



Biology or Gender Identity in Sport

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Abstract

Today, the question of who can compete as a woman or a man in different sports is becoming more and more important. Is it biological sex that determines the legitimacy of a sport or gender identity? There is also the question of what motivates athletes to compete in the sport of the opposite sex. There are sports where it is worth competing as a man in the women's event or as a woman in the men's event. In many cases, the conflict between gender identity, biological sex and perceived self-image is indeed an inner fulfillment of the individual, while in other cases the laws allow the athlete to change gender and thus compete in the category of the opposite sex.

Our research is focusing on the last 10 years of sport results in the field of Olympic Programm, we have examined the issues that arise in sports, which we believe should be addressed in the future in all cases in order to sort out the gender categories in relation to sports. In some sports, gender segregation has a positive impact on the performance of the athlete, such as athletics, which is in the spotlight in this area. Boxing, weightlifting, skiing, etc. are among the sports in which men have a significant technical and physical advantage over women, while in gymnastics there is a significant potential for gender role reversal. As a starting point for discussion, we would like to raise the question of what is fair and what is not fair to athletes. Is there any chance for women against transgender participants?

Introduction

Biological gender is defined anatomically, while social gender denotes psychological, social and cultural differences (Giddens, 2008). The concepts of sex and gender are sometimes used as synonyms for each other, although the conceptual difference between them should not be confused. Some authors reserve the term gender to express the biological differences between men and women, while simplifying the concept of gender to men's (e.g. leadership, independence, aggressiveness) and women's personality traits and accepted behavior patterns (sensitivity, sweetness, childcare) (Bem, 1981). Others believe that the distinction between the definitions is much more complex. Judith Butler (1990), for example, argues that gender is neither a cultural nor a natural entity; gender is a multifaceted cultural phenomenon through which "gendered nature" or "natural gender" is created and maintained as a "pre-significant", pre-cultural, politically neutral surface on which culture acts. In other words, the concept of social gender refers to social expectations regarding the self-image and behavior considered appropriate and accepted for men and women. Biological gender determines whether we are born male or female, while social gender deals with the expectations of a given society regarding our behavior and self-image (Jackson and Scott, 2002). By the latter we mean the set of cultural values, dispositions, roles, practices and characteristics that develop on the basis of gender.

Keywords: biological sex, gender identity, sport, transgender

According to Buda (1985), in contrast to the characteristics related to biological development, gender on the one hand covers psychological differences, and on the other hand, it is linked to the socially established characteristics of masculinity and femininity, that is, masculinity and femininity. Bem (1981) believed that, in addition to gender identity, the extent of a person's adaptation to social norms can determine their behavior through the concept of gender schema. That is why we consider the field of sports, where these concepts have recently been mixed, to be an interesting question. Does biological sex determine the system of disciplines in sports or is gender identity a divisive topic that has arisen more and more recently.

More recently, attention has been paid to the topic of transsexuality, which Buda (1998) called a serious disorder of gender identity. In the case of transsexuals, the feeling that they belong to the other gender develops in early childhood, which they interpret as a mental disorder. The regulation of the participation of individuals with an atypical gender identity and transgender in sports competitions is an extremely complex and complicated issue, since women's and men's sports were evidently separated from each other for many decades due to the binary nature of gender (Gál, 2016).

Conceptual framework

Gender identity is formed simultaneously and in close interaction with the learning and possible acquisition of exaggerated generalizations about gender differences, behaviors and roles. The formation of our identity deeply influences and shapes our behavior and thinking in later life. Norms, norm systems, and social interactions will determine what we consider masculine or feminine, and this is how we learn patterns of action. Later on, the need to be like a little girl or a little boy acts as a direct motivating force. Appropriate psychosocial identity goes hand in hand with the development of social gender roles (Béki, 2018).

The rigid and restrictive nature of female and male gender roles can be considered a significant obstacle to the development of personality, which is why it would be good if men and women, regardless of their gender role, made their behavior dependent on the situation. According to Marsh and Jackson (1986), the formation of identity (socialization) and everyday activities (sports) both influence the formation of self-image. When the self-images of female weightlifters and female athletes playing other sports and non-athletes were compared, it became clear that the experienced conflict due to the two self-images is significantly smaller than previously thought. However, the exceptions were those female athletes who played socially disapproved sports, which was explained by the fact that their sport is more strongly connected to masculinity than to femininity, which is manifested both in physical abilities and appearance, self-esteem and emotional stability. The results of gender role identity confirmed the concept of androgyny. Female athletes scored high on the tests in terms of masculinity, but equal to non-athletes in terms of femininity. They described themselves with the words

"confident", "competitive", "strong", "determined", which served as an explanation for the stable self-image and also for reducing the tension generated by the role conflict (Béki and Gál, 2013).

Social gender ideology states that a person is "programmed to be a certain gender" by society, and according to them, it is not at all certain that someone is actually female or male just because they are biologically born that way. In other words, according to them, gender identity is also a learned skill. This theory would completely separate the concept of gender from biological reality, ie from the fact that a person's gender is written into DNA, and it is already decided at conception whether a boy or a girl will be born, depending on whether the pair of chromosomes determining gender is XX (female) or XY (male) (Lenskyj, 2012).

Most competitive sports segregate male and female athletes due to biological differences between the sexes. Because exposure to testosterone in males leads to physiological advantages in strength and endurance, female sports need to be a protected category to ensure fairness in competition. Since the concept is based on safety, we consider it an interesting question to compare the social acceptance of sports and gender identity, i.e. the transgender phenomenon.

Sex refers to biology: reproductive organs, hormones, and chromosomes. Gender refers to culture: the meanings and behaviors socially assigned to or expected of people. Many cultures perpetuate the assumption that sex and gender are congruent, and that gender should be based on the sex a person is assigned at birth. Broadly speaking, gender identity refers to the degree to which someone's internal sense of self matches or departs from cultural expectations based on the person's assigned sex at birth. To some degree at least, cisgender people identify with the gender that culturally matches their sex assigned at birth, while transgender people identify with another gender from the one culturally expected (or multiple genders, or no gender) (Buysse et al, 2004). Cisnormative cultures assume gender remains stable and also support a gender binary, assuming there are exactly two genders, and that every person is either/or.

Washington and Karen (2001), concluded that both female and male athletes are under pressure to maintain "hegemonic masculinity" in sport. Male athletes are expected to be muscular, strong, callous, and driven to win in all circumstances, while female athletes are expected to be disinterested in sports precisely because these masculine traits are incompatible with traditional female roles and attributes. If a woman plays sports, she should definitely emphasize her feminine features, e.g. with long hair and wearing pretty clothes. Eckes and his colleagues (1998 cited in Washington and Karen 2001) draw attention to the fact that the fitness movement, which has become so fashionable in recent years, provides women with a sporting opportunity to preserve feminine features, beauty and the traditional concept of femininity through exercise, and less emphasis is placed on health preservation and equality. Ross and Shinew (2008)

directly state that since sport has been institutionalized, it has continuously preserved and reproduced the dominance of men and the subordination of women, and that beliefs related to sports are connected to the biological and physical superiority of men.

For instance, while women were not allowed to compete in the first modern Olympic Games in 1896, the proportion of female athletes at the Olympics gradually increased to reach an unprecedented 49% at the Tokyo 2020 Olympic Games (insidethegames). For instance, while women were not allowed to compete in the first modern Olympic Games in 1896, the proportion of female athletes at the Olympics gradually increased to reach an unprecedented 49% at the Tokyo 2020 Olympic Games (Gebel, 2022). Providing support and fair policies for athletes who are transitioning or identify as non-binary to participate in sports in a way that respects their gender identity. Promoting women's involvement in sports is an important tool in gender equality in development and social change (Huggins and. Randell, 2007).

Nowadays the field of sport, from grassroots level to elite, is facing the challenge of how to include transgender athletes in competitions. Regulations governing the participation of a person from outside the sex/gender binary have existed since the 1940s.1–4 Bekker offers four principles of Gender Inclusive Sport as an alternative policy and research paradigm. De-centre regulatory science; increase access to community and youth sports; and double down on gender equity. He instead demonstrates the value of approaching equity and inclusion as allied causes (Bekker, 2023).

The gender gap in sport, although closing, remains, due to biological differences affecting performance, but it is also influenced by reduced opportunity and sociopolitical factors that influence full female participation across a range of sports around the world. This commentary is intended to provide a forum to discuss issues underlying gender differences in sport performance from a global perspective and acknowledge the influence of cultural and sociopolitical factors that continue to ultimately affect female performance (Capranica, 2013).

However, gender affirming hormones have an unknown effect on athletic performance among transgender individuals during gender transition, making it difficult to develop guidelines for transgender inclusion in sports (Roberts et al, 2020). Several guidelines for inclusion of transgender athletes in elite international or professional sports exist but they are based on limited research (Ingram and. Thomas, 2019; Gooren and. Bunck, 2004). The World Athletics (IAAF) and the International Olympic Committee (IOC) created guidelines requiring female athletes to demonstrate suppression of testosterone levels to less than 5-10 nmol/L for at least 12

months prior to competing in women's events. However, athletes have challenged the section of these guidelines applying to women with disorders of sexual development and other causes of hyperandrogenism, citing a lack of supporting evidence, which calls these guidelines into question (IOC, 2016; Camporesi, 2018)

Gender affirming administration of testosterone in transmen decreases adiposity, and increases muscle mass, thigh muscle volume, haemoglobin, grip strength and thigh strength (Gooren and. Bunck, 2004; Van Caenegem et al, 2012). Gender affirming blockage of testosterone and administration of oestrogen in transwomen (oestrogen) has the opposite effect, but transwomen retain an advantage in muscle mass, volume, and strength over female controls after 1 year on oestrogen (Laparow et al, 2008, .Wiik, 2020). Most changes in body composition occur within the first year on testosterone or oestrogen, with slower changes after that time. (Gooren and. Bunck, 2004; Mueller et al, 2011; Figuera et al, 2018) There are two contentious issues that need further discussion. First, the contention that transgender females have no athletic advantage at any stage of transitioning when competing against cisgendered females is highly questionable, as there is evidence to the contrary. Second, the sporting policies provided to support the inclusion of transgender females seem to omit sports that require the physical components of strength, power, size, combat skills and speed. These sports would present a greater athletic advantage for transgendered females (Roberts et al, 2020). The authors have made a significant start in this area, but a more nuanced argument is needed to understand the inclusion policies aimed at this special population.

Currently, World Athletics requires that transgender athletes and athletes with differences of sexual development have testosterone levels ≤ 5 nmol/L in order to be eligible for the female category. There has been heavy criticism of this, and previous, testosterone-based regulations Karkazis and Carpenter, 2018; Hutcheon, 2015; Karkazis et al., 2018). Although no openly transgender athlete has competed in the Olympics to date, the increasing visibility of gender-diverse people in society (Floyd et al, 2019) means that the sports administrators and legislators must create rules to accommodate athletes from outside the sex/gender binary (Buzuvis, 2017).

Béki (2018) classified sports into 3 groups in terms of their social acceptance. Based on the evaluations on a Likert-scale, figure skating (1.9), synchronized swimming (1.4) and rhythmic gymnastics (1.3) were considered to be feminine, while heavy field athletics (4.2), wrestling (4.5), judo (3.9), football (4.0), boxing (4.4) and ice hockey (4.1) were viewed as masculine (Table 1.)

Table 1. Perception of sports based on Béki's classification (2018)

Feminine	figure skating, rhythmic gymnastics, synchronized swimming
Masculine	wrestling, judo, boxing, weightlifting, football, ice hockey, heavy field athletics
Androgynous	water polo, volleyball, handball, basketball, taekwondo, canoe, kayak, marathon running, pole vault, cycling, speed skating, rowing, cross-country skiing, biathlon, track and field, table tennis, tennis, badminton, gymnastics, triathlon, swimming, fencing, sailing, surfing, diving, equestrian, sprint, field hockey, archery, shooting modern pentathlon, bobsleigh, curling, luge, snowboarding, ski jumping

The evaluation of the situation of women's sport was measured by a Likert-scale, in which respondents had to give their opinion in connection with the equality of the sports of the two genders. The results indicate that the perception of women's sport varies: 21.8% of the respondents did not agree with the statement that female and male sports are completely equal. The largest proportion (45.1%) partially agreed with the statement, whereas one-fifth of the participants feel that the two fields are completely equal.

Based on the opinions of the respondents, from the sports included in the Olympic program, they regarded boxing as the most masculine sport (31.8%), followed by weightlifting, heavy field athletics and wrestling. There are sports in which the respondents fully reject the *raison d'être* of the female version. The highest percentage of answers in this respect was given to weightlifting (30.8%) and boxing (22.7%), but from team sports football (11.7%) and ice hockey (11.1%) were considered as sports not appropriate for females. This result was also interesting because before the research I had expected that boxing would be seen as the least appropriate sport for women. Although it was indeed boxing which was regarded as the most masculine sport, the existence of the female version was questioned to a higher extent in the case of weightlifting. Thus, for future sports professionals these two sports seem to be the least acceptable for women.

The essence of sport and fair play is predicated on the assumption that individuals must fall in with one of the preordained categories of female or male. To compete as an athlete, individuals must align themselves as female or male and join the corresponding team. This is not a difficult task for a cisgender person but a transgender one is inevitably going to face unique challenges posed by this binary or dualistic view of sex. precarious situation of transgender athletes and their extraordinary body self-narratives.

There are many quantifiable performance-related differences between male and female athletes. In contrast, the performance-related differences between transwomen who have received gender affirming hormone treatment (GAHT) and cisgender women are less clear. GAHT for transwomen consists of an antiandrogen agent plus the introduction of exogenous estrogen (Seal, 2016) with the goal of altering the hormonal milieu and, as a result, feminization of the body

(T'Sjoen, 2019). To date, there have been no prospective studies investigating the changes in athletic performance in transgender athletes after hormonal transition. In non-athletic transgender populations, studies are commonly focused on clinical outcomes, such as bone health (Wiepjes, 2019).

Method

We conducted this study to examine in which sports that are socially accepted for women transgender athletes appear and vice versa, which sports do not have such phenomena. The basis of our research was the 2018 revised version of Metheny's (1965) classification, which was examined by Béki. We use this classification for the acceptance of sports and connect it with the performance.

In sports demanding speed and power, muscular strength and the ability to generate high rates of force are recognized as key determinants in athletic success. Understanding both the physiological effects of GAHT on athletic performance, and the time course of these effects, is of importance to decision-makers and those undertaking policy reviews. While it is known that testosterone levels are markedly reduced in transgender women taking testosterone suppressing GAHT, the effects of this hormonal change on physiology, and the time course in which these changes occur, are less clear. Individual studies provide crucial, primary research on the topic, but a systematic review is warranted to provide a robust summary of the available evidence.

Our hypothesis:

1. We assume that mostly transgender men appear in sports.
2. We assume that transgender men appear in sports that are not socially acceptable for women.
3. We assume that transgender women do not appear in sports that are socially acceptable for women.

Results

When we started investigating this phenomenon, we encountered many pro and con opinions on social media. Since this phenomenon is very divisive, it was interesting for us to present some opinions. Sport is for everyone, but at the

same time it should be about equality and fair play. If a transgender athlete competes in a competition, one must definitely take into account what is behind their motivation. Since male athletes enjoy an advantage in many sports, as we presented earlier, we believe that gender identity is not the only factor behind starting a sport.

Jordan Peterson stated that "Psychologically, it is very difficult to understand that a man who, by his own decision, operated on himself as a woman, or starts living as one, suddenly decides to start playing sports among women who have been preparing for this all their lives. And after this man beats them in their sport, he pretends that his victory is the triumph of the oppressed."

At the same time, Ellis Cashmoor thinks exactly the opposite, according to which This is the 21st century, a century in which we embrace gender diversity. Prisons, educational institutions, the military, and all large institutions are beginning to adapt to this. And transgender people must be accepted. Sports cannot be an exception. (...) Sport was never about equality. Nature does not distribute her gifts equally"

If we examine that everyone has the right to run as a transgender, then the question also arises that if a transgender man can run among women, then why can't a transgender woman run as a man? An American case reflects that a transgender woman wanted to compete as a man in wrestling, but she was not allowed to do so because she was considered dangerous. If this is actually true, then a transgender man among female wrestlers is not dangerous to women. The same question arises in boxing and all contact sports, since in those sports where body against body combat does not appear, we can only talk about it being unfair.

Metheny examined the social acceptance of sports. The first group included those that were not recommended for women, the second those that were neutral from this point of view, and the third those that were perfectly suitable for women. Metheny divided the groups into further subcategories and provided an explanation regarding the classification:

First of all, he does not consider sports in which there is direct physical contact between opponents suitable for women. These are the sports in which, based on our investigation, transgender athletes appear without exception. Examining combat sports, we come across many cases in boxing. Athletes who have to undergo hormone testing come mostly from the African and Asian continents. For example, a woman who was biologically a man started boxing already in the youth category.

We can talk about physical contact not only in combat sports, but also in several team sports, even though the sport itself is not about that. Such are handball and football in this category. Examining these sports, many associations have already signed biologically male athletes to female teams.

Also not acceptable are those sports in which heavy objects have to be moved, i.e. those that use the body's strength intensively. One such sport is weightlifting. Several biologically male athletes appeared and won prestigious competitions in this sport as well.

In the case of women, he also does not consider long-term continuous stress, such as marathon running, to be acceptable. In 2023, a transgender man already won the marathon in the women's category.

The neutral category includes those sports in which the weight of the moving object is medium and does not require a greater effort, as well as those sports where physical contact between opponents is prohibited by the rules of the game. It is important to note here that the appearance of transgender people in these sports is different due to their nature. While transgender athletes appear in swimming, skiing and many sports belonging to this category, there is still no precedent for this in gymnastics, for example.

The category of sports specifically suitable for women includes those where the sports equipment is light in weight and small in size (javelin throw, tennis, etc.), or the female body provides an aesthetic experience to the viewer (rhythmic gymnastics, synchronized swimming, etc.).

In two more categories, Metheny defined those sports in which physical contact is impossible, as the opponents are separated by a net (badminton, volleyball, tennis, etc.) and those that require joint mobility and flexibility (high jump, etc.). In this category, I would highlight Béki's research, according to which this category is much narrower and only 3 sports belong here, these are: figure skating, rhythmic gymnastics, synchronized swimming. We did not find any cases where a transgender athlete competed. An interesting question in the future may be whether female transgender athletes will take the place of men in these sports and thus dominate feminine sports?

Overall, we found that transgender athletes appear in those sports where physical strength dominates. Where feminine grace or joint laxity is authoritative, there are no cases where transgender athletes appear despite being inferior in terms of results.

Conclusion

One of the most absurd debates of our time is whether athletes were born biologically male but who identify as female have the right to compete in women's competitions or not. Since we found that transgender athletes appear in sports where it is worthwhile because they can win, it can be concluded that the background of the competition is not dominated by gender identity, but rather by other sports political interests.

Our assumption that only male transgender athletes appear in the various competitions was not confirmed. We found an

example where a female transgender athlete also competed, but was not allowed to compete among men, which fundamentally violates the issue of equal treatment.

Our second hypothesis was overturned, as transgender athletes appeared in many cases even in the neutral category, mostly in sports where it was worthwhile to start as a man among women.

Our third hypothesis was confirmed, not a single woman has appeared in the men's category in sports considered feminine.

However, we would like to draw attention to the fact that it would be important to treat transgender athletes separately, regardless of biological sex, in order to restore the spirit of equality and fair play in sports. Based on our recommendations, it would be worthwhile to assess in a separate category how many athletes would remain who actually changed their gender for the love of sport and gender identity and not for the sake of achieving success. Furthermore, it must be taken into account that this phenomenon will lead to the death of women's sports within a short period of time.

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