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Development and validation of the Gender Stereotypes in Sport Scale (GSSS) in an Italian soccer context

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ABSTRACT

This study aims to develop and validate the Gender Stereotypes in Sport Scale (GSSS), an instrument evaluating people's endorsement of gender stereotypes in sport with a focus on soccer. The study was conducted with a total sample of 740 Italians, including 389 women and 351 men aged 18 to over 60, 403 laypeople and 337 experts in the field (i.e., athletes, coaches, medical staff, and managers). First, a pool of 22 items was initially created after conducting interviews with the experts. Next, the factorial structure of the scale was assessed through cross-validated exploratory-confirmatory factor analyses with two different sub-samples of 370 participants each. Three factors for a total of 16 items emerged from the analyses: "stereotypical beliefs" (i.e., stereotypical opinions about women and girls in soccer), "egalitarian beliefs" (i.e., items emphasising the equality of male and female performances), and "openness" (i.e., items concerning people's open-mindedness about women and girls in soccer). The validity of the GSSS was supported by significant correlations with sexism and adherence to masculine traits. Men, those with lower education, and experts reported higher endorsement of gender stereotypes according to all three factors. Crucially, multigroup confirmatory factor analysis confirmed scale invariance across gender, education, and familiarity with soccer. The GSSS allows researchers to assess gender stereotypes in sport, facilitating the understanding of their correlates. By better comprehending the causes and consequences of these beliefs, scholars and practitioners can contribute to ongoing public discussions regarding gender equity and promote inclusivity in the sport domain.

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A stereotype is a set of assumed beliefs about the characteristics of a social group or category. By extension, gender stereotypes are organised sets of attributes and activity-domains that are "deemed" appropriate for boys/men and girls/women (Golombok & Fivush, 1994). Gender stereotypes are shaped by cultural, social, and historical contexts, often reinforced through media representations, educational systems, and family dynamics. They influence how individuals are perceived by others, frequently leading to expectations that can limit personal expression and opportunities. Internalising

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these beliefs can also affect how individuals view themselves, potentially resulting in self-fulfilling prophecies where people conform to societal expectations, even if they do not align with their true identities or capabilities (King et al., 2021).

For decades, if not centuries, sporting activities have been marked by gender stereotypes, resulting in the perception of certain sports as exclusively masculine domains in which women were marginalised (European Commission, 2014; European Parliament, 2019; Fink, 2008). Although females' participation has greatly increased in Western countries, gender stereotypes persist, shaping which activities are deemed (un)suitable for girls and women based on their perceived compatibility with biologically or socially constructed feminine traits (European Non-Governmental Sport Organization, 2023; Ross & Shinew, 2008). Sports are not gender neutral. They play a unique role in maintaining gender-based power relations and hierarchies, especially by supporting masculine dominance in ways that other social institutions do not (Cooky, 2018). Sports represent one of the few remaining social institutions where boys and girls, as well as men and women, are separated by sex. This segregation, combined with the emphasis on physicality, positions sports as a significant social and cultural arena for reinforcing notions of male dominance and female subordination (Cooky & Messner, 2018). The gendered aspects of sports are deeply rooted in historical and cultural contexts where sports have traditionally been seen as a domain for men, reinforcing notions of masculinity and physical prowess (Connell, 2005). This has resulted in the marginalisation and undervaluation of women's sports and female athletes, who often face discrimination, less media coverage, and fewer opportunities for professional advancement compared to their male counterparts (Messner, 2002). The connection between sports and power imbalances is evident in various ways. For instance, the pay gap between male and female athletes is a stark indicator of these inequalities, with female athletes frequently earning significantly less than males (Cooky et al., 2013). Forbes' (2021) data shows a considerable gap between the world's most-paid male and female athletes, namely the boxer Conor McGregor and the tennis player Naomi Osaka. Specifically, there is a 120-million-dollar difference between the two athletes (180 million dollars vs. 60 million dollars). This disparity is also evident within the same sport; for instance, in tennis, male players consistently earn significantly more than their female counterparts. In 2021, Roger Federer earned approximately 90 million dollars, while the highest-paid female player, Naomi Osaka, earned around 60 million (Forbes, 2021). Such gaps reflect not just market dynamics but also deeply ingrained societal attitudes that prioritise men's sports and view them as more valuable or entertaining.

Additionally, the lack of representation of women in leadership roles within sports organisations perpetuates a cycle of male dominance, where decisions affecting all athletes are often made by a predominantly male leadership (Knoppers & Anthonissen, 2008). The privilege of masculinity in sports can also create exclusionary and hostile environments for those who do not align with traditional gender norms. Women, non-binary individuals, and men who exhibit non-hegemonic masculinities may face discrimination, bullying, and a lack of support, which can discourage participation and limit their opportunities for advancement (Baiocco et al., 2018; Denison et al., 2021). A relevant contribution on this topic comes from the theory of hegemonic masculinity (Connell, 2005), which examined the male sex role and proposed a model of multiple masculinities and power relations. According to Connell and Messerschmidt (2005), successful participation

in sports is a salient hegemonic masculine practice in specific settings, such as at secondary school and in the media representation of commercial sports, and proposes athletes as popular exemplars of hegemonic masculinity, particularly for body contact confrontation sports like rugby and soccer, centred on domination, aggression, and ruthless competitiveness. A competitive sport context activates the masculine dimension and increases adherence to gender roles (Clément-Guillotin & Fontayne, 2011). This has led boys and men to participate in sports traditionally considered masculine, such as those characterised by strength and competition, and girls and women to participate in feminine sports, such as those characterised by aesthetics (Klomsten et al., 2005; Peral-Suárez et al., 2020).

The fear of judgment and perceptions of disparities in opportunities between males and females are among the reasons that deter many girls and women from engaging in physical activity despite their enjoyment of it (Cowley et al., 2021). This situation is particularly concerning because insufficient engagement in physical activity is now recognised as one of the most critical global health concerns, given its strong correlation with leading causes of mortality, such as cardiovascular disease (Lim et al., 2012). In Italy – the context of the present research – women constitute 43.3% of all sportspeople. Since women make up 51.1% of the total population, there remains a gender gap in sports participation that has nonetheless been progressively declining in recent years (CENSIS, 2023). Considering the entire Italian female population, there are almost 9 million women, 30.2% of the total, who, although not practicing sports, engage in some physical activity. Also, 29.2% of women practice at least one sport. On this basis, 40.6% of the total female population (around 12 million women) are still excluded from this healthy practice. Historical precedents and media representations reinforce these disparities. In Italian society, soccer and other activities characterised by endurance and high levels of competition have long been celebrated as quintessentially masculine pursuits, with male players idolised, and extensively covered in the media, creating a public image of the sport as a male domain. These gendered perceptions are not merely cultural artifacts but are perpetuated by institutional practices that allocate more resources and visibility to men's sports. Despite the increasing achievements and popularity of female athletes, the legacy of gender stereotypes continues to shape the sports landscape in Italy.

In the literature, there are several studies addressing gender stereotypes in sport settings (e.g., Boiché et al., 2014; Gentile et al., 2018; Mateo-Orcajada et al., 2021; Plaza et al., 2017). Better comprehending this phenomenon and its effects on people's lives and well-being is indeed of crucial importance. However, to our knowledge, this issue has not yet been investigated using a reliable measure of gender stereotypes robustly validated among laypeople and experts in the field, such as athletes, coaches, medical staff, and managers. Given its relevance and the lack of research, we believe that developing and validating a robust measure to explore gender stereotypes in sport is imperative not only for psychologists but also for anyone interested in understanding their dynamics and consequences. Therefore, the present research aimed to provide a reliable instrument to measure people's beliefs about men and women in sport. To do so, we considered some of the most relevant correlates of gender stereotypes described below.

Correlates of gender stereotypes in sport

According to the sociopsychological literature (e.g., Glick & Fiske, 1996; Xu et al., 2021), there are some variables that have theoretical and empirical links with gender stereotypes in sport, namely sexism, individuals' personal adherence to gender stereotypes, and a few socio-demographic characteristics (i.e., gender, education, and familiarity with soccer). Given their relevance, we considered this information to test the validity of our new measure.

Sexism is a form of prejudice based on stereotypical beliefs about gender (Dovidio et al., 2008). Glick and Fiske (1996) introduced a groundbreaking perspective on sexism, viewing it as a complex construct comprising two attitudes: hostile and benevolent. Hostile sexism is expressed as hostility and resentment toward women. It reinforces the belief in male dominance and implies the consideration of women who defy traditional gender roles as threats to societal order and male authority. Conversely, benevolent sexism is expressed in a seemingly positive and subtle manner. Women are paternalistically regarded as affectionate yet delicate individuals, leading to the assertion that they require men's protection and assistance (Glick & Fiske, 2001). Sexism is deeply rooted in traditional gender roles or people's stereotypical conceptions of traditional gender roles. Accordingly, previous research on this topic (e.g., Russell & Trigg, 2004; Swim & Cohen, 1997) has shown that individuals high in both forms of sexism also generally endorse gender stereotypes.

Gender stereotypical beliefs have been largely studied in terms of their internalisation and resulting effects (Endendijk et al., 2013; Freeman, 2007; Zosuls et al., 2011). One of the most important investigations in this field was conducted by Koivula (1995), who examined the gender appropriateness of sports in relation to participants' gender and the internalisation of gender stereotypes. Results showed differences in gender appropriateness ratings between groups classified according to the adherence to stereotypes and between men and women. Men and those who reported greater internalisation of the male stereotype were more inclined to classify sports as masculine or feminine, thus endorsing gender stereotypes in the sport domain. According to the author, an explanation might be that these individuals engage to a greater extent in gender-based schematic processing. A similar finding was observed by Hardin and Greer (2009), who confirmed that men and individuals higher on adherence to masculine gender role beliefs were more likely to rate sports as masculine. No similar pattern emerged among the female participants. As reported by Xu et al. (2021), sport potentially serves as a substantial vehicle for manifesting manliness; thus, in this context, men tend to use gender schema more frequently than women.

Furthermore, we considered the participants' educational level. Wicker and Cunningham (2023) recently conducted an important study examining the correlates of gender stereotypes by using survey data from the European Values Study (2022). They found that males and those with lower and medium (vs. higher) education expressed more gender stereotypes, measured with statements on gender role attributes (e.g., "All in all, family life suffers when the woman has a full-time job"). This result aligns with previous research, according to which education commonly promotes ideas of equal opportunities and egalitarian norms. A study conducted by Gang et al. (2013) delved into the evolving attitudes toward foreigners among Europeans spanning from 1988 to 2008. Their findings

indicated that higher levels of educational attainment were correlated with more favourable attitudes toward foreigners. Consequently, the authors posited education as a potent "antidote" (p. 177) against exclusionary sentiments. Similarly, Deole and Zeydanli (2021) conducted a panel study focusing on gender attitudes in Europe following World War II, a period coinciding with the widespread introduction of compulsory schooling across many nations. Their results revealed a significant association between increased educational attainment and more positive gender attitudes in the UK and Switzerland.

Finally, we took into account the participants' familiarity with soccer, namely their experiences as athletes, coaches, medical staff, or managers. Previous research in the sport context has shown the presence of gender stereotypes among managers and technical staffs (e.g., Burton et al., 2012; Madsen et al., 2017). In line with these findings, Mateo-Orcajada et al. (2021) found that gender stereotypes are still present among teachers and trainers. In particular, their results indicated that trainers scored higher than teachers on the dimension referring to the fact that boys benefit to a greater extent than girls from physical education classes. Instead, teachers scored higher than trainers on the factor addressing the differences in the possibilities of physical development of boys and girls.

Current measures of gender stereotypes in sport

Despite the recognised importance of addressing gender stereotypes in sports, current measures often fall short of capturing the complexity of these biases (Messner, 2002). This section reviews several key scales used to assess gender stereotypes within the sport domain, including the gender-typing indicator of sport activities (see, e.g., Hardin & Greer, 2009), the Personal Endorsement of Gender Stereotypes Scale (Boiché et al., 2014; Bonnot & Croizet, 2007) and its adaptation for soccer by Chalabaev et al. (2009), the Scale of Attitudes toward Gender Equality in Football in the Context of Schools (or SAGEFS; Gil-Madrona et al., 2022; Méndez-Hinojosa et al., 2024), and the scale on gender beliefs concerning physical activity developed by Granda Vera et al. (2018). By examining these tools, we aim to clarify gaps in existing research and justify the need for a more comprehensive measure.

The majority of research on gender stereotypes in the sport domain has focused on gender-typing of sport activities (e.g., Hardin & Greer, 2009; Riemer & Visio, 2003). The most used measure in this context involves asking participants to indicate their perception of different sports on a Likert scale ranging from "very feminine" to "very masculine." Plaza et al. (2017) employed this indicator among French individuals and found that fighting sports (e.g., kickboxing), contact team sports (e.g., rugby, soccer), as well as activities based on mechanics (e.g., motorcycle racing) were mainly typed as masculine activities, whereas aesthetics sports (e.g., synchronised swimming, dancing) were systematically characterised as feminine. The same procedure has been used across time and cultures, yielding analogous findings in various studies (e.g., Koivula, 1995 in Sweden; Csizma et al., 1988 in the U.S.; Xu et al., 2021 in China). Despite its widespread employment in the literature on gender stereotypes, this single item is limited to evaluating individuals' perceptions of specific physical activities and does not encompass broader beliefs about the involvement of men and women in sport.

Boiché et al. (2014) used the Personal Endorsement of Gender Stereotypes Scale proposed by Bonnot and Croizet (2007), which was originally developed to assess stereotypes

regarding men's and women's abilities in mathematics. This measure involves subtracting the score attributed by respondents to women from that given to men. In their studies, Boiché et al. (2014) adapted the scale to assess two personal stereotypes in the sport domain: (a) a stereotype about sport competence (i.e., "Personally, I think that performance of boys/girls in sport is … "), with responses ranging from 1 (*very poor*) to 7 (*very good*); (b) a stereotype related to the significance of sport participation (i.e., "Personally, I think that for boys/girls doing sport is … "), with responses ranging from 1 (*not important at all*) to 7 (*very important*). Notwithstanding its parsimony, this measure lacks information about the sport under evaluation, thereby preventing an understanding of the activity the participant has in mind while responding. Sport type is important to consider when attempting to understand gender stereotypes across various sports (e.g., dancing and tennis; see Plaza et al., 2017).

In line with these considerations, Chalabaev et al. (2009) assessed girls' endorsement of the stereotype that girls are not good soccer performers by rewording the two items proposed by Boiché et al. (2014) into: "Personally, I think that girls' performance in soccer is … " and "Personally, I think that for boys/girls playing soccer is … " evaluated from 1 (*very poor/not important at all*) to 7 (*very good/very important*). Similarly, Xiang et al. (2018) used a measure composed of four items aiming to evaluate the extent to which students endorsed the stereotype that running is a male sport and boys have more ability in running than girls. Sample items are: "Running is more for boys than girls" and "Girls cannot do as well as boys in running." Participants were asked to rate the items on a 5-point scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). Although these scales specify the activity to be evaluated, it is plausible that they cannot capture the complexity of stereotypical beliefs about men and women in the sport domain. Gender stereotypes represent a multifaceted social issue that transcends mere evaluations of male and female athletic prowess (Chalabaev et al., 2013). Many other dimensions need to be considered, such as stereotypical beliefs about women's emotional expression and stereotypes concerning economics, including disparities in funding, sponsorship opportunities, and financial compensation in sports. Importantly, these measures have never been tested for their psychometric properties.

Of relevance to the present study, Gil-Madrona et al. (2022; Méndez-Hinojosa et al., 2024) developed and validated the Scale of Attitudes toward Gender Equality in Football in the Context of Schools (SAGEFS). This measure assesses gender equality in formative ages through 20 items covering sexist beliefs (e.g., "Soccer is a male sport"), egalitarian beliefs (e.g., "The performance of girls in soccer could equal or exceed that of boys"), and relational aspects (e.g., "When we play soccer in physical education class, boys usually insult less-prepared girls") on a 5-point scale ranging from 1 (*totally disagree*) to 5 (*totally agree*). Despite its valuable contribution to the literature, this measure was created for people of school age and validated only in this population (i.e., children between the ages of 10 and 13). This makes most of the items (e.g., "When forming mixed teams to play soccer in physical education class, girls are selected at the last option") not applicable to other samples and, thus, the measure less applicable in non-school settings.

The scale developed by Granda Vera et al. (2018) to explore gender beliefs and stereotypes regarding physical activity and sport is subject to similar limitations. The measure is composed of 24 items (e.g., "Generally speaking, girls are weaker than boys," "There are

activities that girls tend not to practice because they are more typical of boys") assessed on a 4-point scale (from *totally disagree* to *totally agree*) and validated in Spain among students aged 9–13. Similar to the SAGEFS developed by Gil-Madrona et al. (2022; Méndez-Hinojosa et al., 2024), some items (e.g., "The physical education teacher tends to require more of boys than girls") make the scale not fully applicable to other samples by restricting its utility to specific research contexts.

Starting from these considerations, we drew from previous studies and projects on gender stereotypes in the sport domain (i.e., Gil-Madrona et al., 2022; Méndez-Hinojosa et al., 2024) and settings other than physical activity (i.e., Brown & Gladstone, 2012; European Values Study, 2022; Fakunmoju et al., 2016) to develop and test a complete self-report measure assessing people's endorsement of gender stereotypes in sport among laypeople and experts in the field. In doing so, we directed our attention to the Italian context and focused mainly on soccer, one of the most typical examples of masculine-typed physical activity (e.g., Koivula, 1995; Valenti et al., 2021). Importantly, we aimed to create a measure composed of items with easily modified wording, thus fully applicable to soccer and other physical activities commonly thought of as masculine, like rugby and basketball (Plaza et al., 2017).

The present study

The Gender Stereotypes in Sport Scale (hereafter abbreviated as GSSS) was developed and tested to assess individuals' endorsement of stereotypes in the sport domain with a specific focus on soccer. In Italy, soccer holds an unparalleled position as the most popular and influential sport activity, deeply ingrained in the national identity. Over half of the population has a favourite team, twenty-five million Italians watch soccer through various media channels, and over ten million supporters regularly attend live matches (Federazione Italiana Giuoco Calcio, 2023). Notably, the game's popularity is mainly due to men's clubs and the men's national team. In 2022, the Federazione Italiana Giuoco Calcio registered over 35,000 women's soccer players, representing less than 4% of total soccer participants nationwide. Also, data shows that 1% of Italian licensed coaches are females (Federazione Italiana Giuoco Calcio, 2023). These statistics vividly illustrate the profound gender disparities entrenched within Italian soccer, reflecting a systemic imbalance in both player and coaching participation.

Method

Development and generation of the scale's items

We considered laypeople and experts (i.e., athletes, coaches, medical staff, managers) involved in men's and women's soccer clubs in northern Italy. The "dual" approach we adopted in the study (i.e., laypeople and experts) allowed us to capture a wide range of perspectives and ensure the validity and applicability of our measure across different levels of involvement in physical activities. By integrating feedback from these sources, we aimed to make our scale a more effective tool for assessing gender stereotypes in the sport domain.

To generate the items, the second author conducted telephone and in-person interviews with the experts. Their insights were crucial given their extensive experience and nuanced understanding of gender dynamics within the sport domain. A total of 70 items were formulated to reflect different facets of gender stereotypes in sport, like economic (e.g., "I would agree if a stadium ticket to see a women's soccer match cost the same as a ticket to see a men's soccer match"), relational (e.g., "More subgroups are created in a women's soccer team than in a men's soccer team") and technical (e.g., "The female soccer player and the male soccer player can get to perform the athletic gesture with the same precision") aspects. The second and third authors discussed each statement and selected the most understandable and representative of gender stereotypes by also considering the sociopsychological literature on the topic (e.g., Cormack & Hand, 2020; Ellemers, 2018; Gil-Madrona et al., 2022; Méndez-Hinojosa et al., 2024). This phase resulted in a pool of 22 items.

Analyses and hypotheses for testing the validity of the scale

After examining the GSSS factorial structure through exploratory and confirmatory factor analyses, we explored the relationships between our scale, sexism, and adherence to gender stereotypical characteristics to determine the concurrent validity of the scale. Based on the above-mentioned literature, we assumed that endorsement of gender stereotypes about men and women in sport would be positively associated with hostile and benevolent sexism, as well as adherence to masculine gender traits.

In addition, to seek further evidence of validity, we examined differences in the GSSS by considering gender, educational level, and familiarity with soccer. We expected men, those with low-medium education, and experts in the field to report more gender stereotypes than women, highly educated participants, and laypeople. We considered these variables also to test measurement invariance through multigroup confirmatory factor analysis (multigroup CFA; Byrne et al., 1989).

Sample and procedure

A cross-sectional design was used. A sample of 740 Italians (53% women) – laypeople (n = 403, 62% women) and experts (n = 337, 41% women) – consented to participate. The age distribution ranged between 18 and over 60, with 74% of the respondents reporting an age between 18 and 40 years old (see Table 1 for more details on the sample). Data were collected through paper-and-pencil (n = 186) and computer-based modes (i.e., Google Forms; n = 554). A snowball sampling strategy was employed, with the initial participants recruited through the experimenters' networks, including sport clubs in northern Italy. Participants who responded online were contacted via e-mails and social media. Instead, those who responded via paper-and-pencil – mostly experts – were approached by the second author, who then went to their respective sport clubs and asked them to self-complete the questionnaire.[1]

In line with the national guidelines of the Italian Association of Psychology (AIP), institutional ethical approval was not required for adult participants and anonymous questionnaires. All the procedures performed in the study were in accordance with the APA ethical guidelines, the ethical principle of the Helsinki Declaration, and the Oviedo

Table 1. Sample description by socio-demographic characteristics.

Variable		Value (%)
Gender	Woman	389 (53%)
	Man	351 (47%)
	Other	0
Age	18–24 y/o	292 (40%)
	25–40 y/o	253 (34%)
	41–60 y/o	172 (23%)
	> 60 y/o	23 (3%)
Education	Less than high school	53 (7%)
	Professional diploma	45 (6%)
	High school diploma	360 (49%)
	University degree	233 (31%)
	Postgraduate diploma	49 (7%)
Soccer	No	403 (54%)
	Yes	337 (46%)
Role	Player	250 (75%)
	Coach	48 (14%)
	Technician	8 (2%)
	Medical staff	4 (1%)
	Team manager	21 (6%)
	Director	3 (1%)
	Other (i.e., 2 referees, 1 secretaryship)	3 (1%)
Type of championship	Amateur	49 (14%)
	Beginner	238 (71%)
	Professional	43 (13%)
	National	7 (2%)
Gender championship	Female	158 (47%)
	Male	179 (53%)

Convention on human rights and biomedicine. Full informed consent was obtained before participants started the questionnaire. At the beginning of the study, participants were informed about how the data were collected, processed, and stored.

Measures

The questionnaire started with informed consent and demographics. At the end, respondents were debriefed and thanked for their participation. The scales are presented here in the order in which they appeared in the questionnaire.

Socio-demographic information

We collected information about participants' gender, age (from 1 = *18–24 years old* to 4 = *more than 60 years old*), and education (from 1 = *less than high school* to 5 = *postgraduate diploma*). Then, we asked participants to indicate whether they are engaged in soccer and, in case of an affirmative answer, more information on their activity (i.e., role, type of championship, gender championship; see Table 1).

Gender Stereotypes in Sport Scale (GSSS)

The scale assesses endorsement of gender stereotypes about men and women in sport through 22 items covering different aspects of the phenomenon (e.g., "Soccer is a male sport," "I think women's soccer has great scope for development" [reverse], "If I already paid a TV subscription for men's soccer, I would extend the fee to also have the option

of women's soccer" [reverse]). The responses were given on a 6-point Likert scale, ranging from 0 (*strongly disagree*) to 5 (*strongly agree*).

Sexism

To measure sexism, we used the Ambivalent Sexism Inventory (ASI; Glick & Fiske, 1996) in its Italian version (Manganelli Rattazzi et al., 2008). This scale is composed of 22 items divided into two subscales: hostile sexism (e.g., "Most women interpret innocent remarks as sexist") and benevolent sexism (e.g., "Women should be cherished and protected by men"). Participants had to indicate their level of agreement on a 6-point Likert scale, ranging from 0 (*strongly disagree*) to 5 (*strongly agree*). Preliminary analysis confirmed the robustness of the two-factor solution (see the Supplementary Material on the Open Science Framework [OSF] for more details[2]). The score of hostile sexism was computed as the average of 13 items ($M = 1.36$, $SD = 0.97$; $\alpha = .91$).[3] Instead, the score of benevolent sexism was computed as the average of nine items ($M = 1.71$, $SD = 1.08$; $\alpha = .85$).

Adherence to gender stereotypes

This variable was assessed by using the Italian version (Rubini et al., 1989; see also Monaci & Veronesi, 2019) of the Personal Attributes Questionnaire (PAQ; Spence & Helmreich, 1978), devised to evaluate the gender scheme understood as a self-image characterised by masculine or feminine traits. We employed 16 items divided into two subscales: masculine (e.g., independent, competitive) and feminine (e.g., emotional, gentle) traits. For each characteristic, participants were asked to evaluate themselves on a 5-point semantic differential scale. Preliminary analysis confirmed the robustness of the two-factor solution (see the Supplementary Material on the OSF webpage[2]). The masculine and feminine factors in our sample showed good reliability ($\alpha = .71$ and .80, respectively). Thus, the masculine score was computed by averaging eight items ($M = 3.41$, $SD = 0.57$), and the feminine score by averaging eight items ($M = 3.98$, $SD = 0.57$). To obtain a single index of participants' self-identification with masculine (vs. feminine) attributes, we computed a differential score by subtracting the feminine score from the masculine score so that higher ratings indicated greater adherence to traditional masculine traits rather than feminine ones ($M = -0.57$, $SD = 0.83$).

Analytical approach

An exploratory-confirmatory cross-validation strategy (Hoyle & Painter, 1995) was applied to evaluate the factorial structure of the GSSS. We randomly divided the sample into two halves (see Table S1 and Table S2 in the Supplementary Material on OSF for more details on the two sub-samples[2]). One sub-sample ($n = 370$, 51% women) was employed to examine the dimensionality of our scale through exploratory factor analysis (EFA). The other sub-sample ($n = 370$, 54% women) was used to test the replicability of the factor model through a confirmatory factor analysis (CFA). Gorsuch (1983) recommended maintaining a participant count of no fewer than 100 and ensuring a minimum of five participants per measured variable for effective factor analysis. Adhering to these guidelines, the sample size utilized in the split-half sample was deemed more than sufficient.

Before the EFA, we conducted the Kaiser-Meyer Olkin test (KMO) and the Bartlett test of sphericity to examine data factorability. For the EFA, parallel analysis was used to select factors. This technique plots the eigenvalues computed from the actual data against the eigenvalues extracted from random data that match the key characteristics of the actual data. The factorial structure resulting from the EFA was validated through a CFA. To assess CFA model fit, we considered the Comparative Fit Index (CFI), Tuker-Lewis Index (TLI), Root Mean Square Error of Approximation (RMSEA), and Standardised Root Mean Square Residual (SRMR). Overall model fit was judged using the following cut-off values: for the CFI and TLI, fit is considered adequate if the CFI and TLI values are > .90, and better if they are > .95 (van de Schoot et al., 2012); for the RMSEA, values smaller than .05 indicate excellent fit, values between .05 and .08 indicate good model fit, and values greater than .10 suggest poor model fit (Hu & Bentler, 1999); for SRMR, values smaller than .08 indicate good fit (Hu & Bentler, 1999).

Internal consistency was computed using McDonald's omega and Cronbach's alpha coefficients. We then examined the Omega if the item is Dropped (OiD) and Alpha if the item is Dropped (OiD) indices. As additional indicators of item discrimination, the Corrected Item-Total Correlations (CITC) were computed. CITCs with a value greater than .30 were considered acceptable (Wang et al., 2007).

The concurrent validity of the scale was evaluated by using Pearson's correlation coefficients between our measure, the two subscales of sexism (i.e., hostile and benevolent), and participants' adherence to gender stereotypes, considered as individuals' self-identification with masculine (vs. feminine) traits. Then, we examined differences in the GSSS by considering gender, educational level, and familiarity with soccer through independent *t*-tests.

Potential ceiling and floor effects were measured by computing the percentage of participants indicating the minimum and maximum possible scores on the GSSS. The percentage of participants scoring ceiling and floor effects above 20% was considered substantial (Liberato et al., 2020; Murugappan et al., 2022).

Finally, to test whether the GSSS elicited similar responses across different groups (i.e., men and women; highly and low-medium educated participants; laypeople and experts), we conducted a multigroup CFA, which is a statistical method that examines the observed differences in a measurement model, known as measurement invariance (Byrne et al., 1989). The initial phase of assessing measurement invariance involves configural invariance, wherein a model is constructed to determine if the items load onto the same underlying factor. Configural invariance is considered marginally acceptable if the RMSEA falls within the range of .08 to .10 (Fischer & Karl, 2019). The subsequent step is metric invariance, where factor loadings are constrained to be equivalent across groups. Achieving metric invariance allows for the comparison of correlation coefficients between groups. The final step is scalar invariance, which imposes uniformity on item intercepts across groups. Metric and scalar invariances are attained if the changes in CFI and RMSEA between models are below .01 and .015, respectively (Cheung & Rensvold, 2002).

Data analyses were performed using Jamovi software (version 2.2.5) for the EFA, the CFA, correlational analyses, and independent *t*-tests. We used R (version 4.1.2) with "lavaan" (Rosseel, 2012), "semTools" (Jorgensen et al., 2022), and DACF (Liu & Wang, 2018) packages for the multigroup CFA and ceiling and floor effects.

Results

Cross-validated exploratory and confirmatory factor analysis

To examine the GSSS factor structure, we first performed an EFA (Maximum Likelihood) to identify the number of factors and the items' factor loadings. Bartlett's test of sphericity was significant ($\chi^2 = 4481$; $df = 231$, $p < .001$), and the KMO index of sampling adequacy was 0.90, indicating that the data were suitable for factor analysis. Based on parallel analysis, the EFA suggested a three-factor solution (see Figure 1).

We ensured each factor was interpretable and had at least three items (Izquierdo et al., 2014). We verified that each item had standardised factor loadings larger than .40 and communalities larger than .30 (Guadagnoli & Velicer, 1988). If these conditions were not met, we excluded those items and repeated the procedure. The final EFA was performed on 16 items and indicated a three-factor model. Table 2 presents items' factor loadings and communalities. The first factor (labelled as "stereotypical beliefs") includes those items that describe stereotypical opinions about women and girls in soccer (e.g., "During practice or in matches, females are more considerate in their game interventions on their opponent"). The second factor (labelled as "egalitarian beliefs") comprises those items that emphasise the equality of male and female performances (e.g., "A women's World Cup excites like a men's World Cup" [reverse]). Finally, the third factor (labelled as "openness") includes those items that describe people's open-mindedness about women and girls in soccer (e.g., "I would encourage my daughter to try soccer" [reverse]). These factors explain more than 50% of the variance.

The CFA, carried out on the second half, found that the three-factor model produced a good fit to the data (CFI = .970; TLI = .965; RMSEA = .078, 90% CI [0.069, 0.088]; SRMR = .052). Factor loadings were all high and consistent. All items exceeded the factor loading cut-off value of .40 (Stevens, 2012) (see Table 3).

Reliability

The McDonald's omega and Cronbach's alpha coefficients for internal consistency were very good (ω = .93, α = .93 for "stereotypical beliefs"; ω = .91, α = .91 for "egalitarian beliefs"; ω = .89, α = .89 for "openness"; Nunnally & Bernstein, 1994). The elimination of

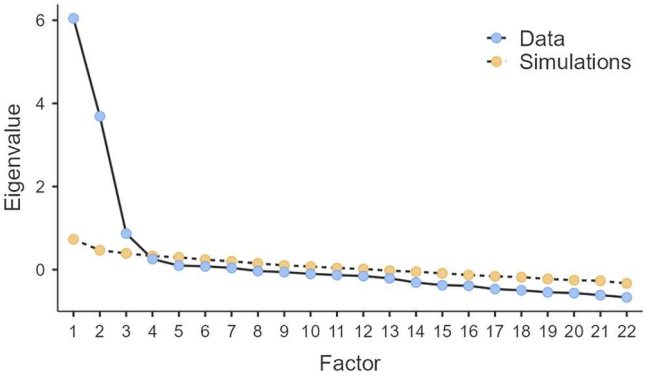

Figure 1. Parallel Analysis of Factor Components of the Gender Stereotypes in Sport Scale (GSSS).

Table 2. EFA of the 16 items on three factors.

	Item	Stereotypical beliefs	Egalitarian beliefs	Openness	Communality
1	More subgroups are created in a women's soccer team than in a men's soccer team.	**.73**	−.01	−.08	.50
2	Soccer is a male sport.	**.58**	.02	.24	.50
3	A female soccer player is less determined than a male soccer player.	**.86**	.11	.01	.74
4	During practice or in matches, females are more considerate in their game interventions on their opponent.	**.75**	−.20	.02	.64
5	In the physical confrontation, a female soccer player is less resolved than a male soccer player.	**.86**	.04	.04	.76
6	The female soccer player and the male soccer player can get to perform the athletic gesture with the same precision.	.22	**.74**	.01	.58
7	If I already paid a TV subscription for men's soccer, I would extend the fee to also have the option of women's soccer.	−.28	**.54**	.19	.49
8	I would agree if a stadium ticket to see a women's soccer match cost the same as a ticket to see a men's soccer match.	−.23	**.61**	−.07	.44
9	A female soccer player during a game can run the same miles as a male soccer player.	−.01	**.70**	−.13	.43
10	In the future, the technical level of women's soccer will equal that of men's soccer.	−.03	**.76**	.05	.62
11	A women's World Cup excites like a men's World Cup.	.17	**.65**	.16	.58
12	I would enroll my daughter in a girls' soccer camp.	−.19	.30	**.61**	.58
13	I think women's soccer has great scope for development.	.38	.13	**.48**	.60
14	A female can be very talented to play soccer.	.37	.00	**.51**	.54
15	I would watch a women's soccer match.	−.19	.26	**.54**	.45
16	I would encourage my daughter to try soccer.	.12	−.10	**.83**	.72
	Proportion of explained variance	22.9	19.7	14.5	
	Cumulative proportion of explained variance	22.9	42.6	57.1	

Note: The items from 6 to 16 were reverse coded. The items in Italian and the complete list of the 22 items are available on the project's OSF page: https://osf.io/ur3wp/ (see the "Codebook" document). Significant factor loadings are reported in bold.

Table 3. CFA of the 16 Items.

Factor	Item	Factor Loading	SE	*p*	95% CI
Stereotypical beliefs	1	.91	0.068	<.001	[1.39, 1.65]
	2	.95	0.069	<.001	[1.55, 1.82]
	3	.96	0.066	<.001	[1.53, 1.79]
	4	.89	0.072	<.001	[1.43, 1.71]
	5	.93	0.069	<.001	[1.49, 1.76]
Egalitarian beliefs	6	.91	0.061	<.001	[1.27, 1.51]
	7	.92	0.061	<.001	[1.29, 1.52]
	8	.93	0.060	<.001	[1.30, 1.54]
	9	.90	0.058	<.001	[1.18, 1.41]
	10	.92	0.059	<.001	[1.25, 1.48]
	11	.91	0.060	<.001	[1.25, 1.49]
Openness	12	.94	0.053	<.001	[1.16, 1.36]
	13	.92	0.057	<.001	[1.19, 1.41]
	14	.92	0.055	<.001	[1.17, 1.39]
	15	.89	0.056	<.001	[1.11, 1.33]
	16	.93	0.054	<.001	[1.16, 1.37]
Model fit	TLI	CFI	RMSEA	90% CI RMSEA	SRMR
	.970	.965	.078	[0.069, 0.088]	.052

Table 4. Descriptive statistics and reliability indices.

Factor	Item	Mean (SD)	CITC	OiD	AiD
Stereotypical beliefs	1	2.13 (1.75)	.77	.92	.92
	2	1.20 (1.71)	.78	.92	.92
	3	1.22 (1.69)	.86	.90	.90
	4	2.08 (1.80)	.80	.92	.92
	5	1.64 (1.75)	.85	.91	.90
Egalitarian beliefs	6	1.42 (1.60)	.76	.90	.89
	7	1.57 (1.63)	.74	.90	.90
	8	1.34 (1.61)	.73	.90	.90
	9	1.36 (1.48)	.72	.90	.90
	10	1.86 (1.55)	.81	.89	.89
	11	1.61 (1.62)	.75	.90	.90
Openness	12	0.86 (1.28)	.73	.87	.87
	13	1.44 (1.57)	.77	.86	.86
	14	1.28 (1.62)	.72	.87	.87
	15	1.30 (1.51)	.65	.89	.88
	16	1.19 (1.49)	.80	.85	.85
Stereotypical beliefs		1.65 (1.54)			
Egalitarian beliefs		1.53 (1.32)			
Openness		1.21 (1.25)			

Note: CITC = Corrected Item-Total Correlations; OiD = Omega if the item is Dropped; AiD = Alpha if the item is Dropped.

items did not result in neither an increase in omega nor alpha, and the CITCs were all above the considered threshold of .30 (Tabachnick et al., 2019), suggesting good internal consistency and item discrimination (see Table 4).

Concurrent validity

Following the analyses reported above, we computed three scores of the GSSS. In doing so, we reversed the items related to the "egalitarian beliefs" and "openness" dimensions. Then, we performed correlation analyses to test concurrent validity. As shown in Table 5,

Table 5. Relations between the three dimensions of the Gender Stereotypes in Sport Scale (GSSS) and the other variables included in the study.

Variable	1	2	3	4	5	6	7	8	9
1. GSSS Stereotypical beliefs	–								
2. GSSS Egalitarian beliefs	−.03	–							
3. GSSS Openness	.43***	.46***	–						
4. ASI Hostile sexism	.39***	.31***	.31***	–					
5. ASI Benevolent sexism	.07*	.24***	.09*	.60***	–				
6. PAQ (masculine – feminine)	.11**	.19***	.19***	.20***	.12***	–			
7. Gender (a)	.08*	.41***	.17***	.40***	.38***	.30***	–		
8. Age (b)	.03	.07	.09*	.11**	.18***	.14***	.27***	–	
9. Education (c)	−.17***	−.07	−.12**	−.32***	−.23***	−.10**	.16***	.05	–
10. Familiarity with soccer (d)	−.37***	−.12***	−.20***	−.24***	−.12***	−.21***	.21***	.13**	.15***

Note: ASI = Ambivalent Sexism Inventory. PAQ = Personal Attributes Questionnaire.
(a) 1 = Women, 2 = Men. (b) 1 = 18–24, 2 = 25-40, 3 = 41-60, 4 = > 60. (c) 1 = Less than high school, 2 = Professional diploma, 3 = High school diploma, 4 = University degree, 5 = Postgraduate diploma. (d) 1 = Experts, 2 = Laypeople.
The "egalitarian beliefs" and "openness" scores of the GSSS were computed by reversing all the items so that higher ratings indicate lower egalitarian beliefs and openness, thus, greater endorsement of gender stereotypes.
The correlations with gender and soccer were estimated through the point-biserial correlation. The correlations with age and education were estimated through the Spearman's rho test.
* $p < .05$, ** $p < .01$, *** $p < .001$.

Table 6. Differences by Gender, Education, and Familiarity with Soccer on the Three Dimensions of the Gender Stereotypes in Sport Scale (GSSS)

	Women (n = 389)		Men (n = 351)					
	M	*SD*	*M*	*SD*	*df*	*t*	*p*	Cohen's *d*
GSSS Stereotypical beliefs	1.53	1.55	1.79	1.51	738	−2.29	.022	−0.17
GSSS Egalitarian beliefs (a)	1.01	1.02	2.10	1.38	642	−12.07	<.001	−0.90
GSSS Openness (a)	1.01	1.20	1.44	1.26	721	−4.79	<.001	−0.35
	Low-medium (n = 458)		High (n = 282)		*df*	*t*	*p*	Cohen's *d*
	M	*SD*	*M*	*SD*				
GSSS Stereotypical beliefs (a)	1.79	1.55	1.44	1.48	616	3.08	.002	0.23
GSSS Egalitarian beliefs (a)	1.61	1.38	1.39	1.21	653	2.20	.028	0.16
GSSS Openness (a)	1.31	1.29	1.06	1.15	648	2.75	.006	0.21
	Experts (n = 337)		Laypeople (n = 403)		*df*	*t*	*p*	Cohen's *d*
	M	*SD*	*M*	*SD*				
GSSS Stereotypical beliefs (a)	2.28	1.75	1.13	1.09	541	10.50	<.001	0.79
GSSS Egalitarian beliefs	1.70	1.34	1.38	1.29	738	3.37	<.001	0.25
GSSS Openness (a)	1.48	1.36	0.99	1.10	645	5.29	<.001	0.39

Note: (a) Welch's test is reported because Leven's test indicated that the homogeneity of variances assumption was not met for this variable.

For education, we created two groups (i.e., "High" vs. "Low-medium") distinguishing between respondents with a university degree (i.e., university degree, postgraduate diploma) or not (i.e., less than high school, professional diploma, high school diploma).

The "egalitarian beliefs" and "openness" scores of the GSSS were computed by reversing all the items so that higher ratings indicate lower egalitarian beliefs and openness, thus, greater endorsement of gender stereotypes.

all the dimensions of our scale were found to have a positive association with hostile and benevolent sexism, which suggests that individuals who reported more stereotypical beliefs, who indicated that women cannot perform sports activities as effectively as men, and who reported less intentions to give women's sports a chance, also reported more sexist attitudes. In addition, the GSSS scores positively correlated with respondents' self-identification with masculine (vs. feminine) attributes, indicating that participants who reported greater endorsement of gender stereotypes in sport also identified more with stereotypical masculine rather than feminine traits.

Also, we conducted independent *t*-tests to examine potential differences in the GSSS scores between men and women, highly and low-medium educated participants, and experts and laypeople (see Table 6). In line with our predictions, men reported higher scores on all three dimensions of the GSSS than women. Furthermore, participants with lower-medium educational levels indicated higher scores on all three dimensions than those with university and postgraduate degrees. Finally, experts in the field scored higher on all three ratings than laypeople.

Ceiling and floor effects

Ceiling and floor effects were examined for the three GSSS scores. No ceiling and floor effects were observed as all the percentages (2.57% and 11.2% for "stereotypical beliefs"; 1.08% and 8.51% for "egalitarian beliefs"; 0.81% and 19.7% for "openness") were below the recommended threshold (i.e., 20%; Liberato et al., 2020; Murugappan et al., 2022).

Table 7. Gender Stereotypes in Sport Scale (GSSS) measurement invariance.

Type of invariance	CFI	RMSEA	ΔCFI	ΔRMSEA
Gender				
Configural invariance	.966	.083		
Metric invariance	.965	.082	0.001	0.002
Scalar invariance	.962	.082	0.002	0.000
Education				
Configural invariance	.970	.079		
Metric invariance	.969	.077	0.000	0.002
Scalar invariance	.969	.075	0.000	0.002
Familiarity with soccer				
Configural invariance	.967	.082		
Metric invariance	.965	.081	0.001	0.001
Scalar invariance	.961	.083	0.004	0.002

Note: For education, we created two groups (i.e., "High" vs. "Low-medium") distinguishing between respondents with a university degree (i.e., university degree, postgraduate diploma) or not (i.e., less than high school, professional diploma, high school diploma).

Multigroup confirmatory factor analysis

We tested measurement invariance across different groups. As shown in Table 7, the results of this analysis showed overall support for configural, metric, and scalar invariances, supporting the use of the GSSS, the comparison of correlations, and the comparison of means across each of our sample groups.

Discussion

Although there are some studies addressing gender stereotypes in sport settings (e.g., Boiché et al., 2014; Gentile et al., 2018; Mateo-Orcajada et al., 2021; Plaza et al., 2017), most empirical research has never investigated this phenomenon using a reliable measure of gender stereotypes robustly validated. The present study sought to fill this gap in the literature by developing and validating a new scale that aims to measure individuals' endorsement of gender stereotypes in sport with a specific focus on soccer. Importantly, this validation study was conducted among laypeople, athletes, coaches, medical staff, and managers.

The measures used so far in the sport domain among adults have never been tested for their psychometric properties. Also, most of the studies have focused on children and adolescents by considering only a few items examining male and female athletic prowess (e.g., "Girls cannot do as well as boys in running"; Xiang et al., 2018). Gender stereotypes are a complex social issue that, in sport settings, encompass a multitude of facets, such as unequal pay and prize money, limited access to resources and facilities, and the perpetuation of traditional gender roles within coaching and leadership positions. Additionally, they may manifest as societal pressure to conform to narrowly defined ideals of masculinity and femininity, ultimately impacting participation levels and opportunities for athletes of all genders (see Hively & El-Alayli, 2014). The GSSS was developed to meet the need for a valid instrument for measuring gender stereotypes across the board. Through this measure, it is indeed possible to investigate various features, such as stereotypical beliefs, gender roles, as well as egalitarian attitudes related to women in sport, especially in soccer. In this regard, it is noteworthy that our items, with their easily modified wording and focus on various elements of gender stereotypes,

can be fully applicable to soccer and other physical activities commonly thought of as masculine, like rugby and basketball (Plaza et al., 2017). For these reasons, the GSSS can be considered a relevant tool for investigating people's endorsement of gender stereotypes in the sport domain.

The present findings revealed that our scale is a valid and reliable three-factor measure of gender stereotypes assessing stereotypical opinions about women and girls in soccer (i.e., "stereotypical beliefs"), male and female sport performances (i.e., "egalitarian beliefs"), and individual's open-mindedness about the role of women and girls in soccer (i.e., "openness"). The CFA confirmed the solution provided by the EFA. Item analysis demonstrated overall good internal reliability and consistency of our scale. Crucially, through multigroup CFA, we found overall support for configural, metric, and scalar invariances across various groups (i.e., men and women; highly and low-medium educated participants; laypeople and experts), indicating that correlation coefficients and means can be safely compared across these samples and bringing further support to the validity of our scale.

The GSSS validity was established through a series of correlations and independent *t*-tests, which showed that the three scores of the scale positively correlated with sexism and personal adherence to masculine gender traits. These relationships underscore the foundational role that gender norms play in shaping attitudes and behaviours, as demonstrated in prior research, which highlights how the endorsement of gender stereotypes often correlate with adherence to traditional masculine norms and higher levels of sexism (Glick & Fiske, 2001). Also, we found that men, those with low-medium education, and experts reported higher endorsement of gender stereotypes than women, participants with a university degree or a postgraduate diploma, and laypeople. These findings reflect common results and considerations reported in the literature indicating that gender stereotypes are often more prevalent among individuals who may not have been exposed to progressive educational environments (Ridgeway & Correll, 2004). Our results are crucial for tailoring interventions aimed at examining and dismantling stereotypes; educational initiatives must be designed with these demographic differences in mind. For instance, programmes targeting men and those with lower educational attainment could focus on fostering critical discussions around masculinity and its impact on gender equality. In this sense, research shows that such targeted educational strategies can effectively challenge ingrained stereotypes and promote more egalitarian attitudes (Wicker & Cunningham, 2023).

Gender stereotypes often serve as the foundation upon which sexist attitudes and behaviours are built (Glick & Fiske, 2001). Such beliefs can contribute to the normalisation of sexism within sporting environments, where women athletes may face discrimination (Kalkan & Engin, 2020), objectification (i.e., the viewing or treatment as sexual objects; Nussbaum, 1995), and unequal treatment compared to their male counterparts (Schlesinger & Weigelt-Schlesinger, 2013; Slater & Tiggemann, 2011). The normalisation of sexist attitudes in sports not only impacts the immediate experiences of female athletes but also perpetuates a broader cultural narrative that devalues women's contributions in the sport context, reinforcing harmful stereotypes that can deter young girls from pursuing athletic careers. Research has shown that these attitudes can lead to a cycle of underrepresentation and lack of support for women in sports (Messner, 2002). Accordingly, our findings revealed that people who endorsed more gender stereotypes in sport also reported more sexist attitudes in terms of both hostile and benevolent sexism. Our findings highlight the urgent

need for educational programmes aimed at both athletes and coaches. Such initiatives could challenge existing stereotypes and promote awareness about the detrimental effects of sexism, fostering a more inclusive environment in which all athletes can thrive. The literature emphasises that educating athletes about these issues can lead to significant changes in attitudes and behaviours, ultimately benefiting the entire sporting community (Hively & El-Alayli, 2014). In this sense, sports organisations should enhance the experiences of female athletes and challenge the systemic barriers they face. In doing so, it is crucial to engage not just women but also men and other stakeholders to cultivate allies who can help foster a more supportive environment for all athletes.

As for the internalisation of gender stereotypical traits, Bem (1981, 1985) argued that individuals tend to interpret information through the lens of preexisting gender schemas, seeking to "match their preferences, attitudes, behaviours, and personal attributes against the prototypes stored within it" (Bem, 1981, p. 355). This process can be particularly influential in shaping individuals' perceptions and interactions within the sports domain, where societal norms often dictate what is considered appropriate behaviour for men and women. Those who adhere more strongly to masculine traditional roles are inclined to assess information based on gender-linked associations, thus emphasising distinctions between masculinity and femininity more than individuals who support gender equality (Bem, 1985; Xu et al., 2021). In line with these important considerations, we found that those who internalised masculine (vs. feminine) stereotypical characteristics reported higher scores on all three dimensions of the GSSS, thus showing more agreement with gender stereotypes in the sport domain. This finding echoes previous studies suggesting that the internalisation of gender stereotypes can significantly influence attitudes towards women's capabilities and roles in sports, often leading to biased evaluations of female athletes (Chalabaev et al., 2013). Moreover, the internalisation of these traits can perpetuate a cycle where women athletes feel compelled to conform to masculine ideals, further marginalising their feminine attributes and contributions to the sport. This dynamic can inhibit their participation and performance, creating a self-reinforcing barrier to equality in athletics. Addressing these internalised stereotypes is essential for fostering a more inclusive sporting environment where individuals can express their identities without the constraints of traditional gender norms. Implementing educational initiatives that challenge these preexisting gender schemas could play a key role in transforming attitudes, promoting acceptance of diverse expressions of identity, and ultimately contributing to a more equitable landscape in sports.

Additionally, prior studies suggested that sport can significantly contribute to the expression of masculinity (Plaza & Boiché, 2017; Xu et al., 2021). As a consequence, within this framework, men are generally inclined to utilise gender schemas more frequently than women. A relevant consideration on this point is that individuals of higher social status may tend to support conventional stereotypes about individuals unlike themselves, in contrast to beliefs that favour their social groups (Rowley et al., 2007). Considering that men often hold higher social status than women (Fiske et al., 2016; Yanadori et al., 2021), they may also be more predisposed to endorse gender stereotypes, especially in male-dominated fields, such as those related to physical activities. Accordingly, our findings indicated that male participants exhibited a higher propensity to endorse gender stereotypes in sport compared to females. This result is in line with previous sociological literature on masculinity and power imbalances, according to which

men often find it advantageous to support and perpetuate gender stereotypes as a means of maintaining power and privilege (Connell, 2005). By upholding traditional masculine ideals, men reinforce their dominance within the sports domain, securing greater resources, recognition, and influence. This alignment with hegemonic masculinity not only bolsters their own status but also marginalises women and non-conforming individuals, preserving existing power hierarchies (Messner, 2002).

Furthermore, we found that individuals with low and medium educational levels reported greater endorsement of gender stereotypes than those with higher education. This trend highlights the significant role that education plays in shaping individuals' beliefs and attitudes towards gender norms. Previous investigations have shown that people's backgrounds and experiences are related to the gender stereotypes they maintain (Wicker & Cunningham, 2023). In this regard, one of the most influential variables is education, which is often correlated with greater exposure to progressive ideas, social diversity, and opportunities for intellectual growth (Ridgeway & Correll, 2004). The implications of this finding extend beyond individual beliefs; they reflect systemic issues within educational institutions themselves. If educational systems fail to actively promote gender equality and critical thinking about gender roles, they may inadvertently perpetuate stereotypes among their students. To effectively combat these harmful beliefs, it is essential for educational initiatives to incorporate discussions about gender diversity, equality, and the impacts of stereotypes on various groups, including women in sports. By doing so, we can cultivate a more informed and inclusive generation that recognises and challenges the harmful norms that restrict participation and opportunities for all genders in athletics and beyond.

It is noteworthy that experts in the field scored higher on all three dimensions of the GSSS than laypeople. This finding is consistent with previous research (Mateo-Orcajada et al., 2021; Schlesinger & Weigelt-Schlesinger, 2013) indicating that the intensive training and professional culture inherent in soccer may reinforce stereotypical beliefs about gender, contributing to the perpetuation of biased attitudes and behaviours among those deeply involved in the game. Moreover, the hierarchical nature of soccer institutions could exacerbate these stereotypes, as individuals in positions of authority may wield significant influence over team dynamics and organisational culture. By using our measure, sports organisations, educational institutions, and policy makers can more accurately assess the prevalence and intensity of gender stereotypes among athletes, coaches, medical staff, and managers. This can inform the creation of comprehensive training and awareness programmes that address these biases directly. Additionally, the GSSS can be used to evaluate the effectiveness of such interventions over time, ensuring that efforts to promote gender equity are data-driven and impactful.

Limitations and future directions

The present research is an important starting point to deepen the study of gender stereotypes in sport and understand better how these beliefs are perceived and experienced. However, there are some limitations that should be considered. First, the validation of the GSSS was conducted in Italy and is now limited to this cultural context. Future research should aim to replicate our findings and assess the applicability of this instrument across diverse countries. In this regard, conducting experimental manipulations

to investigate causal relationships between the GSSS and potential psychosocial outcomes would offer valuable insights into its effects.

Furthermore, it is worth mentioning that most of the items of our scale are reverse-coded. Despite the often-acknowledged challenges associated with such statements (see Suárez Álvarez et al., 2018), we decided to include them in the GSSS as a means to mitigate social desirability bias. Given the sensitive nature of gender stereotypes, individuals may be inclined to respond in a socially desirable manner, potentially masking their true beliefs. Utilising reverse-coded items can help counteract this tendency (Paulhus, 1991). On this point, although ceiling and floor effects were below the threshold of 20%, it is crucial to recognise that the "openness" dimension of the scale – composed of five reverse-coded items – seems to have a slight tendency toward the floor effect. For these reasons and given the paucity of research, future studies could leverage our scale as a foundational tool for developing additional indicators of gender stereotypes in sport settings. Also, due to the relevance of gendered discourses to the topic (e.g., see de Haan & Knoppers, 2020), further indicators could be developed by consulting language, communication, and narratives that construct and perpetuate gender roles and identities within society.

Finally, it is important to note that without establishing the temporal stability and predictive validity of our scale, the reliability of the GSSS remains limited. Temporal stability, or test-retest reliability, is essential to ensure consistent results over time. Without this, it is difficult to determine if the scale reliably measures gender stereotypes in sport across different periods. Additionally, predictive validity is crucial for demonstrating that the scale can accurately predict related outcomes or behaviours. Future research should focus on longitudinal studies and predictive analyses to address these limitations and enhance the robustness of the scale.

Conclusions

Considering that gender stereotypes are one of the main barriers hindering gender equality and inclusivity in physical activities, this research aimed to develop and validate a measure assessing people's endorsement of stereotypical beliefs about men and women in the sport domain. The GSSS provides researchers with a valid and reliable tool for assessing the pervasive influence of gender stereotypes in sport, specifically focusing on soccer. By better comprehending the causes and consequences of these beliefs, researchers and practitioners can contribute to ongoing public discussions regarding gender equity and how best to address stereotypes and promote inclusivity in the sport domain. Our hope is that this study can be useful in the long term not only to investigate gender stereotypes but also to empower stakeholders to implement targeted interventions aimed at challenging and dismantling these harmful beliefs. The GSSS can contribute to a nuanced understanding of the complex dynamics surrounding gender stereotypes in sport, ultimately paving the way for positive change and progress toward more inclusive and equitable sporting environments.

Notes

1. The experts who participated in the study were different from those who took part in the telephone and in-person interviews.

2. Data and Supplementary Material are available through the Open Science Framework (OSF; https://osf.io/ur3wp/).
3. Two items that in the original scale were assigned to benevolent sexism (i.e., "Men should sacrifice to provide for women" and "People are often unhappy without heterosexual romance") loaded here on the factor related to hostile sexism.

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Data availability statement

Data and Supplementary Material are available through the Open Science Framework (https://osf.io/ur3wp/?view_only = 17078e5e3c974cae8e3b6bb90f1514ba).

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