/thetwo-way/2016/05/19/478699594/boxing-great-manny-pacquiao-wins-senate-seat-in-the-philippines> [<https://perma.cc/J2JK-MHHJ>].

156. McPhate, *supra* note 154.

157. Kim Vandenberg, *Donna de Verona Paves the Way for Women in Sports*, SWIM SWAM (Sept. 24, 2016), <https://swimswam.com/donna-de-varona-paves-way-women-sports/> [<https://perma.cc/H54K-ABH7>].

158. See, e.g., CHARLES CLOTFELTER, BIG-TIME SPORTS IN AMERICAN UNIVERSITIES *passim* (2011) (discussing this affiliations point in the context of U.S. college sports); Florence Morton, *Do Medals Matter*, SPORTING SPEAK (Mar. 7, 2014), <https://sportingspeak.wordpress.com/2014/03/07/do-medals-matter/> [<https://perma.cc/9ERX-MCN2>] (interrogating the national impacts of winning and losing the medal count); Laura Woods, *Why Nike Uses Endorsements & Sponsorships*, BIZFLUENT (Dec. 3, 2016), <https://bizfluent.com/about-6465548-nike-uses-endorsements-sponsorships.html> [<https://perma.cc/54YS-9C3X>].

the world,”¹⁵⁹ and corporate sponsors conduct their own “Brand Olympics”¹⁶⁰ on the view that their connection to star athletes increases their brand’s value, credibility, and sales.¹⁶¹ The star–company connection is considered so effective in these respects that Forbes Magazine recently suggested that Nike’s 2016 \$1 billion lifetime deal with global soccer icon Cristiano Ronaldo “may be a bargain for [the] sportswear giant.”¹⁶² An analogous return inures to teams and franchises, whose brands’ valuations are enhanced by their association with star athletes.¹⁶³ Finally, “[w]hen the team does well, since (fans) have such a strong psychological connection, they feel the success” as well.¹⁶⁴

The vast majority of athletes—both youth development and elite athletes—benefit from the institutional structures established to cultivate the champions and the enterprise. Inspired by role models like Usain Bolt, Brandi Chastain, and Cristiano Ronaldo, and by teams like USA Soccer and Real Madrid, children, adolescents, and young adults seize opportunities to train and compete for wins, teams, scholarships, and leadership positions. Along the way, they benefit from competitive experiences that involve both success and failure, and from “improved rates of mental and physical health.”¹⁶⁵ These are not simply ancillary goods, as many countries and their institutions view the cultivation of athleticism as a standalone benefit—separate from the cultivation of champions.¹⁶⁶

159. Neel Burton, *Olympics Medal Count Reflects World Order*, PSYCHOL. TODAY (Aug. 12, 2012), <https://outrre-monde.com/2012/08/12/olympics-medal-count-reflects-world-order/> [https://perma.cc/NYN4-LLR6]. Burton notes, semi-seriously, that “[a]ll this muscle flexing is not only beautiful to watch, but also considerably healthier and cheaper than a nuclear arms race or out-and-out war.” *Id.*

160. Elain Low, *Brand Olympics: The Medal Count for Coca-cola, Nike, McDonalds*, INV. BUS. DAILY (Aug. 11, 2016), <http://www.investors.com/news/brand-olympics-pt-1-whats-the-medal-count-for-coca-cola-nike-mcds/> [https://perma.cc/33HV-LFNX].

161. Woods, *supra* note 158.

162. Kurt Badenhausen, *Why Cristiano Ronaldo’s \$1 Billion Nike Deal May Be a Bargain for Sportswear Giant*, FORBES (Dec. 2, 2016), <https://www.forbes.com/forbes/welcome/?toURL=https://www.forbes.com/sites/kurtbadenhausen/2016/12/02/cristiano-ronaldos-1-billion-nike-deal-is-a-bargain-for-sportswear-giant/&refURL=https://search.yahoo.com/&referrer=https://search.yahoo.com/> [https://perma.cc/K3JG-4KFZ]. Nike apparently spends upwards of 13% “of its revenue dollars on such costs.” Kyle Stock, *Is Nike Spending Too Much on Superstars?*, BLOOMBERG (Mar. 20, 2014), <https://www.bloomberg.com/news/articles/2014-03-20/is-nike-spending-too-much-on-superstars> [https://perma.cc/B5KL-XTGJ].

163. See, e.g., Kurt Badenhausen, *What You Need to Know about the Money in the Patriots-Falcons Super Bowl*, FORBES (Feb. 2, 2017), <https://www.forbes.com/sites/kurtbadenhausen/2017/02/02/7-things-to-know-about-the-money-in-the-patriots-falcons-super-bowl/#5c2c1612692f> [https://perma.cc/FJ3Z-U8T]; Brian Windhorst, *Owner Dan Gilbert on Money Spent on Cavs’ Core: ‘We’re all-in,’* ESPN (Oct. 30, 2015), http://www.espn.com/nba/story/_id/14012880/cleveland-cavaliers-owner-dan-gilbert-defends-paying-record-salaries-luxury-taxes [https://perma.cc/8FWS-P6MM].

164. John Keilman & Genevieve Bookwalter, *Cubs Victory Gives Fans Psychological Boost*, CHI. TRIB. (Nov. 4, 2016), <http://www.chicagotribune.com/sports/baseball/cubs/ct-cubs-psychology-of-winning-met-20161104-story.html> [https://perma.cc/K5KF-C26G].

165. Donna A. Lopiano, *Modern History of Women in Sports: Twenty-five Years of Title IX, The Athletic Woman*, 19 CLIN. SPORTS MED., 163, 163–73 (2000).

166. See, e.g., AUS. GOV’T, AUS. SPORTS COMM’N, PLAY. SPORT. AUSTRALIA, 3 (Mar. 2015), available at http://static.ausport.gov.au/play_sport_australia/files/inc/be0c2c14ad.pdf [https://perma.cc/9KQU-2YF9] (listing fostering national pride, intracommunity engagement in a diverse

Athleticism is both an aesthetic and a way to develop and perfect socially valuable traits which, in addition to leadership, include “teamwork, perseverance, discipline, [and] grit.”¹⁶⁷ These traits are socially valuable in part because they are highly transferrable. Although competitive sport is clearly not the only way to develop professional skills, sport “teaches fundamentals for success” which is why “executives like to hire athletes.”¹⁶⁸ Consistent with these preferences, the data suggest that, whatever their place in the hierarchy of talents and abilities, former athletes “are more likely than [others] to be thriving in purpose, social community and physical well-being.”¹⁶⁹

Again in the beginning, sport was designed only to benefit males and their associates, but today it is designed also to benefit females and theirs. Specifically, beginning in the early 1900s, females were included in competitive sport out of recognition that exclusive traditions and stereotypes were no longer societally acceptable and to expand the reach of the institution also to this segment of the population.¹⁷⁰ More recently, competitive sport has committed to the women’s category both to provide females with an equal opportunity at the direct and indirect goods of sport and to feature successful female athletes and competitions as a way to combat traditions and stereotypes that subordinate women more generally. Title IX in the United States is illustrative of the latter two rationales.¹⁷¹ It is because of these dedicated efforts that there are female champions like Serena Williams and Katie Ledecky, that we know who they are, that they provide role models for aspiring champions, and that girls and women are able to have the experiences and develop the professional skills that make them competitive with men for the longer term positive opportunities and outcomes outside of athletics.

And again, if sport did not act affirmatively to carve out an exclusive women’s category defined by sex, females and their associates would be excluded from the most important of these benefits.¹⁷² As the IOC’s recent experience and the

society, strong communities, mental and physical health and the economic benefits that flow from a healthy population, the development of successful traits including “confidence and self-esteem,” and reduced crime rates, as among the benefits that flow from strong participation rates).

167. *From Elite Female Athletes to Professional Leaders: For All the Places Sport Will Take You*, ERNST & YOUNG GLOB. LTD. (2013), [http://www.ey.com/Publication/vwLUAssets/Elite_female_athletes_to_exceptional_leaders/\\$FILE/Elite%20female%20athletes%20and%20exceptional%20leaders%20Rio%20event.pdf](http://www.ey.com/Publication/vwLUAssets/Elite_female_athletes_to_exceptional_leaders/$FILE/Elite%20female%20athletes%20and%20exceptional%20leaders%20Rio%20event.pdf) [<https://perma.cc/653S-SDFX>].

168. Nanette Fondas, *Research: More Than Half of Top Female Execs Were College Athletes*, HARV. BUS. REV. (Oct. 9, 2014), <https://hbr.org/2014/10/research-more-than-half-of-female-execs-were-college-athletes> [<https://perma.cc/JP8P-R6NN>] (adding competitiveness to this list of attractive attributes and de Verona adding, “[i]f you try out for a basketball team but quit in the middle of the first game, or if you choose not to pass the ball to your talented teammate because you don’t like her, or if you are unwilling to spend extra hours to work on a weakness, you aren’t going to get very far.”).

169. *Understanding Life Outcomes of Former NCAA Student Athletes*, GALLUP-PURDUE INDEX REP. 4 (2016), https://www.ncaa.org/sites/default/files/2016_Gallup_NCAA_StudentAthlete_Report_20160503.pdf [<https://perma.cc/EV2W-VAH6>].

170. See *supra* note 106 and accompanying text.

171. See *supra* notes 106 and 165 and accompanying text.

172. See Tucker, *The Caster Semenya Debate*, *supra* note 116; see also O’Mara, *supra* note 72 (quoting

experience of other governing bodies has shown, adopting sex blindness in competitive sport has the perverse effect of enabling non-elite boys and men to win spots and championships from elite girls and women.¹⁷³ Because of the performance gap, females are not competitive for the win in elite competitions¹⁷⁴ and their win share would drop significantly in development sport.¹⁷⁵ Top ranked high school girls could still sometimes defeat non-elite high school boys, but even then, the boys would take up a lot of the room at the top.¹⁷⁶ They would take up

Tucker). The principal support for this proposition lies in “before and after” stories like that of Title IX. *See, e.g.*, Lopiano, *supra* note 165, at 163–73. For example, it is widely recognized that Title IX, which has been interpreted to require parity of opportunity between the sexes in education-based sport, resulted in “major changes in the psychologic and sociologic environments of women and girls in society.” *Id.* at 171–72. Specifically, women and girls who participate in sport today have “greater confidence, self-esteem, and pride in their physical and social selves.” *Id.* at 165. Title IX has also afforded girls and women access to the setting “where boys have traditionally learned about teamwork, goal-setting, the pursuit of excellence in performance, and other achievement-oriented behaviors and other critical skills necessary for success in the workplace.” *Id.* (“I believe that it is no accident that 80% of the female executives in Fortune 500 companies identified themselves as having been ‘tomboys.’”).

173. *See infra* notes 232–236 and accompanying text (discussing the Women’s 800 Meters Final at the 2016 Rio Games). Some U.S. states have implemented Title IX in a way that requires not only the creation of sports opportunities for females but also equal opportunity for girls and boys. One effect of this sex blind interpretation of the statute has been to cause boys to join girls’ teams, which provide them with an opportunity they would otherwise be missing, either entirely or in the relevant period, to benefit from sports-specific training and competitive opportunities. To my knowledge none of the boys identified as intersex or trans; however, like all mixed or open events, this experience provides direct evidence of the effects of including male bodies in female sport. The Massachusetts experience with girls’ swim teams and competitions has received particular systematic attention. *See, e.g.*, Zuri Berry, *In Massachusetts, Boys Playing on Girls Teams Causes a Ruckus*, MAXPREPS (Jan. 10, 2012), <http://www.maxpreps.com/news/0JxGMTsgEeGkPAmVebEWg/in-massachusetts,-boys-playing-on-girls-teams-causes-a-ruckus.htm> [<https://perma.cc/M3Y5-PQ3A>] (reporting on the issues created by the increasing number of boys signing up for and rising through the ranks of girls’ teams and events); Karen Crouse, *Girl Defeats Boys to Win Girls Swim Title*, N.Y. TIMES (Nov. 19, 2011), <http://www.nytimes.com/2011/11/20/sports/broderick-wins-massachusetts-girls-swim-title-against-field-including-boys.html> [<https://perma.cc/2XKT-QHRJ>] (girls’ 50-yard freestyle sensation had to beat eight boys to win the title); Mike Cullity, *Equal Rights v. Title IX*, ESPN (June 15, 2012), http://www.espn.com/high-school/girl/story/_/id/8055704/massachusetts-era-allows-boys-compete-girls-sports-such-field-hockey-swimming-volleyball-gymnastics [<https://perma.cc/UU4D-DTU4>]; Cameron Smith, *Mass. Girls Swimming Championship Bizarrely Features One Boys Race . . . With One Boys Swimmer*, YAHOO! SPORTS (Nov. 26, 2012), <https://sports.yahoo.com/blogs/highschool-prep-rally/mass-girls-swimming-championship-bizarrely-features-one-boys-175129848.html> [<https://perma.cc/H38P-FJDB>]; Emily Sweeney, *MIAA to Study Boy-Girl Swim Team Records*, BOS. GLOBE (Jan. 1, 2012), <https://www.bostonglobe.com/metro/regionals/south/2012/01/01/miaa-discuss-issue-boys-breaking-girls-swim-records/GILdeKK1n548NexqvgRC2J/story.html> [<https://perma.cc/J9QU-MQHH>] (reporting on “[t]he governing body that regulates high school athletics in Massachusetts . . . taking a closer look at the controversy surrounding mixed-gender swim teams, and . . . address[ing] the issue of boys breaking girls’ swimming records”); *see also, e.g.*, Peter Hasson, *High School Boy Wins All-State Honors in Girls Track and Field*, DAILY CALLER (June 3, 2016), <http://dailycaller.com/2016/06/03/high-school-boy-wins-all-state-honors-in-girls-track-and-field/> [<https://perma.cc/NAG4-97KJ>] (in Alaska).

174. *See supra* notes 53–54 and 115–143 and accompanying text.

175. *See supra* note 173 and accompanying text.

176. *See, e.g.*, Crouse, *supra* note 173 (reporting on the victory of Sarah Broderick in state high school championship). Broderick went on to swim competitively in college. *Sarah Broderick, Swimming and Diving Roster, University of New Hampshire Wildcats*, UNIV. N.H. ATHLETICS, http://unhwildcats.com/roster.aspx?rp_id=3355 [<https://perma.cc/5P74-82HN>] (last visited Oct. 30, 2017). Her closest male competitors in the state high school championship did not. Although they took up two

spots on team and then in the semi-finals and finals of state and national age group events, and because these are the proving grounds for further opportunities, it is rational to assume that, without more, this would translate to diminished returns for girls and women.¹⁷⁷ To the extent the existence of these opportunities has some trickle-down effect to participation rates, including participation in intra- and extramural fitness sport, it is also rational to assume that these would also be diminished.¹⁷⁸

Although the benefits of competitive sport are significant and highly prized across societies, the institution has not gone unchallenged in these respects. In particular, sport's commercialization, the high price nations and municipalities must pay to secure important events and teams, and the opportunity costs associated with that price are seen as anathema to many who would prefer different allocations. Four prominent perennial challenges are the generally losing proposition of hosting the Olympic Games,¹⁷⁹ the high cost of the stadiums necessary to keep professional teams,¹⁸⁰ the astronomical salaries paid to some top athletes,¹⁸¹ and the outsized role of big time sports in some college settings.¹⁸² Some critics have also challenged the exclusiveness of competitive sport; the fact that there are winners and losers for participation, celebration, and success, especially in youth settings contradicts the "everyone can play" model they prefer.¹⁸³ These challenges are unlikely to win in the broadest marketplace of ideas: at least some cities will continue to find value in hosting the Games and building stadiums, teams will certainly continue to find value in funding winning athletes and ventures, and at least collectively, we will continue to enjoy

of the six places in the state high school final, finishing second and sixth respectively, their best performances were well outside of the range necessary to swim in college. *See id.*

177. *See supra* note 172 and accompanying text; *see also* Cullity, *supra* note 173 (quoting "former Olympic gold-medal swimmer Nancy Hogshead-Makar" criticizing Massachusetts' approach to the interpretation of its equal rights amendment: "The reason why that analysis is wrong is because girls will always lose [opportunities].") (internal quotation omitted).

178. *See generally* Dionne L. Koller, *How the Expressive Power of Title IX Dilutes its Promise*, 3 HARV. J. SPORTS & ENT. L. 103 (2012); Dionne L. Koller, *The Obese and the Elite: Using Law to Reclaim School Sports*, 67 OKLA. L. REV. 383 (2015).

179. Clay Dillow, *Hosting the Olympics is a Terrible Investment*, FIVETHIRTYEIGHT (Aug. 15, 2016), <https://fivethirtyeight.com/features/hosting-the-olympics-is-a-terrible-investment/> [<https://perma.cc/SV6L-7N6Q>]; T.W., *The Economist Explains: Why Would Anyone Want to Host the Olympics?*, ECONOMIST (Sept. 8, 2013), <https://www.economist.com/blogs/economist-explains/2013/09/economist-explains-0> [<https://perma.cc/E58S-VRUF>].

180. *See, e.g.*, Alexis Garcia, *Sports Stadiums are Bad Public Investments. So Why are Cities Still Paying for Them?*, REASON (Mar. 17, 2015), <http://reason.com/reasonTV/2015/03/17/sports-stadiums-are-bad-public-investmen> [<https://perma.cc/C2R7-HU3E>]; Andrew Zimbalist & Roger G. Noll, *Sports, Jobs, & Taxes: Are New Stadiums Worth the Cost?*, BROOKINGS (June 1, 1997), <https://www.brookings.edu/articles/sports-jobs-taxes-are-new-stadiums-worth-the-cost/> [<https://perma.cc/DL7X-PRY9>].

181. *See supra* note 162 and accompanying text (discussing Ronaldo's \$1 billion deal with Nike).

182. *See generally* CLOTFELTER, *supra* note 158 (describing the phenomenon and the issues it raises for these institutions).

183. *See generally, e.g.*, VIVIAN GUSSIN PALEY, *YOU CAN'T SAY YOU CAN'T PLAY* (1992) (developing the argument for the inclusive pedagogy); *supra* note 180 (citing Dionne Koller's work on this trade-off in the educational setting).

competition.¹⁸⁴ But as the defeat of some related initiatives and the regulation of others reflects, they are important checks both on the merits of the allocations in particular settings and on the more extreme iterations of these phenomena.¹⁸⁵

3. Using Sport for Social Change

Finally, sport is a global enterprise which intends to extend its goods and influence as broadly as possible.¹⁸⁶ The most prominent manifestation of this goal today is commercial; for example, the NBA exporting its product—the sport and the business of basketball—to China,¹⁸⁷ and Nike exporting its product—physical fitness and related clothing and equipment—to India.¹⁸⁸ But it was originally and is still also political and cultural. Nelson Mandela, who famously banked on rugby as a force for political change in his home country of South Africa,¹⁸⁹ understood that “[s]port has the power to change the world. It has the power to inspire. It has the power to unite people in a way that little else does. It speaks to youth in a language they understand.”¹⁹⁰ This idea is the cornerstone of the Laureus

184. Indeed, as to competition, the trend is to increase opportunities rather than to shift focus from competitive to non-competitive opportunities; this is rationalized on the grounds that are described above, that participation in competitive sport provides important valuable social benefits that should be available to everyone. *See, e.g.*, PLAY. SPORT. AUSTRALIA., *supra* note 166, at 3–4 (describing federal initiative to increase the population’s participation in competitive sport and listing its societal benefits); Dear Colleague Letter from Seth M. Galanter, Acting Assistant Sec’y for Civil Rights, U.S. Dep’t of Educ. (Jan. 25, 2013), <https://www2.ed.gov/about/offices/list/ocr/letters/colleague-201301-504.html> [<https://perma.cc/NJ85-WQ6Q>] (requiring schools receiving federal funds to provide equal opportunities for disabled students to participate in extracurricular athletics and to reap the benefits of that participation “includ[ing] socialization, improved teamwork and leadership skills, and fitness”).

185. *See, e.g.*, Associated Press, *Hamburg Residents Reject Bid to Host 2024 Olympics*, N.Y. TIMES (Nov. 29, 2015), <https://www.nytimes.com/2015/11/30/sports/olympics/hamburg-residents-reject-bid-to-host-2024-olympics.html> [<https://perma.cc/6MB8-QFGK>]; Henry Grabar, *How to Stop the Stadium Wars*, SLATE (Mar. 17, 2015), http://www.slate.com/articles/business/moneybox/2015/03/obama_s_stadium_plan_would_limit_public_financing_of_sports_complexes_could.html [<https://perma.cc/3GCC-8LUY>] (regulating the issuance of government bonds in connection with sports facilities); Dear Colleague Letter, *supra* note 184 (disallowing school teams from excluding disabled students who can be accommodated without changing the fundamental nature of the game).

186. INT’L OLYMPIC COMM., OLYMPIC CHARTER 13–14, *available at* https://stillmed.olympic.org/Documents/olympic_charter_en.pdf [<https://perma.cc/3FX6-3Y4H>] (last visited Oct. 30, 2017) (in force as of Aug. 2, 2015) (setting out the Fundamental Principles of Olympism); *id.* at 17–19 (describing the goals of The Olympic Movement).

187. *See* Edward Cody, *The NBA Has Become a Leading Export to China*, WASH. POST (Feb. 15, 2006), <http://www.washingtonpost.com/wp-dyn/content/article/2006/02/14/AR2006021401827.html> [<https://perma.cc/RL52-PTV5>].

188. *See* Angela Natividad, *Ad of the Day: W+K India’s First Nike Ad Celebrates the Power of Sport in Women’s Lives*, ADWEEK (July 12, 2016), <http://www.adweek.com/brand-marketing/ad-day-wk-indias-first-nike-ad-celebrates-power-sport-womens-lives-172473/> [<https://perma.cc/PVT5-BSRD>] (describing the strategy behind and linking to video of “Da Da Ding”).

189. David Bond, *How Nelson Mandela used Sport to Transform South Africa’s Image*, BBC SPORT (Dec. 6, 2013), <http://www.bbc.com/sport/25262862> [<https://perma.cc/38RF-GVB9>]. This particular story was the basis for the 2009 movie *Invictus*, directed by Clint Eastwood and starring Morgan Freeman and Matt Damon.

190. LAUREUS FOUND., OUR MISSION, <https://www.laureus.com/content/our-mission-1> [<https://perma.cc/6AU4-45T8>] (last visited Oct. 30, 2017) (quoting Mandela at Laureus’ first World Sports Awards in 2000).

Foundation for Good, of which Mandela was the first patron,¹⁹¹ and ultimately of the Olympic Movement itself, which seeks “to contribute to building a peaceful and better world by educating young people through sport practiced in accordance with Olympism and its values.”¹⁹² These values include, among other things, “[r]espect for international conventions on protecting human rights” and specifically the “rejection of discrimination of any kind.”¹⁹³

Sport’s intended reach includes vulnerable sub-populations which in most places continues to include women.¹⁹⁴ Thus, the Olympic Movement intends to “encourage the regular practice of sport by all people in society, regardless of sex, age, social background or economic status,”¹⁹⁵ and holds out “[g]ender equality [as] a top priority.”¹⁹⁶ Its “two main aims” with respect to gender equality “are to make access to sport in general and the Olympic Games easier for female athletes, and to increase the number of women in sports administration and management.”¹⁹⁷ This inclusion, anti-subordination, and empowerment mission is shared by firms associated with the Olympic Movement and for which it is also a stand-alone value, related to but separate from its profit motives. For example, “NIKE, Inc. is committed to building deeper community connections and spurring positive social change around the world”¹⁹⁸; this includes “investing in

191. *See id.* The Foundation brings together luxury brands and international sports legends to develop humanitarian projects around the world. LAUREUS FOUND., INTRODUCTION TO LAUREUS, <https://www.laureus.com/content/introduction-laureus> [<https://perma.cc/AD3T-D3NG>] (last visited Oct. 30, 2017). Its World Sports Academy includes such stars as Edwin Moses, Roger Federer, Martina Navratilova, and Nadia Comaneci. LAUREUS FOUND., LAUREUS WORLD SPORTS ACADEMY MEMBERS, <https://www.laureus.com/academy/members#&slider1=3> [<https://perma.cc/U9V5-4SAF>] (last visited Oct. 30, 2017).

192. INT’L OLYMPIC COMM., OLYMPIC CHARTER rule 1.1, https://stillmed.olympic.org/Documents/olympic_charter_en.pdf [<https://perma.cc/52AG-ASE7>] (last visited Oct. 30, 2017) (in force as of Aug. 2, 2015). The founder of the modern Olympic Games, educator Baron Pierre de Coubertin, had as “his main priority at first . . . the idea of peace among nations.” Norbert Müller, *The Origin of the Idea of Peace in the Modern Olympic Movement*, SPORT J. (Mar. 7, 2008), <http://thesportjournal.org/article/the-idea-of-peace-as-coubertins-vision-for-the-modern-olympic-movement-development-and-pedagogic-consequences/> [<https://perma.cc/4D9D-683X>].

193. INT’L OLYMPIC COMM., IOC CODE OF ETHICS art. 1.4 (2016), <https://stillmed.olympic.org/media/Document%20Library/OlympicOrg/IOC/What-We-Do/Leading-the-Olympic-Movement/Code-of-Ethics/EN-IOC-Code-of-Ethics-2016.pdf> [<https://perma.cc/6WQ3-DPWG>] (listing sex as an example of prohibited discrimination); *see also supra* note 190 (noting that Laureus includes combatting racism and sexism among its goals).

194. *See, e.g.*, Tom Murphy, *Laws Discriminating Against Women Persist Globally*, HUMANOSPHERE (Feb. 19, 2015), <http://www.humanosphere.org/human-rights/2015/02/laws-discriminating-women-persist-globally/> [<https://perma.cc/E63X-2UVR>]; Press Release, U.N. Women, Discrimination against women persists around the globe hampering development (July 5, 2012), *available at* <http://www.unwomen.org/en/news/stories/2012/7/discrimination-against-women-persists-around-the-globe-hampering-development> [<https://perma.cc/PH6H-99F2>].

195. INT’L OLYMPIC COMM., PROMOTE OLYMPISM IN SOCIETY, <https://www.olympic.org/the-ioc/promote-olympism> [<https://perma.cc/SU6V-PA9M>] (last visited Oct. 30, 2017).

196. *Id.*

197. *Id.*

198. NIKE, ABOUT NIKE: COMMUNITY IMPACT, <https://about.nike.com> [<https://perma.cc/DAT7-DUZV>] (last visited Dec. 17, 2017).

adolescent girls as the most powerful force for change in the developing world.”¹⁹⁹ Specifically, the company’s non-profit Foundation seeks to “challenge rigid gender norms” so that girls and women gain “opportunities to become supported, educated and empowered in a way that benefits everyone.”²⁰⁰

Without this explicit focus on females and their particular social status and associated concerns, sport could not accomplish its ends in these respects. The unsettling of social norms based specifically in facts and stereotypes about female bodies—their traditional procreative function and relative strength and power—requires attention to these bodies and all that they can actually do. Anti-discrimination messaging and humanitarian work that erases these differences or features and focuses on male bodies and their circumstances cannot do this work. It also makes practical sense to work within the taxonomy of the target populations. The fact that this taxonomy overlaps almost perfectly with sport’s goal both enhances the likelihood of progress and ensures that the approach is carefully tailored.

Sport is properly subject to the criticism that its rights mission is sometimes just rhetoric, and that its commercial aims dwarf, and are often in tension with, this mission. More specifically, no one is or should be under the illusion that sport can singlehandedly change the fate of women around the world. Nevertheless, experience shows that sport does have the power to contribute to the unsettling of subordinating stereotypes and norms when it specifically promotes and sets aside separate opportunities for females. Title IX has undoubtedly served this function in the United States and the draw of prize money and medals has served a similar function in countries like Kenya and Ethiopia.²⁰¹ Indeed, even the most traditional societies can be seen turning to sport as political tool to signal and bolster the creation of new rights for girls and women. The best example of this phenomenon in the current period may be Saudi Arabia, where “[p]hysical education is not on the curriculum for girls in . . . schools” and their “participat[ion] in sports is an act of defiance” against conservative doctrine.²⁰² Nevertheless, in a “major shift” away from this tradition, the country sent four female athletes to the 2016 Olympics in Rio for the first time, as part of a package

199. Press Release, Nike News, Nike Foundation Joins Cross-Sector Leaders In Gender Equality Symposium (Mar. 30, 2009), <https://news.nike.com/news/nike-foundation-joins-cross-sector-leaders-in-gender-equality-symposium> [<https://perma.cc/D8LN-BE8B>].

200. *Id.* Nike’s 2016 “Da Da Ding” ad—featuring a group of successful Indian women who “each learned the discipline and strengthened the confidence she attributes to her rise to early participation in sport”—exemplifies the synergies between its corporate and non-profit goals. *Da Da Ding*, NIKE NEWS (July 10, 2016), <https://news.nike.com/news/da-da-ding> [<https://perma.cc/4NTD-MNML>] (including link to ad on YouTube: <https://www.youtube.com/watch?v=2YDrgoRpic8> [<https://perma.cc/GLA8-5AFC>]); see also Natividad, *supra* note 188 (reporting on the ad’s designation as “Ad of the Day” by AdWeek on July 12, 2016).

201. See GRANT JARVIE & JAMES THORNTON, *SPORT, CULTURE AND SOCIETY: AN INTRODUCTION* 4, 406 (2d ed. 2006)

202. Associated Press, *Saudi Arabia Sends Four Female Athletes to Rio*, NBC UNIVERSAL (July 31, 2016), <http://www.nbcolympics.com/news/saudi-arabia-sends-four-female-athletes-rio> [<https://perma.cc/J3HA-J7LC>].

of “incremental, significant openings” that also included limited voting and candidate rights.²⁰³

B. The Challenge from the Gender Identity Movement

Like the feminist movement before it, the gender identity movement seeks to persuade institutional decision makers to develop policies designed to recognize, normalize, include, and empower intersex and trans people who throughout history have been erased or severely marginalized and often subject to violence.²⁰⁴ Mostly this movement has focused on the trans community, which is both larger and particularly “associated with high levels of stigmatization, discrimination and victimization, contributing to negative self-image and increased rates of other mental disorders.”²⁰⁵ For example, in the United States, “[t]ransgender individuals are at a higher risk of victimization and hate crimes than the general public” and “[a]dolescents and adults with gender dysphoria are at increased risk for suicide.”²⁰⁶ In less tolerant parts of the world, trans people are at even greater risk of violence, social isolation, and reduced life span.²⁰⁷

As part of this policy reform effort, the movement of individuals aligned with it seek to have institutions replace sex-based classifications with classifications based on identity.²⁰⁸ Although this switch is often couched differently, for example for recognition of intersex and trans people based on their identity,²⁰⁹

203. *Id.* The four women all received wild card entries, meaning they did not qualify on their athletic merit but were permitted entry as part of the IOC’s commitment to inclusion especially of athletes from smaller, under-developed countries. Going forward, those athletes and others will be training at a new “state-of-the-art sports complex with a swimming pool, gym, indoor running track, and sprawling outdoor soccer fields.” *Id.* The country’s goal is to develop the infrastructure necessary to produce athletes of both sexes who will meet the standard qualification measures. *Id.* (describing the developments in Riyadh, including at the all-female Princess Nora University).

204. See THE INTERSEX CAMPAIGN FOR EQUALITY, <http://oii-usa.org/> [<https://perma.cc/XZF2-FP3R>] (last visited Oct. 10, 2017); *Understanding Transgender People: The Basics*, NAT’L CTR. FOR TRANSGENDER EQUALITY, <http://www.transequality.org/issues/resources/understanding-transgender-people-the-basics> [<https://perma.cc/WP9A-UAKY>] (last visited Oct. 10, 2017).

205. *What is Gender Dysphoria: Challenges/Complications*, AM. PSYCHIATRIC ASS’N, <https://www.psychiatry.org/patients-families/gender-dysphoria/what-is-gender-dysphoria> [<https://perma.cc/9HJ3-FF6N>] (last visited Nov. 6, 2017).

206. *Id.*; see also *Why is Transgender Equality Important?*, *Transgender FAQ*, GLAAD, <https://www.glaad.org/transgender/transfaq> [<https://perma.cc/YH8G-PS4S>] (last visited Oct. 10, 2017).

207. See, e.g., Nina Lakhani, *LGBT in El Salvador: Beatings, Intolerance, Death*, AL JAZEERA (Aug. 12, 2015), <http://www.aljazeera.com/indepth/features/2015/08/lgbt-el-salvador-beatings-intolerance-death-150805075132892.html> [<https://perma.cc/Y68R-NQ4S>]; Lorraine Mallinder, *Trans People are Risking their Lives in Istanbul*, PUB. RADIO INT’L (Dec. 16, 2016), <https://www.pri.org/stories/2016-12-16/people-are-risking-their-lives-trans-istanbul> [<https://perma.cc/BV4G-QS8M>].

208. See, e.g., Buzuvis, *supra* note 118, at 47 (discussing the phenomenon in sport); Patrick S. Shin, *Sex and Gender Segregation in Competitive Sport: Internal and External Normative Perspectives*, 80 LAW & CONTEMP. PROBS., no. 4, 2017, at 59 (discussing the phenomenon in sport); Niraj Chokshi, *Boy Scouts, Reversing Century-Old Stance, Will Allow Transgender Boys*, N.Y. TIMES (Jan. 30, 2017), <https://www.nytimes.com/2017/01/30/us/boy-scouts-reversing-century-old-stance-will-allow-transgender-boys.html> [<https://perma.cc/PEJ4-DULK>]; O’Mara, *supra* note 72 (discussing the phenomenon in sport); Shulevitz, *supra* note 4 (discussing the phenomenon generally).

209. This is the case in sport and so far also in the college applications process. See, e.g., Kiera

the effect—that where there are conflicting signals about what makes someone male or female, identity trumps biology—is the same. The simple but powerful point is that sex-based classifications by definition exclude all trans and some intersex people because their biology does not match their identity.²¹⁰ Erasing biology and focusing singularly on identity serves to highlight similarities rather than differences and to ensure inclusion on the grounds of similarity. Thus, everyone who identifies as a woman is a woman—we are all alike in this way—even if our biology is different otherwise.²¹¹ This identity may have been assigned at birth—in the case of intersex people—or assumed by the individual herself later in life—in the case of trans people—but either way, the argument appears to be that because identity is essential to personhood and inclusive in ways that biology is not, it ought not only to be respected but privileged. The related argument that sex is on a spectrum serves as practical support for this view; that is, it is argued that it also makes sense to use identity instead of sex since sex can be “messy.”²¹²

Consistent with this goal, individuals aligned with the identity movement have challenged sex classifications in a number of institutional contexts. For example, they have challenged the necessity of governments’ administrative interests in easily identifying people by their physical characteristics including their biological sex, resulting in the reformation in some jurisdictions of the rules that govern the amendment of birth certificates, driver’s licenses, and other vital identity documents.²¹³ They have challenged others’ privacy interests in sharing

Feldman, *Who Are Women’s Colleges For?*, N.Y. TIMES (May 24, 2014), <https://www.nytimes.com/2014/05/25/opinion/sunday/who-are-womens-colleges-for.html> [<https://perma.cc/4SVQ-5XE9>] (in higher education); *infra* notes 218–223 and accompanying text (discussing the claim in sport).

210. See, e.g., Kaitlin Mulhere, *Inclusive Dialogues*, INSIDE HIGHER ED (Jan. 21, 2015), <https://www.insidehighered.com/news/2015/01/21/womens-college-cancels-play-saying-it-excludes-transgender-experiences> [<https://perma.cc/Z2QY-H29U>] (reporting on cancellation of a famous play about “sex, menstruation, birth, and more” at an all-women’s college on the grounds that it “excludes the experiences of transgender women who don’t have a vagina”); Brandon Voss, *Vagina Monologues Playwright Responds After Show Canceled for Not Being Trans-Inclusive*, ADVOCATE (Jan. 21, 2015), <https://www.advocate.com/arts-entertainment/theater/2015/01/21/college-cancels-vagina-monologues-not-being-trans-inclusive> [<https://perma.cc/M88Y-3QU7>] (reporting that the theater board based its decision on view that “[a]t its core, the show offers an extremely narrow perspective on what it means to be a woman,” a perspective that is “inherently reductionist and exclusive” because “[g]ender is a wide and varied experience” which “cannot simply be reduced to biological or anatomical distinctions”).

211. See *id.*; Hughes, *supra* note 6 (quoting Janice Forsyth referring to intersex and male-to-female trans athletes as “natural women, with natural differences in their biology”).

212. See *infra* notes 262–271 and accompanying text (describing this argument in detail); see e.g., Buzuvis, *supra* note 118, at 47 (arguing that gender ought to replace sex as the taxonomy and that “the easiest way to determine if someone is male or female is to ask them”). But see *supra* Part III and *infra* Part V (explaining that in the vast majority of cases establishing sex is simple and that in the few cases where it isn’t, established medical and scientific protocols do this work effectively).

213. See, e.g., Lisa Leff, *‘M’ or ‘F’? Outdated IDs Worry Transgender People*, WASH. POST (June 15, 2013), https://www.washingtonpost.com/politics/m-or-f-outdated-ids-worry-transgender-people/2013/06/15/3ed1c948-d605-11e2-b05f-3ea3f0e7bb5a_story.html?utm_term=.b36aece04587 [<https://perma.cc/2PNK-LKQA>] (describing the problem and the progress advocates have made); LAMBDA LEGAL, CHANGING BIRTH CERTIFICATE SEX DESIGNATIONS: STATE-BY-STATE GUIDELINES <https://www.lambdalegal.org/know-your-rights/article/trans-changing-birth-certificate-sex>

intimate spaces like bathrooms and locker rooms, and educational settings like colleges, and dormitories according to biological sex, resulting in policies in some contexts that permit people to use these spaces according to their identity instead.²¹⁴ And they have challenged triage and treatment practices in prisons and hospitals that do not take into account intersex and trans people's special needs, sometimes resulting in relevant accommodations.²¹⁵ Throughout this ongoing process, policy makers and the public have become more knowledgeable and engaged, even as both the challenges and responses remain controversial and highly contested. Thus, at the same time as this education and engagement has resulted in the Boys Scouts agreeing to accept members on the basis of their gender identity,²¹⁶ the Obama Administration's decision to read out "sex" and read in "gender identity" in its interpretation and enforcement of anti-discrimination law "produced a surprisingly broad backlash, from secular feminists as well as evangelical conservatives."²¹⁷

It is in this unsettled context that the challenge to sport's traditional sex classifications has arisen. The claims have varied depending on the interests of the particular intersex and trans athletes at issue, but in general they have been for inclusion into the women's category of athletes with male bodies who identify as women. As detailed in Part III above, what builds and sustains the male body, first in utero and then in puberty, are the SRY gene, testes, and their product—bioavailable testosterone outside of the female range.²¹⁸ Both male-to-female trans athletes and athletes with 5-ARD and PAIS have a male body in these respects.²¹⁹

designations [<https://perma.cc/3CP4-LGC8>] (last visited Nov. 6, 2017) (providing up-to-date information in this regard specifically); NAT'L CTR. FOR TRANSGENDER EQUALITY, ID DOCUMENTS CENTER, <https://www.transequality.org/documents> [<https://perma.cc/X3ET-7A6G>] (last visited Nov. 6, 2017) (providing interactive resource for individuals seeking requirements for name and gender identity changes on essential documents).

214. See, e.g., Press Release, U.S. Dep't of Justice, U.S. Departments of Justice and Education Release Joint Guidance to Help Schools Ensure the Civil Rights of Transgender Students (May 13, 2016), available at <https://www.justice.gov/opa/pr/us-departments-justice-and-education-release-joint-guidance-help-schools-ensure-civil-rights> [<https://perma.cc/E95L-D2MV>] (setting out the Administration's position on the use of public facilities); see also Liam Stack, *Female-Only Cambridge College to Allow Transgender Women*, N.Y. TIMES (Oct. 4, 2017), <https://www.nytimes.com/2017/10/04/world/europe/uk-transgender-women-cambridge.html?&moduleDetail=sectionnews0&action=click&contentCollection=Europe®ion=Footer&module=MoreInSection&version=WhatsNext&contentID=WhatsNext&pgtype=article> [<https://perma.cc/86P4-FXNJ>].

215. See, e.g., Abby Ellin, *Transgender Patients Face Challenges at the Hospital*, N.Y. TIMES (Feb. 16, 2016), <https://well.blogs.nytimes.com/2016/02/16/for-transgender-patients-challenges-at-the-hospital/> [<https://perma.cc/H76M-396H>] (accommodations in health care settings generally); Denise Grady, *Living as a Man, Fighting Breast Cancer: How Trans People Face Care Gaps*, N.Y. TIMES (Oct. 16, 2016), <https://www.nytimes.com/2016/10/17/health/transgender-health-care-breast-cancer.html> [<https://perma.cc/4KB3-R2GA>] (accommodations in treatment of disease); TRANSGENDER L. CTR., PRISONS AND POLICING RESOURCES, <https://transgenderlawcenter.org/resources/prisons> [<https://perma.cc/EP46-JAGA>] (last visited Oct. 10, 2017) (accommodations in prisons).

216. Chokshi, *supra* note 208.

217. See Shulevitz, *supra* note 4.

218. See *supra* notes 34–54 and accompanying text.

219. Trans women who have physically transitioned have had gonadectomies and so their bodies no

Especially earlier on, the claim for inclusion assumed the condition that the athlete would either have their testes removed surgically (a gonadectomy) or the testes' androgenic effects neutralized via estrogen therapy. Although these approaches do not eliminate all of the performance advantages associated with having a male body—much of this advantage is structural and set in utero and in puberty—either or both would cause a reduction in the athlete's testosterone levels from within to below the male range.²²⁰ Because of this, and because they are medical standard of care for transitioning outside of sport,²²¹ it was seen by sports policymakers as an acceptable compromise.²²²

More recently, however, the claim from those with male bodies who identify as women has been for the right to compete in the women's category without condition, that is, without having to alter their biology. For example, in advance of and around the time of the 2016 Rio Games, athletes with 5-ARD and PAIS who identified as women—including, most prominently, South African runner Caster Semenya—were re-described as “natural women” who were “gifted” genetically with “hyperandrogenism.”²²³ They are “natural” because their bodies have not been altered. They are “women” because this is how they identify. And they are genetically “gifted” with “hyperandrogenism” because they have the SRY gene, testes, bioavailable testosterone in the male range, and the male secondary sex characteristics that result from those primary characteristics.

This last version of the claim for inclusion is supported by three related arguments, all of which are designed to convince the public and policymakers that the goals of the feminist and identity movements are aligned or at least not significantly inconsistent.

The first is rhetorical—that switching out sex for identity in this space would do no cognizable harm. Specifically, some advocates and academics suggest that including intersex and trans women in the women's category would not change

longer produce testosterone in the male range. But up to the point of their surgeries, which generally occur after puberty, their bodies developed as male with all of the structural advantages that entails. Athletes with 5-ARD and PAIS may have had gonadectomies as children pre-puberty, in which case their bodies did not develop as male in that period; but if the surgeries occurred after puberty, they also developed as male. Athletes with these conditions may not have a fully formed penis and their testes may sometimes be undescended, but these differences from the male norm, while deeply challenging for cultural reasons and reproduction, are not relevant to performance.

220. See *infra* notes 299–302 and accompanying text (discussing the details of this compromise).

221. *IOC Regulations on Female Hyperandrogenism*, *supra* note 9; see also *supra* note 96 and accompanying text (discussing the standard medical protocol in this period for individuals born with 5-ARD and PAIS.); see generally, e.g., FENWAY HEALTH, *THE MEDICAL CARE OF TRANSGENDER PERSONS* (2015) (describing the clinical treatment procedure).

222. See *Dutee Chand v. Athletics Fed'n of India*, CAS 2014/A/3759, at ¶ 461 (2015) (decision transcript quoting experts noting that “there is no woman with normal ovaries and normal adrenal glands with testosterone at 10 nmol/l”); Layden, *supra* note 12 (quoting geneticist Eric Vilain, who was involved in the development of the rule, as saying that it “‘allowed for testosterone to be considerably above the normal female range. . . so I have always looked at the guidelines as very inclusive”).

223. See, e.g., *What is an Intersex Athlete? Explaining the Case of Caster Semenya*, *GUARDIAN* (July 29, 2016), <https://www.theguardian.com/sport/2016/jul/29/what-is-an-intersex-athlete-explaining-the-case-of-caster-semenya> [https://perma.cc/Q3ZD-S2M3]; Hughes, *supra* note 6 (discussing the IOC's hyperandrogenism rule).

anything for females assuming they also identify as women; it would merely expand the size of the group so that it included everyone who identifies as a woman. According to this argument, because all who identify as women are “natural women” we would all be in this together and thus there would or should be no in-group fight about the boundaries of the category.²²⁴ Moreover, the fact that females would lose to women would be logically irrelevant and so not a cognizable harm, since “women” not “females” is the category, and since a woman would always win the women’s category. That woman might be male in all relevant biological respects, but unless she were feigning her identity, on the same logic, there would be no cognizable harm.²²⁵ Finally, the fact that the women’s category would include individuals who are male and thus look like men should cause no cognizable harm because characterizing women according to a particular standard of physical femininity would be impermissibly exclusionary.²²⁶ The entire point of the project to replace biological sex with identity is to make the physical irrelevant.

The second is that even if the physical is relevant, the performance gap between elite females and intersex and trans women is likely to be smaller than average, and thus, that including the latter in the women’s category should be insignificantly disruptive of the natural hierarchy. This is the argument that Dutee Chand has made in the Court of Arbitration for Sport (CAS) which has also been adopted by Caster Semenya’s advocates.²²⁷ It is buttressed by, among others, the argument that this likely smaller performance gap proves that testosterone is not *sui generis* as a biological trait, that it is no more special than other innate and cultural advantages that can also affect an individual athlete’s potential to be competitive for the win.²²⁸

The third predicts that because switching out sex for identity only opens up the women’s category to intersex or trans males who either already do or determine openly to live as women, and because these populations will always be small relative to the population of biological females who continue to identify as women, the inclusion of intersex and trans people in the women’s category could be predicted to have a less-than-important effect on elite competition.²²⁹ This

224. See e.g., Hughes, *supra* note 6. This argument, that so long as we are all the same gender we are all in this together, is also made outside of sport. See, e.g., Alexandra Brodsky, *Don’t Use Girls as Props to Fight Trans Rights*, N.Y. TIMES (Oct. 27, 2016), <https://www.nytimes.com/2016/10/27/opinion/dont-use-girls-as-props-to-fight-trans-rights.html> [<https://perma.cc/LB5Z-EVJY>] (arguing that because brain sex is all that matters, our interests are joined).

225. See, e.g., Katrina Karkazis, *The Ignorance Aimed at Caster Semenya Flies in the Face of the Olympic Spirit*, GUARDIAN (Aug. 23, 2016), <https://www.theguardian.com/commentisfree/2016/aug/23/caster-semenya-olympic-spirit-iaaf-athletes-women> [<https://perma.cc/VY49-RXQ9>].

226. See *supra* notes 144–150 and accompanying text (discussing the claim that challenges to intersex and trans women are about “policing femininity” according to a white western aesthetic).

227. See *Dutee Chand*, CAS 2014/A/3759, at ¶¶ 517, 526; Jeré Longman, *Understanding the Controversy Over Caster Semenya*, N.Y. TIMES (Aug. 20, 2016), <https://www.nytimes.com/2016/08/20/sports/caster-semenya-800-meters.html> [<https://perma.cc/HV8Z-U3UV>].

228. See Buzuvis, *supra* note 118, at 40; Padawer, *supra* note 125.

229. This argument is based on my conversations with individuals associated with the development

argument suggests that policymakers in sport can have it all, that there are so few intersex and trans women relative to the population of females that including the former in otherwise restricted spaces contributes to their normalization and empowerment without significantly disturbing the different project that is establishing the female hierarchy of talents and abilities and using it to promote female empowerment.

All three arguments are flawed. Including biological males who identify as women in the women's category would cause important harm to competitive sport and its stakeholders, including female athletes and those groups and projects that depend on their win share. These arguments are analyzed here in reverse order.

It is true that the incidence of people with intersex conditions relevant to sport is extremely low.²³⁰ The number who would be involved in sport can be predicted to be even lower. And although the incidence of trans women is higher, it is reasonable to assume that it will still be small relative to the number of biological females.²³¹ Nevertheless, there are good reasons not to underestimate their potential effects on the women's category.

If males with DSD and male-to-female trans athletes could compete as women without condition and controversy, including without harm to competitive sports' various brands, they would be identified by scouts and featured more systematically by teams; and because of the performance gap, their win share would increase disproportionately.²³² There is some indication that this is already happening. For example, there is a recognized "recruitment bias" for XY women in athletics (track and field),²³³ and a recent study found specifically that "the incidence of 5-alpha-reductase deficiency in elite female athletes that screen positive for hyperandrogenemia may be more than 200 times that of the general population."²³⁴ Thus, the reported 3:8 incidence of males with very rare DSDs in the women's 800 meters final at the Rio Olympics was not a coincidence, nor was the fact that these athletes took all three spots on the podium.²³⁵

of the related regulations and with people outside of sport who have become interested in the debate within sport. In these conversations, especially among those who are not well-versed in the biology, it is something of a refrain that the incidence of intersex and trans people who identify as women is so small relative to the population of normative women that their inclusion will do no harm.

230. See *supra* notes 82 and 93 and accompanying text (providing incidence rates).

231. See *supra* note 104 and accompanying text (discussing incidence rates).

232. See *supra* notes 53–54 and 115–144 and accompanying text (discussing the performance gap).

233. See, e.g., *Dutee Chand v. Athletics Fed'n of India*, CAS 2014/A/3759, at ¶¶ 482, 523–24 (2015) (discussing this bias).

234. Fenichel, *supra* note 81, at E2–E4. The author is describing the results of doping screens from individuals competing in the women's category, not the biological sex of individuals who have 5-ARD. As explained above, this is a condition that affects biological males.

235. Ian Herbert, *Rio 2016: Caster Semenya Says 'It's not about how we look or how we run' as She Powers to Olympic Gold in 800m Final*, INDEPENDENT (Aug. 21, 2016), <http://www.independent.co.uk/sport/olympics/rio-2016-caster-semenya-powers-her-way-to-olympic-gold-in-800m-final-a7201981.html> [https://perma.cc/J5M7-QVLW]; Donald McRae, *The Return of Caster Semenya: Olympic Favourite and Ticking Timebomb*, GUARDIAN (July 29, 2016), <https://www.theguardian.com/sport/2016/jul/29/the-return-of-caster-semenya-olympic-favourite-and-ticking-timebomb> [https://perma.cc/95YE-8X45].

Moreover, had the winner, Caster Semenya, opted to compete in two or more of the events for which she qualified—the 400, 800, and 1500 meters—instead of just one, it is widely believed by experts in the field that she would have won or at least medaled in those races as well, singlehandedly disturbing the natural hierarchy in not just one but two or three of the ten women's events on the track.²³⁶ Finally, although the incidence of intersex appears stable and small, as societies become increasingly accepting of trans people and respecting of their identities without condition, it is also reasonable to predict that their numbers in competitive sport will also grow, as will their win share.

It is also true that the performance gap between elite females and intersex and trans athletes who identify as women will likely not be as large as the average 10–12% performance gap between elite females and elite males. It could be in individual instances if, for example, an elite male athlete like Bruce Jenner decided to come out as Caitlyn in the midst of her athletic career. But the gap between elite females and intersex and trans athletes who identify as women would likely take account of a lot of non-elite athletes who could be successful in the women's but not the men's category; and as such, it likely would be smaller. Notably, as to trans women and individuals with 5-ARD and as Figure 1 describes, this would not be because they had lower T levels than elite males, as their levels are generally in the normal male range. Rather, it would be because, like the hundreds of men who surpass the women's marathon world record every year but do not make it to the elite level,²³⁷ they can beat the best females but are not as good as the best males.

This begs the question whether it matters how large the performance gap is, if—however large or small—it always determines females' capacity for the win and their overall win share. Paula Radcliffe, who holds the marathon world record in the women's category, beat and was beaten by a lot of males on the day she set that record.²³⁸ The gap between her performance and the average of all of

236. See Gerald Imray, *Semenya Wins 400-800-1,500 Triple at South African Nationals*, SAN DIEGO UNION-TRIBUNE (Apr. 16, 2016), <http://www.sandiegouniontribune.com/sdut-looking-sharp-semenya-does-400-800-double-at-2016apr16-story.html> [<https://perma.cc/Z2T8-JGSC>] (noting that her times in the 400, 50.74, and 800, 1:58.45, met Olympic qualifying standards); *Semenya Wins 1500 at African Championships*, INT'L ASS'N ATHLETICS FED'NS (June 24, 2016), <https://www.iaaf.org/news/report/african-championships-durban-2016-semenya-the> [<https://perma.cc/UY3K-69QY>] (noting that her winning time of 4:01.99 qualified her for the Olympic Games); Ross Tucker, *The Caster Semenya Debate*, SCI. SPORT (July 16, 2016), <http://sportsscientists.com/2016/07/caster-semenya-debate/> [<https://perma.cc/7M2S-HEV3>] (predicting that Semenya would win multiple gold medals in Rio). Semenya's particular intersex condition has never officially been made public but it is widely understood as a result of leaks out of the two investigations that Semenya is an "undermasculinized male" with "internal testes but no ovaries or uterus." Olga Khazan, *Why Hyper-Masculine Women are Scary but Fish-Like Men aren't*, ATLANTIC (Aug. 20, 2016), <https://www.theatlantic.com/health/archive/2016/08/caster-semenya-and-the-abnormal-olympic-body/496724/> [<https://perma.cc/6BCV-L47Y>]; see also Ross Tucker, *Semenya and Hermaphroditism*, SCI. SPORT (Sept. 11, 2009), <http://sportsscientists.com/2009/09/semenya-and-hermaphroditism/> [<https://perma.cc/JWV2-8U6S>]. Some experts have been more specific, allowing that she has 5-ARD. See, e.g., *id.*; see also *supra* notes 82–90, 144, and 236 and accompanying text (detailing the biology underlying the condition and discussing the leaks).

237. See *supra* notes 129–132 and accompanying text.

238. See, MARATHON GUIDE, 2003 LONDON MARATHON, MEN RESULTS 1-100,

their times was much smaller than 10–12%. But this does not change the fact that if they were all classified together, Radcliffe would have lost the race, would not have set any kind of record, and because of this, we would not know who she was. In these circumstances, the answer to the question whether the size of the performance gap matters has to be no. If, as a categorical matter, non-doped females cannot compete for the win because they don't have the testes and bioavailable testosterone associated with this sex characteristic, it is irrelevant that the degree of difference is 2% or 12% or somewhere in between. Insurmountability ought to be the dividing line or else it means nothing to set aside women's sport for biological females.

Finally, the argument that switching out sex for identity does no cognizable harm erases exactly the harm that matters for many, if not most, females. That is, it threatens the movement to ensure equality for women who have been subjugated across millennia and cultures precisely because they are physically different from men.²³⁹ The goals of this movement are not primarily about identity; rather, they are about equal opportunity despite these physical differences which are, in the realm and dialect of sport, relative handicaps.²⁴⁰ In addition to the performance gap, which is immutable, these include at least the physical conditions for menses, pregnancy, and breastfeeding, if not these processes themselves.²⁴¹

For example, tennis champion Novak Djokovic may have been impolitic when he expressed his respect for what elite female athletes accomplish despite their menstrual cycles,²⁴² but he was not wrong to acknowledge—as women do

<http://www.marathonguide.com/results/browse.cfm?RL=1&MIDD=16030413&Gen=M&Begin=1&End=100&Max=23893> [<https://perma.cc/RM7C-YKEF>] (last visited Oct. 10, 2017).

239. See Jawad Syed, *Djokovic Business Case for Higher Men's Pay in Tennis Harms Equality*, CONVERSATION (Mar. 22, 2016), <http://theconversation.com/djokovic-business-case-for-higher-mens-pay-in-tennis-harms-equality-56643> [<https://perma.cc/7GQ8-5WRQ>] (noting that “the long historical disadvantage that women have had [is] due to these very [physical] differences—and how they are perceived”).

240. See *supra* notes 53–54 and 115–143 and accompanying text (discussing the performance gap).

241. Alyssa Rosenberg, *Olympic Swimmer Dana Vollmer's Tart, Honest Take on Pregnancy*, WASH. POST (Aug. 8, 2016), https://www.washingtonpost.com/news/act-four/wp/2016/08/08/olympic-swimmer-dana-vollmers-tart-honest-take-on-pregnancy/?utm_term=.b2f9f28ec7f0 [<https://perma.cc/BCW8-UEDN>] (noting that Vollmer's “frankness about pregnancy and motherhood, and her ability to acknowledge both frustration and joy without letting the former eclipse the latter, are a winning combination all of us can aspire to”); cf. Press Release, U.S. Dep't of Justice, Office of Pub. Affairs, Justice Department Settles Pregnancy and Disability Discrimination Lawsuit Against City of Florence, Kentucky (Oct. 26, 2016), available at <https://www.justice.gov/opa/pr/justice-department-settles-pregnancy-and-disability-discrimination-lawsuit-against-city> [<https://perma.cc/S78W-XUXZ>] (related to physical diminishments commonly associated with pregnancy).

242. At his press conference after he won Indian Wells in March 2016, Novak Djokovic was asked whether he thought the tournament CEO was right that male players should earn more of the prize money than female players. In the course of his response, Djokovic said the following: “I have tremendous respect for what women in global sport are doing and achieving. It's knowing what they have to go through with their bodies, and their bodies are much different than men's bodies. They have to go through a lot of different things that we don't have to go through. You know, the hormones and different stuff, we don't need to go into details. Ladies know what I am talking about.” Tom Ley, *Novak Djokovic Stumbles into Some Thoughts about Women's Tennis*, DEADSPIN (Mar. 21, 2016), <https://deadspin.com/>

privately in the locker room and even occasionally outside of that space—that these are hindering in ways men don’t have to consider.²⁴³ And, although feminine physical traits are not generally considered handicaps, as ornithologists and anthropologists know well, they do code for “female” and all that this signals for other women and for men.²⁴⁴ That these physical differences are not as disabling as history has imagined—that women can, for example, be infantry and athletes even in more traditional societies—alters their social prospects but it does not and cannot close the gap entirely. Because of this, affirmative actions like Title IX, the Olympic Movement’s sex classifications, and the intentional promotion of femininity as embodying both mental and physical strength are necessary to ensure that females also benefit from the highly prized goods of competitive sport.²⁴⁵ They allow females to win when they otherwise wouldn’t, and in doing so, they erode at the socially constructed portion of their disability.²⁴⁶ Formal adoption of the view that being a woman is just about identity destroys

novak-djokovic-stumbles-into-some-thoughts-about-womens-1766131796 [https://perma.cc/UQ9Y-BFN9]. He was roundly criticized for these comments and his suggestion that men ought to make more than women because their events are more popular and thus income-producing. *See, e.g.*, Amara Grautski, *Women’s Tennis Players Battling Novak Djokovic’s Subtle Sexism, Not ‘Hormones’*, N.Y. DAILY NEWS (Mar. 21, 2016), <http://www.nydailynews.com/sports/more-sports/grautski-women-battle-novak-subtle-sexism-not-hormones-article-1.2572414> [https://perma.cc/4Q9Z-3T35]. As Professor Jawad Syed has noted, however, acknowledging women’s different physiologies is essential to the creation and maintenance of a successful, diverse work force.

243. Although it is unusual for female athletes to say more than “I am under the weather” publicly, it does happen. *See, e.g.*, Jolene Latimer, *How Olympic Swimmers Deal With Their Periods*, TEEN VOGUE (July 24, 2017), <https://www.teenvogue.com/story/how-olympic-swimmers-deal-with-periods> [https://perma.cc/62EW-BYFD]; Alana Vagianos, *Olympic Swimmer’s Candid Period Comment is Wonderfully Relatable*, HUFFINGTON POST (Aug. 15, 2016), http://www.huffingtonpost.com/entry/fu-yuanhui-candid-period-comment-is-wonderfully-relatable_us_57b205f5e4b071840412397b [https://perma.cc/JWA7-7QRP].

244. *See generally* Anthony C. Little et al., *Facial Attractiveness: Evolutionary Based Research*, 366 PHIL. TRANSACTIONS ROYAL SOC’Y LONDON 1638 (2011).

245. *See supra* notes 107–150 and accompanying text (discussing the optics of female bodies in elite sport). For an excellent example of this phenomenon, see, for example, Maggie Hendricks, *Nike Commercial Spotlights India’s Female Athletes in Incredible New Ad*, USA TODAY SPORTS (July 20, 2016), <http://ftw.usatoday.com/2016/07/nike-commercial-spotlights-indias-female-athletes-in-incredible-new-ad> [https://perma.cc/8CCL-4VJC]. This is a controversial proposition for some, of course. *See, e.g.*, Emily Liang, *The Media’s Sexualization of Female Athletes: A Bad Call for the Modern Game*, 3 INQUIRIES J. 1, 2–3 (2011) (focusing on the negatives associated with the promotion of physical femininity and sexuality at the expense of achievement); Jeré Longman, *For Lolo Jones, Everything is Image*, N.Y. TIMES (Aug. 4, 2012), <http://www.nytimes.com/2012/08/05/sports/olympics/olympian-lolo-jones-draws-attention-to-beauty-not-achievement.html> [https://perma.cc/A8WM-EKWD] (same).

246. *See Part III.A* (discussing these goods). As Jawad Syed, Professor of Organisational Behaviour and Diversity Management at the University of Huddersfield noted in reaction to Djokovic’s remarks, “[w]omen have historically been stereotyped and disadvantaged in all fields of life, including sports, and part of overcoming this is to accommodate and value differences between the sexes. A neglect of gender differences results in the sameness orientation, the idea that everyone has to be seen as the same regardless of their diversity. This may be problematic because women’s and men’s issues and life cycles . . . are not, and must not, be treated as identical. [T]hese differences need to be valued for greater equality and inclusion, instead of being used to reinforce and augment existing gender gaps—not only in sports but also in entertainment, employment, politics and leadership.” Syed, *supra* note 239.

the scaffolding that underlies these social goods.²⁴⁷

C. The Case for Continuing the Set-Aside

Switching out sex for identity, including in competitive sport, could produce important benefits for the identity movement and certainly for the particular intersex and trans individuals involved. But it would also impede the achievement of competitive sport's institutional goals. Despite the claims of some advocates and policymakers to the contrary, making this policy move in this particular space would be a costly exchange. Thus, the question is ultimately whether, on balance, the case for respecting identity outweighs the case for respecting biology.

For some, it may be that enough progress has been made toward the goal of equality for females that promoting inclusion on the basis of identity is now more important.²⁴⁸ For others, it may be that promoting identity is always more important than promoting equality; we see this claim being made in other spheres.²⁴⁹ Or, contrary to the approach taken throughout this article, it may be that formal sex-blindness—you just don't get to talk about my body—is viewed as the best vehicle to equality for females so that even if intersex and trans women sometimes tax this movement, it is important to stay the course.²⁵⁰ Each of these positions has merit and decisions by sport's policymakers to adopt any or all of them as the basis to switch out sex for identity would be defensible.

It is arguably the case that continuing the set-aside that is the women's category, and retaining that as a females-only space, is a legal imperative in societies where equal protection doctrine is read to require affirmative measures to reduce, in particular, discrimination based on race and sex.²⁵¹ Although

247. As 1500 meters champion Shannon Rowbury has noted, "I think it challenges and threatens the integrity of women's sports to have intersex athletes competing against genetic women. . . . Women have fought far too long to be able to even have the right to compete and now it's being challenged by intersex and trans athletes and I don't think that's right." Scott M. Reid, *Caster Semenya's Olympic Dream a Topic of Controversy*, ORANGE CTY. REG. (July 31, 2016), <http://www.oregister.com/2016/07/31/caster-semenyas-olympic-dream-a-topic-of-controversy/> [<https://perma.cc/35BM-PRCU>] (internal quotation omitted).

248. See, e.g., Shin, *supra* note 208 (discussing this perspective); Associated Press, *IOC Rules Transgender Athletes Can Take Part in Olympics Without Surgery*, *supra* note 9 (IOC statement applying intersex rule to trans women and noting the "social and political changes" that underlie the new rules).

249. See, e.g., Charles M. Blow, *Religious Freedom v. Individual Equality*, N.Y. TIMES (Apr. 1, 2015), <https://www.nytimes.com/2015/04/02/opinion/charles-blow-religious-freedom-vs-individual-equality.html> [<https://perma.cc/YG4S-2STW>] (discussing religious freedom restoration acts as claims that the freedom to protect one's identity is more valid or important than equality).

250. See Jane Flanagan, 'Haters, be patient. . . I have so much more for you': *Gender Row Runner Caster Semenya's Fans Launch #HandsOffCaster Twitter Campaign at Haters Who Say She Shouldn't Run in Rio as a Woman*, DAILY MAIL (Aug. 16, 2016), <http://www.dailymail.co.uk/news/article-3741488/Haters-patient-Gender-row-runner-Caster-Semenya-s-fans-launch-HandsOffCaster-Twitter-campaign-haters-say-shouldn-t-run-Rio-woman.html> [<https://perma.cc/MK8T-225Y>] (discussing the #HandsOffCaster).

251. In the United States Title IX prohibits sex discrimination in educational settings, including in high school and college sport, and it permits sex segregation as a means to assure females equal treatment under this law. Where defining "sex" as "identity" would defeat the purpose of the segregation, doing so would be unlawful.

advocates have argued that identity ought also be included on that list, either as another protected class or as part of sex, they have yet to win this argument.²⁵² Indeed, at the time of this writing, this debate is particularly contentious.²⁵³ Moreover, even if sex is understood to include identity—either because sex is switched out for identity for policy reasons or identity is understood to be biologically based and thus an aspect of sex—the law may still privilege the reproductive aspects of biology since these have traditionally been the basis for the subordination of women.

Whether the set-aside is legally required or not, however, it is the best policy choice for sport and its associated stakeholders. In a purely utilitarian sense, it does more and overwhelming good. The goals of the women's category, which are met when it is protected, are to feature the highest, fastest, and strongest females and thereby to assure them and all females an equal-to-men's chance at the tangible and intangible goods created by competitive sport.²⁵⁴ They also include spreading these goods throughout the world as a way more generally to raise women's prospects. Societies have made a lot of progress against sex discrimination, particularly in the West, but it is a fact that females—numerically half of the world's population—remain a vulnerable sub-population worldwide.²⁵⁵ Intersex and trans individuals are also vulnerable, but not nearly in the same numbers, not categorically, and not similarly for their physical vulnerabilities; in these respects, in the language of anti-discrimination law, they are not similarly situated. In these circumstances, societies do not have the luxury to indulge in the fiction—which will not have significant power outside of liberal democracies in any event—that sex does not exist. In these circumstances, we should not abandon the optics and the possibilities that come from showcasing success in competitive sport by women like swimmer and mother Dana Vollmer and “Shot Diva” Michelle Carter who are identifiable as successful females and who embrace their status as role models.²⁵⁶ Changing the terms of the category

252. See *supra* notes 2–4 and accompanying text (noting the state of the legal challenge in the U.S.).

253. *Id.*

254. See Part III.A.

255. See *supra* note 194 and accompanying text.

256. See Mary Pilon, *You Throw, Girl: An Olympic Shot-Putter's Feminist Mission*, NEW YORKER (Aug. 11, 2016), <https://www.newyorker.com/news/sporting-scene/you-throw-girl-an-olympic-shot-putters-feminist-mission> [<https://perma.cc/BCJ2-446V>] (reporting on Carter as a role model); Rosenberg, *supra* note 241 (reporting on Vollmer as a role model); DANA VOLLMER, MOMMA ON A MISSION, ABOUT DANA, <https://danavollmer.com/> [<https://perma.cc/KC47-X7RF>] (last visited Oct. 10, 2017); SHOT DIVA, MEET THE SHOT DIVA MICHELLE CARTER, www.shotdiva.com [<https://perma.cc/XK98-3TJY>] (last visited Oct. 11, 2017);. This should not be a controversial proposition. For example, we know that particularly for females and minorities, having role models “who look like us” matters to our perceptions of our own opportunities and value. See, e.g., Penelope Lockwood, “*Someone Like Me Can Be Successful*”: Do College Students Need Same-Gender Role Models?, 30 PSYCHOL. WOMEN Q. 36, 36–46 (2006) (reporting on results of two studies “examin[ing] the extent to which matching on gender determines the impact of career role models on the self” and concluding that “female participants were more inspired by outstanding female than male role models” and that “in contrast, gender did not determine the impact of role models on male participants”). And we know that people are more likely to think past negative assumptions and stereotypes when they are exposed to successful counter

so that it includes males who identify as women would relegate athletes like them to non-elite status and reinforce the very stereotypes the category was designed to negate.

Protecting these interests outweighs the interests of individual intersex and trans women to participate in and win sports events as women. It is doubtful that their being able to do so is more broadly beneficial given the inevitable backlash that accompanies their entry into events, a backlash that muddies the optics for their purposes.²⁵⁷ But even if it is, because the stereotypes they need to counter are not based in any sense that they are physically fragile, there are other ways for them to accomplish these ends. On the other hand, participation and success in elite sport is truly a unique opportunity for females to combat the pervasiveness of damaging stereotypes.

V

MEANS-ENDS TAILORING

Sex discrimination is sometimes a good or even the best policy choice. As Part II explains, where this is the case, sex classifications are legal so long as the tool used to distinguish males from females is carefully tailored so that no unnecessary harm or over- or under-inclusion results. Part IV argues that sex discrimination continues to be the best policy choice in the competitive sport space, where the affirmative action of setting aside the women's category for females only operates in a number of ways to empower rather than subordinate them. This Part focuses on the nexus between sport's institutional ends and the means that can most carefully and effectively achieve them. Specifically, it focuses on the question of what is careful and effective sex testing for competitive sport.

The idea of sex testing is anathema to many because, even though this is not usually the case, it can be both physically and emotionally intrusive. Depending

examples. See, e.g., Kait Richmond, *Muslim-American Medalist: The America I Love is Inclusive*, CNN (Aug. 16, 2016), <http://www.cnn.com/2016/08/16/sport/ibtihaj-muhammad-new-day-trnd/index.html> [<https://perma.cc/L62S-MZLG>] (reporting on Ibtihaj Muhammad, the “first American woman to win Olympics medal wearing a hijab” and noting that Muhammad “hopes to inspire young athletes to defy stereotypes and pursue their dreams”); Barry Svrluga, *Simone Manuel on Making History: ‘The gold medal wasn’t just for me’*, WASH. POST (Aug. 11, 2016), https://www.washingtonpost.com/sports/olympics/simone-manuel-on-making-history-the-gold-medal-wasnt-just-for-me/2016/08/11/28cc3fe6-603d-11e6-9d2f-b1a3564181a1_story.html?utm_term=.11bf383c420b [<https://perma.cc/LP78-SE2K>] (reporting on the first African American woman to win gold in swimming).

257. For example, “Tom Fordyce of the BBC wrote if Semenya breaks the world record in Rio, it could spell the end of her career because of the attention it would bring to her condition.” Gibbs, *supra* note 133. And “Ross Tucker, the eminent South African sports scientist, regrets the personalisation of hyperandrogenism, but he is ‘dreading the Olympics because Semenya will win and the fallout will be deeply unpleasant.’” McRae, *supra* note 235. See also Amby Burfoot, *Why the Women’s 800 Will Be the Most Controversial Race at the Olympics*, RUNNER’S WORLD (Aug. 11, 2016), <https://www.runnersworld.com/olympics/why-the-womens-800-will-be-the-most-controversial-race-at-the-olympics> [<https://perma.cc/X94S-JFGT>]; Ben Rumsby, *Caster Semenya Defiant in the Face of Her ‘Haters’ as She Goes for Gold in the Women’s 800m*, TELEGRAPH (Aug. 19, 2016), <http://www.telegraph.co.uk/olympics/2016/08/19/caster-semenya-defiant-in-the-face-of-her-haters-as-she-goes-for/> [<https://perma.cc/ZTV6-RRVT>].

on the individual, it may also be complicated. Nevertheless, where sex discrimination is the best policy choice, some form of sex testing is inevitable. Ensuring that this testing is careful and effective given institutional mission is thus not only legally required; it is also the best way to minimize if not eliminate unnecessary intrusions.

A. Sex and Sex Testing in General

As Part III on the biology of sex and sex differentiation describes, primary and secondary sex characteristics almost always distribute bi-modally.²⁵⁸ That is, taking into consideration both intersex and trans people, and using the most generous reading of the best available evidence as of this writing, approximately 98% or more of the time, individuals have either all male primary and secondary sex characteristics, or all female primary and secondary sex characteristics, and they identify accordingly.²⁵⁹ Historically and across cultures, this bimodal distribution has resulted in a view of sex as binary, and thus of individuals as either male or female.²⁶⁰ It has also resulted in the view that these distinctions are scientifically clean and easily made.²⁶¹

The combined incidence of intersex and trans people, together with the progressive movement to challenge our defaults and to interrogate the role of biology in the construction of gender, have appropriately complicated these longstanding views. We now understand that because sex characteristics do not always distribute bi-modally, sex itself—as representing the cluster of characteristics—is best described as binary with exceptions or not binary at all. Whether it is the former or the latter depends on one’s rhetorical preferences, which are themselves influenced by cultural, political, and disciplinary orientation. In other words, while the bi-modal distribution is a fact not a social construction, how we view and characterize that distribution is constructed.

Those who say that sex is not binary often describe it as “messy” or “fluid” and both individual characteristics and the distribution as reflecting a “continuum,” a “spectrum,” or a “kaleidoscope.”²⁶² For example, bioethicist and science historian Alice Dreger argues that sex characteristics are on a “spectrum

258. See *supra* notes 100–104 and accompanying text.

259. *Id.*

260. *Id.*

261. These perspectives are especially prevalent in circumstances where intersex and trans people are not seen or else dismissed as so aberrational that they are effectively erased. Indeed, the medical history of DSDs is largely the story of the effort to render intersex in particular invisible, to erase its traces, by conforming “doubtful bodies” to one or the other sex. See generally DREGER, HERMAPHRODITES AND THE MEDICAL INVENTION OF SEX, *supra* note 68 (examining the history in England and France); ELIZABETH REIS, BODIES IN DOUBT: AN AMERICAN HISTORY OF INTERSEX (2009) (examining the history in the United States).

262. See, e.g., JOAN Z. SPADE AND CATHERINE G. VALENTINE, THE KALEIDOSCOPE OF GENDER: PRISMS, PATTERNS, AND POSSIBILITIES xiii–xiv (4th ed. 2014) (kaleidoscope); Alice Dreger, *The Social Construction of Sex*, PACIFIC STANDARD, (Mar. 21, 2014), <https://psmag.com/social-justice/social-construction-sex-77099> [<https://perma.cc/N4NX-ETF5>] (spectrum); Hughes, *supra* note 6, at 9.

... where one ‘type’ blends imperceptibly into the next” so that although those characteristics are real, the binary itself is not.²⁶³ This rendering relies on the fact that some of the norms are based in typically unacknowledged ranges.²⁶⁴ Thus, the data represent genetic sex on a continuum from XX to XY with XXY and XYY (and other permutations) in between²⁶⁵; of endocrine sex—here testosterone—on a continuum from 12 to 1150 ng/ml²⁶⁶; and of phenotypic sex on a continuum from, for example, the very small clitoris to the very large penis, with clitoromegaly²⁶⁷ and micropenis in between.²⁶⁸ This rendering is most persuasive when only difference not incidence is plotted, and when we ignore that this incidence is not just noise. That is, if one imagines three people, one sex typical female, one intersex person, and one sex typical male, the rendering is persuasive. Once incidence is factored in, however, the impression that sex is binary is difficult to ignore. And male genitalia can only be seen to “blend imperceptibly” into female genitalia if their reproductive purpose—their semen

263. Dreger, *The Social Construction of Sex*, *supra* note 262. See also CARRIE HULL, ONTOLOGY OF SEX: A CRITICAL INQUIRY INTO THE DECONSTRUCTION AND RECONSTRUCTION OF CATEGORIES 55 (2006). Alice Dreger is a bioethicist and historian of science whose scholarship on the biology and politics of sex is the most thoughtful and thorough I have encountered. Dreger is well known in part for her book HERMAPHRODITES AND THE MEDICAL INVENTION OF SEX, in which she explores the “discovery” followed by the medical erasure of intersex in France and England in the late nineteenth and early twentieth centuries. See generally DREGER, HERMAPHRODITES AND THE MEDICAL INVENTION OF SEX, *supra* note 68. She further traces the legacy of that medical history into the modern period. Specifically, she demonstrates how “medical men” in that earlier time deliberately imposed the binary on “doubtful bodies” in an effort to conform them to traditional social norms about maleness and femaleness; at least some of this effort was politically—as opposed to culturally—driven, that is in opposition to contemporary challenges from individuals and groups who sought acceptance for non-traditional sex roles and sexuality. *Id.* at 91. It is difficult to disagree with Dreger’s assessment that the sex of intersex individuals has been erased and (re)constructed—literally and figuratively—so that they could be made to fit within the binary; and that in this respect, sex (theirs) has been socially constructed.

264. Dreger, *The Social Construction of Sex*, *supra* note 262; Vanessa Heggie, *Nature and Sex Redefined – We Have Never Been Binary*, GUARDIAN (Feb. 19, 2015), <https://www.theguardian.com/science/the-h-word/2015/feb/19/nature-sex-redefined-we-have-never-been-binary> [<https://perma.cc/J3UF-FXYK>].

265. Dreger, *The Social Construction of Sex*, *supra* note 262; Dennis O’Neil, *Tutorial on Human Chromosomal Abnormalities: Sex Chromosome Abnormalities*, PALOMAR C., https://www2.palomar.edu/anthro/abnormal/abnormal_5.htm [<https://perma.cc/3PN3-KRLL>] (last visited Oct. 11, 2017).

266. See *supra* note 45 and accompanying text (representing the range from the bottom of the normal female range to the top of the normal male range).

267. *Specific Conditions, What is Clitoromegaly?*, ACCORD ALLIANCE, <http://www.accordalliance.org/learn-about-dsd/faqs/> [<https://perma.cc/6JU8-S8XE>] (last visited Oct. 11, 2017) (explaining that “[c]litoromegaly” is a medical term meaning that the clitoris has grown larger than is typical in girls” and that “[s]ometimes clitoromegaly happens during fetal development because of a DSD” and “[s]ometimes clitoromegaly occurs during puberty, or even later in life, because of an underlying hormonal shift that is atypical.”).

268. *Specific Conditions, What is “Micropenis”?*, ACCORD ALLIANCE, <http://www.accordalliance.org/learn-about-dsd/faqs/> [<https://perma.cc/X6KX-8S92>] (last visited Oct. 11, 2017) (explaining that “[m]icropenis” is a medical term typically today applied when the length of a [stretched] penis . . . is at least 2.5 standard deviations smaller than the average penis length when stretched . . . [M]en and boys whose penises fall in the smallest 0.6% (smallest 6 in a sample of 1000) are said to have the condition ‘micropenis.’ In practice, some medical texts have defined micropenis in newborns as involving stretched penis lengths of 2.5 centimeters (about 1 inch) or less. Other texts say the definition of micropenis is newborn stretched penis lengths of 1.9 centimeters (about ¾ inch) or less.”).

production and delivery function—is left out of the description. Nevertheless, this approach does important work for affected individuals who are redefined as sex typical as a result.

It also does important work for the identity movement, as it sets up the further argument that because sex is messy, so is sex testing. For example, it has been argued by some social scientists that because sex is not binary, or even “definable,” line drawing to distinguish males from females is “impossible.”²⁶⁹ This argument is primarily in service of the political goal that is switching out sex for identity; that is, if sorting males from females is an impossible exercise because sex characteristics are on a spectrum, we should classify people on different grounds.²⁷⁰ It is also about the difficulties of line drawing at the margins in general. Thus, some would have it that if the margins are troubled or slippery or include anomalies so that the line cannot be drawn exactly right, it should not be drawn at all. In these circumstances, it is often said that any particular cut would be “arbitrary” and so inherently “unfair” to those who would be excluded from benefits as a result.²⁷¹ In any event, the net effect of these arguments is to cause at least some policy makers to question the necessity and scope of sex classifications and testing.

In contrast, those who think of sex as binary with exceptions focus on the implications of the biological facts including on the incidence of sex typical to sex atypical individuals. Thus, although the binary may be slightly troubled at the margins by the <2% incidence of intersex and trans people, it is easily discernible because it is the clearest and truest representation of the data: more than 98% of us fit neatly on the male or female side of the binary. And, again, this incidence is not just noise. Sex differences may inform identity and so are important also for that reason, but they exist in the first instance as a reproductive and species imperative. Consistent with this imperative, we are mostly either (1) 46,XX-females with ovaries which produce eggs, estrogenic endocrine systems, and female primary and secondary sex characteristics which support the female life and reproductive cycle, or (2) 46,XY-males with testes which produce sperm, androgenic endocrine systems, and male primary and secondary sex characteristics—which support the male life and reproductive cycle.²⁷² Approximately 2% or less of us are exceptions to this rule—we are distributed in between as to one or more sex characteristics—and are not so easily sorted. This rendering also does important cultural work, as the ubiquity of sex classifications suggests.

Sex according to this model is easily defined and line drawing to separate males from females is neither impossible nor arbitrary. Indeed, in most cases,

269. See, e.g., Lindsay Parks Pieper, ‘Preserving la difference’: *The Elusiveness of Sex-Segregated Sport*, 19 *SPORT SOC’Y* 1138, 1139 (2016).

270. See *supra* notes 208–213 and accompanying text (discussing this goal).

271. See, e.g., Mary Crossley, *The Disability Kaleidoscope*, 74 *NOTRE DAME L. REV.* 621, 686 (1999) (“[T]his basis for line-drawing . . . is arbitrary and likely to produce unfair results.”).

272. See *supra* Part III (setting out this biology).

either before or immediately after birth, it is pro forma. In more sophisticated medical settings, ultrasounds and related testing before birth can and do distinguish males from females based on genetic sex, gonadal sex, and phenotypic sex. And at birth, regardless of the sophistication of the setting, phenotypic sex is used, as it has across cultures and time, to do the same work. These “sex tests” are not usually considered physically or psychologically intrusive, and neither are the routine verifications of identity documents—another form of “sex test”—that occur over time based on that earlier work. The tests are not error free, but they are highly accurate and reliable: they always capture sex typical individuals, and although it happens, it is unusual for someone who is sex atypical to have been identified as typical at birth.

The evaluation is more complicated and intrusive for the small number of individuals who present atypically. Still, in modern medical settings, relevant experts do this work all the time and again, the line drawing involved is neither impossible nor arbitrary. Thus, in sophisticated medical settings, at birth it is medical standard of care for endocrinologists and specialists in DSD to use a differential diagnosis that derives the facts about the infant’s genetic sex, gonadal and endocrine sex, and phenotypic sex to establish biological sex and the DSD at issue.²⁷³ The latter is necessary because many DSDs have important health effects and the majority of those born with DSD are affected by conditions in this category.²⁷⁴ This diagnostic procedure effectively resolves biological sex one way or the other, except in very rare cases of ovo-testicular disorder, also known as “true hermaphroditism,” in which the individual has both testes and ovaries.²⁷⁵ Thus, as Part III’s discussion of CAH, POS, 5-ARD, and PAIS illustrates, once one looks past external genitalia, individuals who present ambiguously are almost always male or female—their genetic, gonadal, and endocrine sex line up.²⁷⁶ Biological sex and developmental anomalies are then used in consultation with the infant’s parents to establish their legal and social sex.²⁷⁷ What they choose to do, including what physicians recommend, often depends on cultural norms related to the ambiguities at issue; the latter may also be relevant to the individual’s own decision when they face it later in life.²⁷⁸ But again, the

273. See generally ACHERMANN & HUGHES, *supra* note 73 (providing background on DSDs and diagnostic methodology); FAUCI ET AL., *supra* note 38, at 2339–46 (textbook description of differential diagnosis for DSD).

274. See, e.g., *supra* notes 74–80 and accompanying text (noting the most common DSDs, CAH and PCOS, which can involve salt wasting, obesity, and metabolic anomalies).

275. Muhammad Zafar Iqbal et al., *True Hermaphrodite: A Case Report*, ASSOC. PEDIATRIC SURGEONS PAK. J. CASE REP. (2011) (representing the incidence of this condition at 5% of all DSD cases).

276. See *supra* notes 73–99 and accompanying text.

277. *Id.*

278. For example, in some cultures male children regardless of penis size are more highly valued than female children, whereas in others, males are considered likely to be socially successful only if they have a penis in the typical range. Thus, parents and doctors at birth are more likely to choose to identify a male child with a micropenis or ambiguous genitalia as male in the former than in the latter. Tell, *supra* note 86, at 6–11 (describing “intersex management” around the world). The diagnostic standard of care

diagnostic procedure works well to establish the basic biology from which they will work.²⁷⁹

Ultimately, whether we say that sex is binary or not is less important than the fact that where sex is institutionally relevant, line drawing will continue to be important. And because this work treads on sensitive ground, it needs to be done carefully and effectively. Here, carefully means with due care and attention to the physical, psychological, and cultural intrusions that may be entailed. And effectively means with due care and attention to the reasons for the intrusions; the latter must be tailored to those reasons and must not be unnecessarily over- or under-inclusive. As with line drawing at troubled margins in general, most of us are comfortable with reasoned cuts. And as Alice Dreger has noted in the context of sport in particular, the view that “sex is messy” does not preclude us from “com[ing] up with a clear set of rules for sex typing” based on a “dec[ision about] which of the dozens of characteristics of sex matter” to the institution and circumstances at issue.²⁸⁰ Reasoned cuts on these bases are the bread and butter of decision-making by individuals and regulators alike; this is perhaps especially true in sport which is literally all about lines.

B. Sex Testing for Competitive Sport: Testes and an Androgenic Endocrine System Including Bioavailable Testosterone Outside the Female Range

Competitive sport has consistently sought to exclude male bodies from female sport as a way to showcase the best female athletes, to afford them and institutional stakeholders the benefits that flow from winning in this space, and to contribute to the eradication of sex discrimination more generally. As Part III on the biology of sex and sex differentiation explains, the sex characteristics that matter for this purpose are testes and an androgenic endocrine system including bioavailable testosterone outside of the female range.²⁸¹ The former produce the latter, which builds a male body beginning in utero and then in puberty, and which sustains it in related respects throughout adulthood.²⁸²

So long as sport does not go beyond its needs, careful and effective sex testing in this space is therefore not complicated, as it requires establishing the existence, or not, of just these two characteristics, neither of which happens to be messy or to blend imperceptibly into their female analogs.²⁸³ That is, it is exceedingly rare

is evolving in the current period also to take account of how the individual is likely to identify. *See supra* note 96 and accompanying text.

279. Parents in more rudimentary medical settings do not have the benefit of the detailed diagnostic, but when their infants present with genital ambiguities, they also base their decisions as to their children’s legal and social identity in part on cultural norms. *See supra* notes 86–99 and accompanying text (discussing this practice).

280. Alice Dreger, *Where’s the Rulebook for Sex Verification?*, N.Y. TIMES (Aug. 21, 2009), <http://www.nytimes.com/2009/08/22/sports/22runner.html> [<https://perma.cc/S4H8-GZ24>] (concluding that this work can be done).

281. *See supra* Part III. Endocrinologists and related medical professionals may use the term “gonadal sex” to describe these characteristics in combination.

282. *Id.*

283. External genitalia are more difficult to distinguish at the margins so that micropenises and

that individuals have both testes and ovaries²⁸⁴; testes are phenotypically, functionally, and almost always positionally distinct from ovaries²⁸⁵; and as Figure 1 reflects, the only females who will present with testosterone outside of the female range are either doping or have a 46,XX DSD, either congenital adrenal hyperplasia (CAH) or polycystic ovarian syndrome (PCOS).²⁸⁶ Because both of these DSDs tend to involve significant health effects, it is unlikely that individuals with these conditions will be elite athletes.²⁸⁷ This means that athletes who present with testosterone outside of the female range are exceedingly likely to be male or to be doping. As a result, sex typing on these grounds is narrowly tailored to the institution's goals and exceedingly unlikely to result in false positives and under- or over-inclusion.

Thus, the women's category would be open to all athletes who are biologically female, that is, to everyone with ovaries and not testes. This would include females with CAH and PCOS whose T levels rise above the top of the female reference range if their conditions' adverse health effects did not preclude their athletic endeavors. It would also be open to some intersex athletes with 46,XY DSD, including those with complete androgen insensitivity (AIS) as well as those who were diagnosed with partial androgen insensitivity (PAIS) and 5-alpha reductase deficiency (5-ARD) who had gonadectomies before the passage of puberty. The category would also be open to trans women who had gonadectomies and/or T suppression therapy before the passage of puberty. It would not be open to intersex and trans athletes who had testes and testosterone in the male range through puberty, since the point of the women's category in elite sport is to provide a space free of competition from athletes with male bodies. Although it would require these athletes to compete in the men's category as adults even if they identified as women and thus would cause them individual harm, pegging the rule to the pubertal period provides two important sets of assurances.²⁸⁸ The first is that the larger group of athletes who compete as women are not disadvantaged, and the institutions that seek to promote the strength and capacities of the female body through women's sport are not hindered in this societal project by the inclusion of bodies that developed as

clitoromegaly may blend. These particular sex traits are irrelevant for sports' purposes except as a flawed proxy for gonadal and endocrine sex.

284. See *supra* note 275 and accompanying text.

285. See *supra* Part III.

286. See *supra* note 45 and accompanying text.

287. See *supra* notes 74–80.

288. For discussions of the significance of the pubertal period for athletes' differential physiological development, see *supra* notes 46–54 and accompanying text; see also Handelsman, *supra* note 51, at 69–72 (focusing specifically on the sex split at puberty); Lauren Fleshman, *Dear Younger Me*, MILESPLITUSA (May 17, 2017), <http://www.milesplit.com/articles/211759-dear-younger-me-lauren-fleshman> [<https://perma.cc/UNP7-FX2N>] (providing an extraordinary first person perspective). There are not many elite sports that involve pre-pubescent athletes, but there are some, for example, gymnastics. Fiduciaries for athletes in these sports might be swayed by eligibility requirements to push for their charges to undergo otherwise premature gonadectomies and hormone suppression therapy. The medical community, the medical standard of care, and medical ethics are probably the most effective bulwarks against any abusive proxy decision making in this setting.

male.²⁸⁹ The second is that the choice to have or not to have sex-altering surgeries and treatments belongs to the individual based on their identity beyond sport; the possibility that this choice could be influenced by coaches, agents, or sports authorities should be taken off the table.

Establishing the existence of testes and testosterone outside of the female range is also easily done as a clinical matter. Anti-doping screens using blood and urine that include T level screens are already in place, and already ethically and lawfully flag individuals competing as women who are suspicious for doping or male biology.²⁹⁰ Where those screens yield a T level outside of the female range, the athlete is already ethically and lawfully subject to further examination to establish the cause of the elevated reading.²⁹¹ Where the concern is sex not doping, the further examination is intrusive, but it should be less and certainly no more intrusive than a standard woman's physical. Thus, these two sex characteristics can be established quickly and easily by a physician of the athlete's choosing. A spot check will reveal descended or partially descended testes, an ultrasound will reveal undescended testes, and further laboratory analysis of fluid samples will establish the bioavailability of their testosterone. So long as all of this work is consistent with established medical protocols and ethics, which include respect for the patient and their privacy, it should be acceptable other than to those who reject sex as the basis for classification and thus would find any sex testing protocol anathema.

The ease with which this clinical process can be undertaken does not account for the inevitable psychological intrusion that any surprising and unwanted inquiry into an issue so intimate as sex entails. Sport must take this concern seriously, especially because it operates around the world in many places where athletes are not accustomed to any kind of medical examination, where sex taxonomies and gender roles are deeply traditional, and where the athletes may not be able to avoid related publicity. It has botched this piece of its work badly in the past and has caused significant harm in the process.²⁹² It needs to get this

289. Cf. Joanna Harper, *Athletic Gender*, 80 LAW & CONTEMP. PROBS., no. 4, 2017, at 145–46 (citing a study by the author that showed the success of testosterone suppression in transgender women who transitioned post-puberty, thereby mitigating concerns of unfair competition from previously male bodies).

290. Elsas, *supra* note 81, at 253.

291. *Id.*; see also WORLD ANTI-DOPING AGENCY, WORLD ANTI-DOPING CODE 51, 113 (2015).

292. The personal stories of Caster Semenya and Dutee Chand are particularly well known in this regard, but they are certainly not the only athletes who have been harmed by badly designed and implemented protocols in the past. I take the position here that athletes with their biology should not be included in the women's category, but I agree without reservation that the way they were treated in the process of their evaluations was indefensible. See Elsas, *supra* note 81, at 250–52 (summarizing the history of sex testing in Olympic sport); Anna Kessel, *Caster Semenya Wins Gold but Cannot Escape Gender Controversy*, GUARDIAN (Aug. 19, 2009), <https://www.theguardian.com/sport/2009/aug/19/caster-semenya-800m-world-athletics-championships-gender> [<https://perma.cc/XE3H-GMEY>] (summarizing Semenya's story through 2009); Ariel Levy, *Either/Or: Sports, Sex, and the Case of Caster Semenya*, NEW YORKER (Nov. 30, 2009), <https://www.newyorker.com/magazine/2009/11/30/eitheror> [<https://perma.cc/UQ8R-6DMW>] (same); Donald McRae, *The Return of Caster Semenya: Olympic Favourite and Ticking Timebomb*, GUARDIAN (July 29, 2016), <https://www.theguardian.com/sport/>

right.

What this means is that although sport has no business meddling in aspects of the athlete's biology or psychology that are unrelated to its mission, it should care that everyone who is subject to sex testing under its protocols is treated with respect, and that no one is unnecessarily harmed by its rules and procedures. Although athletes put their bodies including their sex in issue when they choose to compete, and thus have very different reasonable expectations of physical privacy than the average person,²⁹³ they are like the average person in that sex is profoundly relevant to their lives beyond sport. Whether the choice to care results from a codification of a certain ethics or simply attention to public and political pressure and the value of sport's various projects and brands, those tasked with questioning and establishing the athlete's "sports sex"—or what Joanna Harper calls "athletic gender"—must be attentive to those broader implications.²⁹⁴ Caring in this context doesn't require sport to guarantee that no one's feelings will be hurt, but it does require that the foreseeable impacts of sex testing be mitigated. At a minimum, this means educating teams, coaches, and athletes *ex ante* about the rules so that athletes are not put into competitive situations in which they don't belong; being honest with athletes who are subject

2016/jul/29/the-return-of-caster-semenya-olympic-favourite-and-ticking-timebomb [http://perma.cc/95YE-8X45] (same); Padawer, *supra* note 125 (summarizing Chand's and other stories).

293. Choosing to be an elite athlete is choosing to put the relevant details of your body in issue. Competitive sport is ultimately about bodies, how they work, how they could be made to work better, and the hands that would be on them to help them succeed. Short of sex testing, athletes provide urine under supervision and have that and their blood tested for a range of substances and processes. *See, e.g.*, U.S. ANTI-DOPING AGENCY, TESTING, <https://www.usada.org/testing/> [https://perma.cc/E2JY-XSG6] (last visited Oct. 12, 2017) (summarizing urine and blood testing programs); WORLD ANTI-DOPING AGENCY, PROHIBITED LIST (2017). Finally, depending on the sport and the contract terms, a more complete physical exam is required. *See, e.g.*, David Siebert, *An Inside Look into the NFL Medical Exam Process at the Combine*, BLEACHER REP. (Feb. 21, 2014), <http://bleacherreport.com/articles/1968230-an-inside-look-into-the-nfl-medical-exam-process-at-the-combine> [https://perma.cc/6E38-5GNJ]. For liability and drug testing purposes, high school athletes in the U.S. are increasingly subject to all of these as a routine matter. *See, e.g.*, SAPULPA PUB. SCHS., REQUIRED ATHLETIC FORMS, http://www.sapulpaps.org/d_e_p_a_r_t_m_e_n_t_s/athletics/required_athletic_participation_information [https://perma.cc/78HD-7G4D] (last visited Oct. 12, 2017) (summarizing the school district's sports physical and drug testing requirements). Given their health and safety rationales, there is no doubt that sports physicals are lawful; and the constitutionality of schools' drug testing requirements has been upheld by the United States Supreme Court. *Vernonia Sch. Dist. 47J v. Acton*, 515 U.S. 646, 666 (1995); *see also* Doriane Lambelet Coleman, *The Ironic Costs of a Child Welfare Exception to the Fourth Amendment*, 47 WM. & MARY L. REV. 413, 516 (2005) (explaining that children have a reduced expectation of privacy at school). Like gynecological exams, sex testing is invasive in ways that are different from urine and blood tests and sports physicals; but the latter are also invasions of privacy that may expose deeply personal and otherwise protected health information and lifestyle details. While most people may have both the expectation and the right to decline to be examined in these ways, elite athletes do not.

294. I think that this incredibly helpful term was coined by Ross Tucker, a South African sports scientist who has followed and written on Semenya's case in extraordinary detail since 2009. Tucker has been sport's "Explainer in Chief" of the science associated with introducing genetic males with DSD into the women's category. Among Tucker's many important contributions has been his willingness publicly to take on the social scientists and advocates who have worked to obscure the scientific facts and bullied contrary voices in the process. *See, e.g.*, Tucker, *The Caster Semenya Debate*, *supra* note 116 (discussing these attacks); *see also* Harper, *supra* note 289, at 151 (using the term "athletic gender").

to testing about why they are being tested, the approved protocols, and their associated rights; categorically protecting the confidentiality of their medical records; and connecting them with additional, independent, resources.

In the end, it is important that sport not shy away from this work simply because it can be politically sensitive and personally intrusive. Retaining sex as the basis for classification is lawful and in some circumstances may even be legally required.²⁹⁵ This work is also necessary for sport to meet its institutional goals which have broad and deep public support.²⁹⁶ Perhaps most important, if the history of sex testing in sport reveals anything it is that proxies for sex and specifically for testes and bioavailable testosterone are flawed and imperfect, and cause both the institution and especially its athlete stakeholders significant unnecessary harm.²⁹⁷ This is as true of the modern clinical approaches as it was of the crude nude line-ups that characterized the earlier periods.²⁹⁸

Thus, the IOC and the International Association of Athletics Federations (IAAF) had the best of intentions when, in 2011 in the wake of pressure following the mishandling of South African runner Caster Semenya's case,²⁹⁹ they announced that they would no longer question an athlete's sex or gender and would allow those who identified as women to compete in the women's category so long as their T levels were at least below the bottom of the male reference range.³⁰⁰ As others have commented, this was a very "generous"—to intersex athletes—compromise.³⁰¹ But it undoubtedly created a mess that the organizations are still working to clean up.³⁰²

This proxy, known as the "hyperandrogenism rule," is flawed and incomplete scientifically because it only tests for one characteristic among the set of characteristics that constitute a male body³⁰³ and it draws the line at a point that

295. See *supra* Part II.

296. See *supra* Part IV.A, B, and C.

297. See generally Elsas, *supra* note 81 (summarizing the history of sex testing in sport).

298. *Id.* (describing these proxies in particular).

299. See *supra* note 292.

300. *IOC Regulations on Female Hyperandrogenism*, *supra* note 9, at 2339–46 (setting out the rule and process for intersex athletes and providing that "[n]othing in these regulations is intended to make any determination of sex. Instead, these Regulations are designed to identify circumstances in which a particular athlete will not be eligible (by reason of hormonal characteristics) to participate in . . . the female category.") In the case of trans athletes, that level must be present for 12+ months. See Associated Press, *IOC Rules Transgender Athletes Can Take Part in Olympics Without Surgery*, *supra* note 9; see also generally Rebecca Jordan-Young et al., *Sex, Health, and Athletes*, 346 *BRITISH MED. J.* 2926 (2014) (summarizing the controversy); Karkazis & Jordan-Young, *supra* note 8; see also Epstein & Dreger, *supra* note 8 (clarifying the data on the variability of natural T ranges).

301. Layden, *supra* note 12 (quoting Eric Vilain who participated in the rulemaking process).

302. The rule was challenged by a different intersex athlete before CAS, which suspended it pending the production of supporting evidence. *Dutee Chand v. Athletics Fed'n of India*, CAS 2014/A/3759, at ¶ 548 (2015) (holding also that the rule will be void if such evidence is not produced within that period). In the meantime, intersex athletes have been permitted to compete without altering their T levels. Although advocates for the athletes and for intersex and trans rights believe this is the right result, because these athletes have gone on to win highly publicized women's events including at the Olympic Games, it has wreaked havoc within competitive sport. See *supra* note 9 and accompanying text.

303. See *supra* Part III (summarizing the biology of sex differentiation).

a female can only reach by doping.³⁰⁴ Indeed, under the rule, males with DSD and male-to-female trans athletes are permitted to compete in the women's category with almost three times the T levels of non-doped females.³⁰⁵ It is also legally flawed because it does not propose to sort males from females but rather among individuals, all of whom identify as women, according to their T levels. Because an individual's T levels are only one among a number of factors that contribute to athletic performance on a given day, it is difficult to justify reliance only on those levels to sort among a group of individuals we have all agreed *ex ante* are "women."³⁰⁶ For example, if the group consists of elite females and non-elite males, a lot of factors in addition to the day's T levels will affect the outcome. In other words, scientifically the means-ends nexus is not especially close. Finally, as implemented, the hyperandrogenism proxy is harmful to everyone concerned: It requires male-to-female trans athletes and males with DSD who identify as women to reduce their T levels using non-medically indicated means if they wish to compete as women.³⁰⁷ And it introduces male bodies into female competition with all of the repercussions to the competitors, the event, and sport's goals that this entails.³⁰⁸

The hyperandrogenism rule can still be defended on the grounds that the means-ends nexus is close enough since testosterone is related to performance³⁰⁹ and any performance gap between females and athletes with high T levels who identify as women is significant if it means females are not competitive for the win.³¹⁰ This is especially likely to be persuasive to those who are willing to trade some measure of scientific accuracy for physical privacy: testing for testosterone is less intrusive than testing for testes and certainly less intrusive than the standard differential diagnostic for DSD. Indeed, the Court of Arbitration for Sport has indicated that with adequate empirical support, these arguments will do.³¹¹ But as it has also suggested, this approach is unnecessarily torturous;

304. See *supra* notes 39–45 and accompanying text (discussing the non-overlapping T ranges).

305. *Id.*

306. *Dutee Chand*, CAS 2014/A/3759, at ¶ 508 (noting the rule's terms are "discriminatory, not only because they only apply to females and not to males, but also because they discriminate between females based on a naturally occurring characteristic"); see also *id.* at ¶ 510/147 (noting "the parties agree that . . . whether a person is a female is a matter of law"); *id.* at ¶¶ 511–532/147–154 (holding the IAAF did not meet its burden to establish that the rule is an adequate means to its otherwise legitimate ends).

307. See Madeline B. Deutsch, *Overview of Feminizing Hormone Therapy*, CTR. EXCELLENCE FOR TRANSGENDER HEALTH, <http://transhealth.ucsf.edu/trans?page=guidelines-feminizing-therapy> [https://perma.cc/F79S-SDJ2] (last visited Oct. 12, 2017); *IOC Regulations on Female Hyperandrogenism*, *supra* note 9; Rebecca Jordan-Young et al., *supra* note 300.

308. See *supra* Part IV.A, B, and C.

309. See *Dutee Chand*, CAS 2014/A/3759, at ¶ 534 (CAS finding that "testosterone is the best indicator of performance difference between male and female athletes"); *supra* Part III (explaining the science).

310. See *Dutee Chand*, CAS 2014/A/3759, at ¶¶ 517, 526, 534, 538 (CAS accepting that the gap will likely be smaller than 10–12%, requiring the IAAF to prove that the gap remains "significant," and suggesting options for developing this evidence).

311. See *supra* notes 309–310 and accompanying text.

segregation on the basis of sex is permissible.³¹² This is also the best approach. The right to compete should not include the right to compete as a woman if it defeats the goals of the women's category.

VI

CONCLUSION

There's no real reason for there to there to be a man and a woman category in acting. . . . It's not track and field. You don't have to separate 'em. Robert de Niro has never said, "I'd better slow this acting down so Meryl Streep could catch up."³¹³

The question whether reading sex out of law and policy is a good or bad idea depends at least in part on whether biology is relevant to the fulfillment of the particular institutional mission at issue. For example, it would be a mistake to assume that it can be read out of elite sports policy without causing a lot of important harm because biology determines competitiveness in this institutional space which is precisely about competition. Thus, despite the arguments of some social scientists to the contrary, even the best female athletes are not competitive for the win against elite and many non-elite males.³¹⁴ This means that if sex classifications are abandoned here, either entirely or in favor of classifications based on gender identity, female athletes would almost always lose to males and both sport and society would lose many of the practical and expressive benefits that inure from including and celebrating females in competitive sport. This is as true of athletes at the highest echelons like Serena Williams and Katie Ledecky as it is of the development athletes in high school, college, and beyond who aspire to take their place.

Sport may be special in this respect, but it is surely not *sui generis*. For example, sex and its associated biology will likely always be relevant in clinical and research medicine because the goals of those institutions are to diagnose and treat disease and generally to contribute to the maintenance of physical health. Regardless of how people identify, male and female bodies are different in their physiology, in the way diseases and conditions present, and in their response to treatment. Because of this, even if personalized medicine becomes the norm, like competitive sport, medicine could not fulfill its objectives if it had to ignore sex. This does not mean that clinical and research medicine are free to ignore gender identity in their dealings with patients and research subjects since success in this space also has a lot to do with respecting the whole person. But it does mean that erasing sex would be destructive of the institutions' core mission.

312. *Dutee Chand*, CAS 2014/A/3759, at ¶ 514 (“It is not in dispute that it is appropriate to segregate athletic competition into male and female categories.”). CAS added that “this may require policing and give rise to difficult decisions when nature does not divide into these categories so simply”; but it clearly does not see these “difficult decisions” as prohibitive. *Id.*; see also *id.* at ¶¶ 511, 534 (agreeing with the IAAF that testosterone could be used to draw this line).

313. *Chris Rock's Opening Oscar Monologue: A Transcript*, N.Y. TIMES (Feb. 28, 2016), <https://www.nytimes.com/2016/02/29/movies/chris-rock-monologue.html> [<https://perma.cc/ZF4Z-2AWP>].

314. See *supra* notes 53–54 and 115–144 and accompanying text (discussing the performance gap).

Other contexts are not as obvious and it is in these settings that adopting a careful, fact-based approach to sex that tracks the structure used in this article can be especially helpful. This approach is based in well-established anti-discrimination law and requires attention to inherent biological differences, institutional mission, and the closeness of the means-ends nexus. It is legally mandated for institutions that are specifically subject to this law.³¹⁵ But it is also useful beyond law, in the development of private sector policy choices.

Despite the political and financial chaos around measures such as North Carolina's so-called "bathroom bill," the thorniest of these questions in this period is not whether it is mission-critical to retain sex as the basis for classification into public restrooms.³¹⁶ Although religion will sometimes provide a different answer, on the facts this matter easily resolves in favor of erasing sex or else reading in gender.³¹⁷ Rather, the difficult questions involve the continued relevance of sex to institutions such as recreational sport,³¹⁸ education,³¹⁹

315. For example, it will provide the template for any analysis of the costs of reading sex out of and identity into actuarial tables incorporated into state laws on the establishment of civil damages. These laws currently permit sex (and race) discrimination in the valuation of life and disability. A bill "[t]o prohibit a court from awarding damages based on race, ethnicity, gender, religion, or actual or perceived sexual orientation" has been introduced in the U.S. Congress but has not been enacted. See Fair Calculations in Civil Damages Act of 2016, H.R. 6417, 114th Cong. (2016).

316. See; Mark Abadi, *North Carolina Has Lost a Staggering Amount of Money over its Controversial 'Bathroom Law'*, BUS. INSIDER (Sept. 21, 2016), <http://www.businessinsider.com/north-carolina-hb2-economic-impact-2016-9> [<https://perma.cc/A47A-8NNS>]; Doriane Lambelet Coleman, *The Lesson of HB2: We are All Different, but Equal*, NEWS & OBSERVER (Oct. 7, 2016), <http://www.newsobserver.com/opinion/op-ed/article106791322.html> [<https://perma.cc/9FDU-JFZT>].

317. Sex classifications are not mission-critical to the functionality of public restrooms because we can and do use either effectively when necessary. Nor does the switch make it impossible for the institutions that support them to provide for the safety or privacy of their entrants. There is no evidence that trans people are more likely to be physically or sexually aggressive than people who are not trans; to the contrary, the evidence that exists is clear that the former are particularly likely to be the victims of violence perpetrated by the latter. (I looked but could only find evidence of the unsubstantiated concern that trans-boys and men were a risk to females. See, e.g., Alia E. Dastigar, *The Imaginary Predator in America's Transgender Bathroom War*, USA TODAY (Apr. 28, 2016), <https://www.usatoday.com/story/news/nation/2016/04/28/transgender-bathroom-bills-discrimination/32594395/> [<https://perma.cc/CG3A-DUHE>]; Katy Steinmetz, *Everything You Need to Know about the Debate over Transgender People and Bathrooms*, TIME (July 28, 2015), <http://time.com/3974186/transgender-bathroom-debate/> [<https://perma.cc/E2RT-EPG6>]. The big safety issue in female bathrooms remains the mean girls who have always used them as their safe bullying space. See, e.g., MICHELE BORBA, *THE 6RS OF BULLYING PREVENTION: BEST PROVEN PRACTICES TO COMBAT CRUELTY AND BUILD RESPECT* 28–29 (2017) (listing bathrooms as a "mean girl" bullying hotspot); *3 Girls Charged after Teen Beaten to Death in School Bathroom*, WNEP (May 9, 2016), <http://wnep.com/2016/05/09/3-girls-charged-after-teen-beaten-to-death-in-school-bathroom/> [<https://perma.cc/5MBH-3CH4>]. In contrast, physical privacy is a legitimate concern because reasonable expectations are based in community norms and sex-segregated public restrooms remain the norm. But this just means that the switch is not cost-free, not that it is cost prohibitive. Having to retrofit restrooms to provide individual space won't affect institutional ends.

318. See e.g., Buzuvis, *supra* note 6, at 158 (noting that sex-segregation in recreational sports has developed more from a desire to "cultivate a particular social experience and community" rather than for physical or biological reasons, supporting the argument that gender is more decisive for inclusion than biological sex).

319. For example, all-women's colleges and co-educational institutions seek in their admissions processes and classroom practices to balance their male and female student populations and then sometimes to provide sex-segregated spaces for particular purposes. These institutions have only recently

insurance,³²⁰ and national security,³²¹ all of which have a history of relying on sex for a complex of reasons that include administrative efficiency and stereotype, but also inherent biological differences. This analysis of sex in sport provides the template for the development of the facts and arguments necessary to resolve these and related questions in a way that ensures that we properly distinguish mission-critical discriminations from those that are both unnecessary and unnecessarily harmful to already vulnerable sub-populations.

begun to have to articulate their goals in these respects. And unlike competitive sport and medicine, the argument that sex differences are mission critical is more complicated for them to make. For example, all-women's colleges must determine whether they exist in part to provide a separate space for female bodies and the developmental experiences uniquely associated with those bodies, or whether it is to provide a separate space for individuals with a "female brain" regardless of their below-the-neck biology. Caitlyn Jenner famously used this term when she announced that she was transitioning. *See, e.g.*, Burkett, *supra* note 63; *see also* Stack, *supra* note 214.

320. *See generally* Jill Gaubing, *Race, Sex, and Genetic Discrimination in Insurance: What's Fair*, 80 CORNELL L. REV. 1646 (1995) (describing generally the use of sex in this institutional setting).

321. C.C.H. INC., EMP. PRAC. GUIDE, § 284 NAT'L SECURITY (2017) (exception to federal employment discrimination law for discrimination on the basis of sex "if the action is taken in the interests of national security").