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Article

Fair Competition and Inclusion in Sport: Avoiding the Marginalisation of Intersex and Trans Women Athletes

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Abstract: Despite the reality of intersex individuals whose biological markers do not necessarily all point towards a traditional binary understanding of either male or female, the vast majority of sports divide competition into categories based on a binary notion of biological sex and develop policies and regulations to police the divide. In so doing, sports governing bodies (SGBs) adopt an imperfect model of biological sex in order to serve their particular purposes, which, typically, will include protecting the fundamental sporting value of fair competition. Yet, one potential consequence of enforcing such an approach would seem to be the exclusion or marginalization of individuals whose biological development does not fit within the binary model, whether due to genetics or through a choice to undergo medical intervention to better represent a chosen gender identity. Any such exclusion or marginalization will inevitably tend to undermine another fundamental value of sport, that of inclusivity. In the context of those with differences of sex development, SGBs appear to be faced with a difficult problem: dealing with a conflict between two fundamental values of sport. Different approaches to this problem have been suggested, with some academics proposing that sports organisations, in general, ought to prioritise fairness above, while others suggest the need to 'balance' competing values or even to prioritise inclusion over fairness. However, it is argued that any of these approaches are, in principle, justifiable as any sport should be free to prioritise or balance its own values. What seems more important for any SGB is the need for a rational and transparent justification of regulations that pursue fair competition at the expense of inclusivity. Furthermore, where fair competition and inclusivity are fundamental values, any such justification would seem to demand adherence to some basic norms. First, the regulations should be built on (and articulate) a consistent and principled basis of what 'fair competition' means in a particular sport. Second, any regulations should only exclude or restrict participation to the minimum degree necessary to achieve the sense of fair competition so articulated. Third, SGBs should be transparent about what their values are and where their priorities lie so that participants and other stakeholders are able to make an informed choice as to whether they wish to participate in, support, or be associated with a particular sport. With reference to the adoption of the Eligibility Regulations for Athletes with Differences of Sex Development (the 'DSD Regulations') by the International Association of Athletic Federations (IAAF), this article seeks to evaluate whether the approach of the IAAF satisfied these basic requirements.

Keywords: sport; fair competition; inclusion; exclusion; rational; regulation; sex; gender

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1. Introduction

Over the last few years there have been a proliferation of regulations introduced across sports placing restrictions on the participation of intersex[1] individuals and trans women in female sport, typically appealing to ideals around the concept of fair competition and reinforcing a traditional divide based on ideas of binary sexual categorization. Some of the higher profile examples include: the DSD Regulations (2019) and Eligibility Regulations for Transgender Athletes (2021) in Athletics, the 'Transgender Guidelines' in rugby union (2020) and FINA's policy on Eligibility to Compete in the Men's and Women's categories in swimming (2022).

The debate around the introduction of such restrictions has generated strong views across sports and more widely, both for and against. Perhaps the most obvious example being the support for, and concerns surrounding, the introduction of the DSD Regulations in Athletics, which have been described as 'one of the most complex [topics] in sport' (Anderson and Knox, 2020 [3] (p. 595)).[2]

What has become clear is that contrasting perspectives reveal a tension between what most would agree are two important sporting values: a concern for fair competition between participants and sport as an inclusive practice, something accessible to all with the power to bring people together. Although not a complete argument, for affirmation of the current importance of both to sport, one need look no further than the fourth fundamental principle of Olympism encapsulated in the Olympic Charter:

> 'The practice of sport is a human right. Every individual must have the possibility of practicing sport, without discrimination of any kind and in the Olympic spirit, which requires mutual understanding with spirit of friendship, solidarity, and fair play' (IOC, 2021 [4]).

As will become clear, although there may well be different perspectives on the relative importance of these values in sport, this article proceeds on the assumption that they are both fundamental sporting values.

Whilst it might be unusual to consider the justifications for eligibility restrictions for both intersex individuals and trans women in the same article (given commonly understood differences in their situations), there are reasons why it may be helpful to do so. First, as will be elaborated in Section 4.2, central to the debate around eligibility of both intersex athletes and trans women to a female category is the generally accepted proposition that genetically 'typical' males have a disproportionately large athletic advantage over genetically 'typical' females.[3] In other words, through the lens of fair competition (as a reason for restricting the participation of intersex and trans women in female sport), the starting point for regulation is the same. Second, something that can be forgotten, is the possibility of individuals identifying (or be considered by others) as both intersex and transgender.[4] For these reasons, it seems appropriate to address what are very similar concerns surrounding how SGBs might approach dealing with the competing values of inclusion and fair competition.

With these themes in mind, consideration is given to the current literature and an argument advanced that any individual sport (subject to external legal restrictions) should be free to prioritise values as it wishes. However, in a context where fairness and inclusion are both valued, it is important that any eligibility regulations are transparent and rationally justifiable(Section 2). Section 3 then highlights some of the potential barriers to transparent and rational justifications caused by the historic and largely unquestioned dominance of a binary, imperfect, model of sex categorisation in sport. Section 4 argues that, in order to overcome these barriers and to deal (as far as possible) with the tensions that exist between fair competition and inclusion, any rational justification relies on a clear and consistent sense of fair competition, one that embraces the concept of 'proportionate inequalities' *in priority* to a binary system of categorisation. Finally, in Sections 5–8, the article focuses on the DSD Regulations in athletics as a concrete example of regulations introduced to reinforce a binary divide and considers the extent to which a sense of proportionate inequalities underpins the current justification of World Athletics.[5]

Although the second half of the article is, therefore, directed towards the issue of how the tension between fairness and inclusion has been handled in the context of intersex athletes, it is suggested that a similar framework (which adopts the concept of proportionate inequalities) could be used to evaluate the necessity and rational justification for regulations that restrict the participation of trans women in a particular sport. This is a point highlighted in the conclusion and something that might be the subject of further research.

2. Approaches to Dealing with the Conflict between Fairness and Inclusivity

Assuming that fair competition and inclusion are both valued, the question is then how to deal with these values when they appear to conflict. Broadly, the current literature seems to suggest three possible approaches. First is the idea that any sport needs to consider competing values and weigh them against each other to determine the appropriate response. Devine, for example, suggests that whilst fair competition is 'a central animating value of modern sport,' it is not the 'overriding' sporting value and that sports governing bodies (SGBs) need to consider and 'balance' any competing values within their sport [5] (p. 165). Likewise, Teetzel has suggested the need for SGBs to 'weigh the desire for fairness with other considerations' [6] (p. 118). However, it is important to recognise that such an approach does not prescribe an outcome; it does not suggest that a balance must be found, just that competing values need to be recognised and their 'weight' assessed.

There is evidence that this kind of balancing approach has found favour with some organisations with significant influence in the sports governance structure. For example, the UK's Sport Councils' guidance on transgender inclusion, whilst recognising that an ultimate balance between inclusion, [safety] and fairness might not be possible for many sports; an exercise weighing competing values needs to take place in order that individual sports determine their priorities [7] (p. 5). At the pinnacle of the sporting pyramid, the IOC's framework on fairness and inclusion also seems to recognise the need for individual SGBs to weigh competing values in deciding whether to implement eligibility regulations and what form they take [8]. However, it should be noted that the UK's Sports Councils and the IOC are not organisations that govern individual sports themselves and do not have to actually make the decisions.

Pike seems to identify an underlying concern here: that a balancing approach may not actually provide much practical help in deciding which value an SGB should prioritise. He argues that the practical consequence of such an approach would seem to be a type of (not very helpful) 'cost/benefit' analysis, which he criticises on three grounds: (1) that inclusion and fairness (and safety) are not comparable 'goods'; (2) that all SGBs have basic duties to players (primarily) in respect of fairness (and safety), which they are not entitled to trade off in pursuit of inclusivity; and (3) there is a lack of transparency because SGBs can just hide behind a balancing exercise to justify any conclusion [9] (p. 159).

Not surprisingly, given his criticism, Pike advocates a different approach, one that recognises the lexical priority of fairness (and safety) above inclusion. Such prioritisation is justified on the basis that each sport owes special obligations to its players and more immediate stakeholders before any obligation to include others or obligations to be inclusive towards society as a whole [9]. Whilst Pike's main focus is on the need to ensure the safety of players in rugby, the elevation of fairness above inclusion in general, seems to reflect a perspective that the most fundamental value to any sport (contact and non-contact) is one of fair opportunity between participants. Sailors takes it further by suggesting that fairness might even be a prerequisite for the existence of sport (Sailors, 2020 [10] (p. 421)), although this is a perspective questioned by Gleaves and Lehrbach [11], a view that will be returned to.

The appeal of Pike's argument is in the general assertion that SGBs have some basic duties which they are not entitled to ignore when regulating their sport and not entitled to 'trade off.' If accepted, this duty-based argument provides an overriding reason for introducing eligibility restrictions and in some sense, a straightforward framework from which to address the problem.

At least in the context of safety in contact sports and the potential harm to all current and future participants, this basic argument appears difficult to ignore. Anyone who accepts the idea that we have a moral obligation not to cause unnecessary harm to others would find it difficult to justify the imposition of sporting rules that unnecessarily put participants at risk of injury. Furthermore, it seems that a precautionary approach to such risks might be justifiable. Broadly speaking, such a position also reflects and underpins common legal duties concerning liability for injury caused due to negligence.

Despite the appeal of this duty-based argument, one should be mindful of the detail of its application in a sporting context. Suits famously claimed that all games, including sports, are 'voluntary attempts to overcome unnecessary obstacles' (Suits [12] p. 55). Assuming this encapsulates a fundamental aspect of all sports, it does raise the question of what, if anything, can truly be deemed 'necessary' to any sport, and if it can, what sense of necessary is meant.

In respect of rugby, Pike recognises the problem of a tension between a duty to protect the safety of players and retaining essential aspects of what he considers rugby to be, such as tackling and scrums. Accordingly, he defines the duty as keeping the sport tolerably safe, without having to alter what is considered the essence of rugby [9] (p. 163). Of course, this still begs the question: what is the essence of rugby? The split between rugby union and rugby league is evidence that this is a subjective question; rugby league retains scrums in name only, but few would question whether it is a form of rugby. Is tag rugby so different that it could not be recognised as rugby? What changes to the laws around tackling and scrums are possible before rugby union becomes a different game?

Perhaps there is something about the collisions involved in tackling that all current participants and stakeholders value so highly that it cannot be omitted, but to call tackling essential seems to mask the possibility that, however unlikely at present, perspectives might change. Perhaps developing research and increased awareness of the dangers of high impact collisions might devalue such practices to the point where their place in the game is questioned internally or the game is forced to remove it due to external regulation.

It should be made clear that this is not an argument that rugby should be tackle-free or risk-free; rather, it presents an alternative view of tackling. Rather than it being 'essential' to rugby, it might be better described as a highly valued practice, the meaning and the value of which may change. In permitting and regulating tackling, World Rugby inevitably trades off some degree of safety in order to include the practice of tackling in some form. Furthermore, the fact that the rules of rugby place no restrictions on the size and weight of players (allowing, for example, 130 kg forwards to collide with 80 kg backs) suggests that safety concerns can be (and are) traded off against restrictions on inclusion. Applying the principle of lexical priority does not appear to get away from the problem of trading values, it just presents it in a different context.

Coming back to fair competition (and since we are not concerned with unnecessary physical harm), it is not quite as easy to see why fair competition should automatically override inclusion. Although Pike points to the IOC consensus statement on sex reassignment and hyperandrogenism, which highlights fair competition as an overriding sporting objective (IOC Consensus Statement 2015 [13]), that is a particular perspective adopted by the IOC, which may or may not be accepted by different sports. In fact, it is arguably one that the IOC has itself questioned in its recent framework on fairness and inclusion ((The 2021 Framework) (IOC, 2021) [8]), which recognises the choice of SGBs to introduce eligibility criteria, and even then, the need to base such criteria on robust scientific evidence of disproportionate competitive advantage [8] (Sections 4 and 6). Such a position is also reflected in the joint position statement of the International Federation of Sports Medicine (FIMS) and the European Federation of Sports Medicine Associations (EFSMA) (Pigozzi et al., 2022 [14]). Furthermore, whilst SGBs will typically have qualified legal duties not to discriminate on grounds such as gender or birth traits, and, possibly, to protect the rights of athletes to a fair competition in the context of anti-doping regulations [15] (para. 166), they do not appear to be under a duty to ensure fairness with regards to natural genetic pre-dispositions. As such, it appears less easy to accept the protection of fair competition as an overriding ethical (or legal duty) of all SGBs.

The 2015 consensus statement (and the more recent 2021 Framework) recognised that the objective of fair competition is limited by the need for eligibility restrictions to be necessary and proportionate, suggesting that the pursuit of fair competition is qualified, and that fairness will not, and should not, always trump inclusion. The focus on necessity and proportionality provides a clear requirement to rationally justify any eligibility restrictions

which, it is argued, demands some evaluation of the extent to which fair competition is likely to be improved against the consequences of any interferences with inclusion. Of course, this sounds very much like the kind of cost/benefit exercise that Pike criticised. Whilst one may well share Pike's concerns with how SGBs actually go about comparing very different 'goods', that does not mean they should not try. For one thing, rather than providing less transparency, as Pike suggests, an attempt to reach some kind of reflective equilibrium would seem to demand greater transparency as it actually ensures SGBs do not hide behind a perceived overriding duty to ensure fairness, which smacks of approaching the problem with a pre-determined outcome. Even if the same result is reached (e.g., introducing a set of eligibility restrictions because of concerns about fair competition), at least all of the potentially negative consequences on inclusion will have been considered and the value choices made clearer for those on the outside of the decision-making process. As Teetzel alludes to, a deeper consideration of the competing values should help justify the 'right' solution, rather than simply the most convenient one (Teetzel, 2014 [6] (p. 118)).

The third possible approach is that of prioritising inclusion (and other sporting values that flow from it) over fairness. Gleaves and Lehrbach take an interesting approach to the problem by questioning the basis on which fair competition has been elevated to its lofty position in the value system of sports, which, they suggest, comes from a problematic assumption that sport is defined by its nature as a comparative test (Gleaves and Lehrbach, 2016, [11] (pp. 314, 315)). Instead, they suggest that this is a particular, westernised, modernised and elitist conception of sport, which masks a more complex understanding of what sport is and why it is valued at all. They argue that an understanding of sport should not be tied to (and dominated by) the idea of a need for a comparative test and that there should be more recognition of the holistic value of sport to the narrative story that it provides to those involved [11] (p. 318). In support of their perspective, they point out the inherent inconsistency between elite sport seen as contests between the best athletes and yet embracing a protected class to give 'disadvantaged' female athletes the opportunity to share in the sporting rewards. Accordingly, even within a westernised, modernised and elitist conception of sport, sport would seem to be more than a simple comparative test and, Gleaves and Lehrbach would argue, is as much about providing opportunities for everyone to develop their own narrative.

Perhaps, as Gleaves and Lehrer suggest, too much value is placed on the role of the comparative test in sport as a whole. However, there seems little doubt that in the modern paradigm of sport, the comparative test is highly valued and would be considered as an essential aspect of most major sports. Accordingly, unless particular sports adopt a basis for carrying out the comparative test that is perceived to be rational and fair, it seems less likely that potential participants will engage in developing their 'narrative stories' through that particular sport. This seems true of any potential athlete, regardless of their sex or gender identity. In other words, there is a danger that in prioritising inclusion over fairness without careful thought about the impact on the comparative test, there is a risk that other participants feel excluded and unable to develop their narratives in that sport; inclusion of some risks the exclusion of others.

As is true in regard to the possibility of prioritising fair competition before inclusion, surely it is for each sport (subject to any external legal constraints) to determine the prioritisation of its values. Some sports may value the competitive test above all else, while some may value inclusion. However, in order that individuals can make an informed choice about whether to participate or associate with a sport, SGBs should seek to reach a transparent and coherent approach.

2.1. Summary

In the context of deciding whether and how to regulate eligibility to participate in female sport, it seems inevitable that SGBs will have to weigh up the implications of any proposed regulation on the competing values to which they ascribe. However, labelling this a balancing exercise is, perhaps, misleading, since it tends to suggest that there is an

ultimate balance to be achieved, when in reality the outcome may well be to prioritise one value, such as fairness, over another value, such as inclusion.

If one accepts a basic libertarian perspective that sports are, fundamentally, voluntary practices to which people can choose to associate, then each sport should, subject to any external legal constraints, be free to choose its own rules and the values they wish to reflect and prioritise. In this context, what seems important is the basis on which SGBs make the choice. SGBs ought to be able to properly justify and coherently explain any regulations that restrict eligibility within their framework of values. If, as is assumed, all sports place some value on fairness and inclusion, then there seem to be some basic requirements that rationally follow.

First, if fairness (or another value, such as safety) is given as the primary reason to justify eligibility restrictions, then SGBs ought to be clear and consistent about the sense in which the term is used. Second, SGBs should at least attempt to consider the impact of any proposed regulations on any competing values; for example, there should be some attempt to evaluate whether a minimal gain in fairness is worth a significant impact on inclusion. Even in the face of some degree of uncertainty in quantifying such gains and impacts (the problem of comparing different 'goods'), it is argued that such an exercise has significant merit as regards transparency. By attempting to reach what might be termed a reflective equilibrium, it at least provides evidence of trying to rationalise the decision as far as is possible and thereby achieves a more justifiable solution, rather than just embracing the most convenient. Third, given that fairness and inclusion are both valued, any eligibility regulations should be designed to be as inclusive as possible and restrictions on participation should be only such that are necessary and proportionate.

This rest of this article focuses, primarily, on the first of these requirements: the issue of what is meant by fair competition and how that interacts with a binary classification system based on notions of 'typical' male and 'typical' female. After all, without a coherent and consistent meaning of fair competition, it seems impossible to properly consider the extent to which any regulations may make the sport fairer or whether any form of eligibility restriction is proportionate and necessary.

In looking at this issue, this article will draw on Rawls' conception of fairness and justice to articulate how an SGB might embrace a coherent and consistent sense of fairness and achieve what Teetzel referred to as a 'right' solution, rather than a convenient one (Teetzel, 2014 [6] (p. 118)). With that perspective in mind, this article will then consider the extent to which the IAAF appeared to have adhered to the three requirements identified above when implementing the DSD Regulations.

However, before turning to Rawls' conception of fairness and justice, it will be helpful to make some initial observations regarding problems of terminology that make any transparent justification of fairness in female athletics particularly problematic.

3. Sport and the Meaning of Sex, Gender, Male and Female

It is difficult to move much further in a discussion about fair competition and inclusion in female sport without first seeking to clarify what one means by female, sex, and gender. That sex and gender are often used ambiguously and interchangeably, even in a legal context, is a problem noted by several academics (Cooper et al. [16] (p. 26), Greenberg [17], McGrath [18], Adair 2011 [2]). It is also one recognised more widely. For example, the UK's Office for National Statistics (ONS) notes both the interchangeable use of the terms and that the definitions it gives are not reflective of the definitions of the current UK government, which is unable to agree on a position (ONS, 2022, [19]). It is a problem that seems to be underpinned by a historically dominant conceptualisation of sex and gender that simply embraces a binary description of individuals as either male or female, man or woman, and has ignored the existence of individuals who do not fit easily within such polar opposites [17] (p. 268). In more recent history, some clarity has been sought by seeking to distinguish sex as a purely biological concept and gender (and gender identity) as a socially constructed one.

Whilst gender is far from a straightforward concept (Cooper et al. [16] (p. 11)) in broad terms, the idea of gender identity as a social construct that describes behaviours, attributes and characteristics typically associated with a particular sex seems fairly well accepted (Greenberg [17], McGrath [18], Adair [2], ONS [19]). Furthermore, gender identity appears to be increasingly recognised as a subjective choice, regardless of one's biological birth traits, and not something to be forced on an individual (Garcés de Marcilla Musté [20]).

Although there are many who doubt that sex is a purely biological concept (Fausto-Sterling [21] p. 4, Amy-Chinn [22] p. 313; Garcés de Marcilla Musté [20] p. 861, Karkazis et al. [23] p. 7 and [24]), the idea that it describes one's status as male or female by reference to particular, objectively ascertainable biological traits (such as the presence or absence of certain chromosomes, hormones, internal sexual organs, external genitalia and gonads as well as secondary sexual characteristics) is a pervasive one that tends to resonate with the general public and also policymakers that impose and uphold binary sex categorisations. As Kakarzis has pointed out, biological factors hold particular appeal and power for regulators and policymakers because they introduce ideas of neutrality and objectivity [24]. As such, biological sex is often offered up as a stable concept.

However, since there appears to be no one, agreed upon, determinative biological marker of male or female (Garcés de Marcilla Musté [20] p. 861), and, seemingly, different perspectives on which markers are relevant depending on the purposes of the categorisation ([Kakarkis [24], Cooper et al. [16]), use of the term 'biological sex or biological male/female' is not straightforward. Without clarification, such terms potentially mask the subjective choices made by regulators and policymakers in determining which biological factors are considered relevant (and why) when applying a binary categorisation. Furthermore, it also masks the reality that there is no inherent need to categorise people by reference to sex in the natural world; categorisation as male or female exists to serve a social or cultural purpose. As Dreger observes "whilst societies [and policymakers] might like their sex categories neat, . . . nature doesn't care. Nature doesn't actually have a line between the sexes. If we want a line, we have to draw it on nature" (Dreger [25] p. 23).[6] In other words, categorising all individuals as either male or female involves imposing a socially constructed and imperfect model on reality (Crasnow [26] pp. 144–545), one that does not easily accommodate the existence of non-binary individuals whose relevant biological markers do not point in the same direction towards male or female.

Accordingly, it is argued that biological sex is not a simple, binary truth that can be 'discovered' without some element of human interpretation; any categorisation relies on context (Karkazis, [24] (p. 6) as does use of the term 'sex' (Schiappa [27] p. 10). Consequently, terms such as 'biological male/female' have the potential to mislead and obfuscate without clarification of the factors considered relevant in making the determination and recognition of the purpose for doing it.

However, the dissonance between an imperfect binary model of sex and the reality of a world that includes non-binary individuals creates more than problems of terminology and conceptualisation, but also real-world ones (such as potential discrimination and marginalisation) (Amy-Chinn [28] p. 1295). Furthermore, the dominance of a binary narrative makes it potentially difficult to recognise the problem; there may be what has been described as 'hermeneutical darkness', where some individuals are marginalised unintentionally, at least in part, by the absence of concepts and language to articulate the reality differently (Amy-Chinn [22] p. 313).

The different contexts of sport and law provide examples of these terminological and real world problems but seem to have taken different approaches to dealing with them.

In a UK legal context, for example, every individual is categorised as either legally male or female, something that, despite a general legal framework that is much more sex and gender neutral than it once was, still appears to have influence in determining legal rights and recognition of legal relationships, such as rights of inheritance and to marry or enter a civil partnership. Initially, a categorisation is made at birth, with individuals assigned their legal sex by healthcare professionals, usually based upon appearance of external genitalia,

unless this is ambiguous (Cooper et al. [16] pp. 10, 13, Garcés de Marcilla Musté [20] pp. 861–862). However, to evolve in line with increasing recognition of fundamental legal rights to self-development, equality and non-discrimination, the UK legal framework has adapted to recognise that individuals (at a certain age) should be able to determine their legal rights based on their chosen gender identity, rather than by reference to their assigned birth sex. Even then, the UK legal framework is still situated within a binary paradigm of sex categorisation, only permitting alteration of one's sex from that recorded on the birth certificate [29]. By virtue of a general move towards reducing the legal significance of birth sex combined with the adoption of a system that permits individual choice about their legal sex and gender identity, the UK legal system appears to have addressed some of the most obvious problems of discrimination and marginalization, even if it does not create a legal right to be recognised as anything other than male or female. Whether that is sufficient to remove underlying, institutionalised inequality, marginalization and discrimination is another question (Cooper at al. [16] pp. 13–14).

In a sporting context, although there are some sports that do not categorise and segregate by sex, the vast majority do and they generally appeal to notions of fair competition and the likely consequences of females being unable to compete with males as reasons for doing so. As will be elaborated in Section 4.2, this shared starting point is based on a generalized acceptance of average differentials in athletic performance between typical men and typical women, ignoring any overlap between the two categories, the individual differences within those categories and the potential for some exceptional women to challenge and compete with men. As a result, most sports have tended to implement a binary segregation based on an uncomplicated, generalized sense of male and female that relies on an individual's legal classification. Whether this largely pervasive approach is still desirable and whether it actually protects or, in fact, undermines equality for women or even achieves fair competition has attracted some interesting academic discussion (Sailors [30]). There have, for example, been calls to get rid of the binary classification system as an impediment to female equality (Kane [31]). However, such discussions do not appear to have had any perceivable impact on the policies of most SGBs. Perhaps this is unsurprising given the undercurrent of 'sporting autonomy', which has traditionally insulated sporting institutions from external legal and political scrutiny and, arguably, helped entrench binary segregation.

What does appear to have affected the policies of some SGBs is the increased visibility of both intersex and trans women athletes, which has challenged the uncomplicated, generalized idea of typical male and typical female on which sex segregation has been traditionally based. However, rather than consider any underlying concerns about binary sex segregation, some SGBs have chosen to create additional restrictions on eligibility within the 'legally female' category [32], the effect of which, it is argued, is to create a new and unique sense of male and female for each sport. For example, when seeking to justify the imposition of the DSD Regulations, World Athletics introduced the term 'biologically male' [33] to draw a distinction within the class of legal females; between those whose eligibility is restricted by the regulations and those who are not. As discussed above, whilst 'biological male' may be appealing in terms of the sense of objectivity it imports, it actually serves to mask a choice made by the World Athletics to focus on only certain biological markers (primarily, chromosomes and the presence of testosterone) and ignore others. In other words, despite the inference, the effect of the regulations was not, actually, to adopt of a universally understood and objective meaning of biological sex, but to create a new sense of sex that focused on distinct biological factors perceived to be relevant for the purposes of World Athletics. As such the terms 'athletic sex' and 'athletic male and female' might be preferable.

What we are left with is what Schiappa has termed a 'rupturing' of the meaning of sex [27] (p. 9) and a range of different senses of sex, male and female which are context dependent (and potentially sport dependent). When those contexts collide, care needs to be taken to differentiate between those different meanings and, importantly, to ensure

no individuals or groups are ignored or marginalised as a result. Accordingly, reference to the terms male/female or sex will be avoided as much as possible. Instead, reference will be made to legal male/female/sex, athletic male/female/sex, and sometimes 'typical' male/female.[7]

4. Fair Competition and the Meaning of Equality of Opportunity in Sport

If, as suggested above, the current perspective on sport is dominated by the idea of a comparative test, one is driven towards the view of sport as a meritocracy, that is, a practice which measures and ranks performance in order to distribute its 'rewards' (rewards here is used to reflect the benefits available to those who are successful at the elite level of sport, including financial rewards, sporting glory and fame). In order to do so, the concepts of fair competition, equality of sporting opportunity and the 'level playing field' play a crucial role. As alluded to in Section 3, such concepts also seem to serve as a generally unquestioned justification for binary sex segregation in most sports and any policies implemented for policing the divide. Given this central role and the potential impact that any eligibility regulations might have on inclusivity, it is argued that any regulations that restrict or control eligibility in pursuit of these ideals (whether through a classification system or otherwise) should be able to articulate a clear and consistent conceptual framework of what fair competition looks like as the 'end' to be achieved. At least theoretically, it should be possible to justify any regulations aimed at ensuring fair competition by reference to the same, consistently applied concept of fair competition that a sport embraces, be that with regard to advantages derived through using technology, doping, being born as a typical male or being intersex.

4.1. A Conceptual Framework for Fair Competition in Sport

Perversely, in the context of a discussion of fair competition, measuring and ranking in sport actually relies on inequality in the demonstration of the attributes that are relevant and valued in contributing towards the sporting performance. Loland summarizes this as ranking by reference to 'relevant inequalities' [34] (p. 43). For example, in swimming, technique, stamina, determination, speed and power may all be attributes that are relevant and valued in contributing to the performance, but if there was absolute equality in these basic attributes then it would be difficult to differentiate between the performances. Accordingly, such 'valued' inequalities (and the performance advantages they give) are accepted as 'fair' and those that are not so valued are deemed unfair and, as a consequence, need regulating and compensating for. Although most sports will value the demonstration of inequalities that derive from natural sources [35], exactly what inequalities are valued (and which need to be compensated for) will differ from sport to sport and adds to why sport can be so varied and appealing. The question then, is how to determine what are valued or 'fair' inequalities for any particular sport.

Rawls' ideas about fair and just distribution amongst a society [35] are helpful for setting out a theoretical basis for making such a determination. He argues that a fair and just system for allocating rights and the distribution of rewards should be determined by those who make up the society, each of whom are assumed to be of equal moral worth. To do so, Rawls suggests a hypothetical 'original position' where free, rational and equal individuals would determine what fairness and justice looks like. Those in the original position would select how to determine rights and duties and on what basis resources would be allocated [36] (pp. 11–12). In order to ensure against self-interest, those in the original position would be behind a 'veil of ignorance' and have no knowledge of any inherent advantages that were likely to increase an individual's share of the resource (such as their natural abilities or assets) [36] (pp. 136–137). On this basis, an agreement would be reached about the way to distribute the resource that was based on a just reward for the effort put in and respected the equal opportunity each individual has to benefit from the resource and the legitimate expectations thereby created. If such ideals are applied to sport, then the rules of any sport should be based on what participants in Rawls' original position

would rationally agree on as a fair and just means to distribute the sporting rewards. In other words, what constitutes valued inequalities and the rules that define how to fairly distribute rewards accordingly (i.e., how to win) would need to be those rationally agreed upon by participants without knowledge of the level of their own or other's inherent abilities. This, arguably, would include having no knowledge of their own or other's birth sex or gender identity (a point returned to later).

Where the inequality is of no perceived value to those in the original position (think the value of performance-enhancing swimsuits), it poses little difficulty; all those in the original position would, it is suggested, agree that rewards should not be influenced by who can afford the best swimsuit. Consequently, all would rationally agree that regulation is required to prevent, or compensate for, such an advantage. In a similar vein, it may be easy for all those in the original position to agree that the sport should not value any advantage that is created artificially as a result of doping. The underpinning rational being the reward of what Loland has described as 'authentic' sporting performance, one that might be considered to be the product of a particular individual's unique, genetic base and the extent to which the individual has managed to harness relevant that genetic base through diet, practice and training [35] (p. 12).

A more difficult case is presented when we consider trying to distinguish between the genetic source (or basis) for naturally produced athletic abilities and authentic performances. If we apply Rawls' original position to athletics, for example, then it seems very likely that the just and fair distribution of rewards would be based on ranking how well participants display naturally produced athletic attributes such as speed, power, stamina and spatial awareness; these being the primary attributes (the relevant inequalities) that the sport of athletics has always valued and measured. To restrict eligibility because individuals have an inherent, genetic pre-disposition to be proficient in those athletic attributes seems arbitrary and contradictory. No one in the original position would be able to rationally agree to regulate and compensate for any particular genetic pre-disposition, at least without some other persuasive reason for distinguishing between them. Applying such a strict interpretation of Rawls' ideas in sport produces what will be referred to as a 'strict athletic merit' sense of fair competition.

However, if one accepts that typical male athletic advantage exists and also recognises the value of sporting rewards being available to all, the adoption of a strict athletic merit sense of fair competition does raise a concern about what sporting rewards are available for those who are not typically male. A sense of fairness based on strict athletic merit is clear and straightforward, but it is not inclusive and would mean (at least at present) typical females would rarely, if ever, be seen in elite sport (Coleman [1] pp. 87–89). Whilst such a result might seem to fly in the face of wider societal interests in promoting gender equality, there are those who advocate for sex integration, suggesting it is detrimental to women to impose sex segregation in the long run since it reinforces a sense of inferiority and disability (McDonagh and Pappano, [37] pp. 148–151). Alternatively, sex integration is advocated with a view to faster long-term 'levelling up' of female athletes alongside some other mechanism (such as categorisation that is not based on sex to achieve a more inclusive sense of fair competition) (Sailors [30] pp. 1128–1129).

Importantly, Rawls does seem to allow those in the original position to have knowledge of some general facts about the world and 'human society' [36] (pp. 137–138), so it might be argued that any just and fair distribution of rewards should recognise the evidence of physiological differences between typical males and typical females and, therefore, the reality that typical male athletic advantage does exist. Of course, due to the veil of ignorance, no one in the original position would know who had such an advantage. One consequence might be that all would agree that typical male/female segregation was a necessary starting point for equal opportunity and fair distribution of sporting rewards. Such a position seems to reflect the general position of most major sports and can be said to reflect a more inclusive sense of fair competition (to distinguish it from the strict athletic

merit sense of fair competition introduced above) that protects the place of typical females in sport.

Although such an argument might seem initially compelling (and seems to reflect pervasive views about both the binary nature of sex and expectations about how sport has been historically administered), it seems to ignore the reality that there are intersex individuals who are atypical and do not fit neatly into binary categories. Dependent upon one's definition of intersex, Adair has suggested intersex individuals may represent up to 1.7% of a typical population (Adair [1]). As well failing to recognise intersex individuals, this argument does not admit the possibility of individuals taking steps to alter their biological markers to better represent their chosen gender identity, also making them 'atypical'.

Ultimately then, accepting male and female categories as a necessary starting point for fair distribution of sporting rewards seems to create an incoherent approach; it accepts the reality that typical men and women are biologically and physiologically different, yet rejects the reality that there are non-binary individuals who are also biologically and physiologically different to both typical males and typical females. It should also be pointed out that once the existence of non-binary individuals is accepted (and there is recognition of their equal moral worth), then it follows that such individuals would necessarily form part of the participants in Rawls' original position. Consequently, it seems unlikely that a just distribution of sporting rewards could be predicated on a binary model of sex that ignores or marginalises their interests.

Organisation of a sport into categories based on an imperfect binary model of biological sex might prove to be a practically useful one to adopt in pursuit of an inclusive sense of fair competition, but is arguably one that is tied to an inclusive agenda and, as a result, also needs to ensure equal opportunity for all, regardless of sex. In the context and pursuit of fair competition, any categorisation should be recognised for what it is, a means to greater end, which is to achieve equality of opportunity for all participants or potential participants. As Crasnow observes, the usefulness of any model depends both on its 'fit' to the real world and how well it achieves its purposes (Crasnow, [26] (p. 145). Failure to recognise that the purpose of imposing a categorisation system in the first place rests on the adoption of an inclusive sense of fairness (not a strict athletic merit one) is likely to result in regulations that are difficult to justify and ones that those in Rawls' original position are unlikely to agree to.

Accordingly, in order to justify a binary classification system that accords with a Rawlsian sense of fairness and justice, it is necessary to rid ourselves of the idea that binary categories are a starting point from which we then determine what fair competition looks like. Instead, it is necessary to consider a more fundamental question about what inequalities are seen as fair or unfair. In this vein, Loland has suggested distinguishing between 'dynamic inequalities' and 'stable inequalities' [38] (p. 588). Dynamic inequalities are those that can be influenced by the participants after the rules for distribution have been agreed (through training and practice, for example) and would include the athletic capabilities such as strength, speed, power, stamina and spatial awareness. Other performance influencing factors such strategy, psychology, technique and diet might also be included in this group. As, in theory, these are factors within the control of all participants, they do not need compensating for. By contrast, stable inequalities are inherent and cannot be influenced subsequently (such as genetic predispositions). Such stable inequalities may need compensating for if, as Loland puts it, they 'significantly' influence the distribution of the sporting rewards. It has been argued that this is necessary to ensure that those with similar 'talents' have an equal opportunity of reward (Anderson and Knox, [3] (p. 595).

In terms of Rawls' conception of fairness and justice, the perspective being advocated appears to be that whilst the genetic lottery should have some influence in the distribution of sporting rewards, its role should not be too influential. Therefore, if any genetic predisposition creates too great a performance advantage, then those in the original position would agree that the means of distribution should compensate for it. It is possible that the stable inequality might be one that provides an advantage across a range of sports

or one that is sport specific (Camporesi [39] p. 702). By extension, it also seems possible that the principle could require compensation for a combination of genetic predispositions. However, it is important to stress that the emphasis is on the magnitude of the performance advantage being too great in any particular sport, not on the specific genetic origin (or origins) of the advantage, which ought to be irrelevant. Given its potential impact on a number of commonly valued athletic attributes, increased levels of endogenous testosterone might stand out as a special case, but it seems impossible to get past the need for evidence about the magnitude of performance advantage it actually provides in any particular sport.

Of course, there would need to be a consensus about what constitutes 'significant' influence or what constitutes 'too great' a performance advantage. Accordingly, if those in the 'original position' are to agree to compensate for a stable inequality, then they need to have sufficient (and reliable) information about the actual magnitude of advantage provided and also something objective to compare it against; otherwise, it is impossible to justify it as 'too great' or 'significant'. There are parallels here to Rawls' argument concerning the nature of 'perfect' procedural justice, where he suggests that there is a fundamental requirement for an independent criterion for what constitutes a fair division (Rawls, 1971, [36] p. 85). Most obviously, this objective yardstick might be another stable inequality that is valued and not compensated for or, possibly, a similar inequality that is. If it is not a comparison against another stable inequality, then it should at least have some reference to an existing value or norm within the sport (such as historic margins of victory, although this would seem to be an argument better directed at the uncertainty of outcomes, rather than about fair competition).

In any event, the result of an approach that sees the magnitude of performance advantage as the starting point for eligibility restrictions is to adopt a sense of fairness and equality of opportunity more obviously appealing to the principles of a Rawlsian sense of fairness, justice and equal opportunity, but also one which provides a potential justification for regulations that compensate for some stable inequalities, which might include typical male athletic advantage. However, such an approach does require that both the actual magnitude of performance advantage and the relative magnitude of performance advantage be known.

To compensate for one stable inequality but not another that provides a similar level of performance advantage (or to compensate for an inequality that provides no disproportionate advantage when considered against typical margins of victory) would seem to be inconsistent and represent an arbitrary choice. Accordingly, what is being advocated is the adoption of what will be termed a 'proportionate inequalities' sense of fair competition and equality of opportunity.

4.2. Proportionate Inequalities: Evidence of Performance Advantage

That typical males and typical females have physiological differences that stem from exposure to endogenous testosterone from puberty seems undeniable. That such differences relate to attributes, such as increased lean body mass, larger bones and greater numbers of red blood cells, which are typically valued and seen as helpful in most sports performances also seems well accepted [40–42]. There seems to be a general acceptance that the physiological advantages that typical men have over typical women translates to a general 10–12% male athletic performance advantage [43] (p. 1), which, in turn, may result in a greater or lesser performance advantage depending on the sport in question and the extent to which these typical attributes are valued and prove useful.

The general scientific acceptance of 'male athletic advantage', founded on the influence of endogenous testosterone combined with empirical evidence of actual performance advantage in particular sports (for example, 10–12% is both broadly reflective of the difference in male and female world records in athletics) (Tucker and Santos-Concejero, 2017 [44]), would seem to provide the sort of evidence that those in Rawls' original position might rely on as a basis for agreement that regulations are necessary to compensate for such advantage. Whether, given evidence of the variation and range in the levels of testosterone

across typical males and typical females, those in the original position would all agree to a binary categorisation by sex as the mechanism of compensation (based as it is on average differentials) is an interesting question, but ultimately not one to be answered here. Assuming they would, the question is, then, what to do with non-binary individuals, since it is difficult to see why those in the original position would simply accept the underlying evidence of a disproportionate advantage provided to typical males as a result of the testosterone, should extend to those who may not be 'typically' male. If sex segregation is to be utilised and there is to be regulation that also compensates for advantages enjoyed by non-binary (but legally female) athletes, then sufficiently compelling evidence of the disproportionate advantage they enjoy is needed.

In its guidance on fairness and inclusion in sport, the IOC recommends not only that individual sports need to make their own decisions about how to balance fairness and inclusion, but also that if any restrictions are imposed beyond legal sex, those restrictions are backed by robust scientific evidence. It is argued that this guidance is underpinned by the proportionate inequalities sense of fairness outlined above; SGBs need to have scientifically robust evidence of disproportionate advantage to justify regulations that, in some way, compensate for that advantage.

5. Fair Competition and Equality of Opportunity in Female Athletics: The DSD Regulations

The argument articulated in Section 2.1 suggested that for SGBs to rationally justify regulations that restrict eligibility in the pursuit of fair competition there are some rational requirements placed on them: (1) SGBs should adopt a consistent and objective sense of fair competition; (2) as far as possible, SGBs should consider the impacts on the competing values of fairness and inclusion; and (3) any regulations should be designed to be as inclusive as possible and restrictions on participation only such that are absolutely necessary and proportionate to the gain in increased fairness achieved. Crucially, any consideration of requirements (2) and (3) start with requirement (1) and a clear and consistent understanding of the goal to be achieved. In this regard, drawing on Rawls' ideas concerning fairness and justice, it has been suggested that a proportionate inequalities sense of fair competition might provide a principled and consistent explanation of fair competition, one that could be used to justify eligibility restrictions and reduces the possibility of marginalisation and exclusion.

With that perspective in mind, this article will now consider the extent to which the IAAF appeared to adhere to these requirements when introducing the DSD Regulations in athletics.

5.1. DSD Regulations: Background

Since the hyperandrogenism regulations were introduced by the IAAF in 2011, World Athletics has taken an interesting approach to the problem of non-binary athletes. Ostensibly, the hyperandrogenism regulations recognised competition is built around the division of athletes by their legal status as male or female [43]. However, the regulations made an athlete ineligible for the legally female category if they had endogenous (and useable) testosterone levels above 10 nmol/L, a figure that was seen as the lower end of typical male testosterone levels. If a legally female athlete was ineligible to compete, then they would need to take steps (such as medication or surgical intervention) to reduce their testosterone levels to an appropriate level. The regulations superimposed on the external legal framework, an internal and more reductive basis for determining who was male and female solely for the purpose of athletics. The hyperandrogenism regulations also sought to avoid the classification of athletes by reference to sex as determined by an external agent, a point stressed by professors Ritzen and Hirschberg in giving evidence for the IAAF in *IAAF v Chand* [45] (para. 183). At least on the face of it, by focusing on testosterone levels, the regulations relied on the underlying reasons for the male performance advantage and, in so doing, presented an objectively measurable variable as a determiner of eligibility

(Handelsman et al. [42] p. 807). As alluded to above, by considering testosterone levels as the only relevant biological marker, they also resulted in the adoption of a unique, athletics-specific understanding of sex, male and female.

Of course, in *Chand*, the hyperandrogenism regulations were found by the CAS to be unlawful. The legal problem was that they were not seen as a proportionate means of achieving the aim of ensuring fair competition in the female category. The underlying concern was that the CAS panel felt there was insufficient scientific evidence that legally female athletes with elevated levels of endogenous testosterone had the same degree of performance advantage that typical males had over typical females. In short, there was a lack of evidence that the advantage enjoyed was disproportionate. At a general level, the introduction of the hyperandrogenism regulations seemed to suggest a recognition by the IAAF that the proportionate inequality sense of fair competition was what they were concerned with but did not follow it to its logical conclusion and failed to recognise how important the evidence of actual and relative advantage was. It was not enough to rely on an inference that all legally female athletes with levels of useable testosterone above 10 nmol/L had the same advantage as typical men; the physiological impact of increased endogenous testosterone (and the consequent effect on athletic performance) across the range of legal females that were affected by the regulations was too unclear and uncertain. It is suggested that part of the problem was that the regulations were, primarily, still a mechanism for enforcing a binary divide, rather than being seen as one means towards ensuring a proportionate inequalities sense of fair competition between all participants, regardless of sex.

To replace the hyperandrogenism regulations, the IAAF introduced what have become known as the DSD Regulations. The DSD Regulations have a narrower focus, both in terms of the range of athletes affected and the range of athletic events. Broadly, in order to try and make eligibility restrictions more proportionate, they were drafted to capture individuals and events where the IAAF's evidence of performance advantage was strongest. The result was eligibility regulations that restrict eligibility for fewer legally female athletes, including those with certain DSDs that result in levels of circulating testosterone greater than 5 nmol/L who also have functioning androgen receptors (IAAF [43] p. 3). The 'restricted' events include the 400 m, 400 m hurdles, 800 m, 1500 m and the mile. By moving away from simply relying on useable testosterone levels and taking into account more clearly the evidence of performance advantage, the DSD Regulations certainly appear to take a step towards placing proportionate inequality at the centre of any sense of fairness. However, appearances can be deceiving.

5.2. Do the DSD Regulations Adhere to a Proportionate Inequalities Sense of Fair Competition?

Although the direction of travel of the World Athletics seems to be towards appealing to a proportionate inequalities sense of fairness, two concerns remain which have implications for the rational justification of the DSD Regulations.

First, as suggested already, a proportionate inequalities sense of fair competition demands sufficiently clear evidence of disproportionate advantage, yet there seem to be some real concerns surrounding just how clear the evidence is, both in terms of the actual performance advantage enjoyed by athletes with relevant DSDs and, more obviously, the relative advantage.

Second, whilst any regulations need to make sure that any disproportionate advantage is compensated for, any method of compensation should not result in athletes they impact being disadvantaged. These concerns will be dealt with in turn.

5.2.1. Evidence of Actual Performance Advantage

As discussed already, there seems to be relatively undisputed scientific acceptance that testosterone plays a significant role, through and after puberty, in physiological development and the sporting performance advantage that typical men have over typical women.

World Athletic's position builds on this starting point and suggests that athletes with relevant DSDs have the benefits of increased levels of testosterone from puberty and are, for athletic purposes, identical to typical men, enjoying the same level of performance advantage. However, this is essentially a theoretical position supported, in large part, by a paper by Handelsman, which does not provide empirical evidence of the actual performance advantage enjoyed by athletes with relevant DSDs [42]. The empirical evidence is primarily provided by two papers by Bermon et al. [46,47] (the Bermon Papers). The Bermon Papers are observational studies of performances at the Daegu and Moscow IAAF World Championships together with the medical records of the athletes participating to provide a relational analysis of 'free' testosterone levels and athletic performance across three categories of athlete for each athletic event: those with the highest and lowest levels of testosterone and those with average levels. Ultimately, what they suggest is a possible average advantage in the region of 2.1–2.9% in 4 of the 5 events currently regulated by the DSD Regulations. However, there has been strong criticisms of the Bermon Papers on a number of grounds: (1) the choice and use of tertiles being statistically inappropriate (Franklin et al. [48], Menier [49]; Prof. Holt and Prof. Bohning also criticised the statistical analysis in *Semenya* [40] (para. 176); (2) the inability of other scientists to reproduce and test the results due to problems of accessing the data (Pielke et al. [50]; (3) the lack of uniformity in the sampling procedure given the number of variables (such as time of day when samples were taken) that can influence levels (Prof. Dave in Semenya, [40] (para. 247–248)); (4) whether athletes had given effective consent for the use of their data in the study (Prof. Blockman, Semenya [40] (para. 243)); and (5) the independence of Dr. Bermon, who acknowledged a conflict of interest given his employment with the IAAF and his involvement in the development of the Regulations (Semenya [40] (para. 346)). If Pielke et al. are correct in their attempts to re-analyse the data (omitting what they identified as problematic data points), then the average advantage is in the range of 1.5–2.1% for the currently regulated events other than the 400 m hurdles (3.1%) [50].

Even accepting the Bermon Papers at face value, what they seem to demonstrate is that female athletes with higher levels of testosterone might have an advantage in particular events, and then rely on an inference that some of the athletes in the highest tertile (those with relevant DSDs) are likely to have a much greater performance advantage because they are 'athletically male'. Additional evidence to support the inference was submitted by the IAAF by way of a further study by Dr. Bermon of a small group of athletes whose testosterone levels were suppressed by medication [51] and a double-blind study by Hirschberg et al. of the effects of a 10-week course of exogenous testosterone on 48 typical, physically active females [52]. However, both of these studies have also been subjected to criticism. The 2017 Bermon study (in particular) has been criticised for having a 'statistically insignificant' sample size and from suffering from a lack of a control group (Prof. Bohning in Semenya [40]). Whilst the Hirschberg study does have a larger sample size (48 individuals) and provides some evidence about the causative effect of exogenous testosterone on typical females, it does not provide direct evidence of the performance advantage that athletes with relevant DSDs actually have (and the effect of endogenous testosterone) (Alexander et al. [53] p. 7). Furthermore, both papers had lead authors who, at the time, would appear to have had prima facie conflicts of interest given their respective relationships with the IAAF (Pielke et al. [50]).

Criticism has also been aimed at inconsistencies concerning the underlying hypothesis of increased testosterone providing significant athletic performance advantage in the female category. In relation to the Bermon Papers, Pielke et al. observed that, (1) there were more events in which those athletes in the lower tertile of testosterone levels outperformed those in the highest tertile, and (2) the largest advantage observed for track events was in the 100 m, which was enjoyed by those in the lower tertile [50]. It should also be noted that there were some events where the performance advantage observed for athletes in the higher tertile was greater than in the events that are regulated, but which are not covered by the Regulations (for example, the hammer and pole vault) (Bermon and Garnier, 2017 [46]

pp. 3, 5). Given the suggestion of a link between increased spatial awareness of typical men when compared to typical women (as well as the benefits related to strength and power), their exclusion seems difficult to justify and does not appear to have been fully explained.

In light of these observations and a lack of direct evidence on the effect of endogenous testosterone on athletic performance in typical females and those with DSDs, it is perhaps not surprising that there were significant differences in expert opinion in *Semenya* about several key issues: whether endogenous testosterone impacts the physiological development of women with relevant DSDs differently to typical men, how increased testosterone might impact individuals with DSDs differently, whether other androgens, such as Dihydrotestosterone (DHT) might play a role in physiological and performance advantage and how any physiological advantages caused by testosterone actually influence athletic performance in both men and women.

Accordingly, what emerges from the contrasting expert views in *Semenya* is a sense of uncertainty around the evidence of the actual magnitude of advantage enjoyed by athletes with relevant DSDs. Equally problematic in appealing to any consistent sense of fair competition is the regulation of events where the IAAF's own evidence on actual performance advantage seems less compelling than for some events that were not included. If the evidence is sufficient to compensate for in one event, then presumably it is in another where the evidence is greater, presuming there is not a convincing justification for distinguishing.

Looked at from the perspective of those in Rawls' original position it is arguable that, given the contrasting perspectives on the evidence they would be faced with, the lack of sufficient scientific clarity and certainty would make it difficult for them to agree that any regulations compensating for the advantage provided to athletes with relevant DSDs would be needed. This would be particularly true in relation to the individual events where the evidence was particularly weak. If they accept the evidence was sufficiently clear for some events, it seems compensatory regulations would have to be the outcome for all events where the evidence was equally strong or stronger.

5.2.2. Evidence of Relative Magnitude of Advantage

Of course, a proportionate inequalities sense of fair competition does not require that athletes with relevant DSDs enjoy the same advantage as typical men (10–12%); it only demands that there is evidence of an advantage that is too large, relatively speaking. Accordingly, one might be prepared to accept that the evidence gathered by the IAAF does show evidence of some advantage, perhaps in the region suggested by the Bermon Papers (2.1–2.9%), or, more controversially, in the region suggested by the 2017 Bermon study on the effects of testosterone suppressing medication in four XY DSD athletes (5.7–7.8%) [40] (Para. 325). However, even if one accepts such evidence as sufficiently clear, it remains to be shown that the suggested advantage is too large, which, it has been argued, requires a comparison against some objective measure.

The most rational comparison would be against other 'stable' genetic pre-dispositions that influence (or are suspected to influence) performance, but which are valued and deemed 'acceptable.' For example, in *Semenya*, Dr. Williams highlighted the likely impact of the ACTN3 gene, a genetic pre-disposition that appears to be crucial to the development of particularly fast-twitch muscle reflexes and longer muscle fibers. In fact, Dr. Williams suggested that it was so important to elite sprinting that it would be impossible to compete without it [40] (par. 149). If this genetic pre-disposition is suspected to influence athletic performance but is 'valued,' then its impact might be compared against the evidence of performance advantage of those with relevant DSDs. However, such comparisons do not appear to have been attempted (Semenya [40], (para. 346)).

Considered from the perspective of those in Rawls' original position (who, it should be remembered, have no knowledge about who is male/female or non-binary), it would seem they were being asked to agree that one particular natural, genetic pre-disposition is singled out for compensation but only in relation to the female category. It is argued that any

agreement would have to be based on a rational explanation of why one is distinguished from another genetic pre-disposition (or combination of them). It may be that prolonged exposure to useable, endogenous testosterone is different because it impacts a number of relevant athletic attributes, but any such explanation, at some level, would necessarily rely on evidence that the overall impact on performance is too large compared to any of the other genetic advantages that it is possible to benefit from in athletics. Without compelling evidence of this, it seems unlikely that those in the original position would agree that it is an unfair advantage which needed compensating for.

Of course, it might be pointed out that rationality has practical limits where resources are limited. An organisation such as the World Athletics does not have the time or resources to consider the relative advantage provided by useable endogenous testosterone against other genetic pre-dispositions; testosterone is the 'problem' at hand, so it should be dealt with.

However, it is suggested that such an argument does not deal with either the subjective decision to label testosterone as the only problem nor the rational requirement to have some objective reference point against which performance advantages can be compared, even if it is not the impact of other genetic pre-dispositions but by reference to something such as historic margins of victory.

Although this may not sit so easily with Rawls' original position (i.e., before the rules of athletics were created), it does at least provide some objective reference point from which to ascertain a consistent basis for what fair (and meaningful) competition is.

In *Semenya*, Dr. Bermon did appear to do this by referring to the difference in performance between first and fourth (1.5%) and first and last (3.7%) in the 800 m at the 2016 Olympics and the potential magnitude of advantage that a relevant DSD athlete might have (*Semenya* [40] para. 325). This observation was raised in the context of Dr. Bermon's study of four relevant DSD athletes whose testosterone had been suppressed [51], and suggested that the advantage gained by having a relevant DSD was to elevate athletes who would otherwise not be reaching finals to winning. However, evidence from that study should be treated with caution given the criticisms already identified of a very small sample size and failure to account for variables such as the side-effects of medication. Furthermore, if the Bermon Papers are taken as the indicator of actual performance advantage, then 2.1–3.1% seems broadly comparable to the margins of victory identified by Dr. Bermon in *Semenya*. This might suggest that an athlete with a relevant DSD could be 'elevated' from a middle of the pack runner to one who is likely to win. However, it does not seem to suggest that the outcome is a foregone conclusion or that the advantage is so large that those in the original position would necessarily agree to discount it. What is more, those in the original position would surely have to have some knowledge of typical margins of victory across athletics events to be able to deem 2.1–3.1% too large. Little evidence was provided about historic margins of victory by the IAAF.

Some evidence about historic margins of victory was provided by Prof. Tucker in *Semenya*, who observed not only that Caster Semenya's historic margins of victory were not close to the accepted 10–12% typical male performance advantage, but they were not outliers in the context of elite athletics. He found that the average margin between first and second place (in all events) was between was 0.57% and 0.60%. Six athletes were identified as having margins of victory large enough to be considered 'outliers,' including Usain Bolt (2.9–3.42% margin of victory in the 200 m), Genezebe Debaba (2.6% in the 1500 m), Michael Johnson (2.57% In the 400 m) and Alison Felix (2.43% in the 200 m). Caster Semenya's average margin of victory was 1% [40] (para. 274). It is possible that Caster Semenya and other athletes with relevant DSDs were deliberately running within themselves or have been poorly trained, but this is quite evidently speculation and not something that the World Athletics, itself, has been prepared to suggest.

The lack of evidence about the relative magnitude of advantage provides some basis for skepticism about the extent to which the World Athletics and the DSD Regulations

have embraced a consistent sense of fair competition and one that those in Rawls' original position could agree to.

5.3. Do the DSD Regulations Compensate (and No More) for Disproportionate Advantage

If one is prepared to get over the concerns and criticisms around the evidence of actual and relative performance advantage enjoyed by athletes with relevant DSDs, then there still remains a question over whether the mechanism of compensation ensures a proportionate inequalities sense of fair competition.

In *Semenya*, the CAS was presented with evidence about the actual and potential physiological effects of requiring elite athletes to medicate to enable them to compete, evidence which suggested potentially severe and unpredictable side effects even in cases where suppression was through oral contraceptives. Although the IAAF medical experts pointed to the relative safety and common use of oral contraceptives amongst the general population, it was also acknowledged that effects (and side-effects) are personal, and that the IAAF had little evidence about the effects on elite athletes or women with a relevant DSD (Semenya [40] (para. 593). Consequently, for some individuals it seems quite possible that the effect of medication could go beyond simply compensating for any performance advantage and the side-effects could even increase the risk of serious general health conditions such as stroke, high blood pressure, liver dysfunction and tumors (Prof. Dave and Dr. Gomez-Lobo in Semenya [40] paras. 251, 184, respectively). In considering the evidence, the CAS panel accepted the reality of the possible impacts on individual athletes and noted the lack of specific evidence that the IAAF provided on this point. Consequently, the concern is that the IAAF implemented the Regulations despite a significant element of uncertainty about the effects of medication on individual athletes, suggesting an approach that neither aligns with a proportionate inequalities sense of fair competition nor seems to value the concerns, interests and health of those affected.

Although it is not so obviously linked to the issue of performance advantage (or the negation of it), the CAS was also presented with evidence of the psychological harm likely to be caused by the procedures required to enforce the DSD Regulations and the consequences of being required to take medication. Harms arising from the need for athletes to undergo intimate, intrusive medical examinations, from the likely public nature of any investigation and from the reality of being labelled as having a DSD were all accepted by the CAS ([40] (para. 601, 602)). However, other causes of psychological harm (or the extent of those harms) were not acknowledged. Intuitively, the psychological harm arising from being told that your own understanding of your sex or gender is wrong (or even having that questioned), seems likely to be fairly severe (Dr. Mitra in Semenya [40] Para. 192). This seems true even if such labelling is only in the context of athletics, given that athletics will almost certainly be of central importance to that individual's sense of identity. Similarly, it seems intuitive that there would be significant psychological harm resulting from being forced to take medication, from the prospect of having one's means of economic subsistence taken away and from the inevitable feelings of discrimination and victimization. Exactly what the effect of such psychological harm is on performance advantage is a moot point, but the potential for it to undermine long-term elite performance seems quite possible given the importance that psychology seems to play in elite sport.

Whilst it might be argued that an athlete is acting freely in choosing to medicate and to continue to participate, the sense of 'free choice' that this entails seems pretty thin, essentially coming down to a choice between taking medication and accepting the possibility of significant side-effects (and a potentially significant, unknowable reduction in athletic performance) or not competing. Although athletes can choose to compete in non-regulated events, this again seems to be an unrealistic option if they want to compete at the elite level and also fails to recognise the inconsistency in forcing athletes with relevant DSDs to choose weaker events when typical female athletes could self-select into other events if they perceive a better chance of success. It is arguable that the Regulations blur the line between consent and coercion in this regard (Kyle Knight, Semenya [40] (para. 202).

Accordingly, it seems difficult to defend the argument that the DSD Regulations have been designed to simply negate advantage and ensure a proportionate inequalities sense of fair competition and equality of opportunity for all. In fact, it seems arguable that the what has been achieved is securing fair competition for typically female athletes, whilst non-binary individuals are, in reality, excluded and marginalised. Viewed through the lens of Rawls' original position, it seems dubious that, having accepted the need for compensation, all would agree to impose regulations that might well result in those with relevant DSDs being put at a disadvantage. To provide fair equality of opportunity for all, any compensation would have to ensure it did no more than negate the advantage enjoyed.

6. Is Any Gain in Fair Competition Worth Any Negative Impact on Inclusion?

As indicated in Section 2.1, the underlying issue here is one of transparency and of rationalising the decision as far as possible. In essence, the argument is that any SGB should consider (and be seen to consider) all of the likely consequences of regulations that restrict eligibility and view this in the holistic context of all of its values and purposes. Only then will it be possible to articulate a justification for those restrictions.

Clause 4(j) of World Athletics' constitution states that one of its main purposes is to ensure 'the right of every individual to participate in Athletics as a sport, without unlawful discrimination of any kind undertaken in the spirit of friendship, solidarity and fair play' (IAAF Constitution 2019). Whatever other values and purposes might be relevant, this certainly suggests that any eligibility restrictions have to find a delicate balance between the potentially competing values of fair competition (as one element of concept of fair play) and inclusion. As a result, we should expect careful consideration of both the positive and negative impacts of any proposed regulation within the context of that purpose and the values enshrined in it.

Yet, there is a concern that the decision to implement the DSD Regulations resulted from a less than full evaluation. The problems have already been highlighted. First, without a clear and consistent sense of fair competition, it seems extremely difficult to see how to rationally articulate or assess the gains to the aim of fair competition in the context of athletics as a whole. Furthermore, as illustrated in respect of arguments around the mechanism of compensation adopted by the DSD Regulations (Section 5.2), there seems to have been an undervaluing of both the negative consequences on fair competition but also the harms to other apparent values of World Athletics, such as inclusion. The perception of some that the DSD Regulations were aimed at particular individuals, such as Caster Semenya, and have a disproportionate impact on non-binary athletes from the global south is perhaps testament to that (Karkazis et al., 2020 [54] pp. 2–3, 80)

7. Are the DSD Regulations a Necessary and Proportionate Means of Achieving the Aim?

The argument outlined in Section 2.1 was, assuming fair competition and inclusion are both important sporting values, any regulations aimed at achieving fairer competitions should be as inclusive as possible. If there are alternative mechanisms of compensating that produce the same result in terms of any increase in fair competition but are more inclusive, then that alternative would be rational and preferable. As suggested by the UK's Sport Councils, this might require SGBs to be 'creative' in finding solutions [5] (p. 12).

What is noticeable about justifications and explanations supporting the DSD Regulations is that there appears to be no thought about feasible alternative ways of compensating that might have been more inclusive. For example, if the scientific evidence is clear enough about the magnitude of advantage, a time/distance handicap seems like an obvious mechanism of compensation that would be less intrusive on individuals and remove concerns about disadvantaging those with relevant DSDs. Yet, there does not seem to have been any deliberation on this as a possibility, or if there has, the reasons for rejecting it have not been made clear.

Coleman suggests that the IAAF discharged its burden of showing the Regulations were necessary [55] (p. 89). However, even if we accept the World Athletics' line of argument that athletes with relevant DSDs have the same advantage as typical men, that does not make the DSD Regulations necessary, it makes some form of regulation necessary and potentially justifiable. If World Athletics does truly value the right of all to participate, then it surely has an obligation to consider the most inclusive mechanism of compensation. This is particularly so given that athletes affected by the DSD Regulations have previously been participants in the sport, to whom SGBs should owe what Pike would term a 'special obligation' [9].

8. Conclusions

It has been argued that fair competition and inclusion are both values central to almost all sports. Unfortunately, where regulations in sport restrict, limit, or impose conditions on some participants but not others, there is inevitably some degree of exclusion and discrimination. Rather than focusing on the prioritisation of values per se, it has been contended that the key question should be whether the degree of exclusion and discrimination caused by any proposed regulations can be rationally justified and whether that justification can be articulated. To do so, three basic requirements were suggested: (1) to embrace a consistent sense of fair competition, which (relying on Rawls' ideas on fairness and justice) views proportionate inequalities as the end to be achieved; (2) to undertake a transparent evaluation of how much fairer the competition is likely to become against the possible negative impacts on the SGB's other values and purposes; and (3) to ensure that any regulations achieve their aim in the most inclusive way possible.

Given the generally accepted evidence of typical male advantage and the pervasive narrative of biological sex as a simple binary phenomenon, it is somewhat understandable that SGBs might see the need for categorisation based on biological sex as necessary to allow those who are not typical males a share of the sporting rewards. However, seeing binary categorisation as a starting point (or the 'core' aim (Garcés de Marcilla Musté [19] (p. 3)), rather than a potential means to an end, risks creating regulations aimed, primarily, at policing the divide, which do not achieve any consistent sense of fair competition. Furthermore, they risk (perhaps unintentionally) discriminating against and marginalising both intersex individuals and trans women without a convincing rational justification.

In the context of the implementation of DSD regulations, it is suggested that World Athletics fell into this trap. Although there seems to be some evidence to suggest that a proportionate inequalities sense of fair competition has been recognised as the ultimate destination, apparent gaps in the scientific evidence and failure to consider other mechanisms of compensation suggest World Athletics gave up with a lap or two to go, opting for the solution at hand. As such, it is not clear (at least without more evidence on the actual and relative magnitude of advantage enjoyed by athletes with relevant DSDs) that the DSD Regulations in their current form strike a rationally justifiable trade off between inclusion and fair competition. At the very least, it seems difficult to accept that the mechanism of compensation achieves minimal interference with inclusion or more than a perception of fair competition.

Whilst it is not within the scope of this article, there may well be values and considerations other than fair competition which would help justify retaining a binary model and regulations to police the divide. Some that come to mind (in addition to safety in contact sports) include: given the pervasiveness of a binary gender division in society, the value of having separate spaces for men and women (regardless of concerns about equal opportunities to share in sporting rewards) and the historical structure and organisation of the sport. However, whether such reasons are sufficient is a moot point since it such reasons are not typically given when justifying eligibility restrictions or, at least, they were not in the context of the DSD regulations.

Although this article has focused on the DSD Regulations and consideration of whether a rationally justifiable balance between fair competition and inclusion was achieved in that

context, it is suggested that a similar approach based on a proportionate inequalities sense of fair competition could be applied to regulations that limit or restrict the eligibility of trans women athletes to the female category. Here, the concerns around disproportionate advantage would be slightly different, since they would likely focus on whether there is sufficiently clear evidence that trans women athletes benefit from a continued performance advantage (and the level of such advantage) after they have undergone medical treatment as part of their transition. In other words, the focus would be on how much of the typical male performance advantage trans women retained. However, exactly the same questions would remain regarding the evidence of disproportionate advantage, about whether the impact of any regulations was overall beneficial and whether any regulations were as inclusive as possible.

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Notes

1 The term 'intersex' will be used to describe individuals who, as a result of their genetic make-up, have biological markers that do not all point in the same direction towards what might be described as a common or typical understanding of male or female as binary, mutually exclusive alternatives. It is acknowledged that this term may be used differently in other contexts and that there is some debate about exactly what conditions the term intersex should encompass (Coleman [1] p. 83, Adair [2] pp. 128–129).

2 Words in square brackets added by the author.

3 In contrast to 'intersex', the terms 'typical male' and 'typical female' are adopted from the existing literature and describe those individuals whose biological markers are concordant, in the sense of all pointing clearly towards a binary understanding of male or female (for example, see Coleman [1] p. 83, Adair [2] p. 125).

4 It is possible that an individual could be assigned a male sex at birth, be considered intersex and then transition to a female gender identity.

5 The International Association of Athletic Federations (IAAF) changed its name to World Athletics in 2019. However, as the DSD Regulations were introduced prior to this change, both names are used through this article depending on the context.

6 Words in square brackets added by the author.

7 An explanation of which has been provided above (n. 3).

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