

EUROPA-UNIVERSITÄT VIADRINA FRANKFURT (ODER)



**Discussion Paper Series
in International Economics**

Discussion Paper No. 04

Gender issues in sports

**Prof. Dr. Georg Stadtmann (Frankfurt/Oder)
Igor Tylkin (Frankfurt/Oder)**

August 2026

Gender issues in sports

Georg Stadtmann^a 0000-0002-0600-3654

Igor Tylkin^b 0009-0000-5369-5879

August 2026

Abstract

Women are generally physically weaker than men, which is why many sports classify athletes by gender, such as in athletics, ball sports, and swimming. Due to this classification, there are often separate leagues for men and women that run in parallel without connection. Nevertheless, we argue that gender classification in sports remains important to ensure fair competition. However, this structure also contributes to systemic sexism and discrimination against women in sports, affecting their representation, economic opportunities, and social recognition. This article explores the economic and social dimensions of sexism in sport, notes the roles of women and non-binary persons in the sports industry, discusses the underrepresentation of female athletes in the sports economic literature, and highlights the role behavioral economics can play in understanding these persistent disparities.

Keywords: Sport Economics; Gender Issues; Female Sport; Gender Gap; Underrepresentation of Women; Sexism

^a Georg Stadtmann, European University Viadrina, Grosse Scharrnstr. 59, 15230 Frankfurt (Oder), Germany. Tel.: +49 0335 5534 2700, E-Mail: Stadtmann@europa-uni.de and University of Southern Denmark, Odense.

^b Igor Tylkin, European University Viadrina, Grosse Scharrnstr. 59, 15230 Frankfurt (Oder), Germany. E-Mail: Tylkin@europa-uni.de

Contents

1 Introduction	1
2 Gender and the organization of sport	2
2.1 The importance of gender classification in sport	2
2.2 Gender inclusion, exclusion, and segregation	4
2.3 Transgender participation: An unresolved issue	6
3 Sexism in sport	8
3.1 Working definition and illustrative examples	8
3.2 Why sexism matters	9
3.3 Economically implications of sexism in sport	10
4 Women in sports leadership and support roles	11
4.1 Roles of women in male sports	11
4.2 Roles of women in female sports	12
5 Female representation in sports economics and the sports industry	13
5.1 Females in sports economics research	13
5.2 Industry representation of female sports	15
6 Gender differences in the field of behavioral economics	17
7 Summary, conclusions, and policy as well as managerial implications	19

1 Introduction

Sport is one of the few areas in which biological differences between men and women are openly institutionalized. Because women are, on average, physically weaker than men, many disciplines – such as athletics, ball sports, and swimming – are organized in gender-separated competitions. While this system helps ensure fairness in performance comparisons, it also reinforces a structural separation that goes beyond physical capabilities.

In particular, it contributes to the ongoing marginalization of female athletes in terms of media visibility, economic rewards, and societal recognition. Moreover, the parallel organization of men's and women's competitions often serves as a basis for legitimizing significant income disparities between them. We examine how gender classification in sport intersects with broader patterns of sexism and discrimination. We pay particular attention to the economic and social consequences of this structure, the persistent underrepresentation of women in sports economics research, and the potential of behavioral economics to shed light on these inequities.¹

Transgender participation in sports has recently gained widespread attention, particularly following the case of the American swimmer Lia Thomas, who was initially allowed to compete in women's events but later excluded under revised regulations. This shift highlights the strong influence of political and cultural contexts on eligibility decisions and the lack of a universally accepted framework for inclusion. While the binary classification of athletes into male and female categories remains broadly accepted, approaches to integrating transgender athletes are still evolving and vary considerably across sports and governing bodies. These ongoing debates illustrate that the organization of sport reflects not only biological but also social and political boundaries. It is important to note that the case of the

¹While this chapter addresses the broader topic of gender in sports, it does – more or less – not engage with the economics of demand, such as stadium attendance, the demand for superstars, the superstar effect, or issues of competitive balance. These aspects are comprehensively analyzed in another contribution to this volume (see Deutscher & Nasser, *The Uneven Playing Field: Exploring Gender Gaps in Sports Economics*), which offers an in-depth exploration of these market-based dimensions.

South African athlete Caster Semenya does not concern transgender identity but rather a condition known as Differences of Sex Development (DSD), which is beyond the scope of this article.²

2 Gender and the organization of sport

2.1 The importance of gender classification in sport

In many sports genres, male athletes differ from female athletes in several key aspects. Females tend to be slower, possess less muscle mass, and exhibit lower strength levels. These differences are often influenced by hormonal factors, such as lower levels of testosterone, which plays a significant role in muscle development and physical performance.³

The study of Thibault et al. (2010) demonstrates that biological sex is a key factor influencing elite athletic performance and world records. Since around 1983, the performance gap between men and women has stabilized at an average of approximately 10 % across most disciplines. This gap varies considerably depending on the sport—from about 5 % in swimming to over 17 % in jumping events, and up to 36 % in weightlifting. Despite increased female participation globally, the data suggests that women are unlikely to reach the same peak performance levels as men in the foreseeable future. In a more recent article, Hunter & Senefeld (2024) yield similar results. Men outperform women at the Olympic Games by 5% in swimming and up to 35% in weightlifting. At the same time, McDonagh & Pappano (2007) suggest that women have an advantage in endurance competitions, based

²For more information about DSD and the case of Caster Semenya, see Cooky & Dworkin (2018).

³For example, in preparation for the 2025 UEFA Women's Euro Championship, the Swiss national women's soccer team played a friendly match against the U15 boys' team of FC Luzern. The women's team lost 7:1. Initially, the outcome of the match was not disclosed publicly and was omitted from official communications. However, after the result was leaked, it attracted international media attention and sparked a debate about the current state of women's soccer in comparison to men's soccer. The incident was widely discussed as an illustration of the ongoing physical performance gap between elite female and adolescent male athletes, raising questions about public perception, media narratives, and structural support for women in sports (Otto, 2025).

on the cases of female athletes' successes in ultra-long distance running and swimming. However, this assumption is not confirmed on average, and modern results show the advantages of men in ultra-long races as well (Sitko et al., 2025).

Because women are generally weaker, the rules in some sports are adjusted: for example, in basketball, the size and weight of the ball are modified, and in volleyball, the net height is lower for women. In contrast, other sports, such as soccer, maintain identical field dimensions for both men and women, highlighting how rule modifications vary depending on the sport and its perceived physical demands. A similar adjustment can be observed in tennis, where women play best-of-three sets while men compete in best-of-five sets in Grand Slam tournaments.

If there were no such significant differences between men and women in sports, several issues related to gender segregation and inclusivity would not be important at all:

- No need for gender-segregated competitions: The primary reason for having separate men's and women's competitions is to account for the physiological differences that typically result in varying performance levels. If these differences were minimal or nonexistent, there would be less need to segregate races by gender. This could lead to a more unified competition format where all athletes, regardless of gender, could compete directly against each other in the same events.
- Gender segregation in sports also raises complex issues related to transgender and intersex athletes. For example, determining eligibility and fair competition conditions for athletes who do not fit neatly into the traditional binary gender categories can be challenging. If the performance gap between genders were significantly reduced, the debate over how to accommodate transgender and intersex athletes might become less contentious or less relevant. It would potentially simplify policies and create a more inclusive environment where gender identity has less impact on competition fairness. However, since this is not the case, transgender and intersex issues will remain very important.

Additionally, the industry's development is on a completely different level when comparing male and female sports. For instance, the demand for tickets to women's soccer games is much lower, with some matches drawing only 1/10 of the attendance seen in men's games. This disparity is reflected in salary levels, which are significantly lower for female athletes. The density of competition also differs, with fewer teams and leagues available for women, leading to a less robust competitive environment overall.

However, gender classification does not simply separate athletes – it also structures inclusion and exclusion within the sporting field. The way categories are defined determines who can compete with whom, and who is left outside of recognized competition.

2.2 Gender inclusion, exclusion, and segregation

While the physical differences between men and women are often cited as a justification for gender-segregated competitions, this perspective only captures part of the picture. Müller (2006) offers a more nuanced categorization of how gender is included or excluded in various sports contexts. Her typology highlights different structural and cultural modes of organizing gender in athletic performance.

Müller (2006, p. 397) identifies five different modes of gender inclusion in sports, based on how competitions are structured and how gender differences are perceived in relation to athletic performance.

1. Mixed-gender competitions, such as in equestrian sports, sailing, and motor sports, are characterized by full inclusion of all genders. In these cases, gender differences are considered irrelevant to athletic performance.
2. In some sports like chess and billiards, there is voluntary gender segregation. Here, inclusion is segregated by choice, reflecting a factual but not logically necessary relevance of gender differences for performance.
3. Mandatory gender segregation is common in physically demanding sports. In track and field, as well as in team and contact sports like

soccer, ice hockey, and boxing, inclusion is segregated, based on the assumption that gender differences are relevant to physical performance.

4. In gymnastics, certain apparatuses are restricted to one gender. Men compete on the horizontal bar, rings, and pommel horse, whereas women compete on the uneven bars, illustrating the gender-specific nature of apparatus selection. This gender-specific division of apparatuses has historical and cultural origins that continue to shape the structure of gymnastics today.⁴
5. Some sports require mandatory mixed-gender participation, such as in pair dancing, where participation is only possible as a mixed-gender team. In these cases, gender difference serves as a constitutive principle for team formation. A similar structure can be found in mixed-gender relay events in sports like biathlon, track and field, swimming, and triathlon, where men and women compete as part of one team, and the format explicitly relies on the inclusion of both genders. Also in tennis, alongside singles and doubles events, there is a mixed doubles category, in which teams are required by rule to include one male and one female player.

It is also important to note that the boundaries of gendered participation in sports have shifted over time. Activities that were once considered gender-specific have become more inclusive. For example, water aerobics, traditionally associated with female participants, is now increasingly practiced by men as well. On the other hand, long-distance running was historically restricted to men. In 1967, Kathrine Switzer registered for the Boston Marathon using the initials K. Switzer to disguise her gender. She became the first woman to officially register for and complete the

⁴The gender-specific division of apparatuses in gymnastics has historical roots in the 19th century. Early forms of gymnastics, developed mainly in Germany under figures like Friedrich Ludwig Jahn, were designed for men and emphasized strength, discipline, and bodily control. When women were later included in the sport, different social ideals shaped their participation: female gymnastics was meant to cultivate grace and aesthetic movement rather than strength. Consequently, distinct apparatuses were introduced for women, such as the balance beam and uneven bars. This division became institutionalized through national federations and the International Gymnastics Federation (FIG) and continues to reflect historically constructed notions of masculinity and femininity in sport.

race. In doing so, she challenged and redefined the boundaries of female participation in competitive athletics. Similarly, the women’s marathon was only introduced to the Olympic Games in 1984, illustrating how institutional frameworks have gradually adapted to acknowledge women’s capabilities in endurance sports. Next to the marathon, there are various cases – like not having an official female national team in German soccer until 1982 – which are examples of exclusion of women from sport.

It is also essential to recognize that the transformation of gendered participation in sports has never occurred in isolation. Governments, international federations, and sport organizations play a crucial role in setting and revising the rules that define who is allowed to compete, thereby shaping the very boundaries that the B|Orders in Motion framework conceptualizes as dynamic and negotiable. This framework (Schiffauer et al., 2018) understands borders not as fixed lines but as dynamic and negotiable constructs. It distinguishes between the state of the border – ranging from open to closed, stable to fluid – and different types of borders, including temporal, geographical, and social boundaries. The term B|Orders intentionally embeds the word *Orders* to emphasize the power structures involved in drawing, shifting, or contesting boundaries. This perspective highlights how borders are not merely passive markers but are actively produced, maintained, or transformed through cultural, social, and political practices.

Yet, even within these systems of inclusion and segregation, the boundaries of gender remain contested. The growing visibility of transgender and non-binary athletes challenges existing frameworks and exposes the limitations of binary classification.

2.3 Transgender participation: An unresolved issue

Until now, the focus has primarily been on the evolving boundaries between male and female participation in sport. However, recent developments show that the conversation is expanding beyond the binary. The inclusion of non-binary athletes has become an important new frontier in the ongoing renegotiation of gender categories in competitive sports. For example, since

2021, the New York City Marathon has included a non-binary division, in addition to the traditional male and female categories. This effectively introduced a third starter class, open to runners who identify as non-binary or transgender.⁵

The inclusion of transgender athletes, particularly transgender women, in college swimming has sparked significant debate, primarily concerning fairness and the potential impact on scholarships. While the NCAA has updated its policies to allow transgender athletes to compete under certain conditions, lawsuits and ongoing discussions highlight the complexities and controversies surrounding this issue. Nancy Hogshead-Makar (2024) discusses the case of swimmer *Lia Thomas* and comes up with good reasons why transgender athletes must not compete against biological females. She argues that rather than redefining the women's category, she calls for creative solutions such as new classifications or events for transgender athletes.

The transgender fighter *Fallon Fox* was at some point allowed to start in the women's competition. However, after she broke the skull of her female opponent in one fight, a discussion started about whether this is the right category for her and whether her license should be revoked due to safety concerns and fairness in competition (BJJ World).

While the previous chapter examined how gender classifications and structural rules shape inclusion, exclusion, and participation in sports, the following chapter shifts the focus to the ways in which these gendered structures produce and sustain sexism. It highlights how discrimination, unequal opportunities, and cultural biases persist even when formal participation is possible. Together, the two chapters illustrate the interplay between structural organization and social practices, showing how institutional frameworks and everyday behaviors jointly shape gender dynamics in sport.

⁵New York was also the first of the World Marathon Majors to offer such a category, marking a significant step toward greater inclusivity in elite long-distance running. In 2022, the NYC Marathon also became the first major marathon to award cash prizes to the top five non-binary finishers.

3 Sexism in sport

This subchapter begins by providing a working definition of sexism in sport. It then presents a range of illustrative cases – from high-profile events to lesser-known or niche sports – that demonstrate how sexism manifests in different contexts. Finally, the discussion turns to why tackling this issue is important, particularly from a business and economic perspective.

3.1 Working definition and illustrative examples

Definition: Sexism in sport refers to any form of discrimination, marginalization, or unequal treatment based on gender within the context of athletic activity. This includes unequal access to resources, pay disparities, biased media coverage, gender stereotypes, restrictive dress codes, and the exclusion of certain genders from specific sports or leadership roles (e.g., coaches, referees). Sexism in sport often stems from traditional and culturally embedded assumptions about what men and women are supposedly capable of in athletic performance and participation.

To better understand the practical implications of this definition, we now turn to several real-world examples that reveal how sexism operates across different sports and organizational settings.

- In an interview, Cecilie Uttrup Ludwig, a Danish professional cyclist who now competes in major events like the Tour de France Femmes, reflected on how it all began: When I was a junior, so many people said: 'Because you are a woman, you won't have a chance to make a living from cycling. You should just do it for fun! There are only ten women who can live from cycling.' Cecilie Uttrup Ludwig thought: *"You are not gonna stop me. Then I will be one of those ten."* (Sporza, 2021).
- During the 2018 Ballon d'Or ceremony, host Martin Solveig asked Ada Hegerberg, the first woman ever to win the award, if she knew how to twerk right after she had given a speech about empowering young girls (BBC, 2018a).

- During FC Barcelona’s first joint tour with both the men’s and women’s teams, it was revealed that only the men flew in business class, while the women—added later to the tour—were seated in economy, despite the club’s promotional efforts to present the teams equally (BBC, 2018b).
- In Canadian outdoor rock climbing, sexist route names like ‘Tampon Applicator’ or ‘She Got Drilled’ reflect a tradition where first ascensionists choose names—often using sexualized language (Wigglesworth, 2019).
- Female athletes were required to compete in shorter shorts or skirts—for instance, in beach volleyball or badminton – based on the argument that it would be “more attractive” for the audience (Holzer, 2024).

These examples are selected by the authors to illustrate the range and forms of sexism in sport. They are intended as illustrative cases rather than a representative or exhaustive overview of all incidents. Nevertheless, these examples serve as a convincing empirical foundation for arguing the necessity of structural gender equality in sports.

3.2 Why sexism matters

Sexism in sport limits participation by discouraging girls and women from entering or staying in athletics due to a lack of support, opportunities, and visible role models – resulting in long-term underrepresentation. It also reinforces harmful gender stereotypes by suggesting that men are naturally more athletic or capable, a belief that extends beyond sport and restricts equality in broader society. Female athletes face unequal conditions, receiving less pay, fewer sponsorships, and limited media attention, even at elite levels – impacting their careers and financial stability. Gendered expectations around body image and appearance can also harm mental health, causing anxiety and low self-esteem, especially among young athletes. Ultimately, excluding or undervaluing talent based on gender reduces the quality, diversity, and growth of sport as a whole.⁶

⁶Ultimately, excluding or undervaluing talent based on gender reduces the quality, diversity, and growth of sport as a whole. While much of the research focuses on women,

3.3 Economically implications of sexism in sport

Building on the societal and structural impacts of sexism discussed above, it is important to consider its economic consequences. Gender-based inequalities in sport not only disadvantage female and non-binary athletes but also lead to inefficiencies, lost revenue opportunities, and reduced organizational performance across the sports industry.

Inefficient allocation of resources: When female talent is systematically disadvantaged or excluded (e.g., through lower funding or limited media exposure), athletic potential is not fully utilized. From an economic perspective, this represents a misallocation of resources, comparable to discrimination in the labor market.

Lost value due to limited market integration: The underrepresentation of women's sports in media, sponsorship, and investment not only harms female athletes but also results in lost revenue opportunities for federations, media companies, and brands. Greater gender equity could open new markets and stimulate demand for broadcasting rights, merchandise, and advertising.

Reduced innovation, diversity, and organizational performance: On an organizational level, sexism restricts diversity in leadership positions – for instance, few female coaches or executives – which has been shown to limit innovation and strategic adaptability. Teams and organizations with greater gender diversity tend to perform better, including in the sports industry.

While this subsection focuses on three key economic consequences of sexism, other aspects may exist, such as reduced sponsorship diversity or lower fan engagement. The three selected aspects were chosen based on their prominence in the existing literature (e.g., Cooky & Messner, 2018; Fink, 2016) and their clear link to both organizational performance and

sexism can also affect non-binary and transgender athletes, who may face exclusion, misclassification, or unequal treatment. Recognizing these broader impacts is essential to understanding and addressing systemic inequalities in sport.

market inefficiencies, providing a focused starting point for further research. Moreover, sexism can also affect non-binary and transgender athletes, who may face exclusion, misclassification, or unequal treatment, highlighting the broader systemic impacts beyond the binary gender framework.

These points raise important questions for future research: To what extent are lost value and reduced innovation direct consequences of inefficient allocation of resources? Investigating how these three aspects interconnect could provide valuable insights into the broader economic impact of sexism in sport.

4 Women in sports leadership and support roles

Physical abilities play an important role in the differences between women and men as athletes. However, there are many other positions in the sports industry, such as referees, coaches, managers, and commentators. In these roles, where no physical differences matter, women are still not equally represented. Women remain underrepresented at all levels and positions in sport (see Burton, 2015; Evans & Pfister, 2021). Men coaching women's teams is very common, whereas women coaching men's teams is very rare.

4.1 Roles of women in male sports

As noted above, women remain underrepresented in leadership and organizational roles within the sports industry, particularly in male sports. Nevertheless, there have been some notable exceptions and positive developments in recent years. This subsection highlights selected examples of women taking on important roles in men's sports, illustrating both the progress made and the challenges that persist.

There are several examples of women taking on important roles in male sports, especially in recent years. In 2020, Stephanie Frappart became the first woman to officiate a Champions League match as the main referee (Sky Sports, 2020). In 2024, Sabrina Wittmann was appointed head coach of the

men's 3. Liga club, FC Ingolstadt (Stern, 2024). However, female referees and coaches still face rejection and discrimination – both when working with men's teams (Forbes et al., 2015) and when applying for positions in women's leagues (Drury et al., 2022).

Women also take part in covering sporting events and creating content, for example, as journalists, reporters, or announcers. In this area, women have been active for a longer time. In 1969, Mary Raine became the first female reporter to work at an English Football League First Division match (BBC, 2019). However, recent studies show that female announcers can lead to less excitement among viewers during sports events (Rogers, 2020).

4.2 Roles of women in female sports

Even today, women still do not constitute the majority in coaching and management positions in women's sports. For instance, at the 2023 FIFA World Cup, only 12 of the 32 teams had a female head coach. This imbalance is also observed at the level of student sports. The number of female coaches in college women's soccer is only around 30%. This is partly explained by their shorter tenure compared to their male counterparts, despite comparable results (Nessler et al., 2020). Knoppers et al. (2022) point out that the entire football structure is built in the interests of and from the perspective of men, which prevents female coaches from fitting into it organically.

Research on the effectiveness of male and female coaches in women's sports has yielded mixed results. Boenheim et al. (2025), for instance, reported a greater propensity for risk-taking among women's college basketball teams led by male coaches, which was associated with improved performance. In contrast, Paulson et al. (2023) found no significant relationship between coach gender and team outcomes in women's college softball. Therefore, the underrepresentation of women in coaching positions cannot be fully explained by performance optimization alone.

Overall, women are entering more roles in the sports industry. But they

often face negative reactions, discrimination, and sexism – from both within the industry and from fans. The importance of research in this area has already been shown in sports management (see Baxter et al., 2023). From our perspective, sports economics can also help study this topic. Identifying barriers that prevent women from becoming referees, coaches, or commentators – and finding ways to remove these barriers – can bring new talent into the sports industry. At the same time, it can open up career opportunities for women, which may contribute in a small but meaningful way to reducing global gender inequality.

5 Female representation in sports economics and the sports industry

5.1 Females in sports economics research

Since World War II, women have taken on a much greater role in the economies of developed countries (Olivetti, 2016). While these changes are to some extent reflected in the economic literature (Kahne & Kohen, 1975; Duflo, 2012), Stevenson & Zlotnik (2018) note that women are still underrepresented in textbooks. Most examples feature male economic actors. In sports science, where up to two-thirds of articles focus on male participants (Cowley et al., 2021), this pattern reveals a persistent gap in research attention.

Sports economics is undoubtedly part of mainstream economics, yet it also overlaps significantly with sports science. This makes it essential to examine how female athletes are represented in empirical research in order to identify broader patterns and trends. To this end, we analyze articles published in the *Journal of Sports Economics* between 2008 and 2024, focusing specifically on the gender composition of their data sets.

The representation of female participants is measured as the share of articles that include data on women, out of all articles using data on sports teams, athletes, coaches, referees, or other participants in sports competitions. Accordingly, theoretical articles and those focusing on

infrastructure (e.g., Propheter, 2020) or animals (e.g., Plant & Stowe, 2019) were excluded from the analysis. Between 28 and 43 articles met these criteria each year. Over the period, the share of articles using data on female participants ranged from 6.5% in 2011 to 43% in 2024 (see Figure 1). However, only six articles relied exclusively on female data throughout the entire period, with three of them published in 2024. Furthermore, no articles analyzing data on non-binary athletes were published during this period.

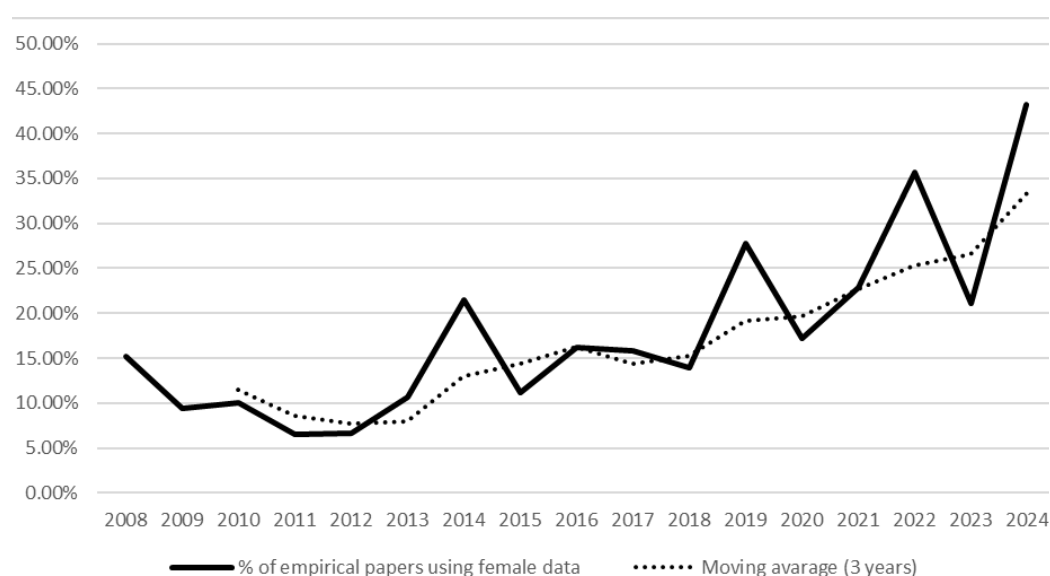


Figure 1

Percentage of articles using female data among all empirical articles in the *Journal of Sport Economics*.

A separate research question could address the representation of women and non-binary persons within the sports economy as academic staff. This could refer to the ratio of authors in scientific journals or conference participants⁷.

⁷As a suggestion for further research, one could track the representation of male and female researchers over time at conferences such as the European Sport Economics Association Conference (ESEA) or the North American Association for Sport Economics sections at the World Economics and International Association (WEIA) conferences. This would provide additional insights into gender dynamics in sports economics research. Conference organizers can promote gender equity by actively encouraging women to submit papers, assigning them roles as session chairs, and ensuring adequate female representation in panel discussions. Additionally, specific sessions could be dedicated to topics such as women in

as well as to leadership positions such as journal editors or heads of research or university departments.

5.2 Industry representation of female sports

The lower proportion of female data usage compared to male data usage can partly be attributed to differences in the development of the respective sports industries. According to a report compiled from open data by Deloitte, total revenue from women’s sports amounted to \$1.9 billion in 2024 (Haskel et al., 2025). In contrast, the NFL generated revenues of just under \$14 billion in the same year (Taranto, 2025). Thus, revenue from men’s sports exceeds that from women’s sports by roughly an order of magnitude, reflecting greater audience interest. This audience interest, in turn, influences the relevance and prioritization of academic research in these fields.

Some research questions cannot be adequately studied using female data, primarily due to differences in the development of the respective sports industries. For example, the impact of sporting events on crime rates has been analyzed using data from the MLB (Mares & Blackburn, 2019) and the NFL (Kalist & Lee, 2016). These leagues are among the most popular in the US, attracting a large portion of the local population and potentially influencing crime rates on a city-wide scale. Currently, there are no women’s leagues with comparable influence. Godinho & Cerqueira (2018) identified a correlation between match results and the share price of football clubs, using data exclusively from men’s football, as men’s teams predominantly affect asset prices.

Meanwhile, the women’s sports industry has been gradually growing in recent years. For instance, Frick & Scheel (2016) analyzed data from competitions within the framework of the FIS Ski Jumping World Cup. Readers in 2025 might wonder whether the article focuses on female or male athletes, as women’s competitions have been included in the FIS Ski Jumping World Cup only since the 2011/2012 season. However, Frick & Scheel (2016) used data ending in the 2010/2011 season; thus, their analysis

sport and non-binary athletes, thereby fostering research and visibility in these areas.

did not cover female athletes. As women's sports continue to develop, the availability of data suitable for academic research is expected to increase, potentially leading to a greater number of articles utilizing such data.

There have also been attempts to develop women's sports using non-market methods. In the USSR, women's sports were used as a tool for propaganda and control over women (Riordan, 1991). The Soviet government developed women's sports not only within the country but also promoted it through international bodies, including the Olympic Committee (Dufraisie, 2020). At the same time, women's sports developed as part of mass and children's sports with the use of totalitarian methods (Dufraisie & Leifer, 2023). As a result, the effectiveness of the female sport system was destroyed after the collapse of the Soviet Union.

Dufraisie (2020) shows that the Soviet Union deliberately encouraged women's participation and supported the growth of the Olympic program. This government-led strategy likely left lasting marks on the landscape of women's sports, helping to explain why, in the Olympics, individual events historically dominated over team competitions. From a sports economics viewpoint, these developments illustrate how political and institutional forces can influence participation patterns and investment behavior. Future studies could explore how these historical legacies still affect the structure, funding, and governance of women's sports in various countries.

Building on this idea, the historical shaping of women's sports through state policies can be seen as a process of constructing and negotiating social and institutional borders. Within the aforementioned B|Orders in Motion framework, these interventions illustrate how gender boundaries in sport are not fixed but continuously redefined through political decisions and organizational practices. Thus, the evolution of women's participation in sport exemplifies how shifting "borders" of inclusion and exclusion emerge from the interaction of power, culture, and policy.

The topics of sexism or barriers for women and non-binary⁸ persons, as discussed earlier, are not sufficiently covered in sports economics, which is a potential resource for increasing the number of articles using female data. The next section will discuss behavioral economics in the context of sports. This is a topic in which female data is used relatively actively, but there is also potential for growth.

6 Gender differences in the field of behavioral economics

Previously, we discussed how economic tools are used to analyze the position of women in sports, as well as the importance of research in this area. Following the idea that sports data can support the study of economics (Palacios-Huerta, 2023), especially behavioral economics (Bar-Eli et al., 2020), such data can be used to explore motivation, risk attitudes, and other behavioral patterns of women.

Articles on behavioral economics regularly appear in the *Journal of Sport Economics* (e.g., Vandebroek et al., 2016; Pikos & Straub, 2020; Lantis & Nesson, 2021). Studies using sports data are also published in journals focused on behavioral economics, such as the *Journal of Economic Psychology* (e.g., Cohen-Zada et al., 2017a) and the *Journal of Economic Behavior & Organization* (e.g., Cohen-Zada et al., 2017b). Volume 89 of the *Journal of Behavioral and Experimental Economics*, published in December 2020, was a special issue featuring only articles based on sports data. Furthermore, leading general economics journals, such as the *Review of Economics and Statistics*, also publish articles that use sports data to explore behavioral topics (e.g., González-Díaz et al., 2024).

⁸To the best of our knowledge, no paper on non-binary athletes in the field of sport economics exists. Of course, there are papers in the field of sport sociology (see, for example, Piggott (2020) or in the field of sport medicine: Armstrong et al. (2023) find that even after controlling for age, natal-male non-binary athletes performed significantly better than natal-female non-binary athletes. This suggests that biological sex continues to influence performance among non-binary runners. Therefore, both natal sex and gender identity should be considered when analyzing or collecting data on athletic performance.

When comparing psychological aspects that could affect athletes' performance, the strength of the effect may differ between men and women. Using the data of female and male swimming teams, Braun et al. (2021) found that female swimmers improve their performance in relays when competing for medals more significantly than men. Thus, female swimmers tend to increase their effort more under social pressure (because they feel responsible to their teammates).

At the same time, female athletes are less sensitive to other types of psychological pressure than male athletes. The performance of professional female tennis players deteriorates less when facing strong opponents compared to their male counterparts (Cohen-Zada et al., 2017a). Moreover, female judokas do not show a decline in performance after defeats, although this effect is observed among male judokas, which is explained by gender differences in the functioning of the hormonal system (Cohen-Zada et al., 2017b).

Gender differences are also observed in sports that are less dependent on physical characteristics. González-Díaz et al. (2024) found a difference in the effort exerted by male and female chess players before and after setting their personal best. Contrary to all previous results, Pikos & Straub (2020) studied amateur bowlers rather than professional athletes and did not find any statistical differences in motivation between men and women.

Therefore, any psychological or behavioral effect identified solely based on male data can only be applied to half of the human population. Expanding research to include female data is an excellent opportunity, especially for PhD students. For instance, the “hot hand” effect, which was studied using NBA data (Lantis & Nesson, 2021), or first-mover advantage, which was examined in male soccer (Vandebroek et al., 2016), could be extended to female datasets.

7 Summary, conclusions, and policy as well as managerial implications

Sexism in sport likely contributes to inefficiencies and missed opportunities in both economic and organizational terms. Reduced funding, media exposure, and access to elite training environments for female athletes suggest that resources may not be fully utilized, and athletic talent could remain underexploited. Future research could empirically examine the magnitude of these inefficiencies and the specific mechanisms through which gender disparities impact resource allocation and performance outcomes.

From an economic standpoint, this is comparable to labor market discrimination, where the full potential of the workforce is not tapped. Moreover, the underrepresentation of women's sports in media and sponsorship results in a measurable loss of value creation and revenue. Federations, broadcasters, and brands miss out on new market segments and fan bases, limiting overall growth in the sports economy. In addition, sexism at the organizational level restricts gender diversity in leadership roles, such as coaching or executive management, which has been shown to negatively affect innovation and long-term performance. Greater inclusion of women and non-binary individuals in all areas of sport could thus improve not only equity but also strategic adaptability and competitiveness. Policymakers and sports managers should promote gender equality measures not only for ethical reasons but also as a means to increase efficiency and profitability.

A relevant question for future research could be: What might greater gender inclusion mean for the sustainability of the sports industry? Potential dimensions to explore include (1) more efficient use of talent and human capital, (2) expansion of market opportunities and audience engagement, and (3) enhanced organizational resilience and innovation capacity. Investigating these aspects could clarify how equity measures contribute not only to fairness but also to long-term economic and strategic sustainability.

On the one hand, the sports economic research reflects the structure and development of the sports industry and is thus influenced by both past

and expected changes in research. As women's sports leagues continue to grow, a rise in studies based on female athlete data can be anticipated. On the other hand, sports economics can actively contribute to shaping the industry. Evidence-based policy recommendations and a general increase in knowledge about women's sports have the potential to accelerate the development and visibility of this sector.

Editors of field journals could play a vital role in addressing gender bias by launching a special issue focused on female-centered datasets and research questions. Such an initiative would not only raise awareness within the academic community but also encourage more inclusive and balanced research in sports economics. Researchers, referees, and editors should also ensure that papers relying exclusively on male-only datasets are not accepted when comparable female datasets are available. Unless there is a compelling justification or a genuine lack of female data, the inclusion of both genders should be considered mandatory to ensure scientific rigor and inclusivity.

It should be noted that differences in behavior or outcomes between male and female athletes may not solely reflect gender, but also the different stakes, professionalization levels, or competitive environments in which they operate. Consequently, insisting on gender-balanced datasets might not always be straightforward or informative. At the same time, one could argue in the opposite direction: analyzing female athletes in contexts where the stakes are comparable to male competitions can provide valuable insights into gender-specific dynamics. Therefore, while inclusion of both genders is desirable to promote balance and generalizability, the context and comparability of the data should always be carefully considered.

Issues related to non-binary identities and social class are currently almost entirely absent from the sports economics literature. The key question is whether – and to what extent – this exclusion should be challenged in order to reflect the diversity of athletes and the societies they are part of. At first, it seemed that women's sports were open to transgender athletes transitioning from male to female. However, in the year 2025, the debate intensified due to the political change in the USA. Earlier decisions were

increasingly reconsidered or reversed.

Some sports organizers, such as the New York Marathon, introduced a third category for non-binary participants. But this raises the question of how prize money should be divided. It took a long time before women were even allowed to run marathons, and even longer until prize money was equally distributed between the male and female categories. Does the introduction of a third category now mean that the prize money pool must be split into thirds? A very simple preliminary idea would be to allocate the total prize money proportionally to the number of participants in each gender category. This approach, however, has not yet been examined in terms of incentive effects, fairness perceptions, or broader social implications. The issue clearly deserves further scholarly attention, as it is highly relevant for sports organizers and shapes public perceptions of inclusivity and equality.

References

- Armstrong, J., Sullivan, A., & Perry, G. M. (2023). Performance of non-binary athletes in mass-participation running events. *BMJ Open Sport & Exercise Medicine*, 9(4).
- Bar-Eli, M., Krumer, A., & Morgulev, E. (2020). Ask not what economics can do for sports-Ask what sports can do for economics. *Journal of Behavioral and Experimental Economics*, 89, 101597.
- Baxter, H., Kappelides, P., & Hoyer, R. (2023). Female volunteer community sport officials: a scoping review and research agenda. *European Sport Management Quarterly*, 23(2), 429-446.
- BBC (2018a). Ballon d'Or: DJ Martin Solveig sorry for Ada Hegerberg 'twerk' question. 4 December 2018 <https://www.bbc.com/sport/football/46435168>
- BBC (2018b). Barcelona puts women's team in economy while men fly up front. 26 July 2018 <https://www.bbc.com/news/world-europe-44965630>
- BBC (2019). The BBC's first female football reporter. 26 December 2019. <https://www.bbc.com/audio/play/w3csym7d>
- BJJ World: Transgender MMA Fighter Breaks Skull of Her Female Opponent. Are we Becoming too Careful not to Offend any Group of People? <https://bjj-world.com/transgender-mma-fighter-fallon-fox-breaks-skull-of-her-female-opponent/>
- Boeheim, R., Freudenthaler, C., & Lackner, M. (2025). Male coaches increase the risk-taking of female teams – Evidence from the NCAA. *Labour Economics*, 94, 102692.
- Braun, C., Fischer, S., Qiu, X., Limmeroth, J., & Kibele, A. (2021). Last and fast? - A gender-specific analysis of effort gains in swimming relay events across Olympic Games and World Championships during the past 20 years. *Psychology of Sport and Exercise*, 55, 101949.

- Burton, L. J. (2015). Underrepresentation of women in sport leadership: A review of research. *Sport management review*, 18(2), 155-165.
- Cohen-Zada, D., Krumer, A., Rosenboim, M., & Shapir, O. M. (2017a). Choking under pressure and gender: Evidence from professional tennis. *Journal of Economic Psychology*, 61, 176-190.
- Cohen-Zada, D., Krumer, A., & Shtudiner, Z. E. (2017b). Psychological momentum and gender. *Journal of Economic Behavior & Organization*, 135, 66-81.
- Cooky, C. & Dworkin, S.L. (2018): Policing the Boundaries of Sex: A Critical Examination of Gender Verification and the Caster Semenya Controversy. In: Cooky, C. & Messner, M.A. (2018): No Slam Dunk: Gender, Sport, and the Unevenness of Social Change. Rutgers University Press, 37-53.
- Cooky, C. & Messner, M.A. (2018): No Slam Dunk: Gender, Sport, and the Unevenness of Social Change. Rutgers University Press.
- Cowley, E. S., Olenick, A. A., McNulty, K. L., & Ross, E. Z. (2021). "Invisible sportswomen": the sex data gap in sport and exercise science research. *Women in Sport and Physical Activity Journal*, 29(2), 146-151.
- Drury, S., Stride, A., Fitzgerald, H., Hyett-Allen, N., Pylypiuk, L., & Whitford-Stark, J. (2022). "I'm a Referee, Not a Female Referee": The Experiences of Women Involved in Football as Coaches and Referees. *Frontiers in sports and active living*, 3, 789321.
- Duflo, E. (2012). Women empowerment and economic development. *Journal of Economic Literature*, 50(4), 1051-1079.
- Dufraisie, S. (2020). Facing the involvement of youths in competitions: Soviet visions and adaptations to the rejuvenation of elite sports (second half of the 20th century). *Frontiers in Sports and Active Living*, 2, 568025.

- Dufraisie, S., & Leifer, D. (2023). Soviet women's sporting superiority: a Cold War issue. *Clio. Women, Gender, History*, 57(1), 111-128.
- Evans, A. B., & Pfister, G. U. (2021). Women in sports leadership: A systematic narrative review. *International review for the sociology of sport*, 56(3), 317-342.
- Forbes, A., Edwards, L., & Fleming, S. (2015). "Women can't referee": Exploring the experiences of female football officials within UK football culture. *Soccer & society*, 16(4), 521-539.
- Frick, B., & Scheel, F. (2016). Fly Like an Eagle: Career Duration in the FIS Ski Jumping World Cup. *Journal of Sports Economics*, 17(8), 813-831.
- Godinho, P., & Cerqueira, P. (2018). The Impact of Expectations, Match Importance, and Results in the Stock Prices of European Football Teams. *Journal of Sports Economics*, 19(2), 230-278.
- González-Díaz, J., Palacios-Huerta, I., & Abuín, J. M. (2024). Personal bests and gender. *Review of Economics and Statistics*, 106(2), 409-422.
- Haskel, J., Giorgio, P., Burton Z., & Tantam, L. (2025). Beyond the billion-dollar barrier: Charting the next phase of growth. Driving long-term success in women's sports. Deloitte. <https://www.deloitte.com/global/en/Industries/tmt/perspectives/charting-the-next-phase-of-growth.html>
- Hogshead-Makar, N. (2024). Sex Matters: Why Transgender Athletes Must Not Compete Against Biological Females. *swimmingworld-magazine.com* 25 January 2024 <https://www.swimmingworldmagazine.com/news/sex-matters-why-transgender-athletes-must-not-compete-against-biological-females/>
- Holzer, L. (2024). Gendered Athletes in Sports: CEDAW's Role in Tackling Heterosexist and Racialized Uniforms in Sports. In: Boillet, V., Weerts, S., Ziegler, A.R. (eds) *Sports and Human Rights. WSHR 2022. Interdisciplinary Studies in Human Rights*, vol. 10. Springer, Cham.

- Hunter, S. K., & Senefeld, J. W. (2024). Sex differences in human performance. *The Journal of Physiology*, 602(17), 4129-4156.
- Kahne, H., & Kohen, A. I. (1975). Economic perspectives on the roles of women in the American economy. *Journal of Economic Literature*, 13(4), 1249-1292.
- Kalist, D. E., & Lee, D. Y. (2016). The National Football League: Does Crime Increase on Game Day? *Journal of Sports Economics*, 17(8), 863-882.
- Knoppers, A., de Haan, D., Norman, L., & LaVoi, N. (2022). Elite women coaches negotiating and resisting power in football. *Gender, Work & Organization*, 29(3), 880-896.
- Lantis, R., & Nesson, E. (2021). Hot shots: An analysis of the "hot hand" in NBA field goal and free throw shooting. *Journal of Sports Economics*, 22(6), 639-677.
- Mares, D., & Blackburn, E. (2019). Major League Baseball and Crime: Opportunity, Spatial Patterns, and Team Rivalry at St. Louis Cardinal Games. *Journal of Sports Economics*, 20(7), 875-902.
- McDonagh, E., & Pappano, L. (2007). *Playing with the boys: Why separate is not equal in sports*. Oxford University Press.
- Müller, M. (2006). Geschlecht als Leistungsklasse. Der kleine Unterschied und seine großen Folgen am Beispiel der "gender verifications" im Leistungssport. *Zeitschrift für Soziologie*, 35(5), 392-412.
- Nessler, C., Gomez-Gonzalez, C., & Gasparetto, T. (2021). Head coach tenure in college women's soccer. Do race, gender, and career background matter? *Sport in Society*, 24(6), 972-989.
- Olivetti, C. (2016). Gender gaps in developed economies. *NBER Reporter*, (2), 24-28.
- Otto, T. (2025): Women's national team defeated 7-1 by U15 boys team. News.com.au. 27 June 2025 <https://www.news.com.au/sport/foot>

ball/womens-national-team-humiliated-71-by-u15-boys-team/news-story/93e87b0dcac51e1d8146eddbb716f3f1?utm_source=chatgpt.com

- Palacios-Huerta, I. (2023). The beautiful dataset. Available at SSRN 4665889.
- Paulson, C., Darvin, L., & Berri, D. (2023). Head coach gender and player performance in NCAA Softball. *Journal of Economics, Race, and Policy*, 6(3), 173-186.
- Piggott, L. (2020). Transgender, intersex and non-binary people in sport and physical activity: A review of research and policy.
- Pikos, A. K., & Straub, A. (2020). Mind the absent gap: Gender-specific competitive behavior in nonprofessional sports. *Journal of Sports Economics*, 21(3), 215-233.
- Plant, E. J., & Stowe, C. J. (2019). Is Moneyball Relevant on the Racetrack? A New Approach to Evaluating Future Racehorses. *Journal of Sports Economics*, 20(3), 428-447.
- Propheter, G. (2020). Does proximity to a new sports facility affect existing businesses' survival time? *Journal of Sports Economics*, 21(5), 451-476.
- Riordan, J. (1991). The rise, fall and rebirth of sporting women in Russia and the USSR. *Journal of Sport History*, 18(1), 183-199.
- Rogers, R. (2020). Boys in the booth: The impact of announcer gender on audience demand. *Journal of Sports Economics*, 21(6), 610-627.
- Schiffauer, W., Koch, J., Reckwitz, A., Schoor, K., & Krämer, H. (2018). Borders in Motion: Durabilität, Permeabilität, Liminalität. Working Paper Series B/ORDERS IN MOTION No. 1 <https://opus4.kobv.de/opus4-euv/frontdoor/index/index/docId/311>
- Sitko, S., Lopez-Laval, I., Cirer-Sastre, R., & Valenzuela, P. L. (2025). Ultra-endurance performance: Are women closing the gap? A systematic review and meta-analysis. *International Journal of Sports Science & Coaching*, 17479541251354909.

- Sky Sports (2020). Stephanie Frappart to become first woman to referee in men's Champions League. 30 November 2020. <https://www.skysports.com/football/news/11945/12147459/stephanie-frappart-to-become-first-woman-to-referee-in-mens-champions-league>
- Sporza (2021). Sammy Neyrinck in het spoor van Cecilie Uttrup Ludwig. 30.03.2021. <https://www.youtube.com/watch?v=3CMpNuwWBow>
- Stern (2024). Erste Cheftrainerin im deutschen Männer-Profifußball: Sabrina Wittmann übernimmt beim FC Ingolstadt. 2 May 2024. <https://www.stern.de/sport/fussball/sabrina-wittmann-wird-erste-cheftrainerin-im-maenner-profifussball-34679226.html>
- Stevenson, B., & Zlotnik, H. (2018). Representations of Men and Women in Introductory Economics Textbooks. *AEA Papers and Proceedings* 108: 180-85.
- Taranto S. (2025). Here's how much each NFL team made in national revenue in 2024 as revealed by Packers financial report. CBS Sports. <https://www.cbssports.com/nfl/news/heres-how-much-each-nfl-team-made-in-national-revenue-in-2024-as-revealed-by-packers-financial-report/>
- Thibault, V., Guillaume, M., Berthelot, G., Helou, N. E., Schaal, K., Quinquis, L., Nassif, H., Tafflet, M., Escolano, S., Hermine, O., & Toussaint, J. F. (2010). Women and Men in Sport Performance: The Gender Gap has not Evolved since 1983. *Journal of sports science & medicine*, 9(2), 214-223.
- Vandebroek, T. P., McCann, B. T., & Vroom, G. (2016). Modeling the Effects of Psychological Pressure on First-Mover Advantage in Competitive Interactions: The Case of Penalty Shoot-Outs. *Journal of Sports Economics*, 19(5), 725-754.
- Wigglesworth, J. (2019). What's in a Name? Sexism in Rock Climbing Route Names. 7 January 2019. <https://thesocietypages.org/en-gagingsports/2019/01/07/whats-in-a-name-sexism-in-rock-climbing-route-names>