# Validation of the questionnaire Conditions of Effective Gender Equality in Sport

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## ABSTRACT

Gender equality is a fundamental right for all people, achieved by respecting the principles of equal opportunities and non-discrimination. Analysing the existence of this equality by carrying out studies that present a gender perspective is essential to be able to contribute to the sustainable development of the different sectors existing in society, such as sport. Thus, the main objective is to design and validate a quantitative tool to analyse the existence of effective gender equality in sport. First, a group of experts analysed the design of the questionnaire. Then, a first pilot test was carried out with an exclusive sample of women, where no reliable results were presented. Subsequently, the questionnaire was distributed to both women and men at the Pan American Games in Chile in 2023. The results obtained from the Exploratory Factor Analysis, the Confirmatory Factor Analysis and the Reliability calculation were favourable and optimal, thus confirming that the questionnaire is valid and reliable for the analysis of effective equality. The final structure presents a total of 16 items divided into the dimensions of Sport Growth, Material Barriers and Empowerment.
**Keywords**: Gender equity, Parity, Equal treatment, Real equality, Formal equality.

## INTRODUCTION

Achieving effective equality between men and women is a global challenge facing all countries today in order to build a peaceful, prosperous and sustainable society (UN, 2020). The creation of new policies and changes to existing legislation are key factors in achieving this gender equality (Alves da Silva, 2024; Pastor and Acosta, 2016). This legislative equality, related to the existence of equal opportunities and non-discrimination between women and men before the law, is called formal gender equality (Sierra, 2018). Currently, although there are laws that guarantee this type of equality, there continues to be significant discrimination in various sectors of society, which makes it impossible to transform formal gender equality into real or effective gender equality. Many individuals who do not conform to traditional gender roles and expectations still suffer prejudice and social discrimination (Lee and Cunninham, 2016). Some examples are related to the reduction of opportunities for women (UN Women, 2022), the devaluation of paid jobs (González et al., 2019) or the lack of accessibility in leadership positions (Powell, 2018).

Today's society must be sensitive and responsible to these situations, seeking a significant change that breaks the separation of traditional gender roles that continue to exist within social norms, values and beliefs in many contexts (Alberdi et al., 2024; Trolan, 2013). Within this society, sport is an important socio-cultural phenomenon that acts as an engine of change to achieve gender equality. Sport is a transmitter of values such as solidarity, respect and inclusion, catering to a sporting cultural reality where all genders can thrive on equal terms (Harmon, 2020); furthermore, the practice of sport is inherent to any condition, role or ability (Nordstrom et al., 2016). Sport as sexual integration challenges gender stereotypes (UN Women, 2022) and helps to situate both genders in mutually respectful relationships, rejecting any conventional sexualised forms (Maclean, 2015). Despite this, women continue to experience significant barriers and differences compared to men that prevent the existence of effective equality (Barreira and Da Silva, 2016; Pill et al., 2024).

Looking at specific aspects related to barriers to effective equality, a lack of social valuation of women's sport can be identified, with the existence of numerous sexist stereotypes (Hoeber 2008; Kavourda et al., 2018; Klavanes et al., 2020; Mérida et al., 2022; Volta et al., 2019). For example, women's perceived poor leadership and low belief in their abilities hinder access to high-level sport positions (Blom et al., 2011; Lee et al., 2017). Also, the resources allocated in sport are often not equally distributed between women and men (Hoeber, 2008), such as the lack of quality and scarcity of material resources, poor sport schedules, equipment and infrastructure (Doğusan and Kiçak 2021; McGinnis et al., 2005) and the scarcity of financial resources and sponsorship (Kamphoff, 2010; O'Brien et al., 2023; Norman and Simpson, 2022).

On the other hand, although female participation has increased in different sporting positions, their responsibilities are still restricted to positions of lesser relevance (Passero et al., 2019). The existence of women in high leadership positions is scarce, worldwide, (Donoso et al., 2023), not only in sports entities, but also in elite coaching or refereeing positions, among other positions (Klavanes et al. (2020); Tjønndal, 2019; Knoppers et al., 2022; Winiarska et al., 2016). Thus, low salaries predominate due to the presence of women in less important positions, with a less decisive division of tasks assigned, fulfilling gender stereotypes in society (Cepeda, 2021; Claringbould and Knoppers, 2012; O' Brien et al., 2023). It should be noted that these women in leadership positions, including sportswomen, have to reconcile their sporting life with their family life. Some favourable measures are related to family co-responsibility policies that prevent women from abandoning their sporting careers (Claringbould and Knoppers, 2012; Klavanes et al., 2020; Organista, 2020), or the existence of aid or action plans that favour the sporting reincorporation of women after maternity (Borrueco et al., 2023).

Finally, overcoming the aforementioned adverse situations and possessing the freedom of choice to have control over one's life is associated with empowerment. Many women have ambitions to advance in their sporting careers (Drury et al., 2022; McGinnis et al., 2005), striving to break down gender barriers, being active agents of social change (Fernandez-Lasa, 2019; Norman and Simpson, 2022). The presence of women in leadership positions is paramount to achieve role models that guide future generations to thrive in their sporting careers (LaVoi, 2016). A woman in high leadership positions feels free to challenge any stereotypical behaviour or gender role assigned by traditional society (Claringbould and Knoppers, 2012). Another influential factor is the creation of mentoring programmes by women who have overcome discriminatory situations in sport, creating support groups that increase their self-confidence, self-esteem and security (Fernández-Lasa, 2019; Inglis, 2000; McGinnis et al., 2005). For this, an essential factor is the close support of sports organisations, giving them opportunities for growth and good rewards associated with the work done, which motivate them to continue promoting to high leadership positions (Molina-Hermosilla, 2016; O'Brien et al., 2023).

### Theoretical foundation

The present study has been conducted on the basis of two gender theories, i) the theory of gender as a social structure (Risman, 2004) and ii) the theory of the sexual division of labour (Kanter, 1997a).

#### Gender theory as a social structure

The theory of gender as a social structure (Risman, 2004) explains a new classification of the mechanisms that contribute to gender outcomes within each dimension of social structure. This theory is based on the existence of a whole society that presents a gender structure that affects individuals and organises expectations linked to their social positions (Risman, 1998). This concept is constructed through traditional gender theories, such as the existence of biological (Udry, 2000), social (Bem, 1993) or sexist behavioural differences (Epsteins, 1988). All this has an impact on the creation of inequality through the expectations of others (West and Zimmerman, 1987).

This theory differentiates people's opportunities and limitations according to their sex, conceptualising gender as a social structure in order to analyse how gender integrates the following three dimensions: (i) Individual Level, based on the construction of the 'self', through socialisation, internalisation, identity work and the construction of gender; (ii) International Cultural Expectations, related to the cultural expectations developed by individuals, because men and women face different cultural expectations even though they occupy the same structural positions; and (iii) Institutional Domain, based on the construction of governmental gender practices, with explicit regulations regarding the distribution of resources and material goods.

#### Theory of the sexual division in the workplace

The theory of the sexual division of labour (Kanter, 1977a) shows a segregated organisational structure where there is limited progression to leadership positions for women in organisations. This organisational structure shapes and defines women's behaviour rather than women's intrinsic factors. The critical variables that explain the scarcity of women in senior positions relate to i) the position or position they hold within the organisation, ii) the power they wield in their positions, and iii) the proportional distribution of jobs.

Thus, according to the author, there are two types of situations: advantageous work situations and disadvantageous work situations. The former are associated with power and good opportunities for promotion, occupied by a majority social category, such as men; however, the latter are associated with limited opportunities, with the female sex being the priority in these positions. Thus, there is a position of dominance where women are relegated to the lowest positions, due to a system of prejudices that

discriminate against women, making it impossible for them to develop towards leadership positions, thus creating the so-called glass ceiling.

Within this context, the concept of the 'token' woman (Kanter, 1997b) appears, associated with all women who carry out occupations socially assigned to the male gender and who are excluded because they are a minority group. These women have to face a series of conflicts, associated with these three essential aspects: i) visibility - the dominant group (men) observes in detail the behaviours of the minority group (women) generating an atmosphere of pressure; ii) polarisation - separation from the dominant group by feeling the minority and experiencing the existing differences; iii) assimilation - the attributes of the minority group disappear in order to be accepted and fit in with the attributes of the dominant group, imposing roles that limit their development.

**METHOD**

*Sample*
The sample to analyse the validity of the instrument and the calculation of reliability consisted of a total of 1,373 persons, divided into i) coordinator-researcher group (n = 4); ii) expert panel group (n = 8); iii) comprehension validity group (n = 20); pilot group 1 (n = 442) and pilot group (n = 899). Purposive sampling was carried out in the different groups of the study.

The main characteristics of the sample used for validation, concerning pilot group 2, are shown in Table 1. Firstly, the sample consisted of a total of 899 people, the mean age of the study participants was 36.05± 13.1 years; in relation to the sex of the population, 61% were male and 39% were female. The majority had completed higher education (31.1%) or postgraduate education (30.7%) and were employed full-time (54.8%). According to marital status, 51.7% of the population was single, while 43% were married; the majority of the sample had no children (61.9%).

Table 1. Sociodemographic variables of the study.

| Variables | M (SD) |
|---|---|
| **Age** | 36.05 (13.1) |
| | **N (%)** |
| **Sex** | |
| Male | 549 (61.0) |
| Female | 350 (39.0) |
| **Education** | |
| I finished primary school | 12 (1.3) |
| I finished high school | 77 (8.6) |
| I am in high school | 30 (3.3) |
| I am in university | 126 (14.0) |
| I finished university | 280 (31.1) |
| I am doing a post-graduate degree | 65 (7.2) |
| I finished a post-graduate degree (masters or other) | 276 (30.7) |
| Other | 29 (3.2) |
| **Occupation** | |
| Full-time employee | 489 (54.8) |
| Employed part-time | 172 (19.3) |
| Unemployed | 54 (6.1) |
| Student | 160 (17.8) |
| Retired | 17 (1.9) |

| **Marital Status** | |
|---|---|
| Single | 463 (51.7) |
| Married | 385 (43.0) |
| Living with a partner | 41 (4.6) |
| Separated | 6 (0.07) |
| Divorced | 0 (0.0) |
| Widowed | 0 (0.0) |
| **Children** | |
| Yes | 341 (38.1) |
| No | 553 (61.9) |
| **Function in Sport** | |
| Athlete | 389 (43.2) |
| Coach | 220 (24.5) |
| Referee | 0 (0.0) |
| Sport manager | 131 (14.6) |
| Other | 159 (17.7) |
| **Sports Modality** | |
| Individual sports | 496 (55.2) |
| Collective sports | 205 (22.8) |
| Mixed sports | 198 (22.0) |
| **Years involved in the sport** | |
| Less than 5 years | 48 (5.3) |
| 5 to 10 years | 143 (15.9) |
| 10 to 15 years | 185 (20.6) |
| 15 to 20 years | 161 (17.9) |
| More than 20 years | 361 (40.2) |
| **Sports Organization** | |
| North America | 329 (36.6) |
| Central America | 133 (14.8) |
| South America | 437 (48.6) |
| **Global Rank** | |
| Global North | 329 (36.6) |
| Global South | 570 (63.4) |
| **Monetary remuneration** | |
| I receive nothing | 208 (23.6) |
| Less than $500 | 170 (19.3) |
| 501 to $1,200 | 185 (21.0) |
| 1,201 to $1,800 | 100 (11.4) |
| 1,801 to $2,500 | 67 (7.6) |
| 2,500 or more | 151 (17.1) |

On the other hand, it can be seen that the majority were athletes (39.8%), followed by coaches (34.4%), other functions - press, health, staff - (14.3%) and sports leaders (11.5%); most were associated with an individual sport (55.2%), with more than 20 years of experience (40.2%). In terms of the sports organisation represented, 48.6% were from South America, 36.6% from North America and 14.8% from Central America. In line with the global division indices (social, economic and political), the majority belonged to the Global South (63.4%). Finally, 23.6% received no monetary remuneration for their sporting duties and 21% received between $501 and $1,200.

*Instrument*
The final design of the questionnaire is composed of a total of 16 items divided into the following three dimensions: A) Sport Growth (SG), subdivided into Accessibility and Growth (SG-AG) and Work-Family

Balance (SG-WFB); B) Material Barriers (MB); and C) Empowerment (EM). The structure is set out in Table 2.

Table 2. Final version of the CIGED questionnaire.

| Dimensions and items |
|---|
| *DIMENSION 1. SPORT GROWTH (SG)* |
| *1A. Accessibility and Growth (SG-AG)* |
| SG-AG1. I have faced difficulties starting my career in sports. |
| SG-AG2. I consider it difficult to move up in my career in sports. |
| SG-AG3. I have an elevated economic cost to travel to my sport related work. |
| *1B. Family and work balance (SG-WFB)* |
| SG-WFB1. I have to have another job to economically sustain my life in sport. |
| SG-WFB2. I have to find work and academic programs with flexible schedules to continue my work in sport. |
| SG-WFB3. I have thought/plan to leave my work in sport to focus on my familial, work, and academic life. |
| *DIMENSIÓN 2. MATERIAL BARRIERS (MB)* |
| MB1. I do my sport functions in good quality facilities. |
| MB2. I have favourable hours to do my work in sport. |
| MB3. I have easy access to the sports facilities to do my work at any hour. |
| *DIMENSIÓN 3.EMPOWERMENT (EM)* |
| EM1. I can overcome adverse situations alone that arise in my career in sport. |
| EM2. My work in sport makes me feel optimistic and satisfied. |
| EM3. Overcoming adverse situations in sport has helped me to have more confidence and self-esteem. |
| EM4. I believe my experience can be important to help other people advance their own careers in sport. |
| EM5. I think that my role in sport helps to reduce gender inequality. |
| EM6. Now I think that I have better control of my life than in the beginning of my sports career. |
| EM7. I have opportunities to accept a position of power and leadership within my career in sport. |

### *Procedure*
The design and validation of the Conditionalities of Effective Gender Equality in Sport (CIGED) questionnaire was carried out in several phases, following the procedure proposed by Carretero-Dios and Pérez (2005) on the design and validation of a new questionnaire. First, a review of the existing international literature on gender inequality in sport was carried out. Numerous studies were identified that proposed a qualitative approach and few studies that presented a quantitative approach using a closed-ended questionnaire. Thus, in order to address a second phase of initial questionnaire design, the numerous results of qualitative studies were categorised into five study dimensions. Thus, the initial proposal presented five dimensions and 69 items: Social Recognition (SR), Accessibility and Growth (AG), Material Barriers (MB), Work and Family Balance (WFB) and Empowerment (EM).

Then, in a third phase, a letter of collaboration as an expert judge was elaborated and sent to 22 people to assess the validity of the content. The fourth phase of the procedure consisted of quantitative interpretation, through the Aiken V assessment, and qualitative interpretation, through the comments and suggestions of the panel of experts. Subsequently, a comprehension validity analysis phase was carried out with 20 amateur female football players.

A first pilot study was then carried out: i) convenience sampling of 442 women, who played their role as sportswomen, coaches, referees or women in sports leadership positions in Spanish sport. However, the construct reliability was not favourable, so a second pilot study was carried out: ii) convenience sampling of 899 women and men who performed their sporting role at the Pan American Games in Santiago de Chile, held between 20 October and 5 November 2023.

The questionnaire was distributed telematically, via the online platform for the distribution of surveys of the University of Murcia and completed voluntarily and anonymously. Finally, the results extracted from these studies were used to address the final phase of analysis of validation and reliability of the questionnaire.

### Data analysis
The data analyses of the psychometric properties of the scale were carried out using the SPSS v.26.0 statistical program of the University of Murcia. The construct validity for the Exploratory Factor Analysis (EFA) was carried out using the FACTOR v.12.01.02 program, with the Maximum Likelihood (MV) extraction method and the Oblimin Direct rotation method. Unweighted Least Squares (ULS) statistical analysis was performed for three factors. The programme used for the Confirmatory Factor Analysis (CFA) was Jamovi v.2.5.5. Other indicators were also taken into account such as the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy, the analysis of replicability with the GH Index, the Barlett's test of sphericity, the analysis of variance, and the measure of skewness and kurtosis. To analyse the reliability of the questionnaire, Cronbach's Alpha, Compact Reliability (CF) and Average Variance Extracted (AVE) tests were performed. Finally, Pearson's analysis was used to calculate the correlation between variables.

## RESULTS

The main results of the scale design and validation study are shown below. Firstly, the action of the experts is shown, followed by the analysis of the psychometric properties of the scale, the Exploratory Factor Analysis, the Confirmatory Factor Analysis and finally, the specific analysis of the reliability.

### Content validity analysis by panel of experts
The content validity analysis of the questionnaire was carried out with the opinion of a panel of experts on a total of 69 items divided into the five dimensions of the study. After the analysis of each item and dimension, the Aiken V analysis was carried out with the items that were not eliminated. The 34 items selected for a pilot proposal of the questionnaire obtained a mean Aiken's V score of 0.92 (95%CI: 0.83 - 0.96), without finding any value lower than 0.8 points.

The Likert-type scale was the most appropriate rating scale chosen by the expert judges and the coordinating group of the study, finally proposing a Likert scale with 7 anchors: 1 'strongly disagree' and 7 'strongly agree'.

### Analysis of the psychometric properties of the scale
The analysis of the psychometric scale properties is detailed in Table 3. This analysis was developed according to the following aspects: i) Correlation of the item with the other items of the factor; ii) Mean (M); iii) Standard Deviation (SD); iv) Variance ($\sigma^2$); v) Cronbach's Alpha ($\alpha$-C) if the item is eliminated; vi) Skewness (S); and vii) Kurtosis (K).

All items showed adequate results for the presented variables of the psychometric properties of the scale; furthermore, the total scale achieved favourable reliability data.

### Exploratory factor analysis
The statistical analysis used to examine the construct validity was ULS, with a total sample of 899 people working in high-performance sport. Firstly, the sample adequacy reflected positive values, close to 1, with a KMO measure of 0.87 points and a Communality ratio of 0.99 points. Also, significant and favourable results were found in Bartlett's test of Sphericity, with $X^2$ 7.524 (gl = 253; $p > .001$). Thus, it was possible to affirm that the data collected were adequate to carry out the PFA.

Table 3. Psychometric properties of the scale.

| Item | Correlation | M | SD | σ2 | α-C without the item | S | K |
|---|---|---|---|---|---|---|---|
| AG1 | 0.621 | 3.54 | 1.9 | 3.61 | 0.473 | 0.342 | -0.968 |
| AG2 | 0.583 | 3.45 | 1.9 | 3.56 | 0.523 | 0.391 | -0.887 |
| AG3 | 0.366 | 3.38 | 2.1 | 4.43 | 0.800 | 0.404 | -1.19 |
| WFB1 | 0.544 | 2.96 | 2.1 | 4.61 | 0.593 | 0.767 | -0.779 |
| WFB2 | 0.556 | 2.96 | 2.1 | 4.26 | 0.582 | 0.763 | -0.691 |
| WFB3 | 0.480 | 4.11 | 2.3 | 5.27 | 0.677 | 0.004 | -1.51 |
| MB1 | 0.688 | 5.35 | 1.8 | 3.09 | 0.724 | -0.942 | -0.067 |
| MB2 | 0.645 | 5.46 | 1.7 | 2.76 | 0.769 | -0.988 | 0.150 |
| MB3 | 0.675 | 5.08 | 1.9 | 3.77 | 0.742 | -0.765 | -0.601 |
| EM1 | 0.571 | 5.86 | 1.3 | 1.69 | 0.846 | -1.26 | 1.68 |
| EM2 | 0.701 | 6.04 | 1.2 | 1.35 | 0.829 | -1.37 | 2.02 |
| EM3 | 0.722 | 6.23 | 1.1 | 1.19 | 0.828 | -1.69 | 3.33 |
| EM4 | 0.706 | 6.29 | 1.1 | 1.10 | 0.831 | -1.69 | 2.97 |
| EM5 | 0.473 | 5.74 | 1.6 | 2.66 | 0.869 | -1.36 | 1.18 |
| EM6 | 0.680 | 5.89 | 1.4 | 1.83 | 0.830 | -1.45 | 2.02 |
| EM7 | 0.634 | 5.88 | 1.4 | 1.93 | 0.837 | -1.32 | 1.23 |

Once the ULS factor analysis was carried out with the questionnaire of 34 items and five dimensions, it was established that the most appropriate analysis was for a total of three factors and 22 items. Within the first factor, items from the SG, WFB and MB dimensions were grouped, in the second factor, four items from MB were respected, and in the last factor, two items from RS were related to EM. Accordingly, a subdivision of the first factor was carried out, applying the ULS technique for the division of the first factor into two groups, which proved to be adequate.

On the other hand, the calculation of the GH-Index was 0.898 points for the first factor, followed by 0.838 for the second factor and 0.867 for the last factor. These results suggest a well-defined latent variable (>0.80), which allows ensuring a good replicability of the scale and dimensions in other possible investigations (Ferrando and Lorenzo-Selva, 2018). Finally, the observed variance of the total items of the questionnaire, assigned to each factor, reflected 13% of the variance for the first factor, 17.3% for the second and 11.5% for the third; thus, the total accumulated percentage of variance was 41.8%. Table 4 below shows the analysis of the ULS factor model with factor structure, factor loadings and communalities (com).

Table 4. Exploratory factor analysis with the ULS model.

| Items | F1 | F2 | F3 | F4 | Com |
|---|---|---|---|---|---|
| ***Factor 1 – Sport Growth (SG)*** | | | | | |
| *Factor 1.A. Sports Growth - Accessibility and Growth (SG-AG)* | | | | | |
| 1. I have to make more efforts to prove that I am able to perform my sport duties# | 0.33 | | | | 0.12 |
| 2. I have experienced situations in sports that have made me feel socially undervalued by other people# | 0.42 | | | | 0.18 |
| 3. I have an elevated economic cost to travel to my sport related work # | 0.48 | | | | 0.25 |
| 4. I have faced difficulties starting my career in sports# | 0.69 | | | | 0.50 |
| 5. I consider it difficult to move up in my career in sports# | 0.69 | | | | 0.49 |
| *Factor 1.B. Family and work balance (SG–WFB).* | | | | | |
| 6. I consider that having children interferes or may interfere with my sports career# | 0.49 | | | | 0.23 |
| 7. I have to find work and academic programs with flexible schedules to continue my work in sport# | 0.57 | | | | 0.34 |
| 8. I have thought/plan to leave my work in sport to focus on my familial, work, and academic life# | 0.70 | | | | 0.50 |
| 9. I have to have another job to economically sustain my life in sport# | 0.54 | | | | 0.33 |

| | | |
|---|---|---|
| ***Factor 2 - Material Barriers (MB)*** | | |
| 10. I have sufficient and adequate material to carry out my sport duties. | 0.76 | 0.76 |
| 11. I do my sport functions in good quality facilities. | 0.83 | 0.83 |
| 12. I have favourable hours to do my work in sport. | 0.68 | 0.68 |
| 13. I have easy access to the sports facilities to do my work at any hour. | 0.79 | 0.79 |
| ***Factor 3 – Empowerment (EM)*** | | |
| 14. My family supports and respects my career and involvement in the sport. | 0.34 | 0.17 |
| 15. My close environment has been supportive enough to start my sports career. | 0.32 | 0.21 |
| 16. I can overcome adverse situations alone that arise in my career in sport. | 0.63 | 0.42 |
| 17. My work in sport makes me feel optimistic and satisfied. | 0.76 | 0.63 |
| 18. Overcoming adverse situations in sport has helped me to have more confidence and self-esteem. | 0.82 | 0.66 |
| 19. I believe my experience can be important to help other people advance their own careers in sport. | 0.81 | 0.63 |
| 20. I think that my role in sport helps to reduce gender inequality. | 0.52 | 0.27 |
| 21. Now I think that I have better control of my life than in the beginning of my sports career. | 0.71 | 0.52 |
| 22. I have opportunities to accept a position of power and leadership within my career in sport. | 0.68 | 0.49 |

*Note: #: Inverse items.*

## *Confirmatory factor analysis*

Once the FEA had been carried out, the CFA was performed, with the proposal of three dimensions and 22 items. Table 5 below shows the main results of the CFA, in relation to the estimated error (EE), the 95% confidence interval, the test statistics (Z; p) and the standardised estimator (Est).

Table 5. Confirmatory factor analysis of the scale.

| Items | EE | Confidence interval 95% | | Z | p | Est |
|---|---|---|---|---|---|---|
| | | Inf. | Sup. | | | |
| **Factor 1 – SG** | | | | | | |
| *SG – AG* | | | | | | |
| SG-AG1# | 0.06 | 1.43 | 1.67 | 25.8 | .001 | 0.81 |
| SG-AG2# | 0.06 | 1.40 | 1.64 | 25.6 | .001 | 0.81 |
| SG-AG3# | 0.07 | 0.78 | 1.07 | 12.5 | .001 | 0.44 |
| *SG – WFB* | | | | | | |
| SG-WFB1# | 0.09 | 1.42 | 1.76 | 18.4 | .001 | 0.74 |
| SG-WFB2# | 0.08 | 1.15 | 1.44 | 17.2 | .001 | 0.63 |
| SG-WFB3# | 0.10 | 1.53 | 1.91 | 17.8 | .001 | 0.75 |
| **Factor 2 - MB** | | | | | | |
| MB1. | 0.05 | 1.27 | 1.49 | 25.8 | .001 | 0.79 |
| MB2. | 0.05 | 1.15 | 1.36 | 25.2 | .001 | 0.78 |
| MB3. | 0.06 | 1.39 | 1.63 | 26.5 | .001 | 0.81 |
| **Factor 3 - EM** | | | | | | |
| EM1. | 0.04 | 0.75 | 0.90 | 20.8 | .001 | 0.65 |
| EM2. | 0.03 | 0.84 | 0.97 | 26.7 | .001 | 0.78 |
| EM3. | 0.03 | 0.83 | 0.96 | 28.8 | .001 | 0.82 |
| EM4. | 0.03 | 0.75 | 0.87 | 26.2 | .001 | 0.77 |
| EM5. | 0.05 | 0.70 | 1.91 | 15.0 | .001 | 0.50 |
| EM6. | 0.04 | 0.89 | 1.05 | 23.6 | .001 | 0.71 |
| EM7. | 0.04 | 0.85 | 1.02 | 21.7 | .001 | 0.67 |

*Note. #: Inverse items.*

The final results detailed a valid final questionnaire for three dimensions and 16 items: Sports Growth - 6 items (1.A. Accessibility and Growth - 3 items; 1.B. Work-Family Conciliation - 3 items); Factor 2. Material Barriers - 3 items; and Factor 3. Empowerment - 7 items. In this way, a total of six items were eliminated in order to obtain favourable results in the WFB, especially in reliability and variance; three items belonging to SG, one item to MB and two items to EM. The two items eliminated in the third factor were the only ones that were related to the initial dimension of Social Recognition, which were grouped together in the AFE to the Empowerment dimension. This final model presented adequate test values for exact fit (Table 6) and for the fit measures (Table 7).

Table 6. Test for exact fit.

| $\chi^2$ | gl | *p* |
|---|---|---|
| 450 | 97 | < .001 |

*Note. $\chi^2$ = Chi-square; Gl = degrees of freedom; p = significance.*

Table 7. Adjustment measures.

| | | | | IC 90% del RMSEA | |
|---|---|---|---|---|---|
| CFI | TLI | SRMR | RMSEA | Lower | Upper |
| 0.94 | 0.92 | 0.05 | 0.06 | 0.06 | 0.07 |

*Note. CFI = Comparative Fit Index; TLI = Tucker-Lewis Index; SRMR = Root Mean Square Residual; RMSEA = Root Mean Square Error of Approximation; CI = Confidence Interval.*

In relation to construct reliability, the measures of factor loadings ($\lambda$) and factor loadings squared ($R^2$) of the items; and Cronbach's Alpha ($\alpha$-C), McDonald's Omega ($\omega$), composite reliability (CF) and average variance extracted (AVE) of the scale factors are shown below in Table 8.

Table 8. Reliability of the scale.

| Items | $\lambda$ | $R^2$ | $\alpha$-C | $\omega$ | FC | AVE |
|---|---|---|---|---|---|---|
| **Factor 1** | | | 0.79 | 0.79 | 0.85 | 0.50 |
| Factor 1A | | | 0.70 | 0.74 | 0.74 | 0.50 |
| 1 | 0.81 | 0.66 | | | | |
| 2 | 0.81 | 0.66 | | | | |
| 3 | 0.44 | 0.19 | | | | |
| Factor 1B | | | 0.71 | 0.71 | 0.75 | 0.50 |
| 4 | 0.74 | 0.55 | | | | |
| 5 | 0.63 | 0.40 | | | | |
| 6 | 0.75 | 0.56 | | | | |
| **Factor 2** | | | 0.81 | 0.82 | 0.84 | 0.63 |
| 7 | 0.79 | 0.62 | | | | |
| 8 | 0.78 | 0.61 | | | | |
| 9 | 0.81 | 0.66 | | | | |
| **Factor 3** | | | 0.86 | 0.8 | 0.87 | 0.50 |
| 10 | 0.65 | 0.42 | | | | |
| 11 | 0.78 | 0.61 | | | | |
| 12 | 0.82 | 0.67 | | | | |
| 13 | 0.77 | 0.59 | | | | |
| 14 | 0.50 | 0.25 | | | | |
| 15 | 0.71 | 0.50 | | | | |
| 16 | 0.67 | 0.45 | | | | |

Finally, in relation to discriminant validity, the data resulting from Pearson's correlation between dimensions was compared with the square root of the AVE, being higher in all factors. In this way, it can be determined

that the scale groups dimensions related to each other (convergent) and that, in turn, each one assesses a different subject (divergent). These data are presented in Table 9.

Table 9. Correlations between questionnaire factors and square root of AVE.

| Factors | F1- CD | F2 - BM | F3 – EM |
|---|---|---|---|
| Factor 1 – SG | **0.71** | | |
| Factor 2 – MB | 0.23*** | **0.79** | |
| Factor 3 – EM | -0.01 | 0.30*** | **0.71** |

*Note. *** Highly significant correlations for p < .001.*

## DISCUSSION

The main objective of this study was to design and validate a questionnaire that assesses the determinants of effective gender equality in sport. In line with the literature review previously conducted and other reviews analysed (Janelle et al. 2020; Kavoura and Kokkonen, 2021; Laudares and Schwartz, 2020; Valentí et al., 2018), most studies on the subject addressed a qualitative methodology, with a reduced number of quantitative studies. Thus, new studies with a quantitative approach are essential to contribute to the in-depth analysis of current gender equality.

Within this quantitative methodology, the priority is to design and validate new tools to complement the scarce existing information. Currently, some questionnaires have been located that analyse the gender barriers perceived by women in the sports context. The most recent, designed and validated by Segado et al. (2022), analysed the obstacles and benefits perceived in Spanish female refereeing, through dimensions related to institutional support, the benefits of refereeing and the perception of a social and family climate. On the other hand, the BSCQW (Barriers to Sport Coaching Questionnaire for Women) tool by Kubayi et al. (2020), based on the socioecological model (LaVoi and Duvote, 2012), was also identified. This tool analysed the barriers perceived by female coaches, located in South Africa, in an intrapersonal, interpersonal, organizational and sociocultural context.

Both quantitative tools mentioned above are focused exclusively on a population group, female coaches or referees; while the tool presented in this study collects information on a varied sample, with items adapted to people who carry out different roles in: i) management positions, ii) sports training - coach, iii) refereeing and iv) sports life - athlete. In addition, it designs more specific dimensions oriented to co-responsibility and compatibility with sports and family life, specific material barriers encountered in the sports context, opportunities for sports growth and psychological aspects related to overcoming adverse situations in terms of gender inequality, through their empowerment.

On the other hand, it is important to mention that a first version made for the validation of the questionnaire, carried out only with a sample of women, was valid but not reliable. In contrast, the two questionnaires mentioned above, by Segado et al. (2022) and LaVoi and Duvote (2012), also used only a sample of women, but were valid and reliable. The difference found between these cases is the different objective of the study; while these two questionnaires proposed an exclusive analysis of the perception of barriers for women, the current study tool aims to assess the existence of effective gender equality between women and men. Accordingly, it is affirmed and justified that the second version carried out with a population of women and men, aligning the study in terms of gender perspective, presents valid and reliable results for a questionnaire that analyses the determinants of effective gender equality in sport. Gender mainstreaming, in global strategies, is the most practical means to achieve gender equality and women's empowerment (UN Women,

2020). Furthermore, this incorporation is also essential in the scientific literature, leading to real and effective changes in institutions, entities and research centres (Jiménez-Picón and Romero-Martín, 2020).

Regarding the main results of the validation of the study, firstly, a group of eight experts in the field, with a professional and/or academic profile, was formed. This group helped to design the structure of the questionnaire, with important quantitative and qualitative contributions on the content, in terms of quality, wording and final assessment. Subsequently, after conducting the Exploratory Factor Analysis for a sample of women and men, the five study variables and 34 items were changed to three dimensions and 22 items: i) Dimension 1 - Sports Growth - 9 items (1.A. Accessibility and Growth - 5 items; 1.B. Work-Family Balance - 4 items); ii) Dimension 2 - Material Barriers - 4 items; and Dimension 3 - Empowerment - 9 items. Within the first dimension, four items from the Accessibility and Growth group, one item from Material Barriers and four items from Work-Family Balance were grouped together, forming two sub-dimensions after reapplying the ULS technique, within Sporting Growth. Four items were maintained in Material Barriers, and two items of Social Recognition were added to the Empowerment dimension.

Subsequently, after performing the Confirmatory Factor Analysis and the Reliability analysis, the questionnaire presented a final structure of three dimensions and 16 items, eliminating a total of six items in order to present favourable validity and reliability values. The final structure of the questionnaire is composed of a first dimension called Sports Growth, which groups, on the one hand, contents related to Accessibility and Growth and, on the other hand, Balance with Work and Family. The SG-AG subdimension is composed of a total of three items related to the ease of access to sporting life at the beginning, the perception of being able to move up and progress within it, and how it can influence an economic and essential aspect, such as the cost of transportation. According to Valencia et al. (2011) the ease of transportation increases demand, if these costs are lower, there may be greater sport participation. The SG-WFB subdimension groups a total of three items, related to the obligation to have a job, and the flexible nature of the same, to be able to perform sports functions, and the possible abandonment of sporting life due to the inability to combine family, work or academic life. The support and improvement of these aspects, such as maternity or salary retribution, directly influences individual promotion, being essential factors in the growth of sporting life.

On the other hand, the Material Barriers dimension analyses the existence of good conditions in relation to infrastructures and flexible accessibility, and the schedules established for the realization of sporting life. In relation to the last dimension of the questionnaire, Empowerment, the two items associated with Social Recognition were eliminated, totally eliminating this dimension after the relationship of the CFA. The contents addressed in EM are linked to overcoming adverse situations during sporting life; increased satisfaction, optimism, confidence and self-esteem; the perceived ability to be able to help others in their sporting life; the important role assigned to reduce gender inequality in sport; increased control over one's own life; and the perceived opportunities to access a position of leadership and power.

Finally, the main theories of the study i) Gender theory as social structure (Risman, 2004) and ii) Division of labour theory (Kanter, 1977a) are related to the dimensions of the study. The theory of gender as a social structure (Risman, 2004) presents the existing hierarchy in a society created by the expectations of other people, based on sex and/or gender. The existence of gender stereotypes and prejudices, which invalidate the competencies of women in the development of their sports functions (Donoso et al., 2022; Mérida et al., 2022; Norman and Simpson, 2022) continue to exist today; as does an undervaluation of women with the use of sexist language (Yildizer et al. 2021). In this way, this theory is directly related to the first dimension of the Sport Growth questionnaire, especially with the Accessibility and Growth subdimension, where the ease of access and the perception of progression in sporting life are exposed, being able to influence the

social structure in it. The second dimension Material Barriers is also closely related to this theory, as the distribution of resources and opportunities, on numerous occasions, are not equally distributed between genders, especially as a consequence of existing gender roles and social invalidation. Examples are for example the scarcity of financial resources, sponsorships, adequate facilities and schedules, and the warmth of material resources (Doğusan and Kiçak, 2021; Bowes et al., 2020; O'Brien et al., 2023).

In relation to the other theory linked to the study, on the division of the work environment (Kanter, 1977a), the experiences of women in the work environment and the limited progression to high leadership positions in organizations are mainly exposed. Thus, the Work-Family Balance subdimension, within the Sports Growth dimension, is directly related, for example, to the lack of maternity support and family life reconciliation programs (Borrueco et al., 2023; Culvin and Bowes, 2021). Progression to leadership positions directly influences the Empowerment dimension, where some perceived limitations are related to horizontal segregation - limited opportunities for promotion and vertical segregation - grouping of roles and tasks according to gender; existence of stereotypes such as low social belief in their abilities as leaders; and, among others, lack of support from sports organizations (Bowes and Kitching, 2021; Donoso et al., 2023; Klavanes et al., 2020; Organista, 2020). Finally, it is important to overcome these adverse situations and have ambition to promote in their sport careers (Drury et al., 2022); feeling free to challenge any sexist behaviour and participating as an agent of social change that helps to achieve gender equality in society (Fernandez-Lasa, 2019; Norman and Simpson, 2022).

## CONCLUSIONS

The main conclusions of the study state that a validation carried out exclusively with women does not show adequate reliability values; however, it can be confirmed that the questionnaire is valid and reliable for a sample of women and men, respecting the principle of gender perspective. First of all, the group of experts participates positively in the design of the questionnaire content, presenting an initial proposal of five dimensions and 69 items, which are reduced to 34 items divided into the five dimensions established. A quantitative analysis is carried out with comments and suggestions from the experts, and a quantitative analysis showing favourable values for the Aiken V.

In relation to the statistical analysis of the CIGED scale, we performed the AFE, stating, firstly, that the data collected from the sample were adequate for the analysis. The Unweighted Least Squares (ULS) factor analysis technique was used, reducing the questionnaire to three factors and 22 items. Subsequently, the CFA and reliability analysis is carried out, eliminating a total of six items to confirm the validity and reliability of the scale. Favourable data are obtained in the test for exact fit and in the fit measures, with favourable CFI, TLI, SRMR and RMSEA indicators. In addition, the scale manifests favourable reliability data in Cronbach's alpha, composite reliability and mean variance extracted.

In line with the discriminant validity, it is determined that the scale groups dimensions related to each other (convergent) and that, in turn, each one evaluates a different subject (divergent). Also, the psychometric properties of the scale showed adequate values for variance, correlation, skewness and kurtosis.

After the analysis of the evaluation of the group of experts, the AFE, the AFC and the reliability analysis, the CIGED scale was found to be a valid and reliable questionnaire for a sample of women and men. The final structure of the questionnaire is as follows: Dimension 1. Sports Growth - 6 items (1.A. Accessibility and Growth - 3 items; 1.B. Work-Family Balance - 3 items); Dimension 2. Material Barriers - 3 items; and Dimension 3.

Finally, the main practical implications are related to the implementation of the questionnaire in different sports contexts, with the aim of analysing the existing effective equality. This questionnaire can be used in various population groups, both for women and men, who develop their sporting life as athletes, coaches, referees and people in leadership positions. In this way, it contributes to the increase of studies on gender perspective, in order to analyse the existing situation and to develop positive action measures that approach the achievement of effective equality in sport. Finally, the principle of intersectionality can be taken into account in these future studies, selecting the study variables related to a possible situation of multiple discrimination in sport.

### Limitations

The main limitations are associated with the sample size. A first validation of the study was carried out only with European women, where the data were not reliable and the information collected from this sample could not be used. In the second validation, a similar sample is not obtained between men and women, with a larger male population; also, the sample does not manage to represent the entire event.

In relation to the characteristics of the instrument, after the validation, the Social Recognition dimension was completely eliminated, and there were no items distributed in other dimensions. Also, the correlation analysis does not show strong relationships between the dimensions of the questionnaire.

### AUTHOR CONTRIBUTIONS

All authors have contributed to all phases of the project. María Carboneros: design of the study, development of the theoretical bases, analysis and interpretation of the data and writing of the article. José María López-Gullón: study design, data collection, writing the article. Salvador Angosto: study design, data collection, data analysis and interpretation, and writing of the article.

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No potential conflict of interest was reported by the authors.

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